

SYMPOSIUM

The cognitive impenetrability of early vision: What's the claim?*

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Abstract Raftopoulos' most recent book argues, among other things, for the cognitive impenetrability of early vision. Before we can assess any such claims, we need to know what's meant by "early vision" and by "cognitive penetration". In this contribution to this book symposium, I explore several different things that one might mean – indeed, that Raftopoulos might mean – by these terms. I argue that whatever criterion we choose for delineating early vision, we need a single criterion, not a mishmash of distinct criteria. And I argue against defining cognitive penetration in partly epistemological terms, although it is fine to offer epistemological considerations in defending some definitions as capturing something of independent interest. Finally, I raise some questions about how we are to understand the "directness" of certain putative cognitive influences on perception and about whether there's a decent rationale for restricting directness in the way that Raftopoulos apparently does.

KEYWORDS: Perception; Cognitive Penetration; Modularity; Perception/Cognition Distinction; Early Vision

Riassunto *L'impenetrabilità cognitiva della visione primaria: di che si tratta?* – L'ultimo libro di Raftopoulos argomenta, tra le altre cose, in favore della impenetrabilità cognitiva della visione primaria. Prima di poter vagliare un'affermazione di questo tipo, bisogna sapere cosa si intende con "visione primaria" e con "penetrazione cognitiva". Nel mio contributo a questo simposio prenderò in considerazione diversi elementi cui ci si può riferire con questi termini – e a cui, nei fatti, Raftopoulos potrebbe riferirsi. Sosterrò che qualsiasi criterio si scelga per descrivere la visione primaria, è necessario che si tratti di un criterio singolo e non di un insieme di criteri differenti. Presenterò quindi un argomento contro la definizione della penetrazione cognitiva in termini parzialmente epistemologici, sebbene sia utile offrire considerazioni epistemologiche nel difendere alcune definizioni come definizioni che colgono qualcosa di indipendente dall'interesse. Solleverò infine alcune questioni relative a come dobbiamo intendere la "direzionalità" di certe presunte influenze cognitive sulla percezione e se ci sia una ragione soddisfacente per restringere la direzionalità nel modo in cui Raftopoulos, a quanto pare, la restringe.

PAROLE CHIAVE: Percezione; Penetrazione cognitiva; Modularità; Distinzione percezione/cognizione; Visione primaria

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ATHANASIOS RAFTOPOULOS' NEW BOOK is an extension and elaboration on themes he's defended in earlier work, concerned mainly with the distinction between early and late vision, the cognitive encapsulation of the former and penetrability of the latter, and the epistemological consequences of both. The book is wide ranging and discursive, and I won't try to address all of its topics in all of their aspects. I will focus on one of the claims I take to be central: that early vision is cognitively impenetrable.

Some of us were first introduced to philosophy – although this self understanding was already out of date at the time – as a discipline concerned primarily or entirely with the careful analysis of concepts. “What is knowledge?” or “what is virtue?” were the paradigmatic questions, and the way to answer them was to do conceptual analysis: to give a definition: a list of necessary and sufficient conditions that included all the commonsensically obvious instances of knowledge or virtue, and that excluded all the commonsensically obvious instances of non-knowledge and non-virtue. Definitions would be subjected to (often elaborate and arcane) putative counterexamples to see whether our intuitions about these hypothetical cases comported with the proposed analysis. The use of intuition was by design, as the goal of the endeavor was to elucidate the *ordinary*, or *folk*, pretheoretic concept of knowledge or virtue or whatever. Ours may not be the only concept of virtue, or even the best concept of virtue (whatever that might mean), but it's *ours*.

Those days, thankfully, are over. Or at least they are in the philosophy of mind. (Epistemology still sees frequent application of intuitive counterexamples, but even this is rarely couched in a framework that explicitly sees the philosophical effort as aiming to elucidate our folk concept; instead there's now a lot of nodding to Carnapian explication, or conceptual engineering, or what we want our concept of knowledge (for example) to *do*.) Our concerns are no longer with our pretheoretic concepts, but with questions

about how the mind works. To that end, we need clear and fruitful concepts, the discovery and articulation of which is part of what philosophers are best trained for; but they needn't be pretheoretically familiar. Clarity and fruitfulness are only loosely related. Although maximal fruitfulness demands at least minimal clarity, some concepts or frameworks can be relatively fruitful without being exceedingly clear, and concepts can be quite clear without being at all fruitful. Our training in the analytic tradition has perhaps equipped us better for clarity than for fruitfulness. This is good as far as it goes, however, since that clarity is quite welcome.

