Predictive Coding and the Myth of the Given

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1. Introduction

Two ideas have shaped philosophical theorizing about perception for a long time. Put roughly, the ideas are: (a) perceptual experience plays a key role in justifying our beliefs about the external world and (b) perceptual capacities are non-cognitive capacities. I call these two theses empiricism and non-cognitivism respectively. Setting some exegetical caveats aside, the conjunction of empiricism and non-cognitivism is the doctrine that is called the doctrine of the Given.[1]

As is well-known, despite its relative popularity, the Given has also met strong opposition.[2] A common claim among the dissenters is that the two theses that jointly form the Given are in deep tension with each other; nothing that is the result of the exercise of non-cognitive capacities can play the role that empiricism envisions. Hence, as Sellars put it, the Given is a "myth."

To save empiricism, skeptics about the Given often adopt the view that perceptual capacities are cognitive capacities. In what follows, I will refer to those opponents of the Given who do so as cognitivists. Thus cognitivism, as I will be using the term, is the view that empiricism is in deep tension with non-cognitivism and we can save empiricism by holding that perceptual capacities are cognitive capacities.

The overarching goal of this chapter is two-fold. First, I want to show that cognitivism is threatened by considerations that are similar to the ones that motivate it. To show this, I first develop an intuitive version of the orthodox argument against the Given and discuss how those who are motivated by this argument might react to some of the contemporary defences of the Given. This takes up the bulk of sections two and three and helps expose some of the core commitments of the cognitivist. I then argue in section four that given these commitments, cognitivists face a challenge that is similar to the challenge that they pose for the Given.

My second goal is to provide a positive solution to this challenge. This is done in the final section, where I show that cognitivists can overcome the challenge by combining their view with a predictive view of perception. Roughly speaking, on this view perceptual systems predict the incoming sensory inputs based on prior models of the environment. Divergence between the predictions and the sensory inputs are then used to update the models in a cascade of prediction and updating. When the system settles into a stable state where the predictions match the sensory input, the resulting model of the environment gives rise to perceptual experience.[3]

Strictly speaking, the main conclusion of this chapter is conditional: if you endorse cognitivism and the deep commitments that motivate it, then one way to remain consistent is to adopt a predictive approach to perception. Given this goal, I do not provide an in-depth defence of the cognitivist's commitments. This said, I do think that these commitments have intuitive appeal, and I will try to make this appeal clear to the reader. Thus, the chapter also provides an armchair,

[1] There is no standard definition of the Given. Correctly understood, it is an umbrella term for a collection of loosely associated ideas. McDowell and Sellars, for example, understand the Given in slightly different ways. See Bonevac 2002 and Watkins 2008 for discussion.
[2] Brandom 2002; Sellars 1956,1968; McDowell 1994, 2009a, 2009b.
[3] See Friston 2009, Howhy 2013, and Clark 2013; 2016

though not by any means conclusive, argument for both cognitivism and a predictivist view of perceptual experience.

I will introduce and explain most of the key concepts that are used in this chapter as they become relevant. But let me offer a few remarks that are important for understanding the two theses that jointly form the Given.

Put roughly, empiricism is the view that perceptual experience plays a key role in justifying perceptual beliefs. A few clarifications about this idea are in order. First, perceptual beliefs are not beliefs about our own perceptual experiences or sense data. Rather, they are world-directed beliefs such as the belief that this table is large or that tree is green. But not all world-directed beliefs are perceptual beliefs. Intuitively, perceptual beliefs are the first line of world-directed beliefs that are justified by perceptual experience.

Second, I assume that perceptual beliefs acquire their justificatory status from perceptual experience by being based either on perceptual experience or on an element that acquires its justificatory status from perceptual experience.[4] The view is thus compatible with perceptual experience justifying perceptual beliefs indirectly. On older versions of indirect empiricism, perceptual experience first justifies beliefs about experience or sense data which in turn justify world-directed beliefs. On more recent versions of indirect empiricism, perceptual experience plays this role by elevating other items, often called seemings or appearances, to the status of unjustified justifiers, and these other items, in turn, justify perceptual beliefs.[5]

Third, the relevant notions of justification and justifying status that I'll be using throughout the chapter are defeasible senses of these concepts. Thus, perceptual experience may justify a belief or elevate an item to the status of a justifier although this justification or justificatory status is ultimately defeated by other factors.

Finally, an empiricist might be a pluralist about justification, where a pluralist holds that there are multiple concepts of justification that differ with respect to the conditions that regulate their application. For example, a demanding sense of justification might impose the second-order requirement that an item justifies a belief, B, only if it justifies the belief that it justifies B. Less demanding concepts of justification may not require this condition. A pluralist empiricist needs to tell us under which senses of justification perceptual experience justifies beliefs. This is a question that I will return to in the next section.

The second set of clarifications concern the idea that perceptual capacities are (or are not) cognitive capacities. I take this to mean that perceptual capacities are capacities the exercise of which results in cognitive states.[6]

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[4] Basing is a technical epistemic notion whose analysis is contentious. I do not presuppose any specific analysis of basing here. But I will assume, as a working hypothesis, that when B is fully based on A, the content of A is the main determinant of the content of B.

[5] The view is also compatible with the view that perceptual experience plays its epistemic role only in conditions where we have justification for some other beliefs. Perhaps, as some have argued, perceptual experience plays its epistemic role only if we have a priori justification for some background beliefs, for example, for the belief that we are not in a skeptical scenario, or beliefs about the reliability of perception. Thus, empiricism is compatible with the idea that perceptual experience does not play its epistemic role immediately.

[6] For ease of presentation, I will assume that perceptual experiences are states. But nothing substantive depends on this assumption. For all that matters, perceptual experiences might be events or processes.

As a first pass, cognitive states (events, processes) are states with propositional contents.[7] Depending on one's other theoretical commitments, the first pass may require some modification. Some theorists distinguish between states with propositional content and states that involve concepts but not in propositional form.[8] For example, we might distinguish the state with the content 'that is a dog' and the state with the content 'that dog'. Let us call the latter type proto-propositional states. To accommodate such a view, we can assume that a state is cognitive if it has either propositional or proto-propositional content.[9]

I call a state conceptual when it is a cognitive state and has a compositional structure pertaining to its propositional content. Not all states with propositional or proto-propositional content have compositional structure. Compositional structure manifests itself in systematicity, productivity and logical inference.[10] But arguably, there are states in adult human beings, human infants, and animals that have propositional content but lack compositional structure. I shall call states that are cognitive but non-conceptual, "proto-conceptual" states. [11]

On the classification scheme that I'm adopting then, cognitive states can be either conceptual or proto-conceptual, where the later can also be divided into propositional and proto-propositional states. Thus, I am adopting a somewhat deflated notion of the cognitive under which the space of the cognitive is larger than the space of the conceptual.[12] But it is important to note that although this account of the cognitive is deflationary, it still excludes some contentful mental states from the domain of the cognitive. Mental maps, for example, would count as contentful non-cognitive states. This taxonomy raises several substantial and exegetical questions, the proper treatment of which falls outside the scope of this paper.

2. Why think that the Given is a Myth?

My argumentative strategy here is to show that the cognitivist solution to the problem of the Given falls victim to the same set of ideas that motivate the worry about the Given in the first place. But what are these ideas? Rather than answering this question through exegetical analysis, I would like to start by sketching an argument against the Given that differs in some respects from its predecessors.[13] This argument starts with our intuitions about specific cases. Let us start with two:

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[7] States with propositional content, in my view, are states such that understanding their psychological and epistemic role requires attributing propositional content to them. The issue of whether the distinction between cognitive and non-cognitive states should be analyzed in terms of content is a contested issue. Block 2023, for example, argues that the distinction should be made in terms of the functional role of a state rather than its content. I disagree. But this paper is not the place to settle this disagreement.

