

FUNCTIONALISM AND THE PROBLEM OF OCCURRENT STATES

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In 1956 U. T. Place proposed that consciousness is a brain process. More attention should be paid to his word 'process'. There is near-universal agreement that experiences are processive—as witnessed in the platitude that experiences are occurrent states. The abandonment of talk of brain processes has benefited functionalism, because a functional state, as it is usually conceived, cannot be a process. This point is dimly recognized in a well-known but little-discussed argument that conscious experiences cannot be functional states because the former are occurrent, while the latter are dispositional. That argument fails, but it can be made sound if we reformulate it with the premise that occurrent states are processive. The only way for functionalists to meet the resulting challenge is to abandon the standard individuation of functional states in terms of purely abstract causal roles.

Keywords: occurrent states, functionalism, U. T. Place, process, conscious experience.

I. INTRODUCTION

A well-known argument against functionalist theories of consciousness concerns *occurrent mental states*. It is one of those arguments that are commonly bandied about in conversation but seldom written down. However, here is an example of it from Kirk Ludwig:

[T]he distinction between conscious mental states and others is [traditionally] conceived of as the distinction between dispositional and occurrent mental states, where occurrent mental states are manifestations of dispositional mental states. . . . Treating conscious mental states as manifestations of dispositional mental states, however, is incompatible with a functional analysis of them. Functional states are dispositional states, so if conscious mental states are analyzed as functional states or in terms of functional states, they cannot be treated as manifestations of dispositional states of any kind. (Ludwig 1998: §8)

I think this argument is unsound. (In saying this I am not picking on Ludwig. It is not his argument, and he rests little weight on it.) However, I think that

functionalism *does* face a problem with occurrent states. Once we see what that problem is, we will discover a similar argument that *is* sound. In this paper, I shall present that argument and examine its implications.

First, let us see what goes wrong with the argument just presented. It will help to have a clear view of its structure, especially since it contains a crucial suppressed premise:

- (1) Conscious experiences are occurrent mental states.
- (2) Occurrent mental states are manifestations of dispositional states.

Therefore,

- (3) Conscious experiences are manifestations of dispositional states.

However,

- (4) Functional states are dispositional states.
- (5) No state can be both a dispositional state and a manifestation of a dispositional state.

Therefore,

- (6) No conscious experience can be a functional state.

All of (1) through (6) are meant as metaphysically necessary truths, and references to *states* are to state-types. Ludwig might formulate (1) as ‘Conscious experiences are identical to occurrent mental states’, but the argument needs only the weaker, predicative premise.¹ Similar remarks might also apply to (2).

The suppressed premise is (5). It is false.² Some mental states are dispositions *and* manifestations. This is because, in general, a disposition can be the manifestation of another disposition. Broad (1933) gave the example of *magnetism*, which is the manifestation of the (second-order) disposition of *magnetizability*. Examples abound of dispositional mental states that are the manifestation of other mental states. For instance, a gullible person will have many dispositional beliefs that are the manifestation of her gullibility.

I propose to revise this argument by replacing its reliance on the idea that occurrent states—and hence conscious states—are *non-dispositional* with the idea that they are *processes*. So the challenge facing a functionalist account of consciousness is not the *dispositionality* of functional states but rather their *non-processiveness*.

That challenge is, I think, a serious one. It does not, however, undermine *all* functionalist theories of conscious experience. Functionalism is too diverse

¹ Furthermore, I actually think that the stronger version is false: see Bartlett (forthcoming: §4).

² So is (2), I think, as I argue in Bartlett (forthcoming: §5). But I shall put that aside here.

a family for such a sweeping claim to be tenable. My target, instead, is any theory that holds the following thesis:

Functional sufficiency thesis (FST): *S*'s having a state that plays an abstract functional role of a certain type metaphysically suffices for *S* to have a mental state of a certain type.

My concern is with functionalism as a metaphysical theory that aims to describe the *nature* of mental states. The FST claims that the nature of mental states is exhausted by their abstract functional roles. This, I shall argue, rules out the possibility that some mental states are processive—which is a problem if conscious experiences are processive.

The FST is what drives functionalism's commitment to multiple realizability. It expresses a general *neutrality* about the states that realize mentality. Provided that a state plays the relevant role, nothing else about it matters: playing a certain type of abstract functional role is all there is to being a certain type of mental state. And for a state to play a given such role is just for it to bear certain causal relations to other states, including input and output states. So a variety of specific kinds of states might qualify.

I take the FST to be a commitment of the standard versions of causal role functionalism—what Carl Gillett (2013) calls the 'Standard Picture'. On this view, functional states are defined by what I am calling abstract functional roles (see Section IV). These in turn are defined, as Gillett says, by 'causal roles of causing *some* property that causes *some* property that causes *some* property, in a complex web of causal relations between topic-neutrally-characterized properties' (169, orig. italics). (I shall speak of states rather than properties, but nothing turns on this.)

Sometimes these functional roles are 'tacked down' at the periphery (Block 1978) by specifying that their inputs and outputs are neural impulses, or some other physical events. I shall consider such versions of functionalism still to adhere to the FST, since the causal relations between the mental states themselves remain abstract.

