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## Commentary on

### **Élisabeth Pacherie's *Time to Act: the dynamics of agentive experiences***

The paper presents a dynamic framework that aims to help in conceptualizing the relations among various parameters of agentive experience, such as the hierarchical level at which an action is specified, the direction of fit of the representation of the action, and the reliability of the agentive experience as a source of knowledge about one's actions. The dynamic framework makes it possible to locate these parameters along a timeline and thereby to gain fresh insights into how they relate to each other, and in doing so to shed light on at least four issues:

- #1. The intentional structure of agentive experiences
- #2. The sense in which agentive experiences are experiences of activity as such
- #3. The form of their contribution to self-knowledge of action
- #4. The way in which predictive and retrospective models can be integrated

I will be primarily interested in issue #3 but will start out by recapitulating some of the main features of the proposed framework. To begin with, a brief consideration of the dynamics of agentive experience reveals two kinds of shift that typically occur during the course of an action, one with respect to the contents of agentive experience and one with respect to their structure.

#### **Content Shifts**

Élisabeth proposes that intentions are typically represented with increasing concreteness/fineness of grain as an action progresses from planning and deliberation up to around the middle of an action, and then with decreasing concreteness/fineness of grain toward the end of the action. For example, one starts out intending to make a chocolate mousse (distal intention), then proceeds to more concrete intentions such as beating these egg whites (proximal intention), and onward to still more concrete intentions, such as moving one's arm like this (movement). Then, as the egg-beating progresses and one perceives the stiffening egg whites, the suggestion is that the content of the agentive experience shifts back up the hierarchy to beating the egg whites, and further up to making a chocolate mousse as the mousse starts to look like mousse. This shift is important because it makes it possible to see how predictive and retrodictive accounts complement each other by targeting different stages along this timeline (Cf. issue #4 above). Thus, the suggestion is that predictive accounts focusing on motor plans and likely sensory consequences apply best to the stages leading up to the middle of actions, as the agent is generating motor plans and calculating their likely effects, whereas retrospective accounts focusing on, among other things, sensory information, apply well at the later stages of actions (in cases in which the sensory information does not match the predictions or there are no predictions).

Two questions about this:

1. What about at early stages of an action, when the content is still at a relatively high level of the hierarchy (making a mousse)? It seems that an experience of intending to make a mousse, if recalled later on, would provide the kind of input that retrodictive accounts appeal to. So is it fair to say that both kinds of model have something to say about the early stages?

2. Élisabeth points out the agentic experiences that will be the most reliable sources of knowledge about our actions will be those at hierarchically lower levels, because they are more closely tied to the processes initiating and controlling actions. So, for example, the experience of extending my arm will be more reliable than the experience of turning on the light as it may turn out that this switch operates the fan and not the light (p.20). This sounds good, although moving up the hierarchy introduces a factor that may *increase* reliability: if my proximate action fails, my higher-level intention enables me to consider alternative proximal actions and try again until I succeed – e.g. flipping various switches until the light goes on. This is fine as long as I retain the goal of turning on the light and simply calculate a new motor plan to achieve it; so moving up the hierarchy may not reduce reliability. What *would* undermine the reliability of my experience would be if, upon perceiving the fan and not the light go on, I deferred to the perceptual information and retrospectively inferred that I had intended to turn the fan on rather than the light.

### Structure Shifts

One begins by representing what one is about to do, then what one is doing, then what one has just done. Thus there is a shift in the intentional structure of agentic experiences over time. Élisabeth proposes to articulate this second observation by appealing to the notion of direction of fit. In the terminology she employs, representations are:

*thetic* if they have mind-to-world direction of fit, the reverse direction of causation, and veridicality conditions;

*telic* if they have world-to-mind direction of fit, the reverse direction of causation and satisfaction conditions but no veridicality conditions;

*thelic* (or pushmipullyu) if they have both.

She proposes 2 conditions for states to be telic:

- (i) They must be temporally prior to the state of affairs they represent.
- (ii) They must have a functional role in bringing about the state.

How direct does this functional contribution have to be? Tim Bayne (2011, p.12) imagines the case of a paralyzed patient who cannot move his arm but who can try to. If the patient experiences himself as trying to raise his arm, can this experience be considered telic? One might say ‘no’ because the tryings are not appropriately hooked up to any processes that would enable them to play a functional role in raising the arm. Or one might say ‘yes’ because the tryings are normally hooked up appropriately in healthy people and so have the function of bringing about the effects they represent. Suppose that a mischievous scientist can (unbeknownst to the patient) detect these futile efforts and intervene to make the patient’s arm move whenever the patient tries to do so. Now the tryings are part of a causal chain that leads to the movement, since the scientist caused the arm to move only when they were detected. Does this make a difference? I will come back to this further below.

Élisabeth's suggestion is that agentive experiences start out being mostly telic, then become predominately thetic, and are later more thetic (note: this is the core of her take on issue #1). There are a few ways in which one might interpret the claim that agentive experiences are thetic:

- (a) Agentive experiences are thetic because they themselves are both thetic and telic, irrespective of their components;
- (b) Agentive experiences are thetic because they contain some component states that are thetic and some other ones that are telic;
- (c) They are thetic because they contain some components that are both thetic and telic.

I am pretty sure that Élisabeth endorses (c), but maybe also (b). Let's briefly get an overview of what states we are talking about and consider which ones might be candidates for being, telic, thetic and/or thetic.

