*Journal of Consciousness Studies* 30 (3): 222-237. 2023.

Defending the malleability of perception

Reply to commentators: Dokic, Orlandi, & Vetter

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First I want to offer my most sincere gratitude to Jérôme Dokic, Nico Orlandi, and Petra Vetter. These are researchers whose work I hold in very high regard, and their productive, incisive commentary should make clear why. I hope this is just the beginning of a fruitful conversation.

One broad area of research that clearly interests all three commentators, and of course myself, is how to categorize components and processes in the human mind, and at what fineness of grain or level/s of explanation. And one high level question in this area is how cognition and perception should be distinguished. Vetter comes out as a sceptic about the continued importance of such a distinction: perhaps we need not or should not attempt to make it. Orlandi seems the most committed to grounding the distinction, and indeed suggests that maintaining some form of modularity may be the only such ground. Dokic’s view is that even maintaining some perception/cognition boundary, there is another distinction that crosscuts that one, namely, the distinction between personal and sub-personal mental processes. Although I vary in my level of agreement with each commentator, I want to try to thread together and employ elements of each commentary in a more unified reply. Hopefully this attempt isn’t futile. At the very least, hopefully the reply produces additional exchange and collaboration. After all, and as should be clear by the range and method of commentary in this symposium, successful theorizing about mental architecture requires a diverse and interdisciplinary collaboration.

The reply will proceed by discussing the following topics: the modularity of mind and its continued motivation, the epistemology of perception and possible top-down influence on perception, mental architecture and levels of explanation, underdetermination and theoretical decision space. Given the richness and range of the three commentaries, and limited space, some comments and criticisms will go unremarked. But this framing should enable address of the most important critiques, taken both individually and collectively.

*The resilience of modularity*

Based on recent progress in neuroscientific research, Vetter is the clear sceptic about the viability of the modular theory of mind. I’ll return below to whether that progress is in fact sufficient motivation to abandon modularity as a dead horse. Interestingly, Vetter also intimates what modularists have standardly taken to be a powerful evidence base for their view. She highlights the important representational function of perception, and then writes,

[O]ur everyday visual environment is complex and cluttered and creating a visual percept that allows us to act in this environment requires a lot of computations and a lot of cortical space. […] Informationally encapsulated modules for either perception or cognition would not be capable of achieving this – they would not be able to integrate the vast variety of different computations needed for each object in our cluttered environment on a functional time scale (Pg #).

Given its combination of representational function, and the stability that perception achieves despite remarkable environmental complexity, the modularist concludes in the opposite direction: perceptual reliability and stability are best explained by a computational model that achieves some robust functional independence. Since perceptual systems like vision must be fast and world-responsive, in addition to stable and reliable, they should be informationally encapsulated. Informational encapsulation putatively eliminates bias; and bias in perception undermines the observed stability and reliability. So, perception must be modular. Finally, functional independence in this form does not imply complete absence of cross-talk—absence of “integration” to use Vetter’s term. It just implies that the cross-talk is constrained to optimize performance. Thus the results of (modular) visual processing—visual experience—will be integrated with perceptual judgments, concepts, beliefs and other cognitive processes (while little or none of the latter bias visual processing). I rehearse this argument not because I think it is successful, but because perceptual success *can* beand *has* been used to support not undermine modularity. This evidence is ultimately *better* explained by malleability, or so I argue, but the abductive argument for modularity should not be dismissed too easily.

Orlandi agrees with this last sentiment, suggesting that modularity might be maintained as an epistemic ideal for our engagement with the world. They suggest this as one additional motivation for maintaining modularity. A second additional motivation, Orlandi proposes, is to ground the perception/cognition boundary. I’ll address these points in reverse order.