However, there are also theories that reject the FST and yet that can still be seen as falling under the functionalist umbrella—albeit perhaps towards its edges. These kinds of theories (one of which is presented by Gillett 2013; see Section V below) move more decisively away from abstract functional roles. They physically individuate not only the system's inputs and outputs, but also its internal states. I shall suggest that such theories, by rejecting the FST, may be able to meet the challenge posed by the processiveness of conscious experience.

My argument will focus on consciousness, as have many other criticisms of the FST (e.g. the 'Chinese nation' case in Block 1978). But my argument is distinct. In outline it runs as follows:

First step: Conscious experiences necessarily are *processes*.

Second step: Abstract functional states necessarily are *not* processes.

Conclusion: Conscious experiences necessarily cannot be abstract functional states.

The main burden of my paper is to defend the second step: I turn to that task in Section IV. A full defence of the first step requires a paper of its own; here, I shall simply argue (in Section III) that its truth is already *widely assumed*. I hope that this will secure the relevance and interest of the second step, and thus the conclusion.

But first, since the distinction between *states* and *processes* plays a key role in both steps of my argument, I must say something about what I mean by these terms.

II. PROCESSES, STATES AND U. T. PLACE

My core assumption about processes is that they necessarily involve *change*. They are internally *active* or *dynamic*. This further means that processes must take place over time. For most philosophers, this is sufficient to show that processes necessarily have temporal stages (e.g. Emmet 1992). Consider, for example, the process of *chewing*. It is composed (at least in part) of a series of *changes over time* in the positions of the jaw, tongue and cheeks.

So processes are necessarily temporal. There must also be some kind of substance in which the required changes occur. However, I shall not say that the substance must be physical. I see no *a priori* reason why a process could not go on in a non-physical substance. Indeed, one might suggest that there are actual non-physical processes: economic inflation, perhaps, or mathematical calculation.³ So I shall hold open the possibility of non-physical processes.

Are processes the same as *events*? It is hard to say, for the situation in the literature on events is extremely messy. There is no agreement on whether events must involve change, or whether they must extend over time. For some authors (e.g. Lombard 1986), events definitively involve change. But for others (e.g. Steward 1997), there are changeless events. I shall avoid this issue by simply not speaking of events. My focus is on the distinction between processes and states.

What about states, then? Matters here are, if anything, in even greater disarray than they are concerning events. There have been many attempts at an account of events, but almost none for states (unless one counts typologies of verbs or predications, one type of which is ‘stative’: e.g. Vendler 1957, Mourelatos 1978). The word ‘state’, of course, strongly connotes something *static*. But that connotation is widely ignored, especially in philosophy of mind. ‘State’ is a default term for a mental item. Philosophers routinely refer to mental states, states of belief, conscious states and so on. Occasionally the word’s default

³ I owe this point to an anonymous reviewer.

status has been made explicit. For example, in arguing that ‘every experience is identical with. . . some neurochemical state’ (Lewis 1966: 17), David Lewis expressly did ‘not distinguish between processes, events, phenomena, and states in a strict sense’ (17n). Similarly, David Armstrong used the word ‘state’ in a broad sense that was ‘not meant to rule out ‘process’ or ‘event’’ (Armstrong 1968: 82). Other philosophers have followed in their footsteps, and the use of the word has become so common as to be entirely unnoticed.

What do Lewis and Armstrong, and others who followed them, mean when they speak this way? We may presume that they do not think that conscious experiences arise from wholly inert neural tissue. For it is almost universally assumed that our experiences are produced by patterns of neural *activity*—as indicated by the ever-popular (though sadly out of date) example of pain’s identity with C-fibre *firings*. We may also presume that they do not think that neural processes are (type-)identical with neural states. For processes are necessarily dynamic, yet states are not. The charitable reading, then, is that these philosophers are treating neural processes (and events) as a *kind* of neural state. On this construal, some states may involve change but others may not, and some states may be extended in time, while others may be instantaneous.

The only philosopher during the materialist turn of the 1960s and 1970s who seems to have been alive to these issues was U. T. Place. In 1956, he asked ‘Is Consciousness a Brain Process?’ Famously, he answered ‘Yes’—or more precisely, he defended the logical coherence of that answer. What is now seldom noticed, however, is his persistent use of the word ‘process’. Place did not emphasize this word in 1956, when he was intent on defending the very intelligibility of materialism. But a decade later, he was moved to clarify as follows:

The view I was defending. . . is that statements like ‘having a pain is a process in the brain’ are logically defensible, and I emphasize the word ‘process.’ The theory as I understand it is a theory about mental processes, not a theory about mental states, and having a pain on this view is a mental process, not a mental state. And if it is not a mental state it cannot be a brain state. (1967: 56)

However, this attempted correction came too late; the default use of the word ‘state’ was already taking hold. Even Place’s colleague J. J. C. Smart, who had initially followed him in identifying sensations with brain processes (Smart 1959), had by then converted (Smart 1967) to Armstrong’s ‘central state materialism’ (1968; see the quotation from Armstrong above). The distinction between states and processes was pushed aside, and with it, Place’s specific association of experiences with brain processes. (And despite Place’s attempt to correct the record, his own view is now routinely described in terms of brain states.)

