On Action and Integration

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Abstract

This paper discusses a deflationary theory of human action developed by John Hyman. His theory of human action comprises two central claims, one about the general nature of action, another about the mark of human agency. An action is the causing of a change by a substance. A human action, as opposed to sub-personal actions, is one that results from the integrated operations of our cognitive and motor systems. Taken together these two claims offer a minimalist theory of human action that does not appeal to intention, the will or the power to choose. The first claim is by now familiar in the literature, not so the second one. This paper offers a critical discussion of this second claim. I shall argue that it sits uncomfortably with certain kinds of mental action. As a fix, I argue that we should appeal to the functional role of the executive system to specify the relevant kind of integration characteristic of human action. I proceed to show how the revised proposal shares the appeal of Hyman's view while avoiding its difficulties.

1. Introduction

Here is Frankfurt's statement of the field-defining problem of the philosophy of action:

> The problem of action is to explicate the contrast between what an agent does and what merely happens to him, or between the bodily movements that he makes and those that occur without his making them. (Frankfurt, 1988, p. 69)

In fact, Frankfurt's statement contains not one but two different problems. He alludes to two different contrasts. On the one hand, we distinguish our actions from the things that happen *in* us, like my bone marrow producing blood cells or my neurons firing. Here we contrast the action of the whole individual human with the activities of its parts, which are things that occur without *us* making them. On the other hand, we contrast actions with the things that happen *to* us, the changes we undergo as patients, as when a drop of acid burns my skin, or someone pushes me. Here we contrast action with motion or

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change. Surely, not everything that happens *in* us is something that happens *to* us.

One root of this conflation may be that philosophers of action seldom distinguish inactivity from passivity – or use 'passivity' to speak about both. But inactivity is the negation of activity, while passivity is its converse (Hyman, 2015, p. 9). The things that occur without my help, like the production of blood cells by my bone marrow, are things with respect to which I am inactive, whereas the things that happen to me, like my skin getting burnt, are things with respect to which I am passive. The problem of explicating one contrast is different from the problem of explicating the other. The problem of action, if we stop reading Frankfurt's sentence right before the second half of the disjunction, is to explain the distinction between action and motion. But the second problem is to explain the distinction between the motions I bring about myself as a whole individual agent and the motions in my body that I do not cause personally.

John Hyman is one of the few who has provided a theory of human agency that distinguishes these two problems (2014, 2015, 2023). His theory is non-standard on two counts. First, intention and the will are not part of the answer to neither the first nor to the second problem. Second, on his view, much as the agency of a group is typically explained in terms of the agency of its members, we should understand the agency of human beings in terms of the collective agency of their functionally differentiated parts (cells, organs, tissues) (2015, Ch. 2).

Hyman's theory of human agency can be captured by two claims, which correspond to the two problems we distinguished:

> **Causing**: an action is the causing of a change by an agent.

It is not a *change* that causes another change, but the causing of a change, or, differently put, something chang*ing* something. Things that happen to a being are changes it undergoes or suffers as patient.

> **Integration**: an action is attributable to the agency of a human agent only when it results from the functionally integrated operations of its motor and cognitive systems.

Things that happen *in* us are changes which do not so depend on this integration.

While *Causing* has had its critics (Ruben, 2018, Hornsby, 2018) and its proponents (Alvarez & Hyman, 1998, Alvarez, 2024, Thomson, 1977, Dancy, 2017, Steward, 2014, Mayr 2011, Bach,

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1980, Bianchi 2024a), this is not so for *Integration*.[1] The latter deserves more attention than it has received. Hyman's minimalist programme and its departure from more standard views which appeal to intentionality or voluntariness to understand human action hinges on its plausibility. As I argue below, *Integration* sits uncomfortably with (some) mental actions. There are 'pure' cognitive actions that need not result from interactions between cognitive and motor processes. But revising the view by eliminating the reference to the motor system to account for such actions brings out a second problem for the view, namely that unless the integration of the operations characteristic of human actions is further specified, *Integration* cannot draw effectively the distinction between the mental changes that are attributable to our agency and those that aren't. In particular, it over-attributes mental changes to our agency.

However, while I critically discuss *Integration*, my goal is to offer a revised account which conserves the appeal of Hyman's original proposal while avoiding these difficulties. Drawing on empirical considerations about the form such integration may actually take in humans, I shall argue that specifying *Integration* in terms of the role executive functions play in the integration of the operations of the subsystems that enable our individual agency avoids the above difficulties. This proposal may be regarded as part of a broader recent trend in the philosophy of action that links empirical research on executive functions and agency.[2] It can therefore be read as an attempt to integrate some ideas of this recent trend into a Hyman-style deflationary programme.

This paper focuses on an internal problem for an initially appealing deflationary or minimalist theory of action and human agency. This should pave the way for a more general assessment of the view in light of rival (deflationary and standard) accounts in future work. But it is worth briefly situating the theory as well as what is meant here by 'theory of human action'.[3] Hyman's view of action is part of a broader approach to action which seeks to first define the very general category of action and then asks what is specific about *human* action (see Mayr, 2011; Kenny, 1975; Alvarez, 2013). In that vein,

[1] One noticeable exception is Haase's review of Hyman's book (2022). He raises a different kind of worry about integration than the one discussed here.

[2] For instance, see Hendrickx (2023), Buehler (2017, 2022, 2023), Wu (2023a).

[3] I thank an anonymous referee for pressing me to clarify this.