[8] Burge 2009

[9] It is my contention that the distinction between propositional and proto-propositional states does not withstands scrutiny. This is because there is neither an explanatory nor a truth-conditional difference between propositional states and their proto-propositional counterparts. But obviously this is a substantive issue that requires proper treatment. What matters for our purposes here is that, as I'll be using the term, proto-propositional states, whether they should be distinguished from their propositional counterparts or not, count as cognitive states.

[10] Fodor 1975.

[11] Many opponents of the Given are self-proclaimed conceptualists about perceptual experience. But it is not completely clear whether they should be categorized as conceptualists under the way that I characterize the conceptual. Perhaps McDowell 1994 would count as a conceptualist, but he has modified his view since then. See McDowell 2009a, 2009b.

[12] The conception of cognitive content and their contrast with conceptual contents is very similar to the account given in Bermudez 2003 and Beck 2012. The main difference is that unlike Beck, I hold that map-like representations are a third category of representations that should be sharply distinguished from representations with propositional content. In my view, map-like representations are non-cognitive.

[13] McDowell Ibid. Sellars Ibid., see Bonevac 2002 and Peacocke 1998 for discussion.

Crowd
There is a rally in the town square, and you are supposed to meet your friend, John, in a side street before going to the rally together. When you get to the street a swarm of people are walking towards the square. You climb a flight of stairs and start scanning the crowd in search of John, but you cannot find him. Nevertheless, given your trust that John always fulfills his promises, you maintain the belief that John is in the crowd. In fact, John is in the crowd in front of you and you have a conscious visual experience of him, but you do not recognise him.

Let us reflect on this example. You believe that John is in the crowd, and you see John. But intuitively, your visual experience of John does not justify your belief that he is in the crowd. To put it more carefully, there is a sense of justification according to which your perceptual experience of John fails to provide justification for your belief. Moreover, it seems that your experience fails to justify your belief in this sense because you fail to recognise John. This suggests that there is some sense of justification on which your perceptual experience of particulars cannot provide justification for positive beliefs about them unless you recognise those particulars.[14] This observation generalizes beyond cases where the belief in question concerns particulars. Consider:

Trumpet
Mary has a very well-developed ability to recognise musical notes. However, her capacity deteriorates in demanding contexts. She is listening to a performance of Mahler's sixth. The trumpet plays the A-sharp. She hears it well but does not recognise it as A-sharp. Nevertheless, because she knows the score very well, she believes that the trumpet must be playing an A-sharp at that moment.

Here again, there is a sense in which, notwithstanding Mary's conscious auditory experience of the note, her experience fails to provide justification for the belief that the note is A-sharp, because she fails to recognise the note. This again suggests that there is some sense of justification on which our sensory experiences of properties cannot provide justification for positive beliefs about them unless we recognise those properties.

The above observations also generalize to demonstrative concepts. Suppose you see John without recognising him because he's wearing a wig. You notice him as "that man with the wig." Later, you see him again and think "there goes that man with the wig again." Your experience justifies your thought partly because you recognise John as "that man with the wig." If you failed to recognise him as such, your experience would not justify your demonstrative thought. Similarly, suppose you hear the trumpet playing A-sharp without recognising it as A-sharp and ask yourself "what is *that* note?" Then the trumpet plays the note again and you think: "there goes that note again." Here, your belief that the trumpet is playing that note again is partly justified because you recognised the note as "that note." If you had failed to recognise the note as falling under your demonstrative concept your auditory experience would not justify your thought that there goes that note again.[15]

[14] The negative belief that John is not in the crowd does not require recognising him. But the positive belief that John is in the crowd or the belief that he is wearing a red shirt, were they to be justified by the sensory experience of John, would require recognising him.
[15] The relevant notion of justification here is doxastic justification: if you were to base your beliefs in these examples, on your experience, your experience would not justify your belief. Whether in such a case we should say that you also lack propositional justification is an interesting question that we do not need to concern ourselves with here.

So far, we have seen that there is a relationship between recognition and justificatory role. Recognitional states are, according to our taxonomy, a specific class of cognitive states. This is because we can attribute propositional (or proto-propositional) content to them. Intuitively, this point generalizes to cognitive states. Take your visual experience in the Crowd example. It would be implausible to say that although you fail to recognise John, your experience has the content that John is in the crowd. Similarly, it would be implausible to say that although Mary does not recognise the A-sharp, her experience has the content that the note is A-sharp.[16] Thus, the observation is an observation about states that lack cognitive content. To have a label, let us say that *cognizings* are transitions from a state A to a state B, where A is non-cognitive, B is cognitive, and B is based on A. The idea so far is that there is an intuitive sense under which cognizings fail to confer justification to B.

The worry about the Given is starting to take shape. According to the Given, perceptual experiences are non-cognitive states. So, on this view, transitions from perceptual experiences to perceptual beliefs are cognizings. Since there is a sense of justification under which cognizings fail to confer justification, the Given has the implication that there is a sense of justification under which perceptual experiences fail to justify perceptual beliefs. However, the Given is also committed to the thesis that perceptual experience justifies perceptual beliefs. Thus, there is a potential tension in the Given.

To turn this worry to a proper argument, we need to say more about the sense of justification under which cognizings fail to confer justification. The sense of justification that I have in mind is bound to the idea of having a specific type of reason.[17] In Crowd, do you have a reason to believe that John is in the crowd? Maybe you do, but since you do not recognise him, this reason is not apparent to you as a reason for your belief even if you reflected on your experience. The reason that you have would not be transparent to you as a reason under reflection. Generalizing on this point, we can say that the sense of justification that is central to the argument is the sense according to which the reason that your perceptual experience offers for your perceptual belief would be transparent to you as a reason for that belief under reflection. We can call the sense of justification that requires this condition, *transparent justification*.

When an item *transparently justifies* a belief, you are in a position to regard it as a reason for the beliefs. Being in such a position requires a set of background conditions, the accessibility of the reason to reflection, the ability to reflect, and the set of rational and conceptual capacities that are needed to evaluate reasons. However, we do not need to hold that such background conditions are necessary conditions for transparent justification. We can say that an item transparently justifies only if, if the background conditions obtained, you would regard it as a reason for your experience. Thus, we can say that children's experiences transparently justify although they lack the relevant background conceptual and rational capacities. Another implication of this idea is that the transparency requirement can be applied even to representations and transitions that happen under the radar of consciousness. We will return to this point in section four.[18]

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[16] Here, I am using a notion of content under which the content of a representational state must be transparent to the subject. Not all accounts of content would accept this constraint. But such accounts, arguably, lose the connection between content and the justificatory role of a representation in the sense of justification that I shall soon elaborate on.

[17] Here and elsewhere, by reason I mean epistemic reason.

[18] McDowell 2009c develops a similar argument in terms of reason as such. According to this argument, non-conceptual items do not provide reasons as such for perceptual beliefs. My idea of transparent justification is close to McDowell's idea of reason as such, but it is less demanding. This is because the capacities to reflect and endorse a reason as a reason are necessary conditions for having reasons as such, but they are not necessary conditions for having transparent reasons. This makes my argument here immune to the hyper-intellectualism charge that Burge 2003 levels against McDowell.

From here, there are two ways to develop the argument against the Given. One option is to argue that the transparency requirement is a general requirement on justification. An item cannot justify a belief unless it transparently does so. On this version of the argument, since cognizings fail the transparency requirement and non-cognitivism has the consequence that transitions from perceptual experience to perceptual beliefs are cognizings, then non-cognitivism implies that perceptual experiences cannot justify perceptual beliefs. Since this clashes with empiricism, the Given is an internally inconsistent position. This version of the argument relies on the idea that transparency is a general requirement on justification. I, therefore, call it the generalist argument.

The generalist argument is not the only option for developing our argument. One might be a pluralist about justification. On this view, there are several concepts of justification that are regulated by slightly different requirements. A pluralist version of the argument would go as follows. Cognizings cannot transparently justify and thus it is a consequence of the Given that perceptual experience does not transparently justify perceptual beliefs. But empiricism is committed to perceptual experience transparently justifying perceptual beliefs. Therefore, the Given is an internally inconsistent position. Let us call this version of the argument the pluralist version.