The abandonment of the early materialist emphasis on brain processes coincided with the rise of functionalism. I think this was no accident. Standard

forms of functionalism—those which hold the FST—have no use for the notion of a brain process.

Place saw that functionalism had a problem with brain processes. The quotation above is from his comments on Hilary Putnam's seminal defence of functionalism, 'Psychological Predicates' (Putnam 1967). Place goes on to argue that just as pain cannot be a brain state, nor can it be a *functional* state—for it is no *state* at all. I suspect that he was right. I also think that philosophers now mostly assume that he *was* right—though they do not see this as a significant fact, and they certainly do not connect it to Place. I shall argue that if conscious experiences are processes, as we seem to think they are, then we must reject the standard forms of functionalism, just as Place did.

Another way in which Place was prescient, though, is that he did not see this problem as fatal for functionalism *tout court*. He held open the door for a 'functional-process theory' (1967: 59ff.) that would better fit the phenomena. I agree that this is a possibility. A theory that abandons the FST has a chance of meeting the challenge. However, it must be said that many will regard such a theory as not being genuinely functionalist.

III. EXPERIENCES, MENTAL PROCESSES AND OCCURRENT STATES

Let me now turn to my argument in earnest. The first step, as I have said, is that conscious experiences necessarily are processes. Instead of arguing for this directly, I shall argue that most philosophers (of mind, at least) are already committed to it. As an initial observation in this regard, recall what I noted in Section II: that conscious experiences are widely assumed to be processive. The only kinds of neural phenomena that are ever seriously put forward as being those that produce our own experiences are neural activations. Again, recall the standard exemplar of C-fibre firing. The very idea that the relevant neural phenomena might be inert is never even considered.

However, the force of this observation is limited. Functionalists, in particular, might conceivably reply (though I have never seen a functionalist actually say this) that while experiences are realized by processes in the human brain, or in organic beings, this is just a contingent state of affairs: it does not have to be that way in all beings. Nevertheless, I shall now argue that philosophers of mind, *including* functionalists, almost universally believe that experiences *must* be processive. The argument is modelled on the first half of the argument presented in Section I (and as in that argument, all statements are intended as metaphysically necessary truths):

- (1) Conscious experiences are occurrent mental states.
- (2') Occurrent mental states are processive.

Therefore,

(3') Conscious experiences are processive.

The first premise is unchanged. But the characterization of occurrent states in the second premise is revised, with concomitant revision to the conclusion. Instead of characterizing occurrent states as manifestations of dispositional states, I characterize them as processes.

(1) and (2') may appear incoherent. How can an occurrent mental *state* be *processive*? However, in the phrase 'occurrent mental state' I intend 'state' simply to refer to the class of mental phenomena to which other philosophers refer when they use that word in the broad manner noted in Section II. I myself do not endorse that broad use.⁴ But the key point for my purposes is that 'state' is extremely commonly used in this manner. Again, instead of arguing directly for (3'), I shall argue that most philosophers are already committed to it. I shall do this by arguing that (1) is, amongst philosophers, a universally accepted platitude, and that (2'), while not a platitude, is implicitly assumed to be an essential characteristic of occurrent mental states.

We can motivate both (1) and (2') by briefly reviewing the history of the notion of occurrent mental states (for a somewhat more detailed history, see Bartlett [forthcoming](#): §2 and 3). While it had earlier antecedents, the notion hit the philosophical mainstream after Alvin Goldman distinguished 'occurrent' from 'standing' wants, and also beliefs, in *A Theory of Human Action* (1970).⁵ An occurrent want, he said, 'is a mental event or mental process; it is a 'going on' or 'happening' in consciousness' (86), while a standing want 'is a disposition or propensity to have an occurrent want' (*ibid.*). The distinction is now standard in epistemology and philosophy of mind. (Ironically, though, in action theory its use has faded along with Goldman's particular version of the causal theory of action.) And of particular relevance to my present argument, it is now a platitude that all conscious mental phenomena—thoughts, judgments, sensations and so on—are occurrent states. This is premise (1) in my argument.

What about (2')? Consider again the above quotation from Goldman. While the word 'event' does not always connote change, 'process', 'going on' and 'happening' plainly do. Goldman also later describes occurrent states as 'activated' (1970: 88). He thus clearly regards occurrent wants as processive or dynamic. In short, he seems to presuppose that (2') is a necessary truth.

I think that (2') is now tacitly assumed by the vast majority of philosophers of mind. That is, it is assumed that occurrent mental states are active states, which involve change. This also entails, of course, that they necessarily extend

⁴ It would be more accurate, but more cumbersome, for me to formulate the two premises like this: (1) All conscious experiences are commonly referred to as 'occurrent mental states'. (2') All mental phenomena that are commonly referred to as 'occurrent mental states' are processive.

⁵ Goldman himself credits the distinction to Alston (1967).

over time (even if just a very short interval). In contrast, standing mental states are assumed to be latent states, which are inert or unchanging. While they *may* be temporally extended, they can also be fully instantiated at an instantaneous moment.