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Hyman writes that 'we can only hope to understand [human action] properly if we acknowledge that action is a highly abstract concept, of the same order as substance, power, process, and event, and if we ask what is distinctive about human agency once the broader category has been defined' (2015, p. 32). Hyman's view of action is minimalist because action is a capacious concept that is readily applicable outside the sphere of human agents, to animals, plants and inanimate objects like artifacts or institutions. His theory of human action is deflationary because what is specific about it is not special. A theory of human action as understood here is a theory of the sort of action that can be attributable to the agency of a certain sort of agents, namely human animals. It should not be understood as a theory of the kind of action only humans can perform, or the kind of action that is essential to being human. For instance, even if it were the case that only humans are capable of intentional action, that wouldn't mean that intention is what demarcates the kind of action attributable to the agency of an animal like us. On his view, what is specific about human action and agency is that they are the product of functional integration. But the same is true of the actions of any complex agent with functionally differentiated parts, hence Hyman's remark that 'it is also worth understanding the idea of human agency as such, even if it turns out to be less special than we thought' (2015, p. 53).

The sort of minimalism about action that goes with *Causing* has been defended in the literature. This is a plausible view with several advantages. One is that defining action in this way allows us to neatly distinguish the active/passive contrast from the voluntary/involuntary contrast and to better understand the connections between them (Hyman, 2015). Another is that it captures a broad sense of action that we find in ordinary thought and scientific discourse, which helps us to view human agency as a case of the agency that is found throughout the natural world, in both animate and inanimate substances (Alvarez, 2013, Thomson, 1977). Yet another is that this minimalism, insofar as it appeals to substance-causation, avoids the problems faced by the traditional doctrine of agent-causalism (Alvarez & Hyman, 1998). Agent-causation, on that picture, is not a special kind of causation, discontinuous with the causation that operates in the natural world, since substance-causation is found elsewhere than in the lives of human being (Lowe, 2009).

However, even if there is something to be said for minimalism about action in general, it is compatible with a more demanding conception of *human* action and agency. Since one may be minimalist about action without being minimalist about specifically human

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action, Hyman's *Integration* deserves scrutiny. As I will argue, minimalism about human action remains plausible, but the kind of action attributable to the agency of human agents is more special than Hyman allows.

Here is the plan. Section 2 further explicates *Causing* and its relation to *Integration* in order to better understand the role the latter plays in Hyman's theory. Section 3 outlines the main difficulty for *Integration*, namely that there are certain mental actions which do not seem to be the product of the operations of the motor system. Section 4 discusses and reject a weaker formulation of *Integration* which tries to account for this kind of mental action. Section 5 introduces my proposal and explains how it improves on *Integration*. Section 6 concludes.

2. Hyman's Theory of Human Action

Let us start by explicating *Causing* a little further.

There are thicker and thinner conceptions of action. Thick conceptions define action as a psychological or rational concept in terms of intentionality, voluntariness, the will, or reasons. Thin conceptions define it as a physical (or non-psychological) concept in terms of causation, substance, power and change. Some conceptions are thinner than others. But what distinguishes thin from thick conceptions is the broadness of the application of the concepts of action and agent. In that respect, Hyman's conception is very thin indeed.

On his view, to act is to cause a change, and actions are causings of change by agents. Actions are neither causes nor effects of movements, but their causing. This is what action, *in general*, is. It does not tell us what intentional or voluntary actions are, and it does not offer a theory of human agency, but only of agency in general.

An agent, on this view, is an entity that possesses an active power to bring about some kind of change.[4] For instance, cyanide is a toxic agent as it has the power to cause harmful effects in biological systems, and a virus is an infectious agent as it has the power to cause sickness. Animals are complex agents, that is, agents with parts, which comprise more minute agents hierarchically organized like cells, organs, or systems with their own powers to cause certain kinds of change. Organisms, parts of organisms and

[4] For a discussion of the notion of active power in recent philosophy of action, see Bianchi (2024b).

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groups of organisms that form integrated wholes typically possess non-aggregative active powers whose manifestations by the whole require 'team work' among its parts (Hyman, 2015, p. 47)

Causing is compatible with the idea that intention or the will play an essential role in human (or animal) action. Intention might be what distinguishes the motions caused by a whole human from the motions caused by her parts or sub-systems. But Hyman rejects the idea and claims that there are many kinds of action that disprove this view:

> … automatic reactions such as ducking or drawing back one's head to avoid a blow, or making an unconscious adjustement to one's posture to maintain balance; some kinds of habitual action, including verbal tics such as echolalia; some kinds of uncontrolled action done in abnormal or pathological states of mind; unconscious action such as talking in one's sleep; and the spontaneous expression of emotion in facial expressions, vocalizations, and gestures, such as smiling, scowling, pouting, shrugging, and laughing or crying out with pleasure or pain. (Hyman, 2023, p. 475).

What then, if not intention or conscious control, makes these actions things to be distinguished 'from the many other unintended movements that occur in and around my body of which I am clearly *not* the agent (heartbeats, peristaltic motions of the gut, reflex responses, etc.)' (Steward, 2012, p. 50)?

This is where *Integration* comes in. Individual human agency, Hyman contends, is defined by functional integration, and in particular, the integrated operations of cognitive and motor systems (2023, p. 475). To say that the operations of motor and cognitive systems are functionally integrated is to say that there is an interaction between them, one whose function is to serve the ends of the organism as a whole and enable its activities.[5] The difference between the motions and changes in our body that we cause personally, like the motions of our legs when we walk, and the motions we do not cause personally, like heartbeats, is that the former but not the latter result from the functionally integrated operations of our motor and cognitive systems. In short, it is this kind of functional integration that distinguishes the actions attributable to the human being as a whole

[5] This is how, in conversation, Hyman specified what he means by 'functionally integrated'.