*The perception/cognition border*

One additional consequence of the cognitive penetrability of perception, Orlandi suggests, is “the dissipation of the border between perception and cognition” (Pg #). Modularity in the form of informational encapsulation would demarcate perceptual processes as distinct in kind from cognitive processes, since the first but not the second are supposed to be informationally encapsulated and therefore cognitively impenetrable. If one gives up modularity, then one gives up this way of marking the perception/cognition border. Here is a twofold response. First, I admit that this putative mark of distinction must be abandoned. But I accept this for independent, principled reasons. In *T&P* I argue that modularity is insufficiently supported by argument and empirical evidence, and is abductively inferior to a malleability alternative. If this means we cannot use it to distinguish perception from cognition, then so be it. However, and second, this does not entail that we must abandon the perception/cognition border. Earlier in the book I identify a handful of non-exclusive marks for the same distinction (as recounted in the précis in this symposium). Those marks don’t constitute a definition, and so as Vetter suggests they may not mark exactly where cognition starts and where it ends. So the distinction may be fuzzier than we would have hoped, but perhaps that hope was always misguided: we are talking human psychology not physics. Nonetheless, we do not need modularity to keep some version of a perception/cognition distinction intact.

*The epistemic importance of modularity*

Another motivation for maintaining modularity, Orlandi argues, is broadly epistemic. I think they are making two separable points here. First, Orlandi suggests that we may want to keep modularity as an epistemic ideal, as a way of underscoring our goal of objective perceptual representation. Second, we may want to maintain modularity since it enables us to keep the rationality of cognition and the a-rationality of perception; admission of cognitive penetrability is therefore tantamount to abandoning that mark of distinction. Orlandi further suggests that my central cases of emphasis—cases of perceptual expertise—do not obviously result in the important consequence of the rationality of perception. Before taking these points in turn, I want to extract an important general feature of Orlandi’s comments.

Modularists and anti-modularists both are interested in personal-level perceptual representation, and neither of them just in sub-personal computational processing. The observation may sound trivial, but a look at certain junctures in the cognitive penetrability debate reveals otherwise, since it has sometimes been suggested that modularists are interested only in sub-personal processing, by contrast to the central emphasis on perceptual experience maintained by advocates of cognitive penetrability. But this characterization is misleading. Much of the motivation for modularity, as I analyze in *T&P* and as Orlandi’s commentary further highlights, is epistemic. Informational encapsulation is supposed to better enable reliable, accurate representation of the world; violation of that encapsulation would putatively threaten that reliability. In the context of epistemology, reliability and accuracy concern personal-level (perceptual) representation; one’s experience is accurate or not. Dokic centres his commentary around roughly the same distinction, suggesting that perhaps my account will yield malleability at the sub-personal level while remaining compatible with modularity at the personal level. His rich analysis reveals additional layers of complexity in this theoretical context but does not yield a modularity-at-one-level-but-not-at-the-other result, and this because of the importance of personal-level representation to all parties (which Orlandi illustrates) and the physical, sub-personal grounds of that representation (which Dokic illustrates). More on this below.

Now to Orlandi’s critiques concerning the epistemic importance of modularity. They write,

Retaining modularity would permit us to keep the ideal of objective perception as a standard that we aspire to, and that we insist on when someone’s perceptions and perceptual judgments are skewed by patently bad theories.[…] This ideal is what motivates us to strive for better perceptions. The very notion of a better, more accurate perception presupposes that there is a type of perception that is objective – a type of perception that tells us *not* about what we already know, but about the structure of the world (Pg. #).

There is a lot to say here. First, a defence of modularity as an epistemic ideal is not a defence of modularity as a descriptive, computational posit. Traditionally, the latter has been the target claim. Second, a clarification to avoid confusion: my claims about cognitive influence on perception, most especially those involving expertise, are not that such individuals perceive what they already know or expect, nor that they are *not* perceptually sensitive to the actual structure of the world.[[1]](#footnote-1) Instead, it is the claim that one’s specialized and often cognitive training, and one’s goals and tasks, will sometimes determine *which* objective, structural features of the world one perceives. The expert goalkeeper and the sports doctor both pick up, through vision, objective features of the striker’s kick; it’s just that they pick up (some) different features, ones suited to their distinct, respective diagnostic tasks. Third, this underlines the inter-subjective objectivity that determines the success conditions for one’s perceptual experiences. It is this, rather than some purely mind-independent \*Objectivity, that “motivates us to strive for better perceptions”. But what counts as “better”, I argue, can vary across epistemic communities. Finally, and for these reasons, we do not need modularity as any kind of ground for an epistemic ideal. In different contexts, different information will be of epistemic and behavioural importance. Thus one’s goals, what one “strives for” perceptually, will vary from (often specialized) context to context. Plausibly, cognitively enhanced perceptual skill will better enable us to pick up the relevant information. Put another way, we should not assume that cognitive influence on perception is *pernicious*. Contrary to Orlandi’s suggestion and consonant with one of Vetter’s, it may be that malleability and the intersubjective, objective norms of a domain, deliver the better epistemic ideal.