The argument that I would like to put forth against the Given is the pluralist one. This argument is less demanding than the generalist version in an important respect. Imagine, for example, a reliabilist view on which transitions from perceptual experience to perceptual beliefs are justified when they are part of a reliable process. The reliabilist notion of justification does not need to satisfy a transparency requirement. Thus, on the reliabilist construal, perceptual experiences do not need to be cognitive to transfer justification to perceptual beliefs. Thus, if there is a sense of justification that the reliabilist view captures, the generalist version of the argument against the Given fails. But a similar reliabilist response to the pluralist argument would be missing the point. Perhaps, there is a legitimate sense of justification that the reliabilist conception captures and this sense does not need to satisfy a transparency requirement. Still, the existence of this sense of justification does not have any bearing on the pluralist argument.

But the pluralist argument is more demanding than the generalist argument in another respect. For, it relies on the idea that perceptual experience provides transparent justification for perceptual beliefs. And empiricism, as introduced earlier, did not include an explicit commitment to this idea.

This said, it would be hard for an empiricist to reject the idea that perceptual experience provides transparent justification for perceptual beliefs. First, the idea has intuitive force. My perceptual experience of the laptop on my desk, for example, not only justifies my belief that the laptop is on my desk, but also disposes me to regard it as the reason for which I have this belief. Such a disposition can be manifest in a variety of conditions, such as conditions in which I am asked to identify my reasons for my belief. Second, the idea seems to be one of the main motivations behind adopting empiricism in the first place. One important reason for adopting the thesis that perceptual experience justifies perceptual beliefs is that it strikes us as the reasons for our beliefs under reflection. It is, indeed, hard to see how an empiricist might deny that perceptual experience provides transparent justification for perceptual beliefs. I will, therefore, assume that empiricism comes with this commitment.

We have arrived at our argument. The argument is that the Given implies that transitions between perceptual experience and perceptual beliefs are cognizings. But cognizings fail to transfer transparent justification. Therefore, it is an implication of the Given that perceptual experience fails to provide transparent justification for perceptual beliefs. But this, as we argued, clashes with

empiricism. For, proponents of empiricism should accept the idea that perceptual experience provides transparent justification for perceptual beliefs.

Before ending this section, I'd like to briefly comment on the relationship between my argument and the orthodox offensive against the Given that is offered in Sellars and McDowell. There are, arguably, at least two lines of argument in the Sellars/McDowell offensive against the Given. One has to do with the dichotomy between the space of reasons and the space of nature/causes. On this line of thought, epistemic relations (reasons, justification) are of a different type and cannot be reduced to the causal relations that natural sciences envision. And since in regarding experience as non-cognitive we place it in the space of causes, we deny it the ability to stand in epistemic relations. Unlike this line of thought, the argument that I have given here does not rely on any form of anti-naturalism about reasons.

But there is a second line of thought in the orthodox offensive against the Given that does not presuppose an anti-naturalist stance on reasons. On this line of thought, transitions from non-cognitive states to perceptual beliefs fail to confer justificatory powers to those beliefs because non-cognitive states fail a general requirement for serving as reasons. This line of thought is closer to the argument that I have developed here. But there are some differences that are worth highlighting.[19]

The first one has to do with the general requirement on justificatory relations that the orthodox attack presupposes. McDowell's argument, for example, has been interpreted as relying on the thesis that an item can serve as a justifier or a reason for a belief only if the subject can articulate it as a reason for the relevant belief. This reading has been the basis of the objection that the argument does not respect the distinction between the requirements for having reasons and the requirements for articulating them.[20] Whether this interpretation is correct or not is an exegetical issue that I would like to avoid here. But it is worth emphasizing that the transparency requirement is much weaker than the articulatability requirement. It would be much harder to argue that there is no sense of justification that corresponds to the transparency argument than to show the same for the articulatability requirement.

The second point has to do with the structure of the argument. The orthodox argument is often interpreted as a generalist argument. The argument can thus be blocked by showing that the requirement on the notion of justification that it presupposes, whatever it might be, does not generally apply to the notion (or notions) of justification. But this response is ineffective against the pluralist argument that I have given here. To block this argument, one needs to show that there is no sense of justification that requires transparency of reasons, and that is a tall order.

Despite the differences between my argument and the way that the orthodox offensive has been interpreted, in what follows I will assume that my argument captures the spirit of the worry about the Given in the orthodox offensive. This is partly because some of the interpretive points are contentious. It is debatable whether the orthodox offense requires articulatability or whether it is a generalist argument. A second reason is that, as will become clear in the forthcoming discussion, the differences are not important for the main line of argument that I am giving here.

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[19] Interpreting the orthodox argument is a substantive exegetical task that I do not want to undertake here. So, I will rely on how the offensive has been interpreted, especially by its opponents.

[20] See Peacocke 1998 for the interpretation and the criticism. In a related spirit, Bonevac 2002 argues that the argument confuses the requirement for knowledge with the requirements for attribution of knowledge.

Moving forward, I will thus assume that the cognitivist offensive against the Given relies on two commitments. First, perceptual experience provides transparent justification for perceptual beliefs. Second, cognizings cannot transfer transparent justification. In the next section, I discuss two recent responses to the cognitivist argument against the Given and explain how cognitivists would react to these responses. My goal in discussing these responses is not to show that they are wrongheaded. Rather, the goal is to show that the commitments of the cognitivist are broader than the two that were identified in this section. This, as we shall see, will play an important role in my argument that cognitivism is threatened by the same commitments that motivate it.

3. Seemings and Recognitional Capacities

Here is a way to think about what happens in Crowd and Trumpet. In Crowd, although you see John, it does not seem to you that John is in the crowd. In Trumpet, although Mary hears the A-sharp, it does not seem to her that she is hearing the A-sharp. One might argue that the reason that the perceptual experiences in these examples fail to provide justification for the relevant beliefs is the absence of seemings. Here, seemings are complex states with two components/aspects. The first aspect is a purely non-cognitive experiential aspect, and the second aspect is a cognitive one whose content is captured in locutions of the form 'it seems to S that P'.

Recently, it has been argued that the argument against the Given can be blocked by appealing to seemings.[21] Whether this is the case or not depends on the relationship between seemings, perceptual experiences, and perceptual beliefs. On one construal, seemings are a specific class of perceptual experiences. For example, some of your perceptual experiences of John in the crowd are not experiences in which it seems to you that John is in the crowd, but some are. The latter provide justification for your belief that John is in the crowd while the former fail to do so. But this version of the view is a version of cognitivism, because seemings are cognitive states. So, this would not do as a response to cognitivism.

On another version of the seemings view, seemings are not perceptual experiences. This can be combined with an indirect form of empiricism where seemings justify perceptual beliefs and acquire their justificatory powers from their intimate relationship with perceptual experiences.[22] For example, in a case where it seems to you that John is in the crowd, the seeming state justifies the perceptual belief that John is in the crowd. And the reason that this seeming state has this justificatory power is partly that it has the perceptual experience of John as a component. Seemings are unjustified justifiers.

It is predictable how those who are moved by the argument against the Given might react to the seemings response. Seemings are hybrid states with a cognitive aspect, where this cognitive aspect plays an important role in explaining how seemings justify perceptual beliefs. But intuitively, intuitions about the epistemic relation between perceptual experience and perceptual beliefs transfer to the relationship between the experiential and the cognitive components of seemings. If the former are problematic, so are the latter. To see this, imagine gerrymandering a view on which the conjunction of non-cognitive perceptual experience and the corresponding perceptual belief is called a seeming*. For example, in Crowd, we can call the conjunction of your visual experience

[21] See Tucker 2013. The seemings view is often presented in discussions of dogmatism and phenomenal conservativism. See Pryor 2000, Huemer 2001; 2007.

