

Answering Libet's Critics — Free Will And Neurological Determinism



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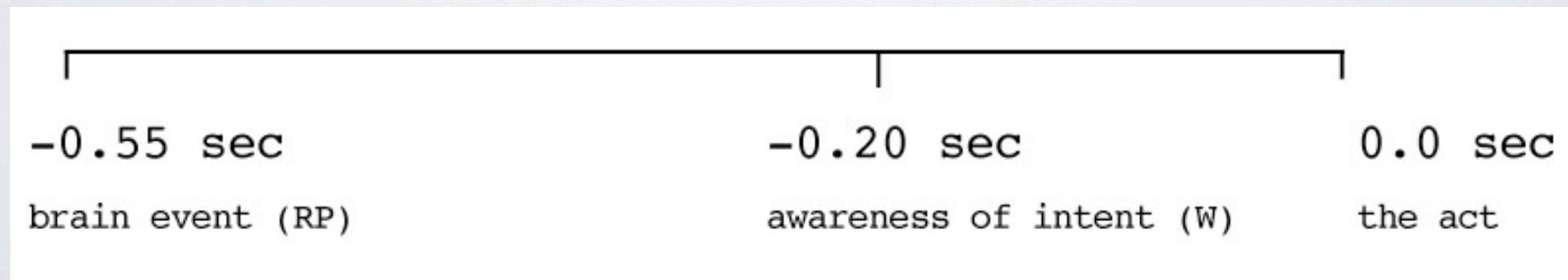
Abstract

Libet (1985) argued that free-will is threatened by his discovery that the RP (readiness potential) measured on an EEG, ramps up as much as 0.8 seconds before any action occurs, and around 0.35 seconds before any conscious mental awareness of choice occurs. Libet claimed that this shows that the brain seems to unconsciously initiate action. Hence, since we typically take it that free choice is conscious, Libet's work seems to pose a threat to free-will. Näätänen (1985: 549), Keller and Heckhausen (1990, in Libet, 1992: 214) and Pockett et al. (2007: 250-252) have replicated this study. Moreover, recent work by Soon et al. (2008) and Bode et al. (2011), using fMRI, also confirm Libet's results, finding even longer lead times before action — up to several seconds (Bode et al., 2011: 1, Soon et al., 2008: 4-6). Now, many philosophers have objected to this work. In this paper, I will try to show that these objections do not succeed, and that this evidence does seem to show that we lack free-will. The paper gives a brief response to the question of long-term decisions.

Background: Libet's and other related work

Libet's Experiment

