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Naturalism and the metaphysics of perception

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1 Introduction

What is the relationship between philosophical and scientific theories of perception? We should not expect there to be a straightforward answer to this question, not least because of the multitude of subdisciplines and methodologies involved. The philosophy of perception, for example, includes research on the epistemic role of perceptual states, the subjective qualities of perceptual experience, and the metaphysical relation between perceivers and the world. Research in the science of perception involves computational models of perceptual algorithms, neurobiological models of perceptual systems, and behavioural models of the relation between perception, attention, and action. In this paper, I will be narrowing my focus to the relationship between two particular debates about perception: the debate between naïve realists, intentionalists, and others, which I will refer to as the 'Metaphysical debate', and the debate between ecological theorists and constructivist theorists, which I will refer to as the 'Psychological debate'.[1]

My interest in the relationship between the philosophy and science of perception comes largely from thinking about recent work in naturalistic metaphysics, which explores the role of scientific theories and data in our metaphysical theorizing.[2] Although I hope this paper paves the way for further work in the naturalistic metaphysics of perception, I will not be making any particularly naturalistic assumptions or arguments here. I am proposing that, regardless of how you characterize the relationship between metaphysics and science, Metaphysical and Psychological theories of

[1] Throughout this paper, I will use the term 'Metaphysical' to describe both the particular debate and the individual theories it involves: intentionalism, naïve realism, sense datum theory, and adverbialism. I will use the term 'Psychological' to describe both the particular debate between ecological and constructivist theories, and the theories themselves. As will become apparent, I want to leave open the possibility that the Psychological debate is as metaphysical as the Metaphysical debate.

[2] The commitments of naturalistic metaphysicians vary widely: for a representative sample see Hawley (2006), Ladyman and Ross (2007), French and Mackenzie (2012), Paul (2012), Chakrabartty (2017).

perception present a particularly interesting case study. Philosophers debating naïve realism and intentionalism take themselves to be engaged in a debate which is distinct from and orthogonal to the psychological debate between ecological and constructivist theories of perception. McDowell (2010), for example, clearly distances the philosophical study of perceivers from the scientific study of their perceptual systems. Even philosophers who acknowledge a relationship between Metaphysical and Psychological theories, such as Lowe (2000), assume that the debate between naïve realism and intentionalism does not stand or fall with the debate between ecological and constructivist theories. When we try to specify the grounds for distinguishing between the two debates, however, we face a challenge: the usual strategies for distinguishing between metaphysical and scientific theories (e.g. appealing to differences in their modal strength, their methodology or their explanatory features) don't seem to apply. I will argue that any differences we find between the two approaches do not license the conclusion that the two debates are orthogonal.

I will suggest that the two debates are engaged in the same general project concerning the nature of perception, and that the Psychological theories are no less metaphysical than the Metaphysical theories. I am not arguing that the Psychological theories are superior to the Metaphysical theories, but merely that the Psychological theories should be recognized as part of the debate about the metaphysical nature of perception.

In the next part of the paper, I will introduce the two debates under consideration: the Metaphysical debate between theories such naïve realism and intentionalism, and the Psychological debate between ecological and constructivist theories. I will then consider the standard strategies for distinguishing between different kinds of theories in virtue of their commitments or methodologies. One might attempt to distinguish between the modal strength of different theoretical claims (e.g. necessary versus contingent truths), different methodological approaches (e.g. conceptual analysis versus inference to the best explanation), or different explanatory strategies (e.g. constitutive versus causal explanation). I will argue that none of these strategies work: both the Metaphysical and Psychological debates rely on inference to the best explanation to draw contingent conclusions about the constitutive nature of perceptual experience. Finally, I will consider and reject the suggestion that the relevant distinction is between personal and subpersonal explanations. Even if this characterizes some of the differences between Metaphysical and Psychological debates, I will

argue that it does not establish that the two debates are orthogonal, and it leaves open that Psychological theories are addressing the same metaphysical questions as Metaphysical theories.

2 Two approaches to theorizing about perception

2.1 Metaphysical theories of perception

A key project in the metaphysics of perception is the attempt to specify the nature of perception. With further qualifications to come, the main positions in the familiar Metaphysical debate can be summarized as follows:

> *Naïve realism*. Perception is a non-representational relation to mind-independent objects.
>
> *Intentionalism*. Perception is a matter of representing mind-independent objects in certain ways.
>
> *Sense-Datum Theory*. Perception is a relation to a mental object.
>
> *Adverbialism*. Perception is an adverbially modified non-relational mental state.

Each of these positions has been put forward as a Metaphysical claim about the nature of perception, but they can also be used specifically to account for the phenomenal character of perceptual experience.[3] I will focus in this paper on the metaphysical positions themselves rather than their accounts of phenomenal character. I will be using the terms 'perception' and 'perceptual experience' interchangeably.