[22] Another version of the seemings view is that seemings are not perceptual experiences and their justificatory powers do not depend on perceptual experiences. This version of the view does not assign any epistemic role to perceptual experiences and is, therefore, incompatible with empiricism.

of John and the belief that John is in the crowd a seeming* state. It would be odd for someone to offer this view as a response to the argument against the Given by saying that seeming* are unjustified justifiers that justify perceptual beliefs and get their justificatory powers from perceptual experiences. A seeming is not a seeming*, but it is not clear why the difference between a seeming and a seeming* should matter for whether the view can serve as a plausible response to the argument against the Given.

The upshot is that the cognitivist has a natural response to the seemings view. But there is also a lesson to draw from this discussion. The lesson is that the cognitivist worry is not just a worry about justifying beliefs. It is a general worry about elevating states to the status of justifiers. On the cognitivist view, transitions from non-cognitive perceptual experiences to cognitive seemings are as epistemically problematic as transitions from non-cognitive perceptual experiences to perceptual beliefs. Let us say that a transition from A to B is *epistemically impotent* when it neither provides transparent justification for B, nor transparently elevates B to the status of a justifier. The cognitivist believes that cognizings are *epistemically impotent*.

A second response to the argument against the Given consists in appealing to recognitional capacities, where recognitional capacities are capacities to form perceptual beliefs on the basis of perceptual experience. Although it has not always been labelled as such, the generic recognitional capacities view has been a somewhat popular view about the structure of perceptual justification,[23] and some versions of the view have been explicitly proposed as a response to the orthodox argument against the Given.[24]

A core idea in the recognitional capacities view is that the perceptual beliefs that arise from the deployment of recognitional capacities are justified. Different versions of the view differ with respect to why the exercise of recognitional capacities are conducive to justification. To have an example, here is a rough sketch of a version of the view that is modelled on Pollock 1971 and Peacocke 2001. The view, put roughly, combines two ideas. First, there is a class of concepts, namely observational concepts, such that grasping them requires possessing the recognitional capacities that correspond to them. The second idea is that exercises of recognitional capacities associated with observational concepts result in justified beliefs. Put more precisely, let C be such a concept. If having a recognitional capacity, R, is a necessary condition for grasping the concept, C, perceptual experiences justify beliefs of the form 'that is C' when such beliefs result from the deployment of R on the basis of those experiences.

The recognitional capacities view is not explicitly presented as an account of transparent justification. But we can assume that the view can be extended to transparent justification. Accordingly, we can assume that perceptual beliefs that result from the deployment of recognitional capacities enjoy transparent justification.[25] As an example, let us assume that the

[23] See Pollock 1971, Peacocke 2001; 2004, Watkins 2008 and Millar 2011. Proponents of this view often have differing conceptions of the nature of experience and the grounds for which exercises of recognitional capacities are conducive to justification. Pollock and Peacocke, for example, ground the justification in the nature of observational concepts while Millar has an externalist conception. Watkins attributes this view to Kant and employs it to respond to McDowell.

[24] Peacocke Ibid., and Watkins Ibid.

[25] This would be a natural assumption for Peacocke's version of the view (Peacocke 2004). On this version, deployments of recognitional capacities are accompanied by a sense of primitive compellingness. I see this as a specific version of the more general condition that when formed as a result of the deployment of recognitional capacities, perceptual beliefs are accompanied with the representation (a feeling or judgment) that the belief is an appropriate response, in some epistemic sense, to the experience. Peacocke's view thus has the resources to explain how perceptual experience provides transparent justification.

concept 'red' is an observational concept. This entails that this concept is associated with the perceptual recognitional capacity to form beliefs of the form 'that is red' on the basis of experiences that represent redness and having this recognitional capacity is a condition for grasping the concept 'red'. One who lacks this capacity does not grasp redness. On the extended version of the recognitional capacities view that we are considering here, since grasping the concept 'red' requires having this capacity, when a belief results from the deployment of this capacity, perceptual experience transparently justifies the belief.

One who thinks of recognitional capacities in this way can accept that in Crowd and Trumpet we lack transparent justification for the corresponding beliefs. But they would explain that this is the case because in these examples recognitional capacities have not been deployed. For example, Mary has the capacity to recognise A-sharp. But for some reason, this capacity does not get deployed in Trumpet. As a result, her belief that the note is A-sharp does not result from the deployment of her recognitional capacity and thus lacks transparent justification. But this does not imply that when her belief does result from the deployment of her recognitional capacities, the belief is not transparently justified.

Here again, I think the cognitivist has a natural response. An example can help motivate this response. I would like to invite the reader to make the following assumptions as they consider the example: (a) things that are soiled have a generic perceptually recognizable soiled appearance and (b) 'soiled' is a recognitional concept. Now, let us consider the following example:

> **Obsessive Compulsion**
> Felix suffers from a mild form of obsessive-compulsive disorder that makes him demand unreasonable degrees of cleanliness. He has a very well-developed recognitional capacity for objects that have a soiled appearance. But because of his disorder, he also has the tendency to deploy his recognitional capacity for soiled objects when he does not recognise an object as clean. Not recognising cleanliness gives him an anxiety that activates the recognitional capacity for soiled objects. He thus has a tendency to see everything that he does not recognise as clean as soiled. One day, he sees a soiled object that in fact does have a soiled appearance, but he recognises it neither as soiled nor as clean. His anxiety kicks in and causes the deployment of his recognitional capacity for soiled objects. As a result, he forms the true belief that the object is soiled.

Intuitively, Felix's experience does not confer transparent justification to his belief. We can ground this intuition on the idea that Felix's deployment of his recognitional capacity is not properly guided by his perceptual experience. But if we accept this explanation, the cognitivist would argue that deployments of recognitional capacities should also satisfy an analogue of the transparency requirement. In Crowd and Trumpet, although the perceptual experiences might play a causal role in the formation of the perceptual beliefs, they do not guide the formation of these beliefs in the relevant sense of the term. The relevant sense is captured by the transparency requirement. The perceptual experiences in these examples do not guide the belief in the sense that if the subject were to reflect on them, she would not see them as reasons for forming the beliefs. A similar consideration applies to Felix's deployment of his recognitional capacity. His deployment is not guided by his perceptual experience in the proper sense of the term because, were he to reflect on his experience, he would not see it as a reason for deploying his recognitional capacity.

Here again, there is a further lesson to be drawn from the discussion. The lesson is that according to the cognitivist, deployments of recognitional capacities are epistemically appraisable in the same way that the deployment of belief forming capacities are. The worry about the Given is not just about mental transitions; it is also about deployments of mental capacities. When a capacity,

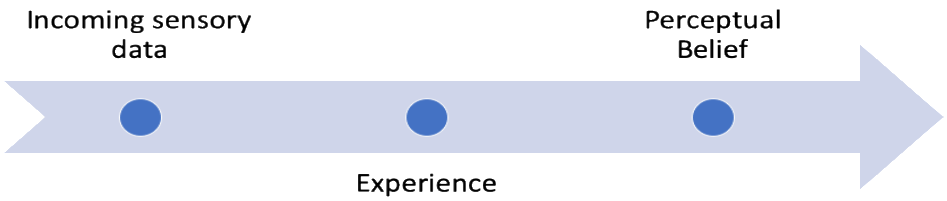
whether it is a recognitional capacity or a belief forming capacity, is deployed blindly in response to experience, that is when its deployment is not guided by experience in the sense captured by the transparency requirement, the transition from perceptual experience to perceptual belief that results from it is, therefore, epistemically impotent.

In this section, I discussed the cognitivist's natural responses to two contemporary responses to the argument against the Give. My goal was not to show that these responses are conclusive. Rather, the goal was to use them to get clear on the commitments of the cognitivist. The upshot has been two-fold. First, the cognitivist worry is not confined to justification; it extends to elevating states to the status of justifiers. When the transition from perceptual experience to a state fails the transparency requirement, the resulting state cannot acquire the status of a justifier from the transition. Second, the worry is not confined to transitions per se; it also applies to deployments of capacities. When a reason is not a transparent reason for deploying a capacity, the deployment of the capacity fails to ground transparent justification for the resulting belief. I will use these observations in the argument of the next section.