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from the activities of the 'more minute agents' that compose it as an organism.

Integration is part of a more general model proposed by Hyman to understand the agency of complex agents with functionally differentiated parts. On this model, individual agency is to be understood in terms of collective agency, whether the agent is an institution, a bodily organ or a human being. Indeed, he writes that, 'individual human agency is always really collective agency' because a human being is a 'highly integrated colony of functionally differentiated but genetically similar cells' (2015, p. 48). On this view, the actions of complex agents are always the product of complex interactions between their parts and systems rather than the result (only) of the operation of a single part, 'the imaginary locus of the active self, or the activity of a specific organ or mental faculty' (2015, p. 52). Differently put, the motions a human being causes personally are not distinguished by the involvement of a very specific part which, somehow, becomes a spokesperson for the whole. Rather, they are distinguished by the relevant functional integration. Since the idea is quite abstract, it will be easier to start with an example:

> A spider spins a web, kills and eats its prey, selects and copulates with a mate. Some of these activities involve parts specifically adapted for them, such as poison-and silk-glands. But since they all involve complex interactions with the spider's environment – and mostly with moving targets – they all involve the integrated operation of its sensory and motor systems, as well as the metabolic systems on which its life and activity continuously depend. One option is therefore to regard the movements that result from the integrated operation of its motor and sensory systems as attributable to the agency of the spider as a whole (Hyman, 2014, p. 18).[6]

But as Hyman notes the proposal about the actions of a spider cannot as such be applied to the actions of human beings. That is because the actions of human beings which involve the integrated operations of motor and sensory systems also involve 'the physiological systems that are responsible for our intellectual and emotional lives …' (2015, p. 50). Hence, Hyman writes 'it is better to think of the

[6] 'Result' here is not a causal notion. When discussing the relationship between the actions of the parts of a complex agent and the actions of the complex agent, Hyman mentions supervenience (2015, p. 47). But note that a composition reading is also available.

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integration of metabolic, motor, and cognitive systems in general as the mark of non-aggregative human agency …' (2015, p. 50).

This is the idea that is captured by *Integration*, namely: an action is attributable to the agency of a human agent as a whole – as opposed to sub-systems or 'more minute agents' – when it results from the integrated operations of its motor and cognitive systems.

3. Mental Action and Integration

How plausible is *Integration*? Hyman thinks it matches more closely our quotidian thought and talk about human agency than the orthodox idea that the will or intention is its mark (2015, p. 52). This seems right insofar as it can readily acknowledge that unintentional and involuntary actions are actions of the whole human agent. But, as he also notes, 'adopting this proposal involves some regimentation of our quotidian thought and talk about human agency'. This is where problems arise for the view. To see why, consider the following claim, which I take to be an incontrovertible truth of our quotidian thought and talk about human agency:

> ***Mental Action***: mental actions are attributable to the individual agency of human beings.

Now, remember:

> ***Integration***: an action is attributable to the agency of a human being as a whole only when it results from the integrated operations of their motor and cognitive systems.

The problem is that there are *some* mental actions that are clearly attributable to our agency, like running a complex calculation in one's head, inferring (in the light of reasons) that Glaucon's theory of justice is false, or imagining a beautiful sunset sky, that, intuitively, do not result from the operations of the motor system – even if they result from the integrated operations of the cognitive and metabolic systems.

Importantly, whether we call them 'mental' has no bearing on the problem.[7] It is true that some actions we tend to think of as mental, like calculating in one's head or deliberating *do* have non-mental –

[7] For a discussion of whether there is a theoretically significant category of mental action, see Levy (2019), Soteriou (2009). Since whether we call such actions 'mental' has no bearing on the problem, we may rely on an intuitive or coarse distinction between mental and bodily actions where

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or not purely mental – instances like developing one's ideas through speech or writing or deliberating on a piece of paper. The motions involved in the latter actions surely result from the integrated operations of the motor and cognitive systems. But we can perform such action *covertly* without moving our lips or our fingers. And even if we agree, with Helen Steward, that in acting mentally, we do cause physical motions in our brains, it remains true that mental actions, although they require the integration of the activities of some of our brain areas and neurons, do not necessarily involve the motor system (2012, p. 33).

The problematic idea which raises difficulties for *Integration* is this:

> **Cognitive Action:** some mental actions do not result from the integrated operations of cognitive *and motor* systems.

This is likely to be a contentious claim. Numerous studies have shown that the sensory-motor system is involved in language and cognition, for instance in action planning, action understanding, tool use, emotion recognition, mental imagery, language understanding and even in the experience of artwork (Gallese & Cuccio, 2018, p. 216). Indeed, it has been shown that the motor system is automatically activated when participants in studies observe manipulable objects, like hammers, when they process linguistic stimuli the meaning of which relates to bodily actions, like 'hand' or 'leg', or when they observe the actions of other individuals (Jeannerod, 2001, Mahon & Caramazza, 2008). For instance, it has been reported that overt actions like moving a finger towards a spot and their covert counterparts, like imagining performing this overt action, can activate a common widespread sensory-motor system (Simos *et al*., 2017). In fact, the psychologist Barry Cohen reports that studies (as early as the first half of the 20th Century) have shown that subjects produce slight muscle contractions when imagining muscular acts, such as covert muscle contractions in the speech musculature when asked to imagine speaking, and that it was possible to observe eye movements in appropriate direction of people asked to form a visual image of an elongated objects (Cohen, 1986). What's more, Jeannerod and Frak report that, generally, mentally simulated movements are slowed down in Parkinson's patients, in the same way

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mental actions are non-bodily actions. Following Wu, we may say that bodily actions are those that involve a type of control of relevant muscles (Wu, 2023b, p. 70). But there are borderline cases like the ones discussed below.

