On Executive Attention*

Commentary on Catherine Stinson's article: *Searching for the Source of Executive Attention*

Abstract

In her excellent and thought-provoking essay "Searching for the Source of Executive Attention" Catherine Stinson argues that many accounts of executive attention threaten to involve some kind of conceptual confusion. While agreeing with many of the key criticisms, I explore some possible responses, which retain some of the flavor of the notion of executive attention.

Andy Clark[1]
University of Edinburgh, UK
School of Philosophy, Psychology, and Language Sciences

In the excellent and thought-provoking essay, "Searching for the Source of Executive Attention," Catherine Stinson argues that many accounts of executive attention threaten to involve some kind of conceptual confusion. Such confusion threatens when executive attention is thought of as involving some kind of supervisory control over what gets attended to and when, and often involves what Stinson (p. 5) describes as the problematic "assumption that there is an ultimate origin of executive control to be found somewhere in the brain, probably in prefrontal cortex."

What makes that assumption problematic is, she argues, its dangerous liaison with a kind of hallucinated, over-endowed, inner homunculus. Concerning this kind of worry in general she states, "The homunculus problem could more generally be attached to any explanation of how a mechanism achieves a given ability that involves the assumption that some part of the mechanism has the ability "(p. 7). The worry, thus, is that by effectively assuming the ability in question, such "explanations" merely assume that which they set out to explain.

Stinson is right to warn us that many accounts that mention executive attention and supervisory control and so forth, may place too much unexplained power in some over-endowed black box. Stinson argues, in addition, that there is something in the way

*This commentary was prepared thanks to support from the AHRC, under the ESF Eurocores CNCC scheme, for the CONTACT (Consciousness in Interaction) project, AH/E511139/1

[1] Department of Philosophy, School of Philosophy, Psychology and Language Sciences, University of Edinburg, UK. Email: andy.clark@ed.ac.uk

the problem is thus conceived that makes such circularity pretty much unavoidable. Thus she writes that:

> This becomes a problem for theories of attention when top-down, or executive attention is thought of as a cause rather than an effect. As the following example illustrates, one folk notion of attention is that it is something that you can direct and turn on or off at will. If an arithmetic teacher tells his or her students to "pay attention", the students try to focus something like their effort or thoughts on the topic at hand. ….In this case, it is natural to say that the student paid attention, and that this caused certain brain processes suitable for doing sums to kick in at the expense of brain processes suitable for daydreaming. The sticky question is not to figure out what happened in the student's brain in terms of processing of sums beginning and processing of daydreams ending, but to figure out what the student did in order to achieve this effect. The tempting answer is that some bit of their brain made the appropriate changes happen by 'directing the attention'. Directing attention, however, is just the psychological phenomenon to be explained. If we explain the student directing his or her attention by virtue of some part of his or her brain directing its attention, we haven't explained much (p. 7).

Is the worry here just that the black box of attention might *easily* be over-endowed (a good caution, reminding us to be careful in our mechanistic models)? Or is it, more ambitiously, that such a black box must *always* be over-endowed? One way to argue for the latter kind of worry would be to note (as Stinson did in a previous version of the essay) that directing attention is the kind of thing that subjects do, and thus not the sort of capacity that can (even in principle) be explained by finding a brain region that lights up when this is going on. Getting married, for example, is a thing that people do, not a thing that parts of brains do, even if parts of brains may play a special role when we say "I do." (This form of argument, as I mentioned, was clearer in the original paper, where an analogy was drawn with the role of the lungs in breathing: the lungs inflate, but they do not breathe, subjects breathe.) The more ambitious kind of argument I have in mind would thus go like this: Executive attention involves the knowing disposition of resources (directing attention to such and such a target). But this, considered as a cause, looks to be an agent level phenomenon. Agents know and decide what to attend to. Brain bits (e.g., bits of prefrontal cortex) at most function within that nexus to help make this possible. So executive attention may be real but it won't be the function of any brain bit to *do* it. It will be an agentive property, belonging to the domain of folk (not scientific) discourse about the mind. The upshot would be just the kind of principled skepticism that still seems to bubble under the surface in Stinson's essay, namely, that "an ultimate source of executive control is not the sort of thing that one *could* localize to any particular brain region" (p.5, my emphasis).