I must now forestall a misunderstanding. My claim is *not* that conscious experiences necessarily involve *qualitative* or *phenomenological* change, let alone that it is widely assumed that this is so. For it is in fact widely assumed that some experiences, such as hearing a steady tone or seeing a blank wall, are qualitatively unchanging. However, such experiences are still assumed to involve *some* variety of dynamic flux or change, even if what that change consists in is not clearly conceived. A sense of change or activity seems to be inherent in the very idea of occurrent states (Bartlett [forthcoming](#)), and hence of conscious experiences. Brian O'Shaughnessy expresses the point well:

[E]ven when experience is not changing in type or content, it still changes in another respect: it is constantly *renewed*, a new sector of itself is there and then *taking place*. . . . Thus, even if I am staring fixedly at some unchanging material object, such staring is not merely a *continuous existent* across time, it is an activity and therefore also a *process*, and thus occurrently renewed in each instant in which it continues to exist. (O'Shaughnessy 2000: 42, orig. italics)

I think that this sense of dynamism is the main driver of the universal assumption that our own conscious experiences can be produced only by neural *activation*—and I think this is why Place (1967) was sure that experiences are brain processes rather than brain states. A static neural state simply seems like the wrong kind of thing to do the job. To take someone whose views about the mind are a far cry from Place's, David Chalmers has remarked that 'there is an intuition that some sort of activity is required for experience' (Chalmers 1996: 296).

Putting this all together, then, and turning our attention to (3'), our very concept of conscious experience appears to include the fact that consciousness is, as Goldman (1970) puts it, a 'going on' of some sort. Place (1967) expressed the very same intuition a few years earlier in explaining how mental processes differ from mental states. He says that a mental process, unlike a mental state, can be said to be 'going on continuously from its onset to its offset' (56), and that mental processes—by which he meant 'sensations, experiences, thoughts, mental pictures, dreams, and the like' (*ibid.*)—all connote some sort of activity. I suspect that Place would have used the term 'occurrent' but for the fact that it had not quite yet come into common use. His distinction between mental processes and mental states very plausibly just *is* the distinction between occurrent and standing states. I suggest that when we say that experiences are occurrent states, we are effectively agreeing with Place that experiences are mental processes.

A further point must be made. It is not just that we think that conscious experiences are processive, and that this differentiates them from many other kinds of mental states. We also think that differences in processive properties make experiences distinct from *each other*; that is, that at least some (if not all) differences *between* experiences will be explained by processive differences. We assume, then, that processiveness is not simply like a light-switch that must be in the 'on' position in order for a state to be conscious. Rather, processiveness is a determinable whose various determinates make distinctive contributions to experiential character.

Again, my discussion in this section is not a full-dress defence of the claim that conscious experiences are processive. It is intended only to support my claim that it is more or less *universally assumed* in philosophy of mind that experiences are processive. I hope to have done enough to motivate the significance of my contention in the rest of the paper, which is that the processiveness of experiences makes it extremely difficult for functionalism to account for them.

IV. THE NON-PROCESSIVENESS OF ABSTRACT FUNCTIONAL STATES

We now come to step two in my argument: abstract functional states necessarily are *not* processes. The argument for step two is modelled on the second half of the argument presented in Section I, just as the argument for step one was modelled on the first half. Here is the full argument (and again, all statements are intended as metaphysically necessary truths):

- (1) Conscious experiences are occurrent mental states.
- (2') Occurrent mental states are processive.

Therefore,

- (3') Conscious experiences are processive.
- (4') Abstract functional states are non-processive.
- (5') No state can be both processive and non-processive.

Therefore,

- (6) No conscious experience can be an abstract functional state.

Whereas premise (5) in the original argument was that no state can be both a disposition and a manifestation, which is false, premise (5') is a trivial truth. So the only premise needing defence is (4'). I now turn to that defence.

As I noted in Section I, the FST expresses a general *neutrality* about the kinds of states that can *realize* mentality. This is because it says that mental

states are just abstract functional roles, and such roles are defined in a way that excludes many kinds of terms from the resulting functional state description. The following principle expresses the most well-known such exclusion:

(β) Abstract functional states are non-biological.

Crucially, (β) is about the functional states themselves, not their realizers. So it does not say that the realizers cannot be biological. It says that abstract functional states are *neutral* as regards biologicality—i.e. that the state description contains no biological terms. In conjunction with the FST, then, (β) has two implications. Firstly, mental states *may* be biologically realized, but do not *have* to be; hence, the standard functionalist claim that there could be non-biological minds. Secondly, any biological properties that those realizers do happen to have will not be appealed to in the ensuing theory of mental states. In particular, they will not figure in the *individuation* of the various kinds of mental states. The mind and its workings can be explained at a level that abstracts away from biological properties.

Here is another principle concerning what is excluded from abstract functional states:

(π) Abstract functional states are non-physical.