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as executed movements (1999, p. 736), which suggests that motor impairments can bear on mental action.

This wealth of empirical data shows that the motor system is involved in a considerable number of cognitive operations that we perform covertly. This has given considerable momentum to the idea that cognition is structured or constituted (at least partly) by the activity of the sensory and motor systems (see Shapiro & Shannon, 2024). But the question that matters here is whether these findings support the view that *all* mental actions result from the operations of the motor system. That is because if the answer were 'yes', then Hyman's *Integration* could be maintained. But it does not and there are at least three reasons why that is so.

The first reason is that if the findings that many cognitive processes are accompanied by motor activation have given momentum to embodied and motor theories of cognition, they are consistent with *Cognitive Action*. For these findings are consistent with other well-established interpretations of the relationship between motor activation and cognitive phenomena, according to which, to simplify, the former are sometimes by-products and not constituents of the latter (see Postle *et al*., 2013, for a general criticism see Mahon & Caramazza, 2008).

The second reason is that some cognitive neurophysiological studies have demonstrated that patients with certain sensory and motor impairments, like apraxia – a motor disorder that causes difficulties with motor planning and the use of objects – do not necessarily have cognitive impairments or 'conceptual deficit' (Mahon & Caramazza, 2008, p. 60). This suggests that, even if motor impairments can bear on mental agency, it does not always do so. Furthermore, conceptually, there is nothing incoherent in the idea that a fully paralyzed patient incapable of bodily action can act mentally.

The third reason is that the scope of these empirical findings is importantly limited where mental agency is concerned. Empirical studies have concentrated on motor cognition – the mental processes involved in action-planning, generating, recognizing and imagining action. Clearly, the view that the same motor processes underlie both motor execution – bodily action – and motor imagery – the imagination or representation of bodily action – is empirically supported (for a review, see Munzert *et al*., 2009). But motor cognition does not exhaust the range of concepts and representations we use in thinking and imagination. Think about abstract concepts like justice, beauty or patience. Unlike words whose meaning is related to bodily actions or concrete objects like hammers and their manipulation, no sensory or motor information corresponds to their meaning. If so, thinking

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of such things does not result from the activity of the motor system. As the cognitive neurophysiologists Mahon and Caramazza point out (2008, p. 67), 'experiments are not required to demonstrate that the scope of the embodied cognition hypothesis is sharply limited up front'.

The general point is that even if most of our cognition and mental actions involve the motor system, it has not been shown that thinking of a more abstract kind results from the operations of the motor system. But even when we can prove the association between motor activities and some mental actions, this does not entail that the former are necessary for the latter. It remains plausible to hold that not every mental action results from the operations of the motor system. Empirical findings on motor cognition offer no easy way out for *Integration*. In the light of this, it would be best to find a different answer. The next section considers a natural answer to the problem introduced in this section: why shouldn't Hyman simply remove the mention of the motor system when it comes to explaining why *specifically* mental actions are attributable to the agency of the whole human agent?

4. Weak Integration

The reason why some mental actions pose a problem for Hyman's view is that *Integration* is specified in terms of the operations of the motor system, whereas, as I argued above, its operations do not always seem essential to mental action. A natural response on Hyman's part then, would be to remove the reference to the operations of the motor system in *Integration*. It may true that a physical action is attributable to a human agent as a whole only when it results from the integrated operations of her cognitive *and motor* systems. And that may also be true of a great deal of mental actions as we saw in §3. But in general, this is not required. *Integration* can be weakened thus:

> ***Weak Integration***: mental actions are attributable to the agency of a human agent as a whole when they result from the integrated operations of their metabolic and cognitive systems.

That would indeed solve the problem. But is it plausible? To some extent it is, but this weakened principle brings out a second important difficulty for Hyman's view, namely that it cannot draw effectively the distinction between (mental) changes that are attributable to our agency and those that aren't. For it over-attributes

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mental operations to our agency. To see why, we need to recall the role *Integration* plays in Hyman's deflationary theory of human action.

Remember, as Hyman defines the broader category of action as the causing of a change by a substance, the role of *Integration* is to tell us what is specific about *human* action. His proposal is that we understand individual human agency in terms of collective agency, and his answer has to do with the kind of substances humans are, *i.e.* complex substances with functionally differentiated parts that possess their own powers to cause (minute) change. But since we are organisms composed of 'more minute agents' (Hyman, 2015, p. 42), we want to understand the distinction between the changes and motions which we cause personally, such as the motions of our lips when we speak, and the changes that we do not cause personally but that are caused by the 'more minute agents' that compose us and our subsystems, such as heartbeats. After all, we do not attribute to our individual human agency all the changes caused by the minute agents that compose us. The thought behind *Integration* is that, since individual human agency is 'really collective agency' of the more minute agents that compose us, the actions attributable to the agency of a human as a whole are defined by the integrated operations of the main systems which are responsible for our sensory, emotional, intellectual, and animal life.