The Metaphysical debate about perception is usually taken to include the four positions outlined above. In what follows I will be restricting my attention to naïve realism and intentionalism, which I take to be the two most popular contemporary theories. I will assume that naïve realism and intentionalism are both 'direct' theories in the sense that they both allow that we have veridical perceptual experience of the mind-independent world, and they both deny that we do so in virtue of

[3] These different roles are captured by French and Crane's (2017) distinction between two levels at which a perceptual theory can operate, according to which Level 1 theories tell us about the nature or structure of experience, and Level 2 theories tell us how Level 1 theories account for phenomenal character. See also Fish's (2009) distinction between the ontological and phenomenal formulations of naïve realism.

first perceiving some mental object or sense-datum. The main difference between the two theories is in how they understand the perceiver's connection to the mind-independent world: naïve realists claim that our relation to the worldly objects of our perceptual experience is not mediated by representation, whereas intentionalists claim that we perceive the world by representing it (accurately or otherwise) as being a particular way.[4]

2.2 Psychological theories of perception

The science of perceptual psychology, and vision in particular, has been dominated over the past fifty years by a debate between two theoretical approaches: constructivist and ecological.[5] It is widely known that the data on our retina are compatible with an infinite number of distinct percepts: one pattern of retinal data could be caused by two objects of different sizes at the same distance from us, for example, or by two objects of the same size at different distances from us. (In vision science, this is also known as the 'inverse problem' of optics.) In each case, however, we experience just one determinate scenario, rather than a set of underdetermined possibilities. Constructivist and ecological theories propose very different ways to account for this.

Proponents of constructivist theories acknowledge that our retinal data underdetermine our perceptual experience. They propose that our minds supplement the sparse retinal information with additional stored information, allowing us to reconstruct which of the many compatible scenes is actually causing our experience. The earliest constructivist theory of visual perception was put forward by Helmholtz (1878), who argued that when we perceive, we draw 'unconscious inferences' from the retinal data to their source: our perceptual experiences are the conclusions of these inferences. Any notion of inference requires positing representations, in the sense of semantically-

[4] There are naïve realists who argue that intentionalism should be considered 'indirect' in the sense that is not essentially world-involving, because we can be in the same type of representational perceptual state whether the relevant worldly object is present or not. Further discussion of the matter can be found in McDowell (1998), Fish (2004), and Drayson (2018). (Some of the claims I make in the current paper diverge from those in the 2018 paper.)

[5] In what follows I will frame the difference between constructivist and ecological approaches in terms of visual perception, but the two positions apply to perception in general and can be applied to all its modalities. Constructivist and ecological approaches tell very different stories about haptic touch, for example.

evaluable states which function as the premises and conclusions of the inferences.[6] Constructivist theories take many different forms: computational models which recreate the causes of sensory input bottom-up look very different from top-down computational models which use stored priors to predict the probability of sensory inputs, and Helmholtz's own model predated computational approaches to the mind. What they all share is the basic constructivist commitment that we perceive the world by drawing inferences from our sensory input.

Constructivist theories can be contrasted with ecological theories of perception. Proponents of ecological theories deny that perception faces an underdetermination problem, because they do not take our sensory input to be restricted to static data on individual sense organs (e.g. the retina). They broaden the notion of sensory input to include dynamic information, such as the way that the ambient light array changes as we move. Ecological theories of perceptual psychology were first proposed by Gibson (1967, 1979), who argued that dynamic information from the light array can account for our determinate perceptual experience in a way that static retinal data cannot, and without any need for inference. Gibson proposed that when a perceiver actively explores their environment, some aspects of the light array will change while others will remain invariant. These invariances supposedly provide information about the world which the perceiver can detect without any need for inference. Ecological theories take a non-representational approach to perception: without the need for inference, there is no need to posit the sorts of representations over which inference would take place.

There is, of course, much more to the psychology of perception than what I am calling the Psychological debate. My interest here is in the debate between constructivist and ecological theories in general, rather than in different versions of them, or in the psychology of perception more generally.

[6] Constructivist theories differ as to whether they understand the representations as propositional contents, formal symbols, or imagistic models.

2.3 Comparing the Metaphysical and Psychological debates

There is a *prima facie* resemblance between the Metaphysical and Psychological debates about perception. It has been noted that the differences between constructivist and ecological theories "echo, to some extent, disagreements amongst contemporary philosophers of perception" (Lowe 2000, 131) concerning naïve realism and intentionalism. Both the Metaphysical and Psychological debates concern whether or not our perceptual experience of the world is mediated by some form of representation. But proponents of Metaphysical theories like naïve realism and intentionalism generally take themselves to be engaged in a different debate from proponents of Psychological theories. In the rest of this paper, I will explore the various ways we might try to distinguish between the two debates.