*Perception and rationality*

On to Orlandi’s related but distinct discussion of the rationality-status of perception. They suggest that,

one common criterion for drawing the distinction between perception and cognition was and is to suppose that while cognition is a *rational* faculty, perception is not a rational faculty. Cognitive states, such as beliefs, are *evidence-*responsive, while perceptual states and processes are not. […] Cases of cognitive penetrability are cases that presumably demonstrate the reason-responsiveness of perception (Pg #).

And so, to abandon modularity is to accept the rationality of perception and give up the relevant criterion for distinction. As Orlandi puts it, “The claim that perception is rational is a radical consequence of cognitive penetrability and it is, I think, part of the motivation for continued interest in this phenomenon” (Pg. #). First, this is true for some but not all relevant theorists. Susanna Siegel and others, as Orlandi notes, have defended the claim that cases of cognitive penetrability open space for theorizing perception as rational, experience itself can be “evaluable as rationally better or worse” (Siegel 2017: 18). It’s important to note here that, for Siegel, this thesis is motivated not just by admission of cognitive penetrability of perception but by the allegedly inferential structure of perceptual processes. It is because, on this view, perception can result from an inferential process that we can then assess whether that process was structurally sound and involved “good inputs”, and its resulting experience reason or evidence responsive. Importantly then, admission of cognitive penetrability alone does not entail the rationality of perception. The relevant point here is that defending cognitive penetrability *could* be done by defending a rationality of perception thesis (since the latter may require but not be entailed by the former), as Orlandi seems to suggest, but that mode of defence is not necessary. There are other relevant consequences.

Orlandi will then insist that this particular consequence is radical, that is, especially important to the debate. And, they argue, the cases of perceptual expertise among others do not bear this consequence as I’ve explained them. Indeed, they suggest that since cases of perceptual expertise do not imply the rationality of perception (nor do they “dissipate” the perception/cognition border) they fail to result in “the sort of meaningful consequences that have been associated with cognitive penetrability” (Pg. #). Orlandi thus concludes that malleability is a red herring. A Red Herring! Well, matching fighting words with fighting words, this seems uncharitable and ad hoc.

What, then, does malleability commit to vis-à-vis the rationality *of perception*? In short, not much if anything. While there is some support offered for Siegel-type views of the rationality of perception, nothing about the proposed malleable architecture requires such an epistemology. But this does not imply that the architecture fails to result in “meaningful”, important consequences. The epistemic consequence I develop is virtue-theoretic, with important lessons for how we should think about perceivers in relation to their experiences.

As a virtue epistemology, the account treats agents rather than their doxastic or other states as the primary locus of epistemic evaluation. Accordingly, it doesn’t treat perceptual experience as rationally assessable. In the case of perceptual expertise, the emphasis is on how the perceiver, qua agent, has improved her perceptual contact with the world. Importantly, this does not always involve improvements in accuracy, but instead improvements in perceptual sensitivity to features that are behaviorally relevant and with less distraction from those features that are irrelevant. The perceiver bears some responsibility for these improvements. At the level of perception, she has achieved epistemic virtue. This is compatible with keeping cognition rational and perception a-rational.

There is space here for some additional rational evaluability. The perceiver bears some responsibility for perceptual improvement because she bears responsibility for the cognitive etiology to which her perceptual experiences are sensitive. That is, those improvements are a result of a cognitive etiology over which the perceiver has substantial voluntary control. The concepts the expert acquires, the skills she learns, the evidence to which she is attentive, these are all responsive to the perceiver’s reasons and evidence, as well as her goals and values. The resulting experiences themselves are not thereby rationally evaluable since they are largely automatic (just like non-expert experiences); they are not “reasoned” in any conscious or deliberate way. They are, however, a result of a background rational process and this is epistemically advantageous. In this way, the perceiver can be assessed as rational (or not), insofar as she is responsible for a cognitive background that can be evaluated both with respect to content and motivation.