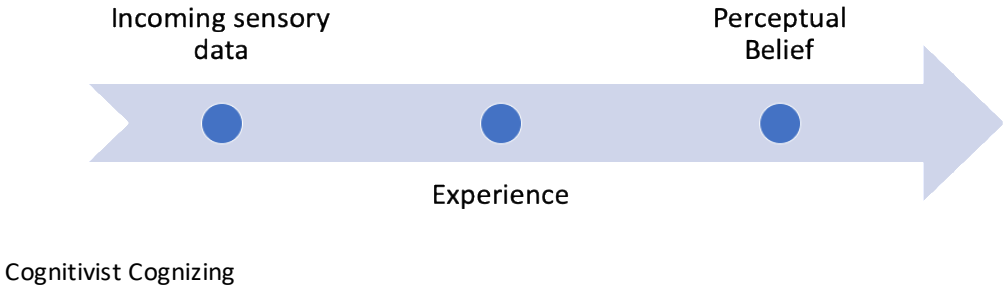
4. Buck-passing

Cognitivists hold that to avoid the problem that threatens the Given, empiricists should embrace the view that perceptual experiences are cognitive states. Here, I want to argue that this is not sufficient for saving empiricism, because a worry similar to the one raised against the Given threatens the cognitivist. I call this argument the Buck-passing argument. After describing Buck-passing and rejecting a few potential responses, I argue in the next section that cognitivists can avoid this problem by adopting a predictivist approach to perceptual processes.

The main idea behind Buck-passing is simple. Since the initial states of our sensory systems are not cognitive states, cognizing must happen somewhere in the path from sensory stimulus to perceptual beliefs. The main disagreement between the proponents of the Given and their cognitivist opponents is about where this happens. Proponents of the Given hold that cognizing happens in the transition from perceptual experience to perceptual beliefs, while the cognitivist locates cognizing in the transition from initial sensory states to perceptual experience (see Fig. 1). But this difference is not a difference maker. If cognizing is an epistemically problematic move, it should not matter whether the move is prior or posterior to perceptual experience. The cognitivist has just passed the buck.



Non-cognitivist Cognizing



Cognitivist Cognizing

Figure 1. If we adopt the Given (top), formation of perceptual beliefs on the basis of experience requires post-perceptual cognizing. According to the Buck-passing argument, even the cognitivist is committed to cognizing. The difference is that on this view cognizings are pre-perceptual (bottom).

The simple argument that I just sketched packs a few substantive assumptions under its belt. Let me re-write the argument with these assumptions made explicit:

Buck-passing

1. The contents of perceptual experience are determined by a set of transitions from and between pre-perceptual sensory states.
2. If the content of a state, *S*, is primarily determined by a set of transitions, *T*, and there are no other grounds that confer *S* transparent justificatory powers, then *S* does not have transparent justificatory powers if there is an epistemically impotent transition in *T*.
3. There are no grounds other than the contents of pre-perceptual states that confer transparent justificatory powers to perceptual experiences.
4. Perceptual experiences do not have transparent justificatory powers if there is an epistemically impotent transition in the set of pre-perceptual transitions that determine their contents. (from 1, 2 and 3)
5. If perceptual experiences are cognitive states, then transitions from sensory inputs to perceptual experiences involve cognizing.
6. Cognizings are epistemically impotent.
7. Therefore, perceptual experiences lack transparent justificatory powers. (from 4, 5, and 6)

If Buck-passing is sound, then the cognitivist has failed in her ambition to save empiricism. The argument is valid. So, let us discuss the premises.

The first premise sits well within contemporary perceptual science. According to a view that we might call the orthodoxy in cognitive science, perceptual processing starts with low-level sensory states that get their contents primarily from their causal relations to the world. Chains of computations over the contents of these states, sometimes aided by the contents of prior states in our perceptual system, eventually gives rise to conscious perceptual experiences. The contents of perceptual experience, on this picture, is determined by the operations performed over the contents of pre-perceptual sensory states.

The second premise is intuitive. It basically says that epistemic impotence transmits across content-determining transitions. If *B* lacks transparent justificatory powers because the transition from *C* to *B* was impotent, then the transition from *B* to *A,* even if it is a transition that would transparently transfer justification, cannot elevate *A* to the status of a justifier. So, unless *A* has other grounds for being a justifier, it is not a transparent justifier.[26] If we deny this premise, we are committing ourselves to the idea that we can cure epistemic impotence by distancing ourselves from it!

The third premise is an important premise that requires a good amount of discussion. I will return to it soon and argue that the cognitivist is committed to it. The fourth premise is entailed by the previous three premises by two rounds of modus ponens.

The fifth premise follows from two ideas. The first one is that early operations of the sensory systems are over non-cognitive representations. This is an empirical claim with an interesting history that we do not need to get into here. Suffice it to say that most theorists these days agree with it.[27] The second idea also makes intuitive sense. If the early stages of the operations of sensory systems involve non-cognitive sensory states and perceptual experiences are cognitive states, then the production of perceptual experience must at some point involve transitions from states with non-cognitive content to states with cognitive content, where the non-cognitive states determine the content of the cognitive ones and thus the latter is based on the former. The two ideas jointly entail that if perceptual experiences are cognitive states the perceptual states that lead to them involve cognizing. This said, I will show in the next section that we can deny this premise if we adopt a predictivist approach to perceptual processes.

Premises 6 was part of the cognitivist's assault against the Given. So, we have good reasons to hold the cognitivist to it. However, as we shall soon see, the cognitivist might try to restrict the scope of its commitments and resist this premise. I will discuss this issue soon.

With this background set, let us return to the premise that there are no grounds other than the contents of pre-perceptual states that confer transparent justificatory powers to perceptual experiences. One way to resist this premise would be to adopt phenomenal conservativism. The view comes in different versions, but the core idea is that the justificatory powers of perceptual experiences are grounded in their phenomenal character, especially, what is often called presentational phenomenal character. On the typical version of this view, the phenomenal character of perceptual experience is sufficient for its justificatory powers.[28] For the sake of argument, we will be concerned with a version of the view on which the phenomenal character of perceptual experience is sufficient for transparent justificatory powers.

Phenomenal conservativism has intuitive appeal. If it seems to me that there is an apple in front of me (in the phenomenal sense of the term) then intuitively I have some transparent justification

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[26] This is a rough version of the premise. To be strict, we need to modify by adding to the antecedent of the conditional that the consequent of the epistemically impotent transition in T does not have any other grounds to confer justificatory powers to it. But this would make our argument unnecessarily complicated without making a crucial difference. So I have put the premise in its rough form here.

[27] When Fodor originally introduced his representational theory of mind, he argued that mental processes happen in the medium of a language of thought with propositional contents. (Fodor 1975). The original version of the view did not restrict this to specific mental processes. So, it was naturally interpreted as applying to all mental processes, including operations of the sensory systems. But the claim that all mental processes operate over propositional contents quickly became the subject of a controversy (Kosslyn 1980, Block 1983) and even Fodor eventually accepted that some of the early operations of the sensory system are over representations that have non-propositional content (Fodor 2007). Many other theorists now side with this view (Bermudez 2003; Camp 2007, Rescorla 2009, Beck 2012).

[28] Pryor 2000, Huemer 2001; 2007.

to believe that there is an apple in front of me, whether this experience is a veridical experience or whether it is a grand illusion. The view thus seems at home with internalist approaches to justification. But as Siegel (2013, 2017) has convincingly argued, etiology should matter even for the internalist. Suppose that the reason that Jack looks angry to Jill is that Jill has an irrational expectation that Jack is angry, and this expectation cognitively penetrates her perceptual processing. Under phenomenal conservativism, we should conclude that Jill has some transparent justification for believing that Jack is angry. But it seems intuitively problematic to assume that in this case Jack's seeming angry to Jill would justify her belief that Jack is angry. Etiology matters! The example also shows that phenomenal conservativism has the consequence that we can get free justification for our perceptual beliefs if these beliefs can cognitively penetrate perceptual processing. Thus, phenomenal conservativism has the consequence that perceptual beliefs, beliefs with contingent world-directed content, can possibly self-justify. This is a hard bullet to bite.