First, one might look at the modal strength of the theories: are Metaphysical theories of perception proposing necessary truths, for example, and are Psychological theories of perception proposing contingent truths (3.1)? Second, one might consider the methodology which produces the theories in question: are Metaphysical theories the result of *a priori* conceptual analysis, for example, while Psychological theories use empirical evidence to draw an inference to the best explanation (3.2)? I will argue that proponents of both Metaphysical and Psychological theories use inference to the best explanation to draw contingent conclusions about the nature of perception, and that neither strategy relies on empirical evidence. Third, I explore whether we can distinguish between two different approaches to inference to the best explanation: perhaps Metaphysical theories concern constitutive explanation while Psychological theories concern causal explanation (3.3)? I will argue that both Metaphysical and Psychological theories of perception should be understood as constitutive explanations of psychological capacities rather than causal explanations of psychological events. I then consider whether we might understand the two debates as concerned with different 'levels' of constitutive explanation, using the personal/subpersonal distinction (3.4). I think this is perhaps the most promising strategy for highlighting how some Metaphysical and Psychological theories differ, but I will argue that it fails to demonstrate that the two debates are in any sense orthogonal to each other.

3 Distinguishing the metaphysical and scientific debates

3.1 Is there a difference in the modal strength of the theories?

Philosophers have traditionally separated philosophical claims from scientific claims in terms of their modal status, arguing that science gives us facts about how the world *actually* is, while philosophy delivers truths about how the world *could* be or *must* be. Many philosophers understand metaphysical truths to be true *of necessity*: metaphysical truths are thus assumed to be truths that hold in all possible worlds.[7] If we apply this framework to the case of perception, we might be tempted to assume that Metaphysical theories propose necessary truths about properties that perception has in all possible worlds, while Psychological theories merely offer us contingent truths about properties that perception has in the actual world.

There are several reasons, however, to think that this modal framework will not help us to distinguish between Metaphysical and Psychological theories of perception. Most importantly, this is not an accurate depiction of metaphysical and scientific claims more generally: there are metaphysical truths which are not necessary, and there are scientific truths which are not contingent. Many metaphysicians acknowledge that a metaphysical model of the world "does not need to rely on claims involving necessity" (Paul 2012, 15), and allow that at least some metaphysical claims about the nature of the world are merely contingently true.[8] Conversely, scientifically-discovered truths (such as the those concerning the molecular structure of water and the atomic number of gold) are often claimed to be necessary truths.

Even if metaphysical and scientific claims more generally could be categorized respectively as necessary and contingent, this would not help us to understand the difference between Metaphysical and Psychological theories of perception. Notice that most Metaphysical theories of perception are *not* framed in terms of necessity. Very few naïve realists can be found explicitly committing to the

[7] Even contingentists acknowledge that it is a widely held belief that "metaphysical truths are not just truths about our world, but are truths about every world: they are metaphysically necessary" (Miller 2009, 23).
[8] Paul emphasizes that understanding the nature of the world is the sort of project that "may take its claims about the world to be contingently true in the actual world and worlds relevantly similar to our world" (Paul 2012, 8).

claim that perception is necessarily an unmediated relation to worldly objects, and even fewer intentionalists explicitly claim that perception is necessarily a matter of representing the world a certain way. (There is a subset of naïve realists who do sometimes appear to be using transcendental arguments to make stronger modal claims. I will not address them in this paper, because their necessity claims do not concern the mind-independent world and thus cannot establish the version of naïve realism under consideration here,.[9]) A standard way to argue for a metaphysically necessary truth is to who show that its negation is metaphysically impossible, but we do not generally find proponents of Metaphysical theories of perception characterizing the negation of their view as impossible, inconceivable, or leading to contradiction.[10] In the absence of explicit modal commitments, we might nevertheless have grounds for interpreting Metaphysical theories of perception as necessity claims on the basis of the arguments involved: strategies relying on conceptual analysis, two-dimensional semantics, the logic of counterfactual conditionals or the cognitive ability to detect metaphysically necessary truths, for example, are associated with the epistemology of modality. But the Metaphysical debate about perception rarely appeals to such strategies, either *a priori* or *a posteriori*.

One might think that philosophers of perception *ought* to be making stronger modal claims about the nature of perception than they do in fact make. In this paper I take no stance on this matter: my aim here is to give an accurate characterization of how proponents of Metaphysical theories describe their own views.