Perceptual experts achieve epistemic virtue. Malleability allows this. This is a meaningful consequence. It alone suffices to show that malleability is no red herring. On my view, in the cognitive penetrability debate, one meaningful consequence from a disjunction of consequences is enough. Orlandi has nicely added another meaningful consequence to the list (a/rationality of perception), but tying the success of malleability to that particular consequence is uncharitable to the disjunctive account I’ve offered. To insist further that rationality is *the* consequence that is most important, that makes or breaks the likes of a candidate case of top-down influence on perception, is unprincipled. Indeed, to insist that it’s the consequence of central importance in the traditional modularity debate would appear to be ad hoc. For instance, Pylyshyn’s (1999) discussion of rationality concerns whether putative cognitive influence on perception is rational qua “semantically coherent”, and Fodor (1983) doesn’t seem to discuss rationality at all. Of course this is not to discount the importance of the rationality of perception question but instead to note that this is largely an innovation in the debate (which Siegel should be credited for) not a traditional fixture in it.

*Abandoning the default position assumption*

A relatively superficial survey of the literature reveals, in fact, that different theorists have highlighted different consequences for alleged cognitive penetration of perception. This has further contributed to the cross-talk that populates the debate/s. To re-emphasize once more, this gives more reason to move on from that debate—from central emphasis on cognitive (im)penetrability of perception—to a range of more interesting cases, and a plurality of explanations of such cases. Many of these cases are genuinely interesting and important instances of cognitive influence on perception, but perhaps not all of them will “count as” cognitive penetration. To insist that this renders them irrelevant is to dredge up the *default position assumption* all over again. If the proposed malleability encourages this move then there is a real sense in which it is a red herring: it widens the scope of theoretical interest and distracts from the myopia of a debate hyperfocused on cognitive penetrability, informational encapsulation, modularity. But if that is the force of Orlandi’s red herring charge, if malleability is a distraction in this sense, then I’d happily own this as success.

A general point about all three commentaries. Each one places substantial emphasis on cognitive penetration, offering critiques concerning how or whether I have successfully defended such a claim. This is understandable, since the first few chapters of the book do attempt a novel defence of this kind. (And much of my previous work attempted the same.) However, the book also advocates a move away from cognitive penetrability, focusing instead on perceptual expertise and a plurality of ways that cognition contributes to such perceptual skill. And again, the accordant malleability account does not depend upon successfully proving cognitive penetrability. So there is tension here: the book both engages the cognitive penetrability debate and then prescribes that we largely leave it behind. Perhaps this tension cannot be resolved but if forced, I’ll take the prescription and abandon the cake.

*Levels of explanation*

Dokic begins his commentary by rightly noting the distinction between personal-level perceptual experience and sub-personal perceptual processing. This distinction is relevant to the modularity debate, since accounts such as mine may be compatible with “the claim that perception is modular at the personal level even though perceptual processes are causally influenced by many types of non-perceptual processes at the subpersonal level” (Pg #). Computational processes might be malleable, while experience remains modular, Dokic suggests. I think this is indeed a “theoretical possibility”, and indeed there must be actual cases where a cognitive influence on sub-personal processing does not result in a subjectively identifiable difference in the phenomenal character of experience. And this because the neural correlates (at the level of sub-personal processing) for experience can be wider in scope, so to speak, than the particular components of processing that are cognitively influenced. Therefore, cognitive influence on perceptual processing does not guarantee cognitive influence on experience, even if the first counts as defeasible evidence for the second. All of that said, if mental architecture is broadly (“massively”) malleable as I’ve argued, then I think the case that Dokic describes will be relatively rare. Or at least such cases will not be common enough for a general claim about the cognitive impenetrability of experience.

First a point of clarification. Typically, the term ‘modular’ is reserved for sub-personal, computational processes. Fodor was explicit about this; it was perceptual *systems* or “input systems” that were supposed to be informationally encapsulated, therefore modular. So in one respect, it may not be appropriate to describe a personal-level experience itself as modular. However, it is perfectly appropriate to talk about experience as cognitively (im)penetrable (and I think this is probably what Dokic has in mind). Indeed, and as discussed above, the modularist shares this interest with their opponents given the putative epistemic motivations for a modular architecture. Now, assuming as Dokic does, that sub-personal perceptual processes output, subvene, or are the neural correlates for personal-level experience, an instance of the cognitive penetration of experience entails cognitive penetration of perceptual processing (somewhere in that process). That, simply, is why cases of cognitive penetration are supposed to threaten a modular architecture. For the same reasons, evidence for cognitive influence on perceptual processing will serve as evidence for cognitive influence on experience (but here again, there is not a strict entailment). The question then becomes: what additional evidence would support malleability of experience (or, if one insists, the cognitive penetration of perception)?

