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Christopher Mole

Attention is Cognitive Unison: An Essay in Philosophical Psychology

New York: Oxford University Press, 2011, 186 pp.

ISBN: 978-0-19-538452-9

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Christopher Mole's *Attention is Cognitive Unison* begins just like every other book on attention: by quoting William James's famed motto 'Everyone knows what attention is' (James, 1890, p. 381). Which it is why it is such a relief to see an author that, for once, moves beyond the commonplace and engages with what James actually had to say about attention. Even more exciting is to see an author that engages *critically* with James, reliving an important yet nearly forgotten controversy in the history of theoretical psychology: F.H. Bradley's dissatisfaction with what James takes to be the received approach to understanding attention. According to Mole's version of the story — which he nicely recounts in Chapter 1 — at the end of the nineteenth century there were three main perspectives on attention: the view according to which attention was involved in willed action, the view according to which attention was a way of perceiving, and the view according to which attention was a kind of directed thinking. When James was writing *The Principles of Psychology*, each one of these views had its own stewards, with James himself defending a variation on the perception-centred view that, nonetheless, was sympathetic toward the other two. But the conciliatory tone of James's own view did little to assuage many of his contemporaries, who, by the turn of the century, grew wary of the many uses with which the psychological literature had endowed the term 'attention'. Bradley (in 1902) registers his concern as 'a kind of protest', noting that theorists have abused of the word 'attention' to such a point that it 'has been used to include and cover what everyone does and must call a state of innattention' (Mole, 2011, p. 6).

The reasons behind Bradley's protest, however, were not altogether clear, and sadly, with the advent of behaviourism, the dispute about the nature of attention was almost entirely left aside. Fortunately,

Mole picks up where Bradley left off. For he suspects that Bradley's dissatisfaction points at something fundamentally right about the nature of attention. It is not that Bradley was disagreeing with James about the specific choice of the perception-centred over the contender views, or about the scientific evidence garnered in support of his arguments. To Mole, Bradley's disagreement with James was actually metaphysical: whereas James thought attention was the sort of thing that could be accounted for by identifying the nature of the process or processes that constitute it, Bradley thought that the question about constitutive processes of attention was wrongheaded. To put it more precisely, and in the terms Mole introduces in Chapter 2: whereas James thought of attention as a 'process-first' phenomenon, Bradley conceived of it as an 'adverbial' phenomenon, the kind of thing that is best accounted for in terms of the way it happens or it gets done (Mole, 2011, p. 30). Thus, what Mole thinks Bradley gets right, and James gets wrong, is the metaphysical category attention belongs to. And so, for the rest of the book, Mole will go on to defend a novel adverbialist view of attention — which is no small feat, considering that most (if not all) research on the cognitive psychology and neuroscience of attention happens to be on James's side.

Before getting onto the arguments Mole deploys against the process-first view (in Chapter 3), and in favour of his own adverbialist alternative (in Chapter 4 and beyond), it is worth wondering whether or not Mole is justified in drawing a metaphysical distinction between 'process-first' and 'adverbial' phenomena. What grounds this distinction, according to Mole, is the fact that 'something fundamental about the metaphysical status of any phenomenon is revealed by the order of explanatory priority between our answers to the questions "What is x" and "What is it for something to be done x-ishly?"' (*ibid.*, p. 25). As an illustration he offers his pet example of the difference between combustion and haste. The idea, in brief, is that in order to explain the phenomenon of combustion one needs to answer what combustion is before one answers what it is for something to combust, whereas to explain the phenomenon of haste one needs to know first what it is for something to be done hastily before one can answer what haste is. Accordingly, attention is more like haste than combustion.

As far as the example goes, the division between process-first and adverbial phenomena seems compelling. Notice, though, that the cases of combustion and haste work well precisely because we already know what they are, and because Mole cherry-picked them to nicely fit the bill — which may explain why it is easy to concede that, when it comes to knowing what each of these phenomena amounts to,

answering ‘What is combustion?’ appears to be informative enough, just as answering ‘What is it for something to be done hastily?’ But would Mole’s metaphysical wedge withstand the test of a different phenomenon, one we are less sure which category it belongs to? Let’s see. Suppose you want to know what neural synchrony is. Neuroscientist A tells you that neural synchrony is the process of phase-locking firing patterns across neurons forming a network. So you think of neural synchrony as a process-first phenomenon. Just to confirm, you ask neuroscientists B, and now she tells you that neural synchrony is the simultaneous oscillation of the membrane potentials in a network of neurons. This definition, though, sounds more adverbial, as it takes neural synchrony to be a way in which membrane potentials oscillate. Did one of the neuroscientists get the metaphysical category right and the other one wrong? I don’t think so. As far as they go both answers are correct. It just so happens that neural synchrony is not the kind of thing that can be easily categorized either as a process-first or as an adverbial phenomenon mainly because the very process of neural synchrony is, as it were, adverbial: it is a way in which neurons oscillate.