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[9] Some naïve realists use transcendental arguments to claim that certain features of our perceptual phenomenology necessitate that we are directly (non-representationally) related to worldly objects. But naïve realism is a position about the mind-independent objects of perception, and it is widely acknowledged that transcendental arguments cannot provide us with necessary truths about the mind-independent world rather than how we take the world to be (Stroud 1968). In a recent defence of transcendental naïve realism, Allen (2019) acknowledges this point and focuses on how a transcendental approach can reveal how naïve realism is possible, or how it is practically (rather than rationally) compelling. See also Allen (this volume) for discussion of different ways to interpret the naïve realist position.

[10] When Lowe argues against naïve realism, for example, he emphasizes that he is not trying to show that naïve realism is incoherent, absurd, inconsistent, or inherently impossible. He explicitly proposes his own alternative theory as a contingent matter of fact rather than a necessary truth (Lowe 1981).

To understand *why* Metaphysical theories of perception are rarely framed as necessary truths, we can take a brief detour into the history of the debate. Each of the Metaphysical theories of perception (intentionalism, naïve realism, sense-datum theories and adverbialism) was introduced to show how perceptual experience is *possible* in the face of the worry that perception, as we ordinarily understand it, might be impossible. Also known as the 'Problem of Perception', this worry arises when we try to reconcile the apparent properties of perception with each other. On one hand, our ordinary perceptual experiences seem to give us access to mind-independent features of the world. But on the other hand, at least some of our perceptual experiences are illusory or hallucinatory and thus inaccurate with respect to the mind-independent features of the world. The Problem of Perception is the problem of providing an account of perceptual experience that can make sense of both of these features: perception's ability to reveal the world to us, and its ability to mislead us.[11]

> "The Problem of Perception is that if illusions and hallucinations are possible, then perception, as we ordinarily understand it, is impossible. […] if these kinds of error are possible, how can perception be what we ordinarily understand it to be, an openness to and awareness of the world?" (Crane and French 2017)

I propose, therefore, that Metaphysical theories of perception should initially be understood as theories of how perception might *possibly* be: they are attempts to offer an intelligible account of perception which solves or dissolves the Problem of Perception. There is nothing to prevent one from trying to solve the Problem of Perception with claims of metaphysical necessity, but since solving the problem requires only claims of possibility, we should not expect to find Metaphysical theories of perception standardly proposed as claims of metaphysical necessity. Contemporary philosophers of perception, however, generally attempt to do more than demonstrate that a particular theory of perception is possible. The debate over Metaphysical theories of perception seems to be concerned with figuring out which of these theories of perception is the *right* one: intentionalists, for example, take their theory to be correct and naïve realism to be wrong; while naïve realists take their own view to be correct and intentionalism to be wrong.

[11] For further discussion of the supposed conflict between different features of perceptual experience and how it challenges the possibility of perception, see Crane (2005).

In this respect, the Metaphysical debate appears to be strikingly similar to the Psychological debate, which focuses on which possible account of perception (ecological or constructivist) is preferable. Psychological theories of perception are also proposed as contingent rather than necessary: their proponents allow that in a different sort of environment, our perceptual systems could have evolved differently. There is no obvious justification, therefore, for interpreting the Metaphysical and Psychological theories of perception as differing in the modal strength of their claims.

3.2 Do the theories result from different methodologies?

Scientific and philosophical theories have often been supposed to differ in methodology as well as modal strength – particularly prior to Quine's (1951) rejection of the analytic/synthetic distinction. Philosophical methodology is sometimes characterized as employing *a priori* reflection on our concepts, for example, while scientific methodology uses *a posteriori* means to test the empirical predictions of our scientific hypotheses. Might we distinguish between the Psychological and Metaphysical debates about perception along these methodological lines?

An obvious problem with this approach is that, post-Quine, philosophers generally agree that there is nothing essentially *a priori* about conceptual analysis. Conversely, science does not always proceed by empirical inquiry: scientists often compare and evaluate theories which make the same empirical predictions. They do so by drawing an inference to the best explanation, taking into account theoretical virtues such as simplicity, parsimony, fruitfulness, and compatibility with other theories, in addition to virtues such as empirical adequacy and predictive strength. Not all scientific theories make empirical predictions: some use hypothetical toy models to capture aspects of the world that are "often unobservable, indirectly confirmable, and abstract" (Paul 2012, 9).