In the light of this, *Weak Integration* should give us a criterion to distinguish the mental actions that are clearly attributable to our individual agency, such as inferring that Glaucon's theory of justice is false, imaging a beautiful sunset sky or solving a complex mathematical problem in one's head, from the mental occurrences of which we are clearly not the agent such as processing sensory information, processes binding together distinct features into a representation of one object, or transmitting signals from one brain area to another.[8]

Can *Weak Integration* play this role? It is unclear. Hyman says that the term 'cognitive' in 'cognitive system' should be understood with the same general meaning as in 'cognitive science' (Hyman, 2015, p. 50). There, 'cognitive' means roughly any kind of mental operation or structure related to perception, attention, memory,

[8] Peacocke makes a similar distinction between mental operations clearly attributable to our agency and those clearly not attributable to our agency (2021, p. 2). For a survey and discussion of the distinction between personal psychology and subpersonal psychology, see Drayson (2014).

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reasoning, language and decision-making. The cognitive system is the output of the many neural and brain activities which are responsible for such mental operations. But then, it is hard to see how *Weak Integration* could characterise a kind of mental occurrences which are distinctively attributable to our individual agency or distinguish *our mental actions* from the variety of mental operations which are clearly not attributable to our agency. For both result from the integrated operations of the cognitive system (and the metabolic and perhaps the sensory systems). The result would be an over-attribution of mental operations to our agency, such as binding features of objects into one representation.

In response, Hyman might simply accept that any cognitive process or event that results from the integrated operations of our cognitive system is in fact attributable to our individual agency. After all, on his minimalist view, action is not defined in terms of intentionality or voluntariness. There might be an important distinction to draw between the kind of mental occurrence that we can perform intentionally or voluntarily, and those that we don't do intentionally or voluntarily. But as in the physical realm, mental action cuts through such distinctions (see Hyman, 2015, p. 7). And, since *Weak Integration* is supposed to explain what's distinctive about human (mental) actions – intentional and non-intentional, voluntary and involuntary – it is not supposed to draw such a distinction. Differently put, the intuition that there is a distinction between different kinds of mental occurrences that result from the integrated operations of our cognitive system is to be explained by the presence and absence of some features like intentionality and voluntariness, not by attributability to individual human agency.

Nevertheless, this response does not allay the worry about the over-attribution of mental operations to our agency. Hyman says that adopting *Integration* may involve some regimentation of our quotidian talk and thought about human agency, but 'it matches it more closely than the orthodox idea that the will or intention is the mark of human agency' (Hyman, 2015, p. 50). But if (almost) any process or event that results from the integrated operations of our cognitive system – like binding features of objects into one representation or transmitting sensory information from one area of the brain to another – is attributable to our individual agency, it is unclear that his proposal matches more closely than orthodox views our quotidian talk and thought about human agency. Even if our

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pre-theoretical distinction may not always be clear-cut, we do distinguish our active thoughts from the processes that merely happen *in* parts of our brain.[9]

Moreover, even if we can get past this counter-intuitive consequence, *Weak Integration* seems to imply that we are active with respect to certain mental changes which are typical instances of changes with respect to which we are *only* passive. Let me explain. On Hyman's view, the distinction between activity and passivity is the distinction between causing change and undergoing change (Hyman, 2015, p. 9, p.35, p. 42). Substances, in general, humans included, are active with respect to a change when they cause it and passive with respect to it when they undergo it – they can also be both (Hyman, 2015, p. 35) or neither. Perhaps, there are mental changes with respect to which we are both active and passive insofar as when we act mentally, we act on ourselves, *e.g.,* we change our beliefs. But there are many mental changes with respect to which we are not active. For instance, people cause us to be upset, sad, disgruntled, disappointed, etc. Becoming sad, disappointed, upset is something we undergo.[10] Yet, it seems hard to deny that the changes that occur when we become upset, or sad, are the result of the integrated operations of our cognitive system – along with our metabolic and sensory systems. But if such changes are, at least partly, generated by the functionally integrated operations of the subsystems responsible for our mental life – in addition to the agent causing us to become upset –, they should, according to *Weak Integration*, be attributable to our individual agency. This would mean that we are, in fact, also active with respect to them because we would personally cause them. But that straightforwardly contradicts our initial plausible assumption that becoming upset, sad, etc. – when people cause us to become so – is something with respect to which we are *only* passive. Thus, it leads to an over-attribution of mental changes to our agency.

Hyman may deny that the active/passive distinction understood as causing versus undergoing change holds for the mental realm. But that amounts to rejecting *Causing*, since if *Causing* holds generally, both for physical and mental actions, there is no reason why 'active' in the mental realm should not be related to causing something, just as it is in the physical realm. Hyman may also deny that getting upset

[9] That is not to say that we aren't the subjects of these processes and events. They still happen in us. But they do not seem to be the product of our agency.

[10] We sometimes cause ourselves to become upset, sad, etc. but this is a different kind of case.

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when somebody upsets us is something we cause personally. But on which basis can he deny this? Whatever the person that upsets us does to make us upset, it will be perceived and interpreted by us: sensory information will be processed, and the cognitive system will integrate the information to generate processes or states that constitute one's being upset. But if causing or generating these processes is an action – which it is if *Causing* is true – it is one that is attributable to our parts and subsystems, and not to our agency. Yet since *Weak Integration* implies that actions that result from the integrated operations of our cognitive system are attributable to our agency, it seems to wrongly imply that we personally cause these processes.

Importantly, this brings out a similar problem for *Integration*. Take a fear response provoked by a snake. Fear involves physiological and psychological changes, such as a readiness to 'flight or fight'. Such changes result both from cognitive *and* sensory-motor processes. But then *Integration* implies wrongly that we personally cause them, and the problem of the over-attribution of changes to our agency reappears.