I say all this by way of warning, because I'm going to spend a lot of time here asking superficially similar questions, in particular, “what is early vision?” and “what is cognitive penetration?” and I want it to be very explicit up front that I don't mean for these to be answered by anything very much like conceptual analysis. Instead, I'll be meaning to ask, what does Raftopoulos mean by these terms, and is this a good thing to mean by them? That is, I'll try to clarify these terms/concepts and assess their fruitfulness.

1 Early vision

Central to this book is Raftopoulos' distinction between early vision and late vision. The distinction is a familiar one, although this is not to say that everyone uses it the same way. What does Raftopoulos mean?

It's hard to tell, unfortunately. One searches in vain for a sentence starting with “... By “*early vision*” I will mean ...”. Raftopoulos seems to think we all know more or less what's meant by “early vision”. And I do, more or less. But since he's going to be arguing that early vision is encapsulated and late vision is not – and this is supposed to be an empirical discovery, rather than a stipulated way to draw that very distinction – we need to know more exactly where that line is. As far as I can tell, he has three different ways of drawing the early/late distinction: one by

representational *contents* (roughly, attributing structural rather than categorical properties), one by representational *format* (iconic rather than symbolic), and one by timing (formed in less than 150 – or maybe it's 170 – ms after stimulus onset). There's a fourth possibility, but I'll save it for later, as I don't find anything in this text that really even hints at it.

The distinction in terms of contents is straightforward enough, even if the boundaries are a bit more vague than we'd like:

The role of early vision is this. Early vision delivers a structural description of the visual scene that contains information about 3D shapes as viewed from the perceiver, spatio-temporal and surface properties, color, texture, orientation, motion, and affordances of objects, in addition to the representations of objects as bounded, solid entities that persist in space and time.¹

Identifying and categorizing [objects] is the role of late vision.²

Let's call the former sort of information "structural" and the latter "categorical". Raftopoulos writes here merely of the *roles* of early and late vision, but it's possible that he means for this to be definitive of the early/late distinction.

At the same time, it is clear that Raftopoulos also thinks that the early/late distinction is marked by a difference between iconic and propositional representations:³ early visual representations are iconic, while other (late visual and cognitive) representations are propositional or hybrid. I say "marked by", rather than "constituted by", as he never explicitly states that iconicity is what makes for the early/late distinction, and I'm not sure whether or not that's his view. Even if it is, I'm unsure whether we should take this as a restatement of the content distinction, or a competitor, because I'm not sure what Raftopoulos takes iconicity to be.

I myself would have taken iconicity to be

a matter of format, not content. Thus, Raftopoulos' mention of iconic "content"⁴ strikes me as oxymoronic. Other times, he writes of iconic (or propositional) "structure"⁵ or "format";⁶ also sometimes about the iconic "image",⁷ all of which I would read as specifying format/structure, not content.

To clarify, consider a subway map. Stops along the lines ("lines" in the sense of *tracks* in the world) are represented as circles along colored lines (lines now in the sense of *curves* on the map), and the ordering among the circles represents the ordering of the stops. Rounded rectangles represent stations where one can transfer from one line to another. The shape and length of the lines don't represent, and color only represents sameness or difference of track. A subway map is an iconic representation, but it's iconic in virtue of its form, not its content. All the content of a subway map could be conveyed in propositional format (a verbal description of which stops come before or after which), although this would be clumsy and unwieldy. The map is vastly more user-friendly, but in virtue of that iconic format. The reason the map is user-friendly, and what makes it iconic, is that it represents in virtue of an abstract structural isomorphism between its own elements and the parts of the thing it represents: spatial relations (in this case, only order relations) among the stops are mirrored by spatial relations among the circles on the map.⁸

Is this, or something like it, what Raftopoulos means by claiming that the outputs of early vision are iconic? His talk about the iconic "image" suggests it is,⁹ as does his reference to Burge¹⁰ and Burnston.¹¹ The frequent talk about "iconic *content*" on the other hand, suggests otherwise. He might, of course, think that the contents carried by iconic representations in vision differ systematically from the contents carried by propositional representations. Early vision might output structural information in an iconic format. But it's a priori unlikely that a distinction that rests on contents will draw the line in the same place as a distinction that

rests on format. Even more so when we recall what “structural” contents are on Raftopoulos’ view. While shape and motion and the likely are obviously amenable to picture-like, isomorphism-based representation, it’s unclear in what sense affordance representations, or representation as of solidity or as of persisting in time, etc. might involve isomorphism in any nontrivial way. Representing something as climbable seems to require a symbolic predicate or something that functions as such. It’s unclear what kind of representation might be structurally isomorphic to climbability, or what that might even mean.¹²