Even if one were to reject Quinean naturalism, however, it would be difficult to find a methodological distinction between the Metaphysical and Psychological debates about perception. Notice that Psychological theories of perception are not generally engaged in making empirical predictions: constructivist and ecological theories are examples of the toy models mentioned above, which don't make observable or directly confirmable predictions. And as I have already observed, proponents of Metaphysical theories are not generally engaged in analysing the concept of perception into necessary and sufficient conditions. They are instead putting forward possible

theories of perception and debating their relative merits, in a process which resembles the methodology of inference to the best explanation.[12] This methodology is explicitly endorsed in the literature. When the naïve realist, for example, argues that perception is a non-representational relation to the world, they are claiming that their theory offers a better explanation of certain perceptual features than the rival theories:

> "What reason is there for thinking that naïve realism about visual experiences is true? The NR [naïve realist] claims that *the best explanation* of the fact that visual experiences introspectively seem to have the NR property […] is that veridical experiences actually do have it: having the NR property explains the way visual experiences introspectively seem." (Nudds 2009, 335, my italics)

Those who reject naïve realism tend to present themselves as offering a "a *better* explanation" than naïve realism of perceptual experience, often appealing to illusions as "powerful abductive support" for intentionalism (Philips 2016, 355, author's italics). Cavedon-Taylor, for example, explicitly acknowledges in his own proposal for an intentionalist claim that his "argument for this claim is an inference to the best explanation" (Cavedon-Taylor 2018, 391, my italics).

Proponents of Metaphysical theories of perception can generally be understood as employing inference to the best explanation. Unsurprisingly, Psychological theories of perception are also the result of inference to the best explanation: constructivists propose that the best way to account for perception is to assume that our sensory input is supplemented by stored information and inferential processing; while ecological theorists propose that perception is best explained by our active role in our sensory environments, which removes any role for inference. We cannot easily distinguish between the Metaphysical and Psychological debates, therefore, by appealing to their broad methodological approaches.[13]

[12] There is nothing singular in this respect about *perceptual* metaphysics: many metaphysical arguments rely on inference to the best explanation. For further discussion, see Hawley (2006), Paul (2012), Williamson (2016).

[13] There may, however, be a way to distinguish the transcendental arguments mentioned previously from inferences to the best explanation. See Gomes (2017) and Allen (2019) for discussion of the relationship between transcendental argument and inference to the best explanation in the philosophy of perception.

One might object that there is a more fine-grained methodological difference between the two debates. Despite my characterization of constructivist and ecological theories as hypothetical toy models, one might think that Psychological theories have a place for empirical evidence which Metaphysical theories lack. But any characterization of the Metaphysical debate as non-empirical seems to be at odds with the very idea of inference to the best explanation, which is usually understood as sensitive to *all* the available evidence (empirical or otherwise). When inference to the best explanation is used to construct and select between philosophical theories, presumably the evidence base should include all of our relevant knowledge, just as it does when it applies to scientific theorizing. There should be, in particular, "no restriction to knowledge gained in some special "conceptual" or "*a priori*" or "intuitional" or "armchair" way" (Williamson 2016, 268).

It looks like we cannot appeal to any peculiarly philosophical methodology to distinguish Metaphysical theories of perception from Psychological theories. Both use the methodology of inference to the best explanation, and neither makes easily testable claims about empirical matters of fact. A more fruitful way to address the distinction might be to allow that both debates are using inference to the best explanation, but with a different kind of explanation. Next I will consider whether Metaphysical theories are proposing an inference to the best *constitutive* explanation and Psychological theories are proposing an inference to the best *causal* explanation.

3.3 Is there a difference in whether the explanations are causal or constitutive?

Some philosophers have been inclined to see the distinction between metaphysics and science as a difference between constitutive and causal explanations. Many metaphysical explanations are indeed constitutive: they account for something's existence or occurrence by appealing to the kind of thing it *is* or *consists in*, that *in virtue of which* it has certain properties. Constitutive explanations like these are synchronic: if a change to an object or event is explained in terms of a change to its constitutive basis, these changes occur at the same instant rather than over a period of time. The *explanandum* and *explanans* of constitutive explanations are not independent existences. Many scientific explanations, on the other hand, are causal: they account for something's existence or occurrence by appealing to the etiological sequence of events which brought it about. Causal explanations are diachronic (i.e. they take time), and the cause (*explanans*) and effect (*explanandum*) are distinct

existences.[14] Could we argue, therefore, that both Metaphysical and Psychological approaches to perception use the same broad strategy of inference to the best explanation, but applied to constitutive and causal explanations respectively?

When we look at the Metaphysical debate about perception, it certainly seems to be primarily concerned with the constitution of perception: naïve realism is characterized as the claim that perceptual experience *consists in* being related to mind-independent objects; while intentionalism is the view that we perceive *in virtue of* representing the world in certain ways. These Metaphysical theories are proposed as synchronic explanations of what perception consists in, rather than diachronic explanations of the temporal antecedents to perceptual experience: "that *in virtue of* which it [perceptual experience] has all the other psychological properties it does" (Logue 2011, 269, my italics); "the kind *in virtue of which* [it] has the nature it does" (Martin 2004, 60, my italics).[15] Further evidence of this commitment to constitutive explanation can be found throughout the philosophy of perception: for a representative sample see Brewer (2011), Stazicker (2015), Crane and French (2017), and Brogaard (2018). We should therefore understand naïve realism, intentionalism, and other Metaphysical theories of perception as offering constitutive explanations of perceptual experience.[16]

If Psychological theories of perception offer causal (non-constitutive) explanations, then we would have a way to contrast the Metaphysical and Psychological debates. Some philosophers of perception do indeed characterize the debate in this way, proposing that scientific psychology provides information only about the *causes* of perceptual experience. McDowell, for example, claims

[14] See Ylikoski (2013) for a fuller discussion of the differences between constitutive and causal explanations. I am not taking any particular stance on the nature of causation or constitution or the dependence relations involved. I remain neutral as to the relation between constitution and identity.