There is, however, a more modest view of executive attention available. Maybe some aspects of our neural architecture function so as to selectively enable the devotion of more neural resources to problems selected by other brain circuits (problems selected

e.g. in response to the teacher's command to focus on the arithmetic problem). This looks like the kind of thing that could be done without hallucinating over-endowed black boxes that look like homuncular mini agents. (Instead, they work rather like an uninformed receptionist who routes clients to specialists, and decides who gets to see whom, when, and for how long, but does so using a swathe of ultimately dumb cues, questions, and routines.)

It is not clear why this wouldn't count as a mechanism of executive attention, for example, the kind of thing said to be damaged in some forms of schizophrenia (see e.g., Frith, 2007). In these models, circuits that specialize in the initiation and monitoring of willed, goal and plan involving actions, need not themselves be thought of as mini-agents capable of attending to things. Rather, they help realize processes of executive attending. So when those circuits are damaged, the agentive capacities of executive attention are impaired.

Could this kind of approach reconstruct the inner cause model of executive attention and supervisory control in a way acceptable to Stinson? I am not sure, not least because I am not sure to what degree Stinson still means to raise the kind of in-principle objection just rehearsed. It may be that she now intends only the weaker point: To explain attention, we can't put all the power of human attending into the black box of executive control. With this, no-one should (or I think, would) argue. It is, in any case, only that hint of a principled skepticism about the very idea of a mechanistic explanation of executive attention that I mean to address.

One possible worry about any such explanation is that lacking attention-wielding inner homuncular mini-agents, *everything* inside now looks like dumb servants, not the well informed masters that might (we may imagine) be needed to deliver true executive control. Hence, we are presented with a kind of dilemma: Either the inner stuff is too powerful and merely assumes that which it sets out to explain, or it is too weak, and we lose sight of the very idea of executive attention itself. If THIS is the frog at the bottom of the beer glass, however, then what is at issue is nothing less than the possibility of a mechanistic understanding of agency itself.

At this point, I cannot help but suspect that even today, we are easily misled by an insidious "inner servants versus inner masters" mind-set. Such set-ups yield false dilemmas. There are no servant circuits and no agent masters. Rather, WE, qua choosing, thinking, feeling, agents, are realized by (perhaps shifting) complexes of circuits. Some of these are more important to some of our capacities (e.g., self-willed actions and the willed disposition of attention) than to others, and sometimes, when these circuits malfunction, we feel a loss of control, even a loss of mental control:

> Evers' mind began to think things over which he had no control….Evers didn't want to think about losing his skin. His mind made him. It also made him think about a Frank Sinatra song in three-quarter time and bowling balls (Clark, 2001, p.76).

If my mind is me, it's not obvious how it can ever seem to coerce me. Yet we often feel just that. The implicit contrast is thus with cases where we feel in control of our own thinking (and attending). But how can this be? What can it mean? After all, we are in some sense realized by sets of sub-personal goings on. So insofar as "we" control them, we do so only in virtue (also) of *being built of* them.

I think there is, hereabouts, a very deep remaining challenge. It is a challenge for both philosophy and cognitive science, and it is one neatly raised by Stinson's discussion. The challenge is to explain more about the way "we" can usefully be treated as being in control of the very goings-on (the hum of inner wires and circuits) that simultaneously realize us as the agents we are. This is the kind of challenge so eloquently confronted by Dennett (1984) (2003) and more recently by Stanovich (2004). But it persists, as Stinson's powerful essay demonstrates, in many forms. Dissolving it once and for all will probably require a lot more (rather than less) attention to the shape of the medley of sub-personal processing that realizes agent level thought and reason.

References

Clark, M. (2001). *The many aspects of mobile home living.* New York: Vintage Books.

Dennett, D. (1984). *Elbow room: The varieties of free will worth wanting.* Mass.: MIT Press.

Dennett, D. (2003) *Freedom evolves.* USA: Viking Books.

Frith, C. (2007) *Making up the mind: How the brain creates our mental world.* Oxford: Blackwell.

Stanovich, R. (2004). *The robot's rebellion.* Chicago: University of Chicago Press.

Stinson, C. (forthcoming) Searching for the source of executive attention. *Psyche*