Of course, whether or not attention is such an uncategorizable phenomenon, or whether or not the adverbialist view fares better at explaining what attention is than the process-first view, is going to depend as much on its own virtues as on its contender’s flaws. Thus, to strengthen the case in favour of his adverbialist view, Mole offers two counter-arguments against the process-first view in Chapter 3. The first argument is relatively straightforward. It starts off with the claim that, ‘if attention is a cognitive process, then, for all events x and y , if x and y instantiate the same cognitive process, then if either one of them is an instance of attention, the other is too’ (*ibid.*, p. 46). Next, Mole suggests that the evidence gathered by Anne Triesman (e.g. Triesman and Gelade, 1980; Triesman, 1998) suggests that some instantiations of feature-binding are instantiations of attention. However, he then brings up neuropsychological evidence of patients with hemineglect who can bind features but cannot attend. Since this fact contradicts the supervenience claim the argument started off with, Mole concludes that attention is not a cognitive process.

The problem with this argument is that the first premise does not seem to be empirically accurate. I don’t think that either Triesman, or anyone else, has evidence to the effect that the instantiation of feature binding is identical to the instantiation of attention (even token identical). In fact, at no point does Triesman, when talking about her own data, suggest that both processes are the same, or that the one

supervenes upon the other. All she remarks is that spatial attention (which is only one kind of attention), under normal circumstances, appears to be necessary for perceiving objects as wholes, which in turn seems to require feature binding. But saying that a process is normally necessary for another process to occur is different from saying that the two are the same process. In fact, the relation between one and the other need not be that of identity or supervenience, it need not even be of constitution: it could be merely causation, and causes can very well occur without effects (and, depending on your views on causation, maybe vice versa too). Besides, Triesman was aware that, although normally required, attention might not even be sufficient for feature binding. For it is very likely that other processes, which may be preserved in patients with hemineglect, are also required for feature binding. As a result, the neuropsychological evidence brought up by Mole should be interpreted merely as suggesting that patients with hemineglect, whose spatial attention is impaired (which constitutes an abnormal circumstance), can nonetheless sometimes perceive wholes. In normal circumstances, attention appears to be necessary for feature-binding perception to occur, but sometimes, as evidenced by patients with hemineglect, 'there are conditions in which wholes are registered automatically without attention' (Triesman, 1998, p. 1305). An empirically accurate reading of the evidence would simply suggest that attention is a normally necessary yet probably not sufficient factor in the feature binding required for whole object perception. Therefore, I doubt that an advocate of the process-first view needs to be committed to the first premise of Mole's counter-argument.

The second argument Mole offers against the process-first view is, I think, more successful, but it is also limited. It is directed against the claim — attributed to Peacocke — that our ordinary experience of failing to pay attention to more than one thing at once ought to be explained by the fact that attention is a single process whose resources can only be allocated to a single target at a time. Mole rightly criticizes this argument by bringing up suggestive evidence indicating that, under certain circumstances, attention can be divided over multiple targets without interference, which in turn suggests that the 'single channel' view is inaccurate (Mole, 2011, p. 44). The problem, however, is that this argument is only successful against the view according to which attention names a single process. Today, numerous scientists espouse the view that attention names several kinds of processes, which explains why, under some circumstances (e.g. when two different processes are engaged), multiple targets can be attended at once (for a recent review, see Chun, Golomb and Turk-Browne,

2011). Thus, Mole's argument is only successful against a decaying single-process view, not against the more up-and-coming view of attention as multiple cognitive processes.