Again, (π) does not say that abstract functional states cannot be physically realized, just that they are *neutral* as regards physicality. As with (β), in conjunction with the FST, this has two implications. Firstly, mental states *may* be physically realized but do not *have* to be. Thus, as is occasionally noted (e.g. Fodor 1981: 119), functionalism permits the existence of minds in beings such as ghosts or angels. Secondly, any physical properties that those realizers do happen to have will not figure in the ensuing theory—and in particular, in the individuation of the various kinds of mental states. The mind and its workings can be explained at a level that abstracts away from physical properties.

I propose that ($4'$) is analogous to (β) and (π). Like them, it says that abstract functional states are neutral as regards a particular class of properties: in this case, processive properties. This is because abstract functional roles define the resulting functional state purely in terms of its causal relations to other, similarly abstractly defined, functional states. (β) and (π) are the familiar manifestations of this abstractness: as I said above, the state descriptions contain no biological or even physical terms. I am claiming that they also contain no processive terms.

Since abstract functional roles are individuated purely by their external causal relations to other states, they do not decompose into constitutive activities or temporal stages. All of their complexity is, so to speak, on the outside; like Gertrude Stein's Oakland, there's no 'there' there. A given functional state m is defined as the state that is caused by (say) states a , b and c , and that in turn causes states x , y and z —where states a , b , c , x , y and z are themselves

individuated in the same way. From this perspective, each state in itself is a simple, indivisible unit. In contrast, as I said in Section II, processes are internally complex: by their nature, they decompose into temporal sequences of activities. (And, in the case of physical processes, into spatial components, but again, I am not assuming that all processes are physical.)

Functionalism does specify, of course, that (e.g.) state m is *preceded* by state a and *followed* by state z —for this is required in order for m to be *caused* by a and for it to *cause* z . So an element of temporality does exist in the relation between states. But functionalism includes no specification of the intrinsic temporal dynamics of any of the states. I am suggesting that this fact explains the difficulty that functionalists have in accounting for occurrent states—and *a fortiori* for conscious experiences. The FST, in conjunction with (4'), rules out that certain mental states necessarily have a particular temporal dynamics; thus, it rules out that certain mental states necessarily are processive, and thus it rules out that certain mental states necessarily are occurrent.

I am not the first to recognize this particular limitation of functionalism. Chris Eliasmith remarks that 'Standard functionalism in philosophy of mind is clearly atemporal' (Eliasmith 2003: 519), and that this makes for a problem '[i]f the dynamics of some aspects of mental life are central to their nature' (*ibid.*)—which I am suggesting (and as Eliasmith also thinks) they are. Abstract functional states are atemporal, and hence non-processive: they *may* be processively realized, but do not *have* to be. Thus, just as functionalism permits non-biological or non-physical realizations of mental states, and it also permits non-processive realizations—including, contrary to (3'), non-processive conscious experiences. And furthermore, (4') means that any processive properties that the realizers of the functional states do happen to have will not figure in the individuation of the various kinds of mental states. Processive properties may be present in the realizers, but they will be explanatorily inert. So, in particular, they will not differentiate occurrent states from standing states. Nor will they differentiate different kinds of conscious states from each other—contrary to (3')'s understood implication that processiveness is a determinable whose determinates contribute in distinct ways to the character of experiences.

My claim is not that (4') is *entailed* by (β) or (π); only that it is *analogous* to them. As I said in Section II, I do not assume that processes must be physical. I think it is an independent fact that abstract functional roles do not feature any temporal properties and are thus non-processive. Indeed, even a role that *did* feature physical properties would not thereby have to feature processive ones, for there are types of mental states that are not processes—i.e. non-occurrent or standing states. So even embracing some form of materialism would not buy functionalists a solution to the problem I am presenting. They would still have to explain why *some* (but not all) functional roles necessarily are *processive*. Hence, it is irrelevant that most functionalists are token physicalists. The claim that functional states are actually realized only by physical states is motivated

by the independent thesis that every particular in our world is physical. As far as functionalism itself (in its standard form, holding the FST) is concerned, there could have been—or could actually be—non-physical mental states, or even an entirely non-physical mind. The FST and (π) jointly entail this metaphysical possibility. Analogously, the FST and $(4')$ jointly entail the possibility that there could have been—or could actually be—non-processive mental states, or even an entirely non-processive mind.

You may reply that there are surely functional roles whose realization requires a process. Indeed, you might even suggest that this must be the case for *all* functional roles. For if the role is occupied, there must be a transition from an input state to an output state, and so there must be a *process* that causally connects those two states.

However, it is unmotivated to call that transition a *process*. A process is more complex than a mere change of state. And in any case, it would be self-defeating for functionalists to say that all functional roles must be processively realized. For again, it is assumed that there are types of mental states that are not processes. We need an explanation of what makes occurrent states distinct from these. If the explanation is to appeal to the processiveness of occurrent states, then the functionalists' claim has to be that the functional roles of occurrent states have some *distinctive* property that necessitates their realization by processes. That explanation cannot be given if *all* functional roles are processive.

Still, the weaker claim that *some* functional roles require processive realization may remain intuitive. But I have argued that this claim is unavailable to the standard versions of functionalism—those which hold the FST, and thus which define functional states as *abstract* functional roles. It *is*, however, available to some theories that drop the FST but remain broadly functionalist in their approach. In the next section, I consider some ways in which functionalism might allow for an account of occurrent states by giving up the FST. Examining these theories will also further clarify the challenge that functionalism faces.