[15] I take it that claims about the constitution of perception need not be understood as claims of metaphysical necessity. As Leuenberger (2014) and others have argued, metaphysical determination relations can be contingent.

[16] There is no tension between saying that an explanation is both constitutive *and* an inference to the best explanation. The methodology of inference to the best explanation is widely understood to apply to both causal and non-causal explanation: Williamson (2016) gives the example of Newton's laws, which provided the best explanation of Kepler's laws, but certainly not because Newton's laws caused Kepler's laws.

that science addresses the "causal or enabling question" of perception, and cautions us to resist the "temptation to suppose that the question is rather a constitutive one" (McDowell 1994, 199). This is a controversial way to characterize the debate, however, as I will now argue: the mind-sciences are concerned primarily with explaining our cognitive *capacities* (rather than particular events or behaviors) and explanations of capacities are usually understood as *constitutive (*rather than causal).

The mind-sciences are not primarily engaged in explaining particular events, such as single instances of cognition or behaviour. Instead, their aim is "to explain the human cognitive capacities – what they are, how they are exercised, in virtue of what we have them, and how they interact" (Von Eckardt 1995, 258). When cognitive scientists, for example, offer explanations of how we are able to comprehend language, to attribute mental states to others, or to perceive the world around us, they seeking to account in each case for a particular cognitive capacity. There is a general consensus in the literature that the *explananda* of the mind sciences are cognitive capacities: see Wallis (1994), Rupert (2009), Samuels, Margolis and Stich (2012), Miracchi (2017) for further evidence.[17]

Explanations of capacities are constitutive explanations: they are not diachronic explanations of one event or phenomenon in terms of the causal processes leading to it, but rather synchronic explanations concerning what gives rise to the capacity: what it consists in. In this respect, explanations of capacities are similar to explanations of abilities, dispositions and propensities (Ylikoski 2013). When we try to account for the fragility of a vase, for example, we are not usually trying to give an etiological explanation of how the vase came to acquire the property of fragility. Instead, we are trying to say what the vase's fragility consists in: which are the properties of the vase in virtue of which it has the simultaneous property of being fragile? Something similar is going in in our explanations of cognitive capacities, when we ask what our ability to attribute mental states to others *consists in* and *in virtue of what* we can comprehend language.[18]

[17] It is also widely acknowledged in the same literature that on the occasions where do want to give a causal explanation of a particular cognitive event, we do so by identifying the capacity of which it is a manifestation.

[18] It is not particularly surprising to learn that scientific explanations can be constitutive explanations, because this is not confined to the mind-sciences. Facts about water's behavior at different temperatures, for example, can be scientifically explained *in virtue of* its molecular properties, which in turn can be scientifically explained *in virtue of* atomic properties and physical forces. Science tells us what atoms, molecules, ecosystems and weather fronts *are*, not merely what causes them. There has been much interest of late in the role played by

Even when scientific psychologists do want to give a causal explanation of the source of a particular token mental state (e.g. a belief or a perceptual experience), the methodology is usually one of explaining how that token mental state can be a manifestation of a mental capacity.[19] The primary focus of the mind-sciences is not the causal explanation of individual mental states, but rather the constitutive explanation of mental capacities: what they are, what they consist in, that in virtue of which we have them. This general lesson transfers to Psychological theories of perception, and is presumably what motivates Burge to claim that constructivist Psychological theories of perception are offering constitutive explanations: he takes it that the aim of perceptual psychology is to explain the structure of perception, and not merely to provide enabling conditions of perception (Burge 2005, 21). (See Fish, this volume, for discussion of the debate between Burge and McDowell on constitutive and causal-enabling explanations.)[20]

It seems plausible, therefore, that Psychological explanations of perception are attempts to give a constitutive account of our capacity to perceive. If this is correct, then both the Metaphysical and Psychological debates about perception involve inferences to the best constitutive explanation.