There are also problems that threaten combining phenomenal conservativism with a cognitivist conception of perceptual experience. An old worry is that if perceptual experiences are cognitive then they are sufficiently belief-like to demand epistemic appraisal and if so, they cannot serve as unjustified justifiers.[29] This gives rise to an acute question: what grounds the justificatory status of the cognitive aspect of perceptual experience?

We can develop this question into an argument against the cognitivist version of phenomenal conservativism. The phenomenal conservative grounds the justificatory status of experience on its phenomenal character in general. This runs into a dilemma when we ask whether the phenomenal character of cognitive experience is itself cognitive or not. If the cognitivist says No, their view has the commitment that non-cognitive phenomenal character can transparently ground the justificatory status of cognitive content. But this would clash with the cognitivist's assault against the Given. It is unclear why non-cognitive phenomenal character can transparently ground the justificatory power of the cognitive content of an experience but not the cognitive content of a belief. Thus, the cognitivist has to give a positive answer to our question: the phenomenal character that grounds the justificatory powers of the cognitive aspect of experience is cognitive phenomenology. This option runs into a serious problem. It is quite plausible to hold that the cognitive phenomenology of a state is intimately bound with the content of the state. A common way to account for this is to adopt the representationalist view that the state has its cognitive phenomenology in virtue of its content. But if so, then we should conclude that the cognitive phenomenology of experience that is itself grounded in the content of experience transparently grounds the justificatory powers of its content. This again, not only seems intuitively problematic but has the consequence that some contingent world-directed contents can elevate themselves to the status of justifiers.[30]

We should conclude that phenomenal conservativism cannot help the cognitivist block Buck-passing. Phenomenal conservativism ignores the etiology of experience in a problematic way, and even if we can save it from this worry, combing phenomenal conservativism with cognitivism runs into serious problems.

But this is not the end of the story. There is a broader strategy that the cognitivist might pursue. The cognitivist might attempt to resist Buck-passing by arguing that transitions between pre-

[29] Sellars 1956, BonJour 1978, Sosa 2007.

[30] The phenomenal conservative might propose to reverse the relationship between the cognitive phenomenology of the experience and its content, holding that the content of experience is grounded in its cognitive phenomenology, as some phenomenal intentionalists might be inclined to do. But this will not help. For, since cognitive phenomenology is in principle separable from non-cognitive phenomenology, this view will also have the consequence that contingent world directed beliefs can be self-justifying.

perceptual states and transitions from pre-perceptual states to perceptual experiences are not epistemically appraisable. So, there is no sense in which they can be judged as epistemically impotent, because they cannot be epistemically appraised at all. This might help the cognitivist block premise 6 of the argument in a manner that is compatible with their assault against the Given. They can hold that post-perceptual cognizings are epistemically impotent, but per-perceptual cognizings are not.

The claim that transitions involving pre-perceptual states are not epistemically appraisable resonates with the Sellarsian dichotomy between the space of reason and the space of causes. But it is unclear why the Sellarsian line between the space of reasons and the space of causes should be drawn right along the line between post-perceptual and pre-perceptual processes. One way to defend drawing the line in this way would be to hold that pre-perceptual states do not have contents. But this would clash with the orthodoxy in contemporary perception science. This orthodoxy explains pre-perceptual processes in terms of operations over contentful states. In fact, explanations of mental phenomena as operations over contentful states is the key change that gave rise to cognitive science. More importantly, we can epistemically appraise mental transitions if we can attribute content to them. Thus, cognitive science provides the basic means for the epistemic appraisals of transitions between pre-perceptual states. The space of reasons extends to the pre-perceptual space.

In response, the cognitivist might accept that there is a sense in which pre-perceptual transitions are epistemically appraisable, but insist that the epistemic evaluation of this space has no bearing on the justificatory powers of perceptual experience. One way to ground this idea would be to argue that because the transitions in the pre-perceptual domain happen under the radar of consciousness, they do not have any bearing on the epistemic evaluations of conscious states. This can be further grounded in the idea that appraisals of pre-perceptual phenomena have no bearing on the rationality of subjects. Thus, we can accept that the domain of the pre-perceptual can be epistemically appraised, while holding that the separation between this domain and the domain of consciousness prevents the epistemic evaluation of the pre-perceptual to have any bearing on the epistemic evaluation of the transitions in the post-perceptual domain. Let us call this the Separatist response. The Separatist cognitivist can accept that cognizings happen at the pre-perceptual level and such transitions are epistemically impotent in some sense, yet hold that this epistemic impotence does not redound on the epistemic status of the perceptual experiences that result from them.[31]

[31] Those who adopt such a view should still explain how and why perceptual experiences acquire their status as unjustified justifiers and as we saw it is not very easy to explain this by appealing to phenomenal conservativism. But perhaps there is a story to be told here. For example, they can appeal to causal factors, the reliability of perceptual processes, or other forms of externalism.

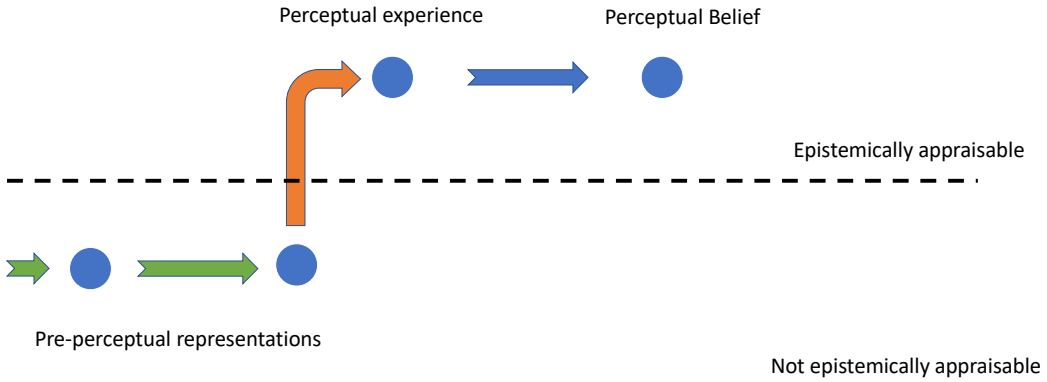

Figure 2. The Separatist response to Buck-passing. The separatist cognitivist can claim that transitions that involve pre-perceptual states are not epistemically appraisable or at least not appraisable in the same sense that post-perceptual transitions are.

Whether separatism is a tenable position or not is a substantive question that we cannot get into here. But we can show that separatism clashes with the cognitivist's offensive against the Given. In particular, it exposes the cognitivist to the two responses that we discussed in the previous section, namely the recognitional capacities response and the seemings response.

According to the recognitional capacities response, perceptual beliefs are transparently justified when they result from the deployments of recognitional capacities over perceptual experiences. The objection that we raised against this response was that deployments of recognitional capacities can fail the transparency requirement and are thus epistemically impotent in the same sense that cognizing is. But now imagine that the proponent of the recognitional capacities view adds, as in fact the most plausible versions of the view should, that deployments of recognition capacities happen below the radar of consciousness. Subjects do not consciously deploy their recognitional capacities. They just kick in. But if so, given separatism, such deployments should not redound on the epistemic status of the perceptual beliefs that result from them. The Separatist proponent of the recognitional capacities response would thus be off the hook of the argument against the Given (Figure 3).