What our discussion brings out is that, as it stands, *Integration* cannot draw effectively the contrast between the things that are attributable to our individual agency and the things that are only caused by our parts. The diagnosis, I surmise, is that the kind of operations in *Integration* which demarcate our agency are too underspecified. How exactly the integration in the interactions between the activities of our subsystems is achieved to enable our action is an empirical question. But to draw effectively the distinction between *our* actions and the things that happen *in* us and avoid the problem of over-attribution, we need to consider the form such integration may actually take, or so I shall argue in the next section.

5. Action, Integration and Executive Functions

we have seen that *Integration* sits uncomfortably with (some) mental actions, and the moves we have considered on Hyman's part raise difficulties of their own. The empirical literature on motor cognition does not support the view that every mental action results from the integrated operations, among others, of the motor system, and adopting *Weak Integration* leads to over-attributing changes to the agency of the whole human agent.

The diagnosis, I have surmised, is that the kind of operations mentioned in *Integration* which demarcate our agency are too underspecified, and we need to consider the form such integration may

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actually take. This section sketches a proposal about how *Integration* can be further specified based on empirically informed work that preserves the appeal of Hyman's view while avoiding both the problem of over-attribution and the problem of the attribution of some mental actions. The main idea is that we can appeal to executive functions and the executive system in humans to specify *Integration* and draw effectively the contrast between the things we personally cause and the things that happen *in* us but are attributable only to our parts and subsystems. This idea is part of a broader, recent trend in the philosophy of action that links empirical research on executive functions and agency. For instance, Buehler argues that the executive system constitutes our capacity to guide our behaviour (2017, 2022, 2023); and Hendrickx writes that 'it is unclear how agency could arise without such integration [between the workings of subsystems] by the executive system' (2023, p. 3134, see also Wu, 2023a). Consequently, what follows can be read as an attempt to integrate some ideas from this recent trend in a Hyman-style deflationary programme. In that vein, my description of executive functions will be brief, as the aim is not to review the empirical work behind them but to highlight a different criterion of action-attribution that would fit well in Hyman's deflationary theory of human agency. Let us turn to the proposal.

The executive system refers to a collection of top-down cognitive processes (many unconscious) whose functions are to control attention and concentration (see Diamond, 2013), maintain and process information, flexibly integrate information related to the situation, set and switch between goals, inhibit inappropriate responses and suppress the influence of distractors, plan action, decision-making and problem-solving (see Christensen *et al*., 2016, p. 40).[11] 'Top-down' here indicates that the function of executive processes is to control other cognitive processes as well as motor processes. Through its functions, the executive system integrates the operations of other subsystems like perceptual, memory and motor systems (see Buehler, 2022, p. 41). There may be different empirical models of this kind of integration, some more hierarchical than others, and I shall remain neutral here on how hierarchical it needs to

[11] The idea that an executive central system exists was mainly rejected until twenty years ago, partly on the charge that this system is a kind of homunculus. Buehler carefully argues in the light of recent empirical research that these charges no longer have traction (2017). In particular, the capacities of the system are not those that it is supposed to explain of the whole human.

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be. But the integration characteristic of the activities of the whole human agent will be, to some degree, hierarchical – although as I mention below, that is not to say that integration in general, that is in all non-human agents, is a hierarchical matter.

The operations of the executive system are generally grouped in three functions: (i) the processes of getting information into working memory and maintaining it active during performance of a task (working memory function); (ii) the processes which suppress the influence of distractors – *e.g.,* attention to irrelevant stimuli and interference from information, prepotent responses, unwanted thoughts – that enable selective attention and concentration (inhibition function); and (iii) the processes activating the representations and capacities needed to carry out a task, and that establish configurations of cognitive processes for subsequent task performances (cognitive flexibility function).[12] The functions of the executive system play four explanatory roles: they explain (i) the directedness of our behaviour towards our goal; (ii) the coordination between our subsystems and parts required for its pursuit; (iii) the integration of information from various sources required for performing a task; and (iv) the compensation for interference required for the successful performance of a task (see Buehler, 2022, p. 34, 2023).

To illustrate, take the example of a human agent engaged in the process of visual search for a robin given by Buehler (2022, p. 38) – a process which exhibits coordination, integration and compensation in the light of the individual's goal. When the agent engages in the process, the cognitive flexibility function contributes to encoding a visual representation (of the robin) into working memory and executive processes hold this representation active in working memory. This explains how the agent's activity is directed towards his goal. But the executive system also explains the coordination between subsystems and parts of the agent required for the task. The cognitive flexibility function activates the relevant abilities of the agent, like computations of priorities, relevant memories, or motor capacities for shifting the eyes. And with the inhibition function, they contribute to the coordination of the operations of the subsystems by regulating the integration of information from a vast range of perceptual systems and by suppressing distracting elements, screening off certain noises or stimuli that would interfere with the task (Buehler, 2022, p. 38).

[12] See Diamond (2013) for an explanation of the interplay between these functions.

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Now, these processes are crucial to address the problem of over-attribution and the difficulties raised by some mental actions. For they enable the cognitive operations we would be naturally inclined to include in the category of mental action such as doing math in one's head, imagining creatively, drawing conclusions in the light of reasons, or choosing how to act. The neuroscientist Adele Diamond explains that doing any math in one's head requires working memory, as does incorporating new information into one's thinking or plans, mentally relating information to derive a general principle, or seeing relations between ideas (2013, p. 143). But such activities would also not be possible without the inhibition and the cognitive flexibility functions, because drawing the conclusion that Glaucon's theory of justice is false or performing a complex calculation also require the suppression of distractions and the activation of the relevant capacities and representations.