Still, even if unsuccessful at the end, Mole's scepticism against the process-first view is, and should be, well taken. Identifying attention with a single cognitive process is probably wrong (although, as I'll suggest shortly, what exactly is wrong about it is not so obvious). Nonetheless, Mole's view isn't simply the denial that attention is a natural kind that names a single process, or that the term names a unified cognitive phenomenon for which it makes sense to try to find a single underlying brain mechanism. Mole also opposes the view that attention is an umbrella notion naming more than one process. In fact, he opposes any perspective that makes use of the process vocabulary. The adverbialist alternative he offers is the cognitive unison theory of attention, which takes attention to be a specific way in which agents engage in certain tasks. Specifically, attention occurs when the set of cognitive resources an agent brings to bear, with understanding, in the service of a particular task is not engaged in any activity that does not contribute to the performance of said task (*ibid.*, p. 51). To put it somewhat poetically: an agent performs a task attentively when she orchestrates her cognitive resources to resonate in unison in the service of said task.

Mole devotes the fourth and longest chapter of the book to elucidate the cognitive unison theory of attention, and to clarify each one of the terms employed in its definition. This is a very rich chapter, full of insightful arguments and plenty of thought-provoking claims. For that reason I won't be able to do justice to the many subtleties of his exposition, which is certainly worth reading. So I'll just cut to the chase. Maybe it is because I'm still in the grips of the process-first view, but no matter how hard I tried, as I was reading the chapter I couldn't help but think that much of the explicatory leverage the cognitive unison theory gets comes from making use of the kind of explanatory tools I would have thought were proprietary of the process-first view. For instance, Mole constantly says that, when attending, the agent 'brings to bear sets of cognitive resources in the service of a particular task'. However, what he means by 'cognitive resources' here is left curiously unexplained. More importantly, whether or not he means something different from what (process-first) cognitive scientists may mean by 'cognitive resources' is also unclear, especially when the expression is used to explain certain phenomena very much the same way in which an advocate of the process-first would do it. To give a concrete example: divided attention is explained by Mole in terms of

the agent's background sets of resources not intersecting, so that the resources allocated to one task don't overlap with those allocated to the secondary task (*ibid.*, p. 75). How is this different from explaining divided attention in terms of two cognitive processes not sharing resources? Likewise when talking about degrees of attention, which, to Mole, can be explained in terms of differences between the sizes of the background sets. How are we supposed to measure their sizes? What is the metric here? Presumably, as per his definition of 'cognitive process' (*ibid.*, p. 58), it may be the number, or maybe the complexity, of the relevant representations. But once again we are back into process-first view territory, explaining degrees of attention in terms of differences in informational load and/or informational capacity of particular cognitive processes. I guess that, at the end of the day, I am not sure what the cognitive unison theory is buying us that the process-view first didn't already pay for.

Maybe the critical difference is that, for the cognitive unison theory, the right level of explanation of attention is the personal level, whereas for the process-first view the right level is the sub-personal level. But that does not seem quite right either, as Mole wants to distance himself from Bradley's and Ryle's agent-level explanations by way of suggesting that unison occurs among 'bits of cognitive processing' (*ibid.*, p. 51), which I take to be sub-personal, even if the representations they operate upon bear agent-level contents (*ibid.*, p. 58). Which again makes me wonder whether the adverbialist view Mole suggests is really at odds with a process-first view, or if it is rather consistent with a less-stringent process-first view according to which attention would be identified with whatever event(s) go on sub-personally in the agent's brain when her cognitive tasks are engaged in unison. After all, if processes are events, I don't see why one cannot make a case to the effect that cognitive unison is identical to the sub-personal event of orchestrating one's background set of cognitive resources in the service of a particular task, in which case we would have an argument in support of the claim that attention as cognitive unison is a process-first view. Incidentally, such a view would probably avoid the numerous metaphysical manoeuvrings Mole had to engage in to explain, in Chapter 5, how his adverbialist theory could account for the causal effects of attention.

Now, Mole is aware of this possibility, but he rejects it outright. In Chapter 6, where he examines the multiple consequences for cognitive psychology that would follow from the acceptance of his cognitive unison theory, Mole critically addresses the very alternative I just suggested:

If, on looking into the brain, a process or set of processes could be identified whose operation accounts for all and only the psychological effects that are attributed to attention, then we could say that the explanatory achievements of process-identifying psychology vindicated its commitment to a process-first metaphysics. (*Ibid.*, p. 120)