3.4 Are there different kinds of constitutive explanation?

Even if both Psychological and Metaphysical theories offer similarly constitutive explanations of perceptual experience, it might be possible to distinguish them by appealing to two different kinds of constitutive explanation. We might explore, for example, whether Metaphysical and Psychological theories are relying on different concepts of constitution, and whether these concepts pick out different kinds of dependence relations.[21] But notice that even if there are different notions of constitution, this does not entail that only one of them has a place in metaphysical explanations.

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non-causal (including constitutive) explanations in science: for the current state of play, see Reutlinger and Saatsi (eds.) (2018).

[19] See Wallis (1994), Rupert (2009).

[20] One might argue we nevertheless *ought to* draw the distinction between metaphysical and scientific explanations in constitutive/causal terms, but this would be a particularly revisionary claim.

[21] See Harbecke (2016) for a discussion of the relationship between material constitution and mechanistic constitution, for example.

Some philosophers of perception seem to suggest that the difference between the Metaphysical and Psychological debates is in the 'level' of explanation concerned. There is a distinction in philosophy of mind between personal and subpersonal levels, which corresponds to the following two ways of ascribing mental states. When we speak of someone calculating a sum, representing a stick in water as bent, or predicting the outcome of an election, we are attributing the calculations, representations and predictions to the person. To give an explanation of mental phenomena by attributing psychological states to persons in this way is to give a personal-level explanation. In the mind-sciences, however, it is common to ascribe the same psychological terms to cognitive subsystems of the person: we might speak of the visual system calculating the Laplacian of the Gaussian, a neural structure representing left-to-right motion, or a Bayesian network predicting the next input. To give an explanation of phenomena by attributing psychological states to subsystems of the person like this is to give a subpersonal-level explanation.

Metaphysical theories of perception appear to offer personal-level explanations: they account for perceptual experience by appealing to how *the person* relates to or represents the world. Some philosophers take this feature to be definitive of metaphysical theories of perception: "What my experience fundamentally consists in (i.e. its metaphysical structure) is that which provides the ultimate personal-level psychological explanation of the phenomenal, epistemological and behavioural facts." (Logue 2012, 212). Logue contrasts personal-level theories such as naïve realism with scientific theories which appeal to "subpersonal psychological facts (e.g. the perceptual processing in the brain that takes place between stimulation of the sensory organs and experience)" (Logue 2012, 212). This description seems to accurately capture some Psychological theories of perception: many computational constructivist theories, for example, ascribe representations of low-level visual features to the person's early visual system rather than to the person. But not all constructivist theories offer subpersonal-level explanations: in Helmholtz's (1878) original constructivist theory, it is the person who draws the inferences (albeit unconsciously) rather than some visual subsystem. Furthermore, ecological theories are particularly difficult to characterize as subpersonal-level explanations of perception, because they do not attribute representations to any

part of the cognitive system.[22] So we cannot easily map the personal/subpersonal distinction onto the distinction between Metaphysical and Psychological theories of perception.

For the sake of argument, however, I wish to grant that there may be some way to make sense of Metaphysical theories as personal and Psychological theories as subpersonal. Acknowledging this, however, would not yet explain why proponents of Metaphysical theories of perception take themselves to be engaged in a project which is separate from and orthogonal to the Psychological debate. When two explanations of one phenomenon focus on different properties or levels of generality, we cannot generally conclude that the resulting explanations are independent from each other in any interesting sense. Consider the case of a chemist and a physicist giving constitutive explanations of properties of water by appealing respectively to its molecular and atomic structure. We do not assume that the atomic explanation is unconnected to the molecular explanation; in fact, we might even think that the molecular explanation holds *in virtue of* the atomic explanation. There are many philosophers who think that personal and subpersonal psychological explanations stand in a comparable relationship to molecular and atomic explanations, and who propose that personal-level explanations are reducible to subpersonal explanations.[23]

Those philosophers who think that the Psychological debate is orthogonal to the Metaphysical debate seem to be making a certain assumption about the relationship between personal and subpersonal explanation. They believe that personal-level explanations of perceptual experience play a privileged role in providing a metaphysical explanation of the nature of perception, and that these personal-level explanations are independent from subpersonal-level explanations. This is a familiar

[22] Notice that not all ways of explaining the brain are subpersonal-level explanations. Subpersonal explanation is a kind of *psychological* explanation which ascribes psychological states (e.g. calculations, representations, prediction) to subsystems of the person. A neural explanation in terms of firing rate or neurotransmitter uptake is not a subpersonal psychological explanation, but rather a neurological (non-psychological) explanation. The particular usefulness of subpersonal explanations comes from their being psychological explanations: they allow us to ascribe contentful mental states where the *person* would not necessarily endorse the content or even have the concepts to express it. The use of subpersonal explanation is consistent with different ontological interpretations: subpersonal explanations might refer to genuinely contentful mental states, some deflationary kind of computational processing, or nothing at all.