Throughout his discussion, Raftopoulos also indicates that early vision happens ... well, *early*, in the sense of happening in a short number of milliseconds post stimulus onset, and not merely happening before certain other operations. Quite often he argues that a certain effect would be an effect on early vision, or on late vision, because it happens a certain number of milliseconds post stimulus. Given the importance of this line of argumentation,¹³ it’s surprising and disconcerting that he never tells us what the cutoff number is or how it was chosen. With a hefty bit of sleuthing, one figures out that Raftopoulos will count anything computed before 150 ms to be early¹⁴ and anything after 170 ms to be late.¹⁵ He is fairly explicit that these short latencies are at least (partly) diagnostic of early vision, perhaps (partly) constitutive:

What characterizes early vision is not the neuroanatomical sites that it involves but rather the functions that it computes and the time frame within which it does so.¹⁶

Again, the talk is about characterization, not constitution. Is this what makes for early vision, or it is just a symptom? Furthermore, I can’t tell if this is the claim that meeting either the functional or the temporal constraint suffices for early-ness, or whether a state needs to meet both. Must a state, say, represent a structural feature of distal objects *and* do so before 150 ms? Or is the function

computed sufficient, even if it sometimes takes in excess of 170 ms?

Maybe, again, it’s supposed to be that these will (often? always?) overlap: that the structural information cited above will (often? always?) be computed within 170 ms. But he hasn’t given us any argument for this. Nor is it clear (to me, at least) where that number (150, or 170) is coming from. If it’s just a number pulled out of the air, we could define an early/late distinction on its basis, but it clearly wouldn’t be an interesting distinction. It *might* be coming from Lamme’s theory about local recurrent processing (LRP),¹⁷ given that LRP provides a reasonable place to draw some line or other, and since LRP is plausibly not cognitively penetrated, and since LRP gives way to global (penetrated) recurrent processing around 150 ms. This is the fourth possible way of drawing the early/late distinction, as mentioned above. But this is really just me guessing; Raftopoulos never even explicitly states the numerical threshold, let alone ties it in with Lamme. Given how easy it would have been to make this explicit, his not doing so makes it hard to have any confidence. Even if this is what’s driving the 150-170 ms cutoff, it is far from clear that this functional criterion for an early/late distinction (being the result of the feedforward sweep, plus local recurrent processing) is going to map even approximately onto either the content constraint or the format constraint.

None of this is to say that there couldn’t be an argument for thinking that these three (or four) criteria are all roughly coextensive, that they all draw the early/late distinction in the same place. Rather, the point is that Raftopoulos hasn’t offered such an argument here.

In earlier work, Raftopoulos,¹⁸ like Pylyshyn,¹⁹ took a very different approach: if you stipulate a priori that early vision is whatever stage of vision is encapsulated, there’s then an empirical argument (from Lamme, etc.) for thinking there *is* an encapsulated stage, and then subsequent empirical questions about the contents of early (/encapsulated) vision, the timing, the for-

matting, etc. That works fine: you get one stipulation and then have to argue for nonemptiness and for any further coextensiveness. The first one is free, but you have to pay after that. Here, however, the approach seems to be to stipulatively define early vision by some combination of content, format, and temporal grounds, and then empirically argue for encapsulation. That first move cannot be allowed, however, unless the combination is clearly specified (is it just one? all three? disjunctively or conjunctively?); even then, an empirical argument is immediately needed for thinking that anything satisfies it.

■ 2 Cognitive penetration

For several years now, there's been a renewed debate about the cognitive penetration (CP) of perception, and a big part of that debate has centered on the definitional question of what we should count as cognitive penetration. As mentioned at the outset, I think no one involved in this debate thinks that this question is to be answered by conceptual analysis, in the style of "what is virtue?", but with this off the table, it's not always clear what would count as evidence for, or give content to, claims about cognitive penetration. Suppose you and I agree that there are attentional effects on early vision, and we agree about what those effects are, but I insist that this constitutes CP and you deny it. What, other than the words, are we disagreeing about?

Any defense of the claim that perception is cognitively encapsulated, and likewise, any defense of a definition (or other statement or characterization) of cognitive penetration of perception embodies at minimum a commitment to the idea that the allowed cognitive influences on perception (i.e., the ones that are admitted to occur and/or are excluded from counting as instances of CP) are different, in important ways, from the prohibited ones (i.e., those that are held not to occur and are conceded would amount to CP if they did). That is, there must be significant

and principled differences between the allowed influences and the prohibited ones.

Such a defense and such a definition are among the main ambitions of the book. Raftopoulos discusses five different statements/definitions of CP, by Pylyshyn, Stokes, Macpherson, Siegel, and Wu, rejecting them all as inadequate in various ways, before offering his own definition. So what, then, is Raftopoulos' improved definition of CP?