Here I think Dokic may set the evidential bar too high. In various places in his discussion, Dokic seems to suggest that the cognitive penetrability of personal-level experience requires either that an experience *E* takes on the attitudinal features of an influencing cognitive state *C*, or *E* inherits the (rich) content of *C*. I’d resist both as conditions on cognitive penetration, and would further resist them as conditions on interesting top-down influence on personal-level experience. Here is why.

While the empirical data may secure the conclusion that sub-personal processing is non-modular, Dokic argues that the data is compatible with experience remaining impenetrable in the sense that “it does not inherit the attitudinal features of intentions, desires or emotions” (Dokic Pg #). If experience is “passive and evaluatively neutral” then experience itself has not been importantly cognitively influenced. This requirement (or requirements) is too strong. If there are cases of “evaluative perception”, where a perceptual experience is charged or transformed with the nature or features of an influencing state (say where one’s visual experience takes on a motivational or value-involving attitude), those cases would suffice as strong evidence for cognitive influence on or penetration of experience (in addition to Prinz 2014 cited by Dokic, see Bergvist and Cowan 2018). But this is not standardly taken as necessary for such cognitive influence: lack of such evidence does not entail that the case in question is not one of cognitive penetration.

Consider a now familiar anecdotal type of case from the “revived” cognitive (im)penetrability literature. If I expect you to be in a foul mood and, as a causal result, then visually perceive your face to express grumpiness, this is alleged as a case of cognitive penetration or influence on visual experience. Most of the debated details to one side, neither the modularist nor their opponent will claim that this is *not* a case of relevant interest *because* the experience does not now function as an expectation (or, to take the emotion case, that a case is not relevant because the experience does not become, or is not charged with, an emotive attitude). Rather, the evidence for cognitive influence resides in the apparent fact that the visual experience I had (as of expressing grumpiness) depends on the background expectation. The cognitive state and the perceptual state stand in appropriate causal or counterfactual relations (about which there is debate of course). Likewise for familiar empirical cases. The subject’s desire for a reward does not render the visual experience motivational, it rather changes (allegedly) the visual perception of the distance or size of some relevant object. Whatever one says about this case, it seems that the allegedly influenced perceptual state need not inherit the motivational nature of the background orectic state in order to be appropriately described as cognitively penetrated by that state. After all, and as I’ve discussed above, the view is not that cognition and perception cease to be distinguishable and therefore cease to be marked by important differences. Malleability remains compatible with a perception/cognition border (even if, on my view, that border is not guarded by modularity).

Dokic’s second, related point, invokes richness of perceptual content. As I understand it, the suggestion is that one might explain relevant cases as *not* involving cognitive penetration because the perceptual content remains sparse. That is, there may be cases where a motivational, doxastic, or emotive state influences sub-personal processing but where the resulting perceptual experience has not been “enriched” by the influencing cognitive state and/or its content. Lacking such rich content, one might conclude, the experience has evidently not been importantly influenced by cognition. Here again, we seem to have a possible source of strong evidence for cognitive penetration—where the conceptual content of a background state is “admitted” into the resulting perceptual content—but this is not, as it were, a necessary source of evidence. Rich perceptual content and cognitive penetration have certainly been linked, and cognitive penetration could be a mechanism for enrichment of content (Siegel 2006 offers an early and useful discussion on this). But the first is not a requirement for the second. And here again familiar cases serve as illustration. In the memory colour effect studies, subjects appear to enjoy differences in basic colour perception as a result of background concepts (Witzel et al. 2011). Likewise for cases where racial bias appears to influence the colour perception of grayscale faces (Levin and Banaji 2006). In neither case is there enriched perceptual content, but both cases have been defended as cases of cognitive penetration or influence on perception. And so far as I know, opponents have not rejected these putative cases on the grounds that they involve only differences in low-level visual content. (To be clear: *T&P* does defend the claim that perceptual content can be enriched. It does not claim, though, that this is a condition on malleability or important cognitive influence on perception).