V. HOW FUNCTIONALISTS MIGHT TRY TO EXPLAIN THE DISTINCTIVENESS OF OCCURRENT STATES

As explained in Section IV, I think that functionalism's problem with occurrent states stems from the essential *temporality* of processes, and the *atemporality* of functional states. This is not to say, however, that the problem is insurmountable. Eliasmith mentions, but does not elaborate on, the possibility of a "temporal' functionalism' (2003: 519) that could allow the necessary temporal dynamics. And as I remarked in Section II, Place (1967) also seemed open to this possibility.

In this section, I shall describe two theories that might fit this bill. The first was presented in response specifically to the problem of occurrent states, by Georges Rey (1993; also 1997).

Rey notes that functionalism typically ignores the distinction between occurrent and dispositional states, to its detriment. He says that his own computational functionalist theory remedies this oversight by classifying sensory states as *processes*. The functional states corresponding to sensory experiences are a sub-variety of what Rey calls ‘comp-judging’ states, which in turn are the syntactic part of the propositional attitude of judging. ‘In general’, he says, ‘comp- Ψ -ing is a relation merely between an agent and a sentence in abstraction from its semantic properties’ (1993: 241). Now a relation is not a process. But, says Rey, the sensory tokens of these comp-judging states are processes, for they ‘correspond roughly to what other philosophers (for example, Alston 1967; Goldman 1970) have called ‘occurrent’ states’ (*ibid.*: p. 242), and therefore ‘a sensory state on the proposed view is fully activated. . . . [S]uch states involve some ‘characteristic processing’: they are best viewed not as single states but. . . as *processes* involving interactions among a variety of cognitive states’ (*ibid.*: 247, orig. emphasis; see also Rey 1997: 297). Rey then further adds that while the details of the account must be worked out empirically, ‘[a]ll that is important for our purposes is that the experience not be metaphysically simple. This is, after all, what the dualist claims, and is all, in essence, that the ‘materialist’ (whatever her ontology) is committed to denying’ (1993: 248). I take this to indicate the very same point I have made about occurrent states: they must be internally complex.

So I think that Rey sees exactly the problem I have been pressing. He clearly accepts (1) and (2’), and hence (3’). But one might see his proposal as an attempt to avoid (4’), by saying that certain functional states must be processive. This is not, however, what really happens in Rey’s theory. His route is not to deny (4’), but to abandon the FST.

I have already emphasized that (4’) does not mean that functional states cannot be processively realized. It is functional states themselves that are non-processive, not their realizers. So Rey’s theory is compatible with (4’)—just as it is also compatible with (β) and (π). His claim that sensory experiences are processes is a stipulation, introduced specifically to satisfy the intuition that such mental states must be processes. It is *added* to his functionalist commitments, rather than *entailed* by them. He is adding non-functional constraints to the theory. In so doing, he abandons the FST. He effectively admits this in his 1997 book. His name for the pure form of functionalism that cleaves to the FST is ‘input/output’ functionalism. In contrast, theories that add non-functional constraints to the abstract causal roles are what Rey calls ‘anchored’ functionalisms. As the name implies, he thinks that the latter are still *functionalist* theories. He says that as long as ‘the causal relations among the states. . . still

play a significant role in identifying particular states. . . such views would still seem to count as functionalist' (1997: 193).

As I have said, I do not want to debate the precise limits of the name 'functionalism'. I grant that there are theories which reject the FST but which still have a claim to that name—such as Rey's anchored functionalisms, of which his own version of computational functionalism is an instance. The key point for my purposes is that in order to obtain a theory that accounts for occurrent states, he is forced to abandon the FST. This is exactly what I am claiming is necessary if functionalists are to avoid the problem of occurrent states.

A second example of a broadly functionalist theory that might avoid the problem is Gualtiero Piccinini's and Carl Gillett's *mechanistic functionalism*. Their concern is not the problem of occurrent states. But their theory, like Rey's, may avoid that problem by allowing that some functional roles necessarily are processive. Again, however, this is achieved by dropping the FST, and thus by moving away from *abstract* functional states.

Gillett (2013) rejects the standard versions of functionalism on which functional roles are characterized in a purely topic-neutral way. He advocates a version in which the causal roles are *specific* rather than *generic*. Specific causal roles are defined by causal relations between spatiotemporal entities or activities in a concrete physical system—or more precisely, as he argues, by *mechanisms*. Gillett follows Piccinini (2010) in calling the theory 'mechanistic functionalism'. On this theory, the mind is the functional organization of the mechanism that exhibits the mind's capacities, and the relevant mechanism is the brain. The functional organization then 'includes the states and activities of components, the spatial relations between components, the temporal relations between the components' activities, and the specific ways the components' activities affect one another' (Piccinini 2010: 286).