It's hard to tell, unfortunately; again, the reader is required to piece together a number of scattered clues. I'll walk us through some of this in detail, to convey a sense of what the book is like. The one thing he calls a definition isn't one, and it wouldn't be *his* definition even if it were a definition. I quote in full:

CP revisited: A cognitive state C cognitively penetrates a perceptual state P when C partially causes P, and the causal chain from C to P is

- (a) mental and internal in the sense that it is contained entirely within the subject;
- (b) C does not act so as to merely select the input for P;
- (c) C affects the perceptual processes that lead to the formation of P in the sense that these processes use information contained in C. The information contained in C is used by the processes that issue P in an online manner, that is, it is used during the course of the processes underwriting P and it does not simply fix the values of some parameters that figure in the state transformations in which the processing in P consists. It follows that when C penetrates P, the conceptual contents of C (or a subset of them) enter the contents of P;
- (d) C may affect P in a top-down manner, or C may be imbedded in the processes that issue P.
- (e) The cognitive effects on perception should be such that if perception is CP, it is nomologically possible for two viewers (or for the same viewer at different times and circumstances), to have perceptual

states with different contents while seeing the same distal stimuli under the same external conditions.²⁰

I don't think this is a definition by anyone's lights. It looks like we are about to see five conditions the causal chain from C to P must meet, for that influence to count as a CP, rather than a non-CP influence. Instead, we get something different; in fact, the last two items, (d) and (e), are, as far as I can tell, simply explanatory glosses, commentary on what the earlier (a)-(c) do and don't exclude. *CP revisited* is really more of a wish-list for a definition, a summary of what was worth salvaging from the previous definitions.

Even cleaned up, I don't think this is what Raftopoulos wants to offer as his definition of CP. We would have something like the following:

CP RE-revisited: A cognitive state C cognitively penetrates a perceptual state P if and only if C partially causes P, and

- (a) the causal chain from C to P is mental and internal in the sense that it is contained entirely within the subject;
- (b) C does not act so as to merely select the input for P; and
- (c) the information contained in C is used by the processes that issue P in an online manner.

I think if we could unpack the idea of using information in an online manner, condition (c) would render (b), and perhaps (a), superfluous.

But this still won't be Raftopoulos' definition, since he wants to include an epistemic criterion of some kind: «one should extend the definition of CP so that any cognitive influences that affect the epistemic role of perception should be deemed as a case of CP». ²¹ This way of putting it suggests that his view is that a causal influence is an instance of CP iff it meets either all three of (a) and (b) and (c); or

(d') C's influence on P affects P's epistemic role or status.

Elsewhere, however, he suggests something much closer to the view that (d') is a conjunct, not a disjunct: «the extended directness condition conjoined with the revised epistemic condition yield a sufficient and necessary condition for CP». ²² These conditions are:

Revised Epistemic Condition for CP: If perception (or a stage of it) is cognitively influenced in a way that either renders it unfit to play the role of a neutral epistemological basis by vitiating its justificatory role in grounding perceptual beliefs in a philosophically interesting way, or enhances its epistemic status, perception (or a stage of it) is CP. If perception (or a stage of it) is cognitively influenced in a way that does not affect its epistemic role it is CI [i.e., cognitively impenetrable]. ²³

(He can't really mean this last sentence. He can't think that being susceptible to some epistemically neutral influences makes a stage of perception ipso facto encapsulated; he must mean instead that no epistemically neutral influences contribute to or constitute CP).

Extended Directness Condition for CP: Visual processes that are intrinsically or directly, in the sense explained above, affected either in a top-down manner or from within by cognitive states are CP. ²⁴

Let's suppose for now that we understand what's meant by «intrinsically or directly» (the «or» here is used to indicate synonymy, not disjunction). Then, since «the extended directness condition conjoined with the revised epistemic condition yield a sufficient and necessary condition for CP», ²⁵ the view is:

CPI: a cognitive influence on perception is an instance of CP iff (i) the influence is direct, and (ii) that influence affects the epis-

temic role or status of the perceptual state.

I have reservations about both conjuncts. I'll start with the epistemic one.

2.a *The epistemic criterion*

First, the theoretical role of the epistemic criterion is puzzling. It was supposed to «augment the definition»²⁶ from directness, but it seems to supplant it instead. This is because the *Revised Epistemic Condition*, even with my friendly amendment, states necessary and sufficient conditions for CP, not just a necessary condition. It therefore yields

CP2: a cognitive influence on perception is an instance of CP iff it affects the epistemic role or status of the perceptual state,

where directness drops out as irrelevant.

Second, I worry that building epistemic requirements into one's definition of CP (a la CP1 or CP2) is a bad idea, at least if we understand "epistemic" in any obvious sense. (I'll consider a non-obvious sense below, in connection with directness).