For these reasons, malleability is perfectly compatible with the *attributive* nature of perception. Experience on my view, like Dokic’s, is *transparent*. Extending the non-modular processing and modular/cognitively impenetrable experience alternative, Dokic worries that “If perceptual experience were causally influenced by mental states at the personal level, such as intentions, desires, emotions, or judgements, it would have a non-attributive phenomenology” (Pg #). Since the consequent would be a dubious result, we might conclude that experience is impenetrable (as Dokic sometimes puts it, non-modular). But I think the conditional as stated is false. Cases such as those I’ve discussed in the last few paragraphs, and throughout *T&P*, are not ones where experience becomes non-attributive. They are instead ones where the features attributed by experience differ as a result of background cognition. The experiences themselves do not, in such cases, become just like the background cognitive state/s. They need not take on the attitudinal nature of the influencing state/s, nor need they (necessarily) inherit the content of those states. If they did, then perhaps they *would* become non-attributive (and indeed that’s what would need to be added to the antecedent of the conditional to make the conditional true). But again, these are not conditions on cognitive penetration or interesting cases of cognitive influence on perception, at least not as I or others have defended.

In the end, I agree with Dokic’s conclusion:

The non-modularity of the perceptual system does not make the phenomenology of perception non-attributive; rather it extends the range of properties that perceptual experience can attribute to the world. […] Perception is shaped by cognitive processes that also shape our values, concern, and knowledge, but what it delivers to the subject is the world itself, or so it seems to us. (Pg #)

Where we disagree, I think, is on how to secure this result. Dokic indicates that we might secure the result by maintaining what he calls “modularity at the personal level”. I worry that this analysis assumes some overly stringent requirements for cognitive penetration or important cognitive influence on perception at the personal level (as just discussed). Abandoning those requirements, and considering the wide range of cases discussed here and in *T&P*, we have strong abductive evidence for important cognitive influence on perception. For a malleable architecture that enables cognitive influence and improvement to personal-level experience.

As a point about methodology, Dokic’s commentary raises important questions about the target/s for explanation in these debates. We have a choice for *explananda* between each of the following. We may be interested in personal level or subpersonal level mental phenomena, in causal relations between cognition and perception or in contentful relations, in computational systems or in experiential content. These distinctions crosscut, and in each case, we may be interested in both sides of the distinction. A related point about methodology concerns the *explanans*. Is there a single level of explanation, a single explanatory approach, that should be favored or maybe even win the day?

Vetter’s commentary suggests that the physiological, in particular the neural, level of explanation should take primacy. She suggests that while modularity may have been defensible when originally introduced decades ago that it is no longer tenable given progress in cognitive neuroscience. That empirical evidence, Vetter suggests, yields the verdict that “while functional specialisation of brain areas clearly exists, ‘informationally encapsulated’ modules for perception do not” (Pg. #). While I would like this verdict to be true, I’m not confident that it will come so easily. And this for two related reasons: underdetermination and a preference for multiple levels of explanation. On the first, I’m of course not a neuroscientist, but my sense is that the evidence that Vetter points to will still underdetermine the theoretical choice. As a computational posit, modularity appears to remain compatible with the updated neural evidence. Generally, the neural evidence seems insufficient to undermine or secure either broad architectural choice: modularity or malleability. This implicates the second reason: in attempting to best understand the human mind, we want to employ a variety of levels of explanation. In addition to the neural level, the best explanation will integrate data and findings at the levels of the physiological, behavioural, computational, and the phenomenological.

The result of this integration will be the same as Vetter’s: modularity looks much less plausible in the face of this range of evidence. The difference is that this result is secured in a less singular way, by appeal to physiological evidence (e.g. eye-tracking data), behavioural data (simply, how subjects behave in relevant circumstances), computational modelling (as one finds in research on perceptual expertise), and finally subjective reports and what they indicate about perceptual phenomenology. All in addition to the neural level. The overall arc of *T&P* takes precisely that form. Underdetermination remains but is mitigated. That range of data converges on a malleable architecture, and the opposed modular architecture looks much less motivated. This recapitulates Dokic’s broad methodological point: the best explanation is going to incorporate questions and evidence from both the subpersonal level (so, the neurological) and the personal level (so, conscious perceptual experience). Brain matters. Experience matters too.