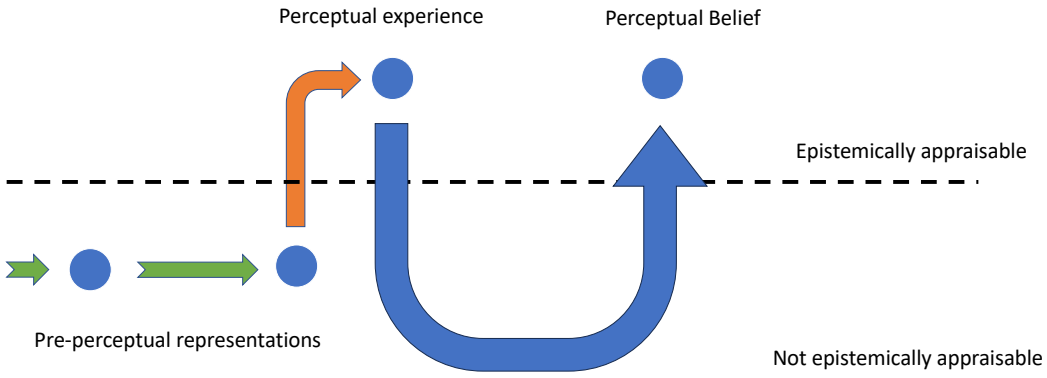

Figure 3. The separatist version of the recognitional capacities view holds that recognitional capacities are deployed unconsciously, and are therefore not epistemically appraisable in the same sense that conscious deployments of capacities are.

A similar move is available to the proponent of the seemings response. Recall that on this view, seemings are hybrid states that combine a non-cognitive sensory aspect with a cognitive aspect. On the version of this view that was offered as a response to the cognitivist, seemings are unjustified justifiers of perceptual beliefs whose epistemic powers are grounded in their relationship to perceptual experience. The cognitivist response to this view was that the transition from a non-cognitive experience to a seeming state is epistemically impotent in the same sense that the move from non-cognitive experience to a perceptual belief is. But here again, the proponent of the seeming response can argue, as it is natural for most of them to do, that the transition from a non-cognitive experience to a seeming state happens below the radar of consciousness. Thus, given separatism, such a transition, even if it is problematic, does not threaten the epistemic status of the resulting seeming state. (figure 4) In fact, this enables the proponent of this view to hold that the seeming state has exactly the same profile as the cognitivist's cognitive experience. It has presentational phenomenology; it has a cognitive component, and its etiology is not relevant to its epistemic status. So, it should have the status of an unjustified justifier, in the same way that the cognitive perceptual experience has.

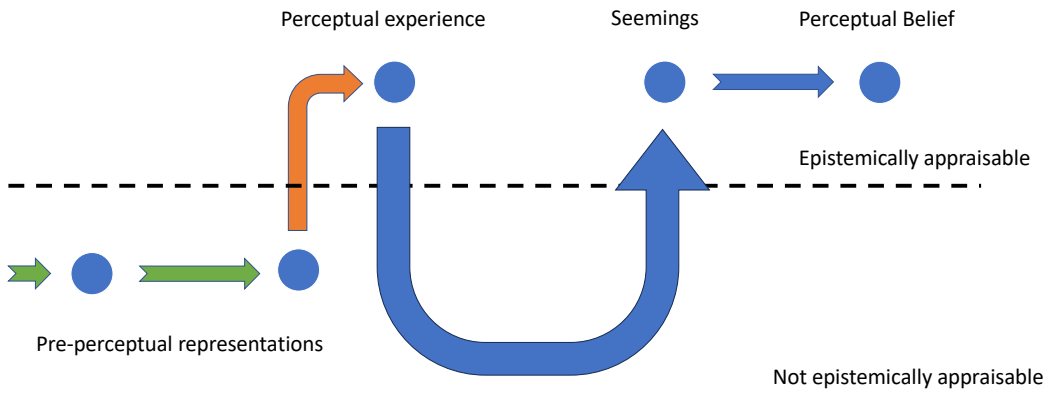

Figure 4. The separatist version of the seemings view holds that transitions from perceptual experiences and seemings happen under the radar of consciousness and therefore not epistemically appraisable in the same sense that conscious transitions are.

So, the idea that mental phenomena below the radar of consciousness are not epistemically appraisable exposes the cognitivist to two straightforward responses to their argument against the Given. Cognitivist opponents of the Given are thus dialectically barred from adopting separatism. So, they cannot block Buck-passing by rejecting premise 6. Since, as we showed earlier, phenomenal conservativism is also unavailable to the cognitivist, Buck-passing remains a serious threat to the cognitivist attempt to save empiricism. Could the cognitivist resist the argument in a different way? I will offer a positive answer to this question in the next section.

5. Predictive Coding to the Rescue

For a long time, the orthodoxy in perceptual science has been that the flow of information in sensory systems is a bottom-up flow that starts with the reception of sensory impingements and travels up the anatomical-cum-representational hierarchy until it results in conscious perceptual experience. Our sensory systems, on this view, are passive observers that receive sensory information and try to make sense of it in a cascade of bottom-up processing.

The new-wave predictive coding approaches, in contrast, see the flow of information as primarily top-down.[32] On these approaches, sensory systems are predictive engines that anticipate the incoming input and use it to choose between competing models of the environment. The flow of information in such systems is primarily top-down because the representations in each layer in the sensory hierarchy are primarily determined by the representations in the higher levels. Each layer predicts the content of the lower levels through top-down signals. These predictions are ultimately matched against the incoming sensory data. When the incoming sensory data does not match the predictions, an error signal travels upwards in the hierarchy and causes the higher levels to change their representations and therefore their top-down predictive signals. The incoming sensory data and the model of the external environment interact through cascades of prediction-error-correction until error is minimized and the whole system settles down into a globally stable and hierarchically distributed total sensory representation that underlies perceptual experience (Figure 5).

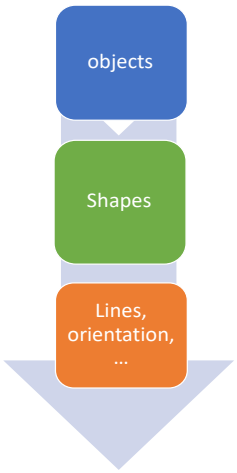

Figure 5. Perceptual System on the Hierarchical Predictive Model. The left side of the diagram where the information flow is top-down is core perceptual sub-system. The right side whose function is to generate an error signal is the error generation sub-system.

The most crucial feature of the predictive framework in relation to our puzzle is that on this model no cognizing happens in pre-perceptual processes. To see how, we need to get into more details. But let me first explain the core ideas with an example.

[32] Clark 2013, 2016; Friston2009, Howhy 2013.

John and Molly have a food cart that sells lunch bowls. The lunch bowls contain three types of items: bases, proteins, and sauces. Customers have three choices for each item. Bases can be white rice, brown rice, or greens. Proteins can be chicken, fish, or tofu, and sauces can be mild, medium or spicy. Customers can order any of the 27 possible combinations that the menu offers. Ordering happens by handing John cards that have symbols for each option. For example, a customer can order a spicy tofu on brown rice by handing John three cards: one card with a spicy symbol, one with a brown rice symbol and one with a tofu symbol. After the customers put their orders in by handing John their cards, Molly assembles the bowls.

This is all good except that John and Molly have a very strange system for communicating. John neither shows the order cards to Molly nor tells her what the orders are. Molly is a math wizard. She draws on her knowledge of the ordering patterns in the past to guess the orders. For example, she knows that on Tuesdays, the guy who orders spicy tofu with brown rice usually arrives first, followed by the old woman who likes mild chicken on a bed of lettuce. Her extensive knowledge allows her to make informed guesses about the orders and that is what she does. Errors obviously happen. But John and Molly have a method to prevent them. This method is also strange. When Molly makes a guess about a customers' choice, she shows John three cards corresponding to her guess. John compares molly's cards to the cards given to him by the customer and gives molly a thumbs up or a thumbs down for each type of card depending on whether the guess was correct or not. Molly keeps revising her guesses based on the feedback that she receives from John until she gets three thumbs up. She then makes the bowl.

John and Molly's system is a simple predictive system. This simple system has two sub-systems. One sub-system, John, receives the customers' orders (input) and compares them with Molly's prediction to generate a signal that tells Molly if her prediction was wrong (error signal). The other sub-system, Molly, is in the business of generating predictions on the basis of its prior knowledge and revising them in response to the error signals that it receives from John.