For one thing, we want a concept of CP to be of use to cognitive scientists who study perception. But we don't want those scientists to have to solve esoteric problems in epistemology in order to assess evidence about CP. "Seemings internalism"²⁷ is the view that one's perceptual justification is determined entirely by how things perceptually seem to them. On this view, *no* cognitive influence has *any* epistemic effect in the relevant sense.²⁸ Do we really want perception scientists to have to determine whether or not seemings internalism is true, in order to adduce evidence about the cognitive penetrability of perception?

For another thing, and relatedly, it strikes me as a bad plan to inject the normative concept of *epistemic effect* into a metaphysical or scientific definition. Surely we want to understand neurocognitive phenomena like CP in a way that is fully and obviously natural-

istic. And that shouldn't depend on whether epistemology turns out to be naturalizable.

For yet another thing, the epistemic criterion threatens to either overattribute or underattribute CP, depending on whether something like seemings internalism is true. The latter is unacceptable to Raftopoulos because he is committed to the CP of late vision. But on any epistemological view whereby cognitive penetration *does* have epistemic effects,²⁹ other forms of cognitive influence besides CP also have similar epistemic effects: perceptual justification can be downgraded (or upgraded) due to pre-perceptual or post-perceptual attentional effects, as well as by CP. This is supported by the standard thought experiments that motivated the epistemic downgrade thesis in the first place – if you think that Gus's belief that he's found gold³⁰ is unjustified in virtue of being a case of wishful seeing, or that my belief that there are snakes in the woods³¹ is still justified, even though it's a case of fearful seeing; those epistemic verdicts don't hinge on any detailed descriptions or assumptions regarding the mechanism by which cognition influences perception. I have argued explicitly,³² and it's been echoed by Siegel,³³ that the *locus* of cognitive influence is of very little epistemic significance, and therefore, CP proper isn't epistemically interestingly different from other forms of cognitive influence on perception.

Third (that last point just now was 2c of the objections to the epistemic conjunct), the epistemic criterion seems to be the wrong tool for the job. The idea, at least so I thought, was to mount an epistemic defense of Raftopoulos' novel definition of CP: we defend a definition of a theoretical term/concept not by its making the pretheoretically correct categorizations, a la traditional armchair philosophy, but by its providing a fruitful way to divide up the phenomena. If Raftopoulos' definition captures an important epistemic distinction (contrary to what I've just suggested), then that explains the sense in which it is an *improvement* over the five CP definitions that he rejects. This

would work much better, I think, if he were to endorse not an epistemic *criterion* for CP, but an epistemic *motivation* for some other criterion. That is, it's not that having epistemic consequences is part of *what it is* to be CP; it's that having epistemic consequences is what makes a directness (for example) criterion for CP a sensible, fruitful criterion, one that carves nature at some real joints, one that yields a concept of CP that we might reasonably care about. This line of defense seems to me much more convincing if epistemic significance is something that follows from the definition, instead of being explicitly built into the definition.

Thus, I think Raftopoulos would be better off endorsing something like

CP3: a cognitive influence on perception is an instance of CP iff the influence is direct.

Epistemic factors could be left out of the definition, thus avoiding all the problems just enumerated, but they could still be used to explain why this concept of CP is better than everyone else's concept of CP. It also has the virtue of simplicity, and also the virtue (for the present purposes) of being a thesis that *Raftopoulos believes is true*. He thinks that an influence affects the epistemic role or status of the perceptual state iff that influence is direct, so he would accept all of CP1-3. It is therefore somewhat surprising that we never get either a compact statement of CP3, or certainly a clear statement of something like CP3 as Raftopoulos' definition of CP. Maybe he thinks that an epistemically laden definition of CP is more innovative than a directness account and for that reason eschews the simpler and cleaner formulation.

2.b The directness criterion

This, I think, is the best version of his view, and it alleviates the worries I've just expressed about the epistemic conjunct of CP1. But as I mentioned, I also have reservations about the directness conjunct.

First, the central notion of directness is rather unclear, especially in light of how much work it's doing in the overall theory. The *Extended Directness Condition*, quoted above, refers back to influences that operate «directly, in the sense explained above».³⁴ But all one finds “above” is this:

The top-down cognitive effects on perception can be broadly categorized into two classes. The first concerns the effects that emerge as a part of perceptual competition and, as such, are intrinsic or direct to the perceptual processing. The second class concerns the effects that do not emerge as part of perceptual competition and, thus, are external to perceptual processing even though they causally affect it.³⁵

Elsewhere, we find:

A cognitive effect on perception is direct if it affects the perceptual processes themselves. Otherwise it is indirect.³⁶

These do too little to clarify this important concept. In fact, Raftopoulos seems to have three different things in mind by “directness”, at different points. They are:

- (a) affecting perceptual processes, as opposed to pre-perceptual, or post-perceptual processes³⁷
- (b) affecting how the inputs are processed, rather than which inputs get processed³⁸
- (c) affecting processing «in an online manner»: ³⁹ coming into play after that processing has begun and before it is finished.⁴⁰

These are distinct. The first is obviously of little use in the present context, as it presupposes a boundary around perception and thus can't be used to establish one. The second one is clear enough – if we don't press it too hard – it's the distinction between an influence that changes the inputs to a process and one that changes the mapping from inputs to outputs. Importantly, this is *not* the distinction the third gloss on di-

rectness is making; here the influence might well change the input/output mapping of some system/process/mechanism, but it doesn't count as "direct" if this remapping gets done before the system/process/mechanism is turned on. (b)-directness and (c)-directness are orthogonal: neither one (nor its negation) implies the other (or its negation).

I don't see why (c)-directness ought to be labeled as *directness*, unless it's in an effort to ride on the coattails of (b)-directness, which, *prima facie* at least, does reasonably qualify as a kind of directness and seems to mark a real and important distinction between two modes of cognitive influence. Raftopoulos presumably means that a cognitive influence is direct in the sense relevant to CP iff it is both (b)-direct and (c)-direct. But then relying on directness, thus construed, to ground a definition of CP requires both that (b)-directness is coherent and that (c)-directness marks some kind of real, noteworthy (presumably epistemic) distinction. I doubt both of these.

I allowed above that (b)-directness is clear enough if we don't press it too hard. Let's press it though. It is the distinction between changing the inputs to something, and changing the input/output mapping computed by that thing. Suppose that you and I read a news article about a protest that ended with police violence. We agree about all the material facts, including that both the protesters and the police made mistakes that led to the violent outcome, but I put great emphasis on the mistakes the police made and am rather dismissive about the mistakes the protesters made. You are the opposite. Consequently, I come to the conclusion that the police were mostly to blame, and you come to the conclusion that the protesters were mostly to blame. Is the difference between you and me a difference in processing, or a difference in inputs? If I give *any* weight to the mistakes of the protesters, it looks like the difference is one of processing, not inputs. But even if I give *none*, it's not like I don't have the information; it's just that I've opted to ignore it – which again seems like a differ-

ence in processing, not inputs.

And yet, in the perceptual case, this distinction between difference in processing and difference in inputs is supposed to do real work. It's supposed to rule out standard Necker-cube-type shifts of covert spatial attention from counting as direct (and thus cognitively penetrating) influences on early vision. But we know that unattended stimuli are often still processed to some extent, so it's not literally true that they no longer serve as inputs. One could insist that "inputs" that don't win the competition weren't inputs after all, since they don't determine the output, but this would obliterate the distinction between output-affecting changes in processing and changes of inputs. It seems then that (b)-directness only really works as a metaphor: changes in spatial attention are *like* changes in inputs. We'll need more than a metaphor if this is to ground our scientific understanding of CP.

Raftopoulos is committed to the encapsulation of early vision. The biggest challenge to this view comes from pre-cueing effects: subjects on the lookout for some object or feature exhibit enhanced perceptual processing for that object or feature. To take just one example, hearing a word might enhance visual processing of that word, in a way that makes subjects able to see degraded letters that would otherwise remain invisible.⁴¹ Because this is not a matter of attending to different regions of the distal array, there's no chance these effects can be equated with moving one's eyes and thereby a violation of (b)-directness. Raftopoulos responds to these kinds of cases by admitting that they involve a change of processing function (not a change in inputs), but this doesn't make the influence direct in the relevant sense, apparently because the rejiggering of the input/output function happens *prior* to the beginning of processing.⁴² It's not "online" and thus not (c)-direct, even though it is (b)-direct. This is odd. It's obvious – trivial, even – that *pre-perceptual* effects of the sort that concern (a)-directness are not perceptual effects; but what is at issue here is something very different. The pre-cueing effects of in-

terest are not “pre-perceptual” in the ((a)-directness) sense of occurring before inputs to the perceptual process are determined; they’re “pre-perceptual” in the sense of occurring before *stimulus onset* (or at least before the processing of that stimulus is initiated). (a)-directness carves nature at some real joints, if only because those very joints are presupposed in the distinction between perceptual and pre-perceptual processes. But there’s no reason to think that (c)-directness does the same, and thus that it’s anything more than an ad hoc move to retain impenetrability claims in the face of counterevidence.

Raftopoulos’ reply will invoke the Epistemic Condition: the distinction between (c)-direct and (c)-indirect cognitive influences is a real distinction and not a frivolous one, because the former are epistemically significant in a way that the latter are not. Note that if this response works, it works just as well if the epistemic considerations are intended to *motivate* the CP theory (as I suggest), as if they are intended to *constitute* CP (as Raftopoulos thinks). So, does this response work?