[23] This is probably the default view among philosophers of cognitive science. It has been articulated as 'homuncular functionalism' by Lycan (1987); see also Fodor (1975).

position in philosophy of mind, most commonly associated with the Sellarsian idea that explanations of mentality belong to a normative 'space of reasons', and not with our descriptive explanations of the scientific world.[24] On this view, personal-level psychological explanations are constrained by norms of rationality, which makes them autonomous from and irreducible to the causal explanations offered by the mind-sciences.[25]

The Sellarsian position, however, is just one way to interpret the relation between personal and subpersonal explanations. As I have already observed, there are philosophers who think that personal-level explanations can be neatly reduced to subpersonal-level explanations, and there are alternatives beyond these two approaches. Those taking a Sellarsian approach to perception, however, seem to think that *only* personal-level explanations provide metaphysical explanations; subpersonal explanations are dismissed as belonging to some distinct and non-metaphysical project. I have no interest here in settling whether personal-level explanations are autonomous from or reducible to subpersonal explanations: I'm simply suggesting that the question itself is a matter for metaphysical discussion, and recommending that metaphysicians of perception should at least consider the possibility that reductive theories can still be metaphysical theories.

4 Conclusion

I have argued that Psychological theories of perception, such as ecological and constructivist theories, are not clearly distinguishable in terms of their modal strength or methodology from Metaphysical theories of perception, such as naïve realism and intentionalism. I have not tried to provide an exhaustive refutation of all possible ways to distinguish the two projects. I happily acknowledge that there are differences between the two projects: differences in how the *explanandum* is framed, for example, and differences in the motivations and background assumptions of the

[24] The space of reasons is introduced in Sellars (1956). For further discussion of the Sellarsian interpretation of the personal/subpersonal distinction, see Drayson (2014).

[25] The Sellarsian position sits uneasily with work in scientific psychology which gives subpersonal content an explanatory role. By characterizing subpersonal explanation as merely causal, these philosophers must interpret their content ascriptions as purely instrumental and therefore non-causal. For more on different approaches to the personal/subpersonal distinction, see Drayson (2012, 2014, 2017).

theorists.[26] But I think that we should be wary of assuming that these differences make the two projects orthogonal to or independent from each other.[27]

I propose that both Metaphysical and Psychological theories of perception can be understood as trying to answer the same metaphysical question about the nature of perception: what is it that constitutes perception? Notably, my argument for this does not rely on any taking any particularly naturalistic stance. I have not denied a role for *a priori* theorizing, for example, or claimed that our scientific judgments are evidentially stronger than our intuitions. I have pointed out that that there is an ongoing debate about the role which scientific theories play in metaphysics, but I have not taken a side in this debate. In this paper, I am merely suggesting that we should acknowledge the possibility of more naturalistic metaphysical positions within the philosophy of perception, instead of ruling that those positions are engaged in a completely different project.

Why do some philosophers of perception deny Psychological theories a place in the debate over the metaphysical nature of perception? I do not that think simple anti-naturalism is to blame: I suspect that many people who deny a role for scientific theories in the metaphysics of perception would happily concede that being H_2O is a metaphysical fact about water, and that having atomic number 79 is a metaphysical fact about gold. Philosophers might allow that water and gold can have scientifically-discovered metaphysical properties, but deny that the same is true of mental phenomena. I think that this is the role played by the Sellarsian interpretation of the personal/subpersonal distinction in the metaphysics of perception, with the resulting claim that perceptual experience, as a mental phenomenon, is governed by different explanatory norms than water or gold. I won't attempt to argue against such approaches here. My aim is simply to highlight that other metaphysical positions are available, and that the philosophy of perception seems to be an outlier in its reluctance to accommodate them. In the metaphysics of mind more generally, there is

[26] See Fish (this volume) for discussion of the differences between the projects of Burge and McDowell, for example, with respect to whether explanations of perception must account for conscious experience. (I am assuming that both Metaphysical and Psychological theories are concerned with explaining conscious perceptual experience, and that both should allow for the metaphysical possibility of unconscious perception.)

[27] A theory which explains the boiling point of water has a different explanandum from a theory which explains the pH value of water, for example, but we would not conclude from that the theories are orthogonal.

an active debate about whether personal-level explanations are autonomous from, reducible to, or eliminated by subpersonal-level explanations.[28] In the metaphysics of perception, however, those who take the subpersonal level to play a role in determining the nature of perception are sometimes considered, as a result, not to be engaging with the metaphysical debate. I think that we do a disservice to both philosophy and science if we assume without argument that the metaphysics of mind must be conducted solely at one particular level of explanation.

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[28] There are further discussions to be had about the relationship between subpersonal-level psychological explanations and lower-level neurological explanations.

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