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Underdetermination remains and it will remain. In the scientific theorizing of mind, we may be terminally stuck with it. To employ Vetter’s language, the brain just does not draw clear lines where we might want them (say, between cognition and perception, or on how they relate). Perhaps there are some important choice points in theorizing the structure of the mind, not to be made on descriptive or observational or straight empirical grounds alone. We may be partly in a position of decision rather than discovery. Suppose that this is the theoretical position we find ourselves in. A question surfaces: what other criteria might assist in making a choice between mental architectures? The answer I favor is not that we should choose the one that is easier or more intuitive (as Vetter intimates), but the one that enables better understanding of the world and of our own contact with it.

A modular architecture opts for a “fixed human nature” as Fodor sometimes put it. It is thus largely insensitive to who we are as individuals, to how we might change our perceptual contact with the world and enjoy perceptual differences relative to one another. Because it doesn’t allow for rich perceptual changes of that kind, it is at odds with differences in how we each understand the environment around us. *Understanding* is an important epistemic value, an achievement or skill that involves a sensitivity to or grasp of how a body of information (often specific to a context or domain) coheres. It is an appreciation of how parts “hang together”, of the patterns, coherence, structure, and relations between the elements that comprise a phenomenon, event, or domain of information. Perceptual experts are highly, perceptually sensitive to patterns, coherence, organization, and relations amongst parts. Plausibly, they achieve *perceptual understanding* in their contexts of specialization. But this achievement is accommodated only by an architecture that allows for robust perceptual change and improvement. That architecture is malleability. We might then favour one theory over the other for reasons that go beyond the purely descriptive or empirical. We might weight the theoretical choice instead partly in favour of the theory that allows space for the important epistemic goal of understanding, achieved perceptually. Again, given terminal underdetermination, perhaps that is a choice we should consider making. Perhaps this serves a better epistemic ideal than the pure Objectivity encouraged by modularity. It serves an ideal that keeps (intersubjective) objectivity, but is sensitive to individual differences in tasks, goals, needs, and cognitive background.

To push a bit further, I will conclude with a sketch (perhaps too existentialist in spirit for some). In addition to understanding (of the world), malleability might be preferred for enhancing self-understanding. This prescription correlates with the provocation that concluded the précis in this symposium. *T&P* concludes with the claim that, for each of us, our contact with the world is very much our own. As we live through our lives, we influence and enrich our very own perceptual processes, playing an active role in developing the contact that we make with the world. The cognitive contact we have and have had informs the sensory contact we have and can have. What environmental features one perceives is partly a function of who one is, what one has learned, what’s behaviourally relevant and important at that time. One understands oneself—one’s mind and how it situates in the world—more deeply when one comes to recognize the rich agency that one possesses over one’s perception and perceptual understanding. One better appreciates and understands the degree to which one is self-making when one appreciates how the intellectual choices one makes now—how one specializes, what concepts one is motivated to learn, what activities one practices and masters, and so on—may influence not just one’s future thinking but one’s future sensory perception of the world. This may go well, may achieve virtue, or it may go badly. And we bear that responsibility. This rich self-understanding is possible only if our minds are malleable in a pervasive and rich way, only if thinking can not only affect but also improve perceiving. Perhaps then, thinking of our selves, this is further reason—not a scientific or epistemic one but in addition to those, a humanistic one—to choose a malleable mental architecture. It puts more of us, as individuals, in our theory of mind.

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1. I don’t think they intended this, but some of Orlandi’s casting of non-modularist views here flirts with a familiar, and flawed, criticism that Fodor often made of New Look Psychology. He often argued that a claim about cognitive penetration comes to a claim that cognition is entirely “continuous” with perception. Cue the Muller-Lyer illusion. The problem is that neither those theorists, nor myself, make such a categorical claim (that all of one’s cognitive states can influence any perceptual process). This is also why the theoretical importance of the Muller-Lyer and other persistent illusions appears to be badly overstated. [↑](#footnote-ref-1)