On the face of it, the Epistemic Condition has the opposite effect: it entails that pre-cueing effects constitute CP. Recall that the Condition states that «If perception (or a stage of it) is cognitively influenced in a way that either [...] or enhances its epistemic status, perception (or a stage of it) is CP». ⁴³ Since pre-cueing can make us better at seeing things that are barely visible, it enhances the epistemic status of perception, thus making perception CP. Raftopoulos clearly doesn’t want this result, so the Epistemic Condition must say something other than what it appears to say.

Above, I argued against the idea of building an epistemic condition in to a theory of CP, at least if “epistemic” is being understood “in an obvious sense”. The role or status of a perceptual state or perceptual belief, *vis-a-vis* justification and/or rationality, has very little to do with CP per se. Similarly, there is no reason to think that *online* cognitive influences on early vision would have a better or worse effect in this regard than the

corresponding pre-cueing effects, where the relevant detectors are biased in advance of perceptual competition, rather than after it’s begun.

But Raftopoulos also has some other broadly epistemic property in mind, besides justification; call it “tractability”.

[T]he reason why the indirect cognitive effects on any perceptual stage should not be considered as cases of CP is that by not affecting perceptual processes themselves, they do not affect the epistemic status of perception in a pernicious way, *in the sense that [sic] could be easily alleviated simply by asking viewers to refocus attention.* ⁴⁴

Pre-perceptual attentional shifts, even a seemings internalist would admit, enjoy the following (broadly) epistemic advantage over instances of real CP: the former are *tractable* in a way that the latter are not, because one could control and mitigate them simply by directing perceivers to focus their attention elsewhere.

I *think* what Raftopoulos thinks is that indirect cognitive effects are always tractable in this sense: easily remediated by instruction from someone with different cognitive states; and that direct cognitive effects are always intractable (i.e., “pernicious”) in that they are not thus remediable. This isn’t what the Epistemic Condition states, and it doesn’t fit with Raftopoulos’ insistence that even positive “epistemic” effects are sufficient for CP, but it does make sense of how he rationalizes the exclusion of attentional shifts.

I find this fairly plausible for spatial attention, but I don’t see how it extends to pre-cueing in general. He says ⁴⁵ that we could make the effects go away by simply pre-cueing perceivers differently, much as we might point to different regions of a reversible figure. These seem importantly different, however. I might have voluntary control over where I focus my attention, but if I have an overweening fear of ducks, what reason is there to think you could simply use pre-cueing to get me to attend

to the rabbit in the image, rather than the duck? What reason is there to think that changing what someone is anticipating or cognitively attending to – when this can't be accomplished simply by pointing – is any easier than changing someone's beliefs? But if it's not easier, then the effects of pre-cueing are no more tractable than the effects of "real" CP.

3 Conclusion

I have focussed here on just two of several themes in this rich and wide-ranging book: the nature of early vision and the nature of cognitive penetration. I have concentrated on disagreements and complaints, as is common in a book symposium; in addition, I have concentrated on questions of definition, which is not common in the philosophy of cognitive science. But I have done so here partly in the hope that it will give Raftopoulos an opportunity to clarify some of the main themes of his book, so that I and other readers might benefit from it.

Notes

¹ A. RAFTOPOULOS, *Cognitive penetrability and the epistemic role of perception*, Palgrave Macmillan, Basingstoke 2019, p. 125.

² *Ibid.*, p. 175.

³ Cf. *ibid.*, p. 18.

⁴ Cf. *ibid.*, e.g., p. 18.

⁵ Cf. *ibid.*, e.g., p. 21.

⁶ Cf. *ibid.*, e.g., p. 21.

⁷ Cf. *ibid.*, e.g., p. 11.

⁸ One of the reasons a subway map can be translated without informational loss into a propositional format is because, although it is an iconic representation, it is a digital representation. Raftopoulos, like many others, seems to equate iconic with analog (cf. A. RAFTOPOULOS, *Cognitive penetrability and the epistemic role of perception*, cit., e.g., p. 21). If "analog" is merely supposed to capture the notion of isomorphism ("analog" as in analogous), then subway maps are analog. But they're still digital in the sense of being discrete, rather than continuous, and one can't infer from their being analog in this isomorphism sense anything about their contents being continuous, fine-grained, dense, or

otherwise nonconceptual. For more on these distinctions, see J. LYONS, *Three grades of iconicity in perception* (in preparation).

⁹ Cf. A. RAFTOPOULOS, *Cognitive penetrability and the epistemic role of perception*, cit., p. 18.

¹⁰ Cf. T. BURGE, *Origins of objectivity*, Oxford University Press, Oxford 2010.