This puts us in a position to see why the kind of cognitive operations that figure in *Integration* and *Weak Integration* which demarcate our agency needs to be specified. On the one hand, if the executive system is a part of the cognitive system, then it is true that mental actions are attributable to our agency when they result from the integrated operations of the cognitive system. But on the other, as we saw, we do not want to attribute every mental operation to our agency. The solution, I suggest, is that only the actions that result from the top-down control characteristic of the executive system are attributable to our agency. Differently put, executive functions allow us to demarcate our mental actions from the processes which are clearly not attributable to our agency but only to our subsystems and parts.

More precisely, the proposal is this:

> ***Executive Integration***: a (mental) action A is attributable to the agency of a human agent as a whole when it results from the integration of the operations of other subsystems by the executive system.

This criterion avoids the general problem of the attribution of some mental actions discussed in §3 because there is no essential reference to the operations of the motor system. And it avoids the problem of over-attribution discussed in §4 because executive functions are not involved in every mental process, but only in those we are naturally inclined to view as mental actions.

Moreover, this criterion need not be confined to mental actions. For as we saw above and as the example of visually tracking a bird illustrated, the executive system coordinates and integrates the

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operations of various subsystems *including* the motor system. This makes *Executive Integration* a plausible criterion to explicate the difference between the things we personally cause and the things that happen *in* us that are not attributable to our agency. On the one hand, passive breathing, peristaltic motions of the gut, pupil dilatation, knee reflex and heartbeats are not attributable to our agency as a whole human agent because they are not generated by executive functions. On the other, the motions of our lips when we talk, the motions of our eyes when we track a bird, or the motions of our legs when we walk are attributable to our agency because they result from the interplay between executive functions and other bodily processes. If this is on the right track, we can maintain Hyman's key idea behind *Integration* by specifying it in the way suggested through *Executive Integration*, while avoiding the difficulties raised by the former and its weaker formulation.

At this point, one might wonder whether my proposal does not, in the end, bring back the will or intention through the back door, as it were. Isn't the executive system underwritten by the involvement of intentions? Not quite. First, the executive system is quite different from the will, for the processes that characterise it are not necessarily conscious – in fact many are unconscious – 'free' or 'autonomous', and it is not the 'imaginary locus of the active self', as there is no need, on that picture, to posit a 'mental' self which is distinct from the human animal. Second, the fact that its processes are 'top-down' does not entail that the 'top' processes underlie or are intentions. The executive system may underlie the formation of intentions. But this shouldn't call into question the compatibility of my proposal with Hyman's approach, for two reasons. The first is that the same charge could be formulated against Hyman's proposal, which appeals to cognitive and motor systems, namely that intentions are underpinned by cognitive and motor processes. The second is that, in fact, even if every human action did result from an intention, it would not follow that the distinction between our activity and the things that merely happen *in* us is explained by intention. Hyman asks us to compare this case with one in which every human act is selfish or stems from a movement of the agent's body that has a selfish purpose (see Hyman, 2015, p. 52). It would not follow that this explains why a thing qualifies as an action, and more precisely, as one that is attributable to the agency of a whole human agent. Differently put, intention or the will does not tell us why we attribute certain kinds of activities in the body and not others to the agency of

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a human being as a whole. The answer to *this* question is integration, or more precisely if my proposal is right, executive integration.[13]

So, what about Hyman's various examples of actions without intention cited earlier in Section 2? Are they attributed to our agency by *Executive Integration*? Some answers might be more straightforward depending on the case.[14,15] For example, *Executive Integration* does *not* require that 'automatic reactions such as ducking or drawing back one's head to avoid a blow or making unconscious adjudgments to one's posture to maintain balance' are attributable to our agency *only* if they are intended or planned, or if they are conscious. In such cases, the executive system integrates information from multiple sources, computes priorities, activates the relevant motor capacities to adjust one's position, and coordinates the activities of various parts to generate the required movement. If, for instance, the blow is to be avoided during a boxing match, the working memory function holds a visual representation of one's opponent active in one's working memory, executive functions activate further motor capacities such as those for shifting the eyes to keep the opponent in one's line of sight, all of it while the inhibition function suppresses distracting elements and stimuli such as crowd noises, and blocks interfering behaviours such as the reflex to close one's eyes when

[13] Where my proposal departs from Hyman's is that there is a specific system which is key to answering this question. But this system, the executive system, is not a mental pineal gland or the will, but a collection of organised parts and activities with certain functions.

[14] Some cases mentioned by Hyman are borderline cases. He mentions uncontrolled actions done in pathological states, but the answer here will depend on the pathology. He also mentions unconscious action done in one's sleep. But whether such actions involve the executive system is an empirical question.

[15] What about habitual actions? Cognitive scientists sometimes contrast executive processes and automatic processes and claim that executive functions are paradigmatically involved in nonroutine situations. One may worry that my proposal implies that habitual and skilful actions are not attributable to our agency as a whole but to our subsystems. This, however, is not the case. It is generally recognised that actions do not feature exclusively automatic or executive processes but involve a mix of the two (see Wu, 2023a). Executive processes and automatic processes are closely integrated in skilled and habitual actions, and executive functions directly influence motor execution (Christensen *et al*., 2016, p. 43). What is true, is that the role of executive functions in highly skilled actions changes, allowing experts to focus on high-level strategic aspects of their action. For a discussion, see Pacherie & Mylopoulos (2020).