The predictive coding approach to perceptual processing has the same generic structure. It, in effect, divides the perceptual system into two sub-systems hosting two sets of processes. We can call these processes the core perceptual processes and the error generation processes respectively. Core perceptual processes (Molly) generate predictions based on prior information in the system. These then help generate what we can call predictive sensory templates (Molly's picked cards). The predictive sensory templates are then sent to an error-generating sub-system (John) that compares them to the incoming sensory data (customers' order cards) and generates an error signal (John's thumbs up/down). The generated error is sent back to the core perceptual sub-system (Molly), which if required, changes its predictions. This cascade of prediction-error-correction eventually results in a stable total sensory representation in the core perceptual sub-system (Figures 5 and 6).[33]

[33] The actual models are of course more complicated. The representations in the core sensory sub-system are hierarchically distributed and predictions at each layer of the hierarchy are informed by predictions at the higher levels as well as prior representations at the same level. The two sets of processes, predictions and error generation, happen at all levels of the hierarchy and there is context-sensitive information about the reliability of the error signal. But the core idea structure is analogous to the one in our example.

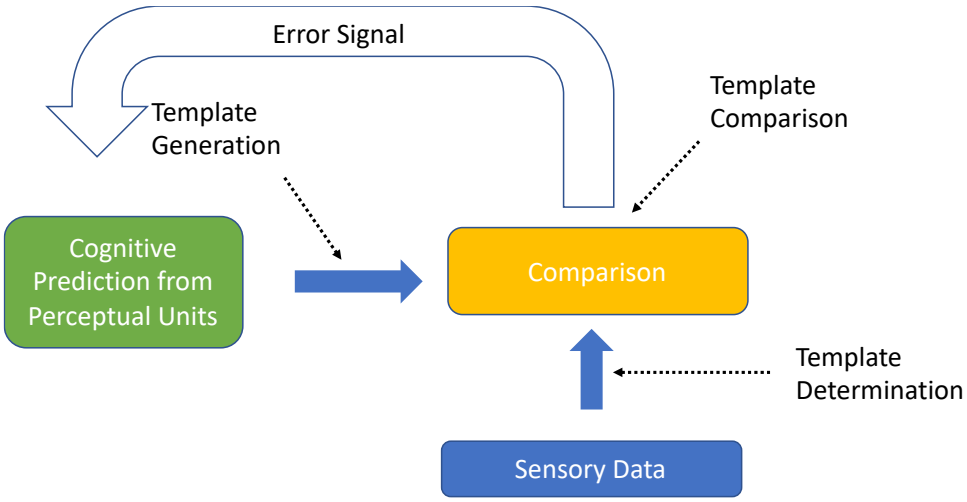

Figure 6. Error Generation. Error generation involves the creation of a predictive template that is compared with the sensory data.

In most predictive models, the core predictive processes consist of Bayesian updating of propositional contents. The representations involved in such processes, therefore, count as cognitive under our characterization. Since these representations underlie conscious perceptual experience after the updating cycle settles down, on these versions of the view perceptual experience is grounded in representations with propositional content. We can, therefore, regard the predictive coding approach as offering us a view on which perceptual experiences are cognitive states.

In the predictive literature, there is not much explicit discussion of whether the representations that are involved in error generation are propositional or not, but some have argued that such representations can be regarded as map-like.[34] I will follow this idea here and assume that both the predictive sensory templates (analogous to Molly's drawings) and the incoming sensory data (analogous to customers' orders) are map-like representations. On the version of the predictive model that I am sketching here then, the two sub-systems of the perceptual system not only have different functions but also operate over different types of representational formats. The core sensory system operates over cognitive representations while the error generation system operates over non-cognitive ones.[35]

What is important for our purposes here is that on the predictivist picture no cognizing happens in the transitions that determine the content of perceptual experience. This is easy to see in the John and Molly case. At no point in the process that starts with a customer putting in an order and ends with Molly putting together the lunch bowl, Molly or John look at a card and think 'oh, that's a spicy fish order'. There is no basing of a propositional content on a pictorial representation. The

[34] Rescorla 2009

[35] The error generating sub-system involves operations over map-like representations, but as Rescorla 2009 argues, such operations can be modeled as conforming to Bayesian updating rules. So, we can assume that, under this approach, the operations in both sub-systems are epistemically appraisable.

predictive structure that is embedded in the procedure enables Molly and John to fill in the orders without any cognizing. Similarly, the predictive perceptual system that we have sketched here, at no point generates a propositional representation directly on the basis of a map-like representation. Although, both map-like and propositional representations are causally implicated in the production of perceptual experience, the organization of the system guarantees that there is no transition where a map-like representation determines the content of a propositional representation. On the version of the predictive approach that I have sketched here, no cognizing ever happens in the perceptual system.

Let me elaborate on this idea by considering a worry. The worry can be articulated as a dilemma, generated by asking whether the error signal is a cognitive representation or not. An objector might argue that if the error signal is cognitive, then we must have cognizing somewhere in the mechanisms that generate this signal. But if the error signal is not cognitive, then cognizing happens when the core perceptual system revises its prediction in response to this signal.
The question as to whether the error signal is cognitive or not is complicated. But to simplify the discussion, let us just assume that it is not cognitive. Still, it would be wrong to conclude that revising the predictions in response to the error signal is an instant of cognizing. For, cognizing requires basing, but the new prediction that the core perceptual system generates in response to the error signal is not based on the error signal. This is because basing, as I am using the term here, requires content determination. When A is based on B, the content of B partially determines what the content of A should be. But in the case of revision in response to the error signal, the error signal does not provide any direction for what the specific content of the new prediction should be. Thus, it does not even partially determine the content of the new prediction.

This is easy to see in the food cart example. When John tells Molly that her prediction was wrong, he does not tell her in what respect it was wrong. His thumb down signal is a command to revise without any further direction. In response to this command, Molly revises her predictions, but it is only her prior information that tells Molly how to revise her predictions. This can be done in a variety of ways. A simple procedure would be that Molly has a probability distribution that generates a ranking for her predictions. She first chooses the highest ranked prediction and when it generates error, she moves down to the second highest ranked prediction. In a more sophisticated arrangement, Molly might use the information that her first prediction was wrong to revise her initial ranking, a process that can be captured in a Bayesian updating scheme. But none of these arrangements would have the consequence that Molly's new prediction is *based* on the error signal. The error signal causes the revision cascade without determining the content of the new predictions.

In the case of a hierarchical predictive perceptual system, the arrangement is more complicated partly because in a hierarchical system there are multiple layers and each layer receives error signals in response to its predictions. So, there is a sense in which the error signals, collectively understood, partially determine the collective content of the predictions of the system. For example, the layer that predicts shapes might receive an error signal while the lower layer that predicts line orientation does not. In this situation, the system revises its shape prediction without revising its line orientation prediction. So, there is a sense in which the error signals collectively 'tell' the system to revise its shape prediction without revising orientation. However, the basic point still applies. Each of these error signals is a revise command that does not determine the content of the new predictions. The system is not *basing* its predictions on the error signal and there is no cognizing in this process.

The goal in this section has been to sketch an account under which cognizing does not happen in the transitions from non-cognitive sensory inputs to cognitive perceptual experiences. I have

argued that the predictive account can do so. This enables the predictivist to block the Buck-passing argument. The predictive approach thus gives the cognitivist an interesting way to block Buck-passing. And I think the best way for the cognitivist to save empiricism while staying faithful to the sensibilities that ground its opposition to the Given is to adopt this approach.

Conclusion

Some opponents of the Given propose that adopting a cognitivist account of perceptual experience removes the obstacle that we confront in accounting for the justificatory role of perceptual experience. Here, I have shown that the worry about the Given is based on some deep assumptions that threaten the cognitivist attempt to save the idea that perceptual experience plays an important role in justifying perceptual beliefs. I then proposed that to solve this problem the cognitivist can adopt a predictive account of perceptual experience. As this came out to be the most plausible option for the cognitivist, the chapter makes a strong case for the idea that cognitivists should be predictivists.

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