-At the start of our action, we have the representation of the whipped egg whites, which is a goal state. This is clearly a telic representation.

-A motor command is then generated. This seems telic, as it precedes the movement it represents and also brings it about.

-An efference copy of the motor command is also generated. This also precedes the movement, and it also has an indirect influence upon whether the movement is carried out, since it is used to compute likely sensory consequences of the movement and thereby to determine whether the movement is a good way of bringing about the desired states. So it appears to be telic. Or perhaps it is also thetic (and thus thetic) since it represents the likely movement for the purpose of generating a hopefully veridical prediction of the sensory consequences?

-The likely sensory consequences of the movement are then calculated. These predictions precede their contents (the actual sensory consequences). Are they telic? Élisabeth appears to say on p.18: 'predictions control actions...the predictions made by the motor system play an active role in the regulation of ongoing actions.' Thus, they have an effect upon whether and how their contents are brought about, and are therefore telic. Yet she notes that they are so by virtue of also being thetic: it is the accuracy with which they represent the relations between movements and subsequent states of affairs that enables them to play their role in initiating and guiding action. So the predictions are thetic.

-Then, once the action gets going, there are actual sensory consequences. These do not precede themselves or bring themselves about, and they represent the world, so they are thetic.

So, Élisabeth appears to be saying that agentive experiences are thetic because (at least) one class of their components, namely the predictions of sensory consequences of actions, are thetic. But would the fact that they have thetic as well as telic components also suffice to make them thetic (cf. (b) above)?

## First-/Third-person asymmetry

Now I will turn to issues #2 and #3 – the sense in which agentic experiences are experiences of activity as such and the contribution of agentic experiences to self-knowledge of action. Élisabeth suggests that the asymmetry between first- and third-person knowledge of agency may be due to the two-faced structure of agentic experience, i.e. we only have telic representations of our own actions. Given this analysis of the structure of first-person agentic experience, there is a potentially dangerous question that needs to be considered: can we have telic representations of other people's actions? (Cf. shared representations in the so-called 'mirror neuron system'). There is reason to think that shared representations may be telic. After all, they interfere with our own actions - think of James Kilner's work on motor interference (Kilner et al 2003), the social Simon effect (Sebanz et al 2003), or more anecdotally, when we watch football we feel inclined to move on behalf of the players on the team we are rooting for. Similar things can be said about shared representations for pain and various affective states (e.g. De Vignemont and Singer 2006), which is interesting in view of Tim Bayne's (2011) suggestion that pain is a good candidate for being a pushmipullyu (=telic) representation. Some of Élisabeth's other work on the so-called who system and the possibility of naked intentions also underscores this point (Jeannerod and Pacherie 2004; Pacherie and Dokic 2006).

Presumably Élisabeth would say that the reason why these states do not undermine the first-/third-person asymmetry is that the second condition for telic states is not fulfilled: these intentional states do not play a causal role in bringing about the goal states in question, since they are in the observer's own motor system and not in the other person's. (If so, might one still say that in the third-person case one experiences the activity as such, just not as *one's own* activity?)

There is something unsatisfying about this reply. Although these representations are not appropriately linked up with the other person's motor system to bring about the represented state, they are linked up with our own motor system in a way that poises them to bring about the state in question. Thus, as I watch the football game, I will be inclined to move to the side to dodge the opposing team's linebacker. This seems more relevant to me than the question of whether they are in fact linked to a causal chain that brings about the represented state. After all, recall the mischievous brain scientist mentioned above – who can detect the paralyzed patient's efforts to raise his arm and then raise the patient's arm – it seems to me not to make any difference with respect to the intentional structure of shared representations if the mischievous brain scientist were to detect my inclination to move in a certain way and then cause the football player to move in that way.

More importantly, however, it seems that things get even more dangerous if we consider joint actions. If we are jointly making a mousse, shared representations activated in my brain as you whip the egg whites may actually contribute to the whipping – if, for example, they enable me to see what you are up to, how you are getting along, etc, and thereby to help you.

Against this background, it is interesting to consider a recent study by Strother et al (2010) involving a joint action version of Haggard et al's intentional binding paradigm. In the experiment, two participants could hit a button to bring about an effect. In the decisive condition, the participants intended to hit the button together but only one participant actually had to hit the button. The result was that the perceived interval between button-press and resultant event was even more compressed for the participant who did not herself press the button. Thus, in this joint action setting, the perception of the other person's action appears to be processed like an experience of oneself performing the action with respect to the prediction of the sensory consequences of the action.

## Joint agency

This brings me to a few fairly open questions and remarks about joint agency with which I will conclude:

-Interestingly, the participants in the Strother et al study did not report greater senses of subjective agency in those cases in which the intentional binding was greatest (i.e. when their partner pressed the button). The authors say this puts pressure on the use of intentional binding as a measure of subjective agency. But perhaps the participants experienced a sense of *joint* agency (this was not probed)...

-How might this dynamic perspective help us in understanding the conditions under which joint agency will be experienced? Would you expect a sense of joint agency to be greater at any particular stage in the timeline of an action?

-Offhand, I would think that the contingency between my movements and yours would be important for experiencing a sense of joint agency – if so, in contrast to a specific kind of match between a prediction of sensory consequences and those sensory consequences, it could be important that the more general prediction that you will adapt to me (or that we will adapt to each other) be confirmed.

## References

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