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faced with an incoming object. Similarly, the expression of emotion in gestures or facial expression seems to depend on integration by the executive system: the inhibition function suppresses the influence of distractors like unwanted thoughts, the cognitive flexibility function activates the relevant motor capacities, such as those for face muscles, and executive processes generate a perceptual-motor configuration, which is then implemented and carried out by motor processes, as would be the case, for example, for the movements involved in jumping out of joy. The important point is that the proposed criterion does *not* attribute only movements effected consciously to our agency, or only those that results from volitions or that somehow ensue from or express our will.

Now, one major advantage of Hyman's model of individual human agency is that it conforms to a general conception of the agency of complex agents such as artefacts, organisms, and groups of organisms. What differs on his account from one type of complex agent to another is the kind of functionally defined parts that must be involved for the action to be an action of the whole individual – as shown by his comparison of the agency of a spider and that of a human being. Does *Executive Integration* share this advantage? It still conforms to a general conception of the agency of complex agents, but it needs to be qualified in two ways.

First, this general conception only concerns complex agents which have an executive system or a functional analogue. For example, there is good empirical evidence for the existence of such an analogue beyond mammals for some avian species (Bobrowicz & Greiff, 2022) and crocodilians (Grendeus & Reber, 2021), as well as the cortical structures underlying executive functioning (Güntürkün, 2012). But not all biological complex agents will share this mark. For instance, photosynthesis is effected equally in the individual cells of plants and does not involve any coordination of the cells' activities by an executive central system (Burge, 2009, p. 264).

Second, Hyman claims that the easiest cases of complex agency to understand are institutions, not biological agents. That is because 'we design them ourselves. We don't need to reverse engineer them, because we engineer them' (Hyman, 2015, p. 47). He takes the example of a university, which possesses the power to award degrees, that none of its functionally defined parts – administrative offices, exam boards, individual professors, lecturers, *etc*. – has. He says that the exercise of the university's power depends on the integrated exercises of the powers of its parts. What we learn from this example, for Hyman, is that the individual agency of complex agents with functionally differentiated parts depends on the integrated operation of

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these parts, rather than on the operations of a specific part such as the will or the self – in the case of humans – or the rector, the dean or the CEO – in the case of institutions. What my revised account suggests is that this does not exclude that some systems, like the executive system, play a more important role than others in accounting for action-attribution to the agency of the whole individual. In general, some institutions or organisations are more hierarchical than others. While the board of directors, the executive part of a government or the rectorate of a university might play similar functional roles in circumscribing the individual actions of these complex agents, as the executive system does in some animals, not all the actions we can attribute to a group or organisation involve an 'executive' part. For instance, an anarchist commune or a self-managed company may lack an executive part whose function is to coordinate and integrate the activities of the other parts. If we can truly ascribe actions to such complex agents that is, if they are indeed complex agents, as opposed to mere collections of individual agents, then we would need to tell a different story. However, it seems to be a virtue, rather than a defect of my revised account that it can draw a distinction between the agency of hierarchical and non-hierarchical complex agents.

The upshot then is that *Executive Integration* also conforms to a more general conception of the agency of complex agents, namely that of highly integrated *and* hierarchical agents. In that vein, the revised account both improve on Hyman's original *Integration* proposal and allows us to maintain both the appealing deflationary character of the view and its main advantage of conforming to a more general conception of complex agency.

6. Conclusion

I have examined a deflationary theory of human action developed by John Hyman which comprises two central claims. The first is a general claim about the nature of action: an action is the causing of a change by a substance – inanimate, animate, non-human, human. The second claim is about the mark of human agency: an action is attributable to the agency of an individual human agent when it results from the integrated operations of its motor and cognitive systems. Taken together these claims offer a minimalist or thin theory of human action that does not appeal to intention, the will or the power to choose. These claims are part of a broader approach to human agency, one that seeks to elucidate human actions by viewing them as a species of a much wider genus of action, instantiated

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both by inanimate agents – *e.g.* certain artefacts, institutions, group agents –, animal agents, and human agents. I have focused on the second claim, *Integration*, and its place in the broader minimalist picture drawn by Hyman. I have argued that it fails to account for pure cognitive actions and that it leads to over-attributing changes to the agency of individual human agents. As a fix, I have suggested that we specify the relevant kind of integration by appealing to the functional role of the executive system. Doing so, I argued, allows us both to avoid the difficulties *Integration* and *Weak Integration* face and to maintain an appealing deflationary theory of human agency which preserves the flavour of Hyman's original proposal.

Finally, one should note that there are further ways which I have not considered here to develop a minimalist theory of human action. One such way is to maintain *Causing*, which creates a very liberal view of what counts as action, and to replace *Integration* with an altogether different criterion. For instance, some have argued that human actions are characterised by the fact that they are exercises of two-way causal powers, whereas the actions of inanimate beings are exercises of one-way causal powers (Alvarez, 2013, Steward, 2012). Others have argued that human actions are characterised by the fact that they are exercises of active abilities to act intentionally (Mayr, 2011, Levy, 2016). These theorists may still endorse a thin or minimalist theory of action in general. But contrary to Hyman's view or the revised version defended here, they endorse a thicker conception of *human* action. It would be worth exploring the advantages and disadvantages of such views over a Hyman-style one such as the one defended in this paper. What I have done here is deal with internal problems for the latter, which is to be done prior to such a general assessment. But the virtue of a minimalist or deflationary approach lies in its capacity to answer certain questions, such as whether and when we need to introduce concepts like two-way powers or the will in our picture of action. And if we can make our proposed criterion work for ascription of action to the agency of complex agents like human organisms without invoking such concepts, then for the sake of simplicity, that's all the better.[16]

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