

Comments on Isham et al.

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I found several aspects of this paper by Isham, Wulf, Mejia, and Krisst interesting and rewarding. In these comments, I first address some issues that arise in the initial, motivational section of the paper. I then comment upon issues that arise regarding their experimental design.

One motivation Isham et al. state concerns the function of consciousness, and the relevance of an experimental paradigm pioneered by Benjamin Libet for exploring the (or a) function of consciousness. The experimental paradigm is thought to be relevant insofar as this paradigm permits the measurement of a temporal window between the moment of initial conscious awareness of intention and the moment that the agent begins to implement the intention by, e.g., moving some part of her body. The relevance to the function of consciousness stems from Libet's speculation that this window may be large enough to allow agents to veto the intention of which they are aware and thereby to halt movement before it begins.

An initial thought: following others in this literature, Isham et al. speak as though determining whether the temporal window between the moment of initial conscious awareness of intention and the moment that the agent begins to implement the intention is sufficiently long to permit a conscious veto is somehow critical for determining 'whether consciousness has any causal role toward action execution' (2). But is this right? 'Consciousness' can be associated with a wide range of mental events, states and processes – e.g., those to do with perception, memory, attention, imagery, thought, metacognitive monitoring, and action. So consciousness may have a wide range of causal impacts, some quite important for action execution, even if conscious vetoes turn out to be relatively unimportant. Of course it may be that one function of consciousness is to enable certain moves in deliberation or to enable certain mental actions. If so, we might predict that agents with enough time can consciously change their minds and thereby change or alter the ways they move their bodies. But this seems to have little to do with the window between awareness of intention and the beginning of motor execution. If agents are able to consciously veto intentions, then presumably they can do so even after movement has begun.

A second thought has to do with Isham et al.'s characterization of the temporal window. Isham et al. characterize it as that between the moment of initial conscious awareness of intention and the moment that the agent begins to implement the intention. But then they also begin the paper by claiming that 'the duration between the moment of intent and the time of action is necessary to deliberate and plan an action' (1). Later in their introduction, they hypothesize that if the temporal window is functionally important – and in particular if it 'serves as the period of deliberation and cancelation – one should predict that more difficult decisions require longer temporal windows since more difficult decisions require more time for deliberation.

This is an odd model of the processes leading from intention to action. One way of construing the model is this: an agent comes to have an intention, perhaps due to non-conscious processes. At some point the agent becomes aware of this intention. The agent then has time to deliberate about whether to execute this intention and to veto it. If the agent does not veto it, or does not have enough time to veto it, the action begins.

Here is an alternative model. The agent arrives at an intention after a process of deliberation. The intention is an attitude of commitment to a plan for action, and in the normal case there is

no need to reconsider the commitment – after all, the commitment is usually made for reasons that arise in the context of prior deliberation. The agent may sometimes see a need to reconsider – perhaps circumstances rapidly change, or perhaps the agent is already uncertain about the action for various reasons – and in such cases, the agent may need to re-deliberate and to change or veto her intention. Notice that on this latter model, the ability to consciously veto an intention may prove important in some circumstances. But one would not predict that more difficult decisions extend the window between awareness of intention and the initiation of action. (One might, however, predict that other factors – difficult action circumstances, uncertainty about the intention or about one's ability to execute it – extend the window. Indeed, it might be that in difficult circumstances agents slow down their execution of action to allow more room for deliberation.)

I turn to Isham et al.'s experimental design. In the first study, participants heard a series of statements. Their task was to (a) agree or disagree with the statement, which they would indicate by pressing a button, and to (b) note the time on a rotating clock that corresponded to 'the earliest moment in which they become aware of having an inkling toward a decision' (3). The temporal window between awareness of intention and beginning of action was thus measured as the distance between the report of the inkling, and the beginning of a movement towards pressing the button (I think: I could not find a specification regarding the way the authors arrived at the measurement of the end of the temporal window). The explicit aim of the first study was to measure this temporal window for difficult decisions, involving intuitively difficult statements (i.e., 'To save a village, it's okay to sacrifice a child'), as compared to easy decisions, involving intuitively easy statements ('I like red more than blue').

Before discussing their results, a few comments are in order. First, as philosophers have pointed out regarding many studies in the Libet tradition, this one does not actually study decisions to act. It studies judgments of agreement or disagreement regarding statements of opinion. Insofar as these may be importantly different processes, the difference may be important. It is easy enough to test – one could use this same experimental setup but give the participants decision tasks in which pressing a button represents a decision to act in some way rather than a judgment of agreement. Second, the implicit phenomenology in this setup is interesting, and may have an impact regarding the measurement of the temporal window. I am not sure whether my own decision-making is guided by inklings, nor am I sure that I could reliably pick out the first moment of an inkling towards a decision. Maybe in some circumstances I could. It would be worth varying the implicit phenomenology in what is asked of the participants to see if this makes a difference. That is, one could run similar studies but leave out language of inklings. Or one could ask participants to note the first moment that they *knew* what they had decided. Why is this important? I take it that getting the temporal window right is crucial to examination of Isham et al.'s hypothesis. But the window seems to vary quite a bit – notice, for example, that study two found different windows for both difficult decisions (41ms vs. 99ms in study 1) and easy decisions (194ms vs. 154ms for study 1). It may be that the window is an artefact of the various demands at issue in a particular context.

This latter comment is especially important, in my view, given the pattern of results found in both of Isham et al.'s studies. Counter to their prediction, Isham et al. found that participants displayed a longer temporal window for easy decisions (154ms in study one, 194ms in study 2) than for difficult ones (99ms in study 1, 41ms in study 2). Why would this be? Isham et al. suggest that in difficult decisions participants may be 'more actively engaged in the deliberation 'before' having an inkling toward a decision' (4). That seems reasonable. Note it is more in line with the second model of deliberation and decision I offered above. But if that is what is happening, then we face (at least) two possibilities worth considering.

First, it may be that in the more difficult cases, participant decision-making involves no inklings, because the type of processing at issue in the difficult cases is importantly different than in the easy cases. Some evidence for this suggestion is that in study 1, participants took a full second longer to make their decisions in the difficult cases, and in study 2 participants took a half-second longer. If we are dealing with different kinds of processes, then we have to be careful in speaking of the temporal window between awareness of intention and beginning of action. For if the window results from different processes in different cases, there is no a priori reason to expect that the window will have the same functional role across the cases. (Isham et al. consider this point in their discussion section.)

Second, it may be that participants are reporting something different between the two cases. Perhaps in the difficult cases, participants, lacking any inklings, or perhaps unable to detect any given the difficulty of the decision, are reporting the moment of the decision. And perhaps in the easy cases, participants are reporting something that precedes the moment of decision – namely, an inkling. If so, one might expect the temporal window to be shorter than in a case that involves the feeling of an inkling, since an inkling is not yet a decision.