But he goes on to reject it on account that ‘nobody thinks this is what psychology finds [or...] “expects to find”, and that pretty much all psychologists agree that there is no one uniform computational function, mental operation or causal mechanism responsible for all and only attentional phenomena’ (*ibid.*, pp. 120–1). On this point I find myself partially disagreeing with Mole. Although he is right in saying that such might have been the consensus back in 1992, when Allport wrote his criticism to Broadbent’s single-process view, I don’t think this is the view most cognitive scientists hold today. Not because a single neural and/or cognitive mechanism underlying all and only attentive phenomena have been found, but rather because there is another alternative one could embrace to retain the explanatory advantages of the process-first view without having to be committed to finding a unifying neural correlate for attention: one could characterize the nature of a cognitive function in terms of critical operations defined at the psychological (personal) level, while acknowledging that they may not be carried out by the same (sub-personal) cognitive and/or neural mechanisms. Indeed, this sort of ‘convergent cognitive evolution’ appears to be in the background of some contemporary understandings of memory (e.g. Anderson and Wilson, 1989; Klein *et al.*, 2002). According to this approach, a cognitive function can be characterized as fulfilling a definite set of adaptive psychological roles without their underlying processes having to share the same description at the neurological, or even computational, level. Accordingly, memory systems fulfil encoding, retention, retrieval, and predictive roles, and such roles warrant their operationalization under an overarching rubric such as ‘memory’, even when there isn’t a single neural or cognitive mechanism underlying all and only mnemonic operations. Notably, this very alternative has been recently articulated in a massive review paper by Chun, Golomb and Turk-Browne (2011), which I think unifies the silent clamour among cognitive scientists that attention should be treated, in fact, a bit like we treat memory (De Brigard, 2011). My suggestion is simply that, as with the case of memory, we could keep the explanatory advantages afforded by the process-first view without having to be committed with the perspective Mole rightly criticizes.

I don't want to belittle the point Mole is making here, though. Quite the opposite: even if his cognitive unison theory isn't fully satisfying, I think his criticisms of the process-first view are relevant and pose a critical challenge to cognitive psychologists and neuroscientists currently working on attention. On the one hand, I think this book highlights the need for cognitive scientists of attention to be clearer about the pretensions and explanatory reach of their theories, and it teaches us to be sceptical about grandiose announcements to the effect that some alleged neural and/or cognitive correlate of attention has been found (e.g. Posner and Petersen, 1990). Unless said cognitive scientists are willing to clarify how the neural/cognitive correlate of attention they allegedly found can account for all and only attentive phenomena defined at the personal level, such bold proclamations should be kept at bay. On the other hand, and albeit indirectly, this book also invite us to question cognitive scientists' use of the locution 'process' in their scientific explanations. The notion of process can no longer be explanatorily primitive. As cognitive theories get more complex, and start involving more mechanistic levels of explanation, it behoves scientists to clarify what kind of processes they may be alluding to. After all, the term 'process' is, I think, substantive-hungry in Austin's (1962) sense. At least as they figure in cognitive explanations, explanatorily useful allusions to processes include metabolic, neural, chemical, informational, computational, electrophysiological, and cognitive processes, to name just a few. And these different kinds aren't simply hierarchically nested. Presumably, every cognitive process is going to be an informational process, that's true, but not all informational processes are cognitive. Likewise, perhaps all cognitive processes are computational, but likely there are many computational processes going on in the brain that aren't cognitive. And the same goes for many other processes down the explanatory ladder. So Mole is absolutely right when remarking that 'the claim that attention is a process does not entail anything about the level at which we can describe the process corresponding to attention' (Mole, 2011, p. 32). Of course I don't read this remark as supporting the claim that attention is not a process, but rather as highlighting the fact that without a precise characterization of what kind of process it is, saying that attention is a process is rather vacuous.

In the last chapter of the book, Mole discusses two philosophical consequences that may follow if one was to embrace his cognitive unison theory of attention. The first consequence has to do with the project of using attention to anchor reference (Campbell, 2002); the second one pertains to the discussion about the relationship between

attention and consciousness (De Brigard and Prinz, 2010). Again, the usefulness of this discussion depends upon whether or not one finds Mole's view compelling, as the philosophical consequences he draws are entirely conditional on the acceptance of the main tenets of his cognitive unison theory. Still, despite my scepticism about the cognitive unison theory — or, actually, about the claim that the cognitive unison theory is inconsistent with a process-first view — I think it is worth exploring these discussions from the fresh and critical perspective Mole provides. In fact, that would be my general assessment of the book: it is worth looking at the phenomenon of attention from Mole's standpoint, however provisionally, for even if you are not convinced by his view, you won't be able to come back to yours without some serious thinking. And that's all I expect from a good book.¹

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[1] Thanks to Daniel Elledge and Sebastian Watzl for useful comments.