On the standard versions of functionalism that are built entirely around abstract functional roles, functional states are second-order states of having a first-order state that plays a certain causal role. Those second-order states are non-physical and (*a fortiori*) non-biological—as per (π) and (β). In contrast, as Gillett (2013) emphasizes, in mechanistic functionalism the functional states are first-order states (or properties, as Gillett prefers) that play causal-mechanical roles. In short, they are states of concrete physical mechanisms. This is the key point for my present purposes, as it makes it plausible that some functional roles would indeed have to be processive. This is because there will plausibly be causal-mechanical functions that cannot be served non-processively. Since the input and output conditions will be physical, and the mechanism itself is physical—and since these properties are *specified in the role itself*—the

limitations imposed by physical and biological laws may necessitate realization by a process.⁶

To clarify the point, consider an example I referred to in Section II: the process of chewing.⁷ Chewing is a *functional* process: it breaks down food to prepare it for more efficient protein digestion in the stomach. This function could not be served non-processively. The component or components to which the function belongs—the jaw and mouth—are biological entities. The function takes as input whole pieces of food and produces as output a mixture of crushed food and saliva, known as a *bolus*. The only way for the jaw and mouth to create a bolus, within the limits imposed by physical and biological laws, is via a process of crushing, grinding and mixing. And that process just *is* the process of chewing. The idea, then, is not that the *realizer* of the chewing role is a process; rather, *the chewing role itself is specified as a physical process*, and what realizes it is some maximally specific combination of physical components and activities. (cf. Piccinini and Craver 2011, who argue that a functional analysis *just is* a sketch of a mechanism—that is, a description of a mechanism that has some gaps that remain to be filled in.)

A mechanistic functionalist theory, then, might be able to claim that given the physical and biological structure of the brain, and hence the limits imposed by physical and biological laws, some mental states must be processes. The idea is that there would be some mental states whose roles would be specified in a way that necessitates a processive realizer—for example, by specifying the production of certain kinds of neurotransmitters, or the summing of action potentials. But this would mean that the roles in question would not be abstract, and hence that mechanistic functionalism abandons the FST.

Place (1967) may have gestured towards the kind of theory that Gillett and Piccinini are developing. While it is not clear to me precisely what he had in mind, some of his remarks suggest a mechanistic functionalist theory. Using an analogy to a motor car, Place says that pain is analogous, not to a functional *state* of the car, but to ‘something like the pumping process which occurs in the car’s fuel pump’ (1967: 61). And he allows that such a process can be *picked out* in functional terms, by describing its functional role within a larger system. (However, he also says that this can be done ‘without saying anything about its physical realization’ [*ibid.*]. I am not sure how to understand this remark, which seems to endorse abstract functional roles.)

I am sure that many philosophers will say that mechanistic functionalism is not functionalism at all—that it actually abandons functionalism for some sort of psychoneural reduction. I take no position on that issue (for some discussion,

⁶ There are also obvious affinities between mechanistic functionalism and teleological functionalism (e.g. Millikan 1984; Lycan 1987), as is noted by Piccinini (2010: 289n.). So teleological functionalism too may be in a better position to cope with the challenge of occurrent states than are the standard forms of causal role functionalism.

⁷ See also Piccinini’s example of the heart’s pumping of blood (2010: 286).

see Piccinini and Craver 2011). My purpose here is not to endorse mechanistic functionalism, nor to assert that it is genuinely functionalist. The fact that Rey, Gillett and Piccinini give up the FST certainly makes them *outliers* in the functionalist family—perhaps even outcasts who will not be invited to family gatherings. I simply wish to point out that their approach may be the only way for functionalists to give an account of occurrent states and, thus, to offer a full account of conscious experiences.

VI. WHAT ABOUT REALIZER FUNCTIONALISM?

It might be thought that *realizer* functionalism can retain the FST while rejecting (4′)—that is, while maintaining that some abstract functional states must be processive.

The argument for this might start with (π) and (β), which I put forward as analogous with (4′). It may be said that realizer functionalism rejects (π) and (β), and thus that it can reject (4′) as well. For realizer functionalism identifies a mental state with the realizer of the pertinent functional role, not with the second-order state of having the role occupied. Hence, one might argue, realizer functionalism is not neutral between physical and non-physical realizers, or between biological and non-biological ones: for it identifies mental states with the neurophysiological realizers of the pertinent functional roles. That is, it says that mental states are neurophysiological states. And hence, could not realizer functionalism also say that *some* types of mental states must be not only neurophysiological but *processive*?

It is a bit hard to know exactly what to say about realizer functionalism, because its stance regarding the FST is ambiguous. On one common interpretation, realizer functionalism is simply a way of arguing for the identity theory, and hence, it straightforwardly rejects the FST. In that case, I have no quarrel with the realizer functionalist.

However, the difference between role and realizer functionalism may not be as large as it seems (cf. Gillett 2013), and it may be that most realizer functionalists retain the FST. Let us assume, in any case, that they do; that is, that they characterize functional roles in abstract causal terms. Can such a theory allow that some kinds of mental states necessarily are processive?

I don't think it can. Even if they reject (π) and (β)—and I'm not sure that they do, but let us assume so for the sake of argument—realizer functionalists still retain (4′). That is, they accept that functional states necessarily are non-processive, and so could be realized by non-processive states, even in the case of conscious experiences. Just like role functionalists, realizer functionalists allow mental states to be realized by different kinds of physical states, where those states do not have to be processive. (Of course, they may then want to identify the mental state with a certain physical realizer, which may in some cases be

a process. But if they do this, they are again rejecting the FST, at which point I can rest my case.)