¹¹ Cf. D.C. BURNSTON, *Cognitive penetration and the cognition-perception interface*, in: «Synthese», vol. CXCIV, n. 9, 2017, pp. 3645-3668.

¹² He could, of course, claim that early vision representations have an iconic *element*, rather than insisting that they're fully iconic. This would make them hybrid, however, which was supposed to be one of the features characteristic of late, rather than early, vision.

¹³ Cf. A. RAFTOPOULOS, *Cognitive penetrability and the epistemic role of perception*, cit., especially pp. 173-198.

¹⁴ Cf. *ibid.*, p. 186.

¹⁵ Cf. *ibid.*, p. 179.

¹⁶ *Ibid.*, p. 183.

¹⁷ Cf. V.A. LAMME, *Towards a true neural stance on consciousness*, in: «Trends in Cognitive Sciences», vol. X, n. 11, 2006, pp. 494-501.

¹⁸ Cf. A. RAFTOPOULOS, *Cognition and perception: How do psychology and neural science inform philosophy?*, MIT Press, Cambridge (MA) 2009.

¹⁹ Cf. Z.W. PYLYSHYN, *Seeing and visualizing: It's not what you think*, MIT Press, Cambridge (MA) 2003.

²⁰ A. RAFTOPOULOS, *Cognitive penetrability and the epistemic role of perception*, cit., p. 118.

²¹ *Ibid.*, p. 123.

²² *Ibidem.*

²³ *Ibid.*, p. 122.

²⁴ *Ibid.*, p. 118.

²⁵ *Ibid.*, p. 123.

²⁶ *Ibid.*, p. 92.

²⁷ Cf. J.C. LYONS, *Critical notice of Chris Tucker, ed., Seemings and justification: New essays on dogmatism and phenomenal conservatism*, in: «Analysis», vol. LXXV, n. 1, 2015, pp. 153-164.

²⁸ Cf., e.g., M. HUEMER, *Epistemological asymmetries between belief and experience*, in: «Philosophical Studies», vol. CLXII, n. 3, 2013, pp. 741-748.

²⁹ Cf. J.C. LYONS, *Circularity, reliability, and the cognitive penetrability of perception*, in: «Philosophical Studies», vol. XXI, n. 1, 2011, pp. 289-311; M. MCGRATH, *Phenomenal conservatism and cognitive penetration: The "bad basis" counterexamples*, in: C.

TUCKER (ed.), *Seemings and justification: New essays on dogmatism and phenomenal conservatism*, Oxford University Press, Oxford 2013, pp. 225-247; S. SIEGEL, *Cognitive penetrability and perceptual justification*, in: «Noûs», vol. XLVI, n. 2, 2012, pp. 201-222; S. SIEGEL, *How is wishful seeing like wishful thinking*, in: «Philosophy and Phenomenological Research», vol. XCV, n. 2, 2017, pp. 408-435.

³⁰ Cf. P.J. MARKIE, *Epistemically appropriate perceptual belief*, in: «Noûs», vol. XL, n. 1, 2006, pp. 118-142.

³¹ Cf. J.C. LYONS, *Circularity, reliability, and the cognitive penetrability of perception*, cit.

³² Cf. J.C. LYONS, *Unencapsulated modules and perceptual judgment*, in: J. ZEIMBEKIS, A. RAFTOPOULOS (eds.), *The cognitive penetrability of perception*, Oxford University Press, Oxford 2015, pp. 103-122.

³³ Cf. S. SIEGEL, *How is wishful seeing like wishful thinking*, cit.

³⁴ A. RAFTOPOULOS, *Cognitive penetrability and the epistemic role of perception*, cit., p. 118.

³⁵ *Ibid.*, p. 117.

³⁶ *Ibid.*, p. 87.

³⁷ Cf. *ibid.*, e.g., pp. 32, 86, and 135.

³⁸ Cf. *ibid.*, e.g., 4, 87, and 95.

³⁹ Cf. *ibid.*, p. 118.

⁴⁰ Cf. *ibid.*, e.g., pp. 118, 136, 149, 199, and 207.

⁴¹ Cf. G. LUPYAN, E.J. WARD, *Language can boost otherwise unseen objects into visual awareness*, in: «Proceedings of the National Academy of Sciences of the United States of America», vol. CX, n. 35, 2013, pp. 14196-14201.

⁴² Cf. A. RAFTOPOULOS, *Cognitive penetrability and the epistemic role of perception*, cit., pp. 136, 195, and 207.

⁴³ *Ibid.*, p. 122.

⁴⁴ *Ibid.*, p. 120 - my italics; cf. also pp. 89, 121, 227, and 243.

⁴⁵ Cf. *ibid.*, p. 243.

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