David Lewis' (1980) famous Martian pain case seems to actually *be* a case in which a conscious experience has a non-processive realizer. Lewis imagines the pain role in the Martian being occupied by 'the inflation of many smallish cavities in his feet' (216). While the word 'inflation' is ambiguous between the process of *becoming* inflated and the (static) state of *being* inflated, Lewis' further remark that 'When these cavities are inflated, [the Martian] is in pain' (*ibid.*) very much suggests the latter reading. So it appears that Lewis, who is probably the most well-known realizer functionalist, did not think that the pain role must be realized processively. He thought that it is indeed processively realized in humans, of course, and therefore that *pain-in-humans* is processive, but he did not seem to identify *pain* (period) with a processive state. (And he notoriously held that even in humans, it was only a contingent truth that pain is realized by neural activity; see Lewis 1994.)

It appears to me, then, that most realizer functionalists hold that mental states are just a matter of having a certain functional role occupied—just as role functionalists do. They impose no further condition on the nature of the realizers. Just like role functionalists, they say that what occupies the pertinent roles is a contingent matter. That could, I think, even include non-physical states, if such states could fulfil the requisite causal roles (though perhaps the realizer functionalist would argue that they could not—hence my uncertainty about whether the realizer functionalist accepts (π) and (β)). It could certainly include non-processive states. So the theory will not account for the processiveness of conscious experiences, or of occurrent states in general.

VII. A LAST PROPOSAL FROM THE FUNCTIONALIST

Here is one last proposal that the functionalist might try. Could not occurrent states, and thus conscious experiences, be understood as processes that are *composed of a series of abstract functional states*? This would seem to be a way of capturing the internal complexity of occurrent states while sticking strictly to the theoretical resources of standard functionalism as codified in the FST—i.e. abstract functional roles.

This is an interesting proposal. But the main observation I want to make about it is similar to my observation about the theories offered by Rey, and by Gillett and Piccinini: it may indeed resolve the problem, but only by relinquishing the FST. In fact, it moves even further away from the FST than they do. Rey, Gillett and Piccinini retain the idea that mental states are functionally individuated; it is just that the functional roles are not abstract. So while they reject the FST, they retain a related thesis in which the functional roles are more narrowly (e.g. biologically, mechanically and physically) specified. In

contrast, the present proposal entirely drops the idea that mental states are functionally individuated, in favour of the idea that at least some mental states are *composed* of functional states. This is quite a different claim. *Being composed of functional states* is not at all the same thing as *being a functional state*—any more than *being composed of proteins* is the same thing as *being a protein*. A process does not become a functional state by being composed of functional states. To think otherwise is to commit the fallacy of composition.

Of course, a proponent of this approach would be free to further argue that the process is *also* itself a functional state (i.e. as well as being *composed* of functional states). But that would be a separate claim that would gain no support from the composition claim and that would run straight into the problem I have already presented in this paper.

So this proposal is even more distant from standard functionalism than are Rey's anchored functionalisms and Gillett and Piccinini's mechanistic functionalism. It takes the central idea of a process for granted, rather than analysing it in functionalist terms. One would want to ask: why do *some* series of functional states, but not others, compose a process that is a conscious experience? This sort of question—a question about what *makes* a certain state or property or phenomenon a mental state—should receive, from a functionalist, an answer in terms of the playing of certain causal roles. (This is how Rey, Gillett and Piccinini will answer it.) But on the proposed compositional account, it receives no such answer. So the fact that the processes are composed of functional states looks rather like a red herring; the theory itself would be otherwise noticeably distinct from functionalism.

VIII. CONCLUSION

Functionalism remains a popular (and perhaps the most popular) theory of the mind. It faces a number of challenges that have been examined in great detail. But one challenge that has never been carefully developed is that functionalism cannot account for conscious experiences, because it cannot account for occurrent states. Indeed, I think that this challenge has never even been clearly *understood*, since it is usually presented as being about dispositions and their manifestations. I have argued that this is not the correct way to understand it. Rather, the challenge is that functionalism conflicts with the very widely held assumption that conscious experiences necessarily are processive.

One option, of course, is simply to repudiate that widely held assumption. This option merits exploration; or at least, it merits being *noticed* as a possibility, even if we do not end up adopting it—as I think we should not, though that is an argument for another time. It is a remarkable fact that, even with the immense proliferation of broadly materialist theories of mind (I include functionalism in

this category) in the past 60 years, the very question of whether consciousness is processive has barely ever been raised, let alone considered. Only Place (1956) spoke consistently and deliberately of brain processes, but this aspect of his view was generally not noticed even at the time, and was quickly forgotten. I think it is time to dust it off and take it seriously. Most philosophers already assume that consciousness necessarily is processive. If they put their money where their mouth is and purposefully embrace that assumption, I contend that they will be led to abandon the standard forms of functionalism—in favour at least of a more constrained version of functionalism, and perhaps even some more forthrightly reductive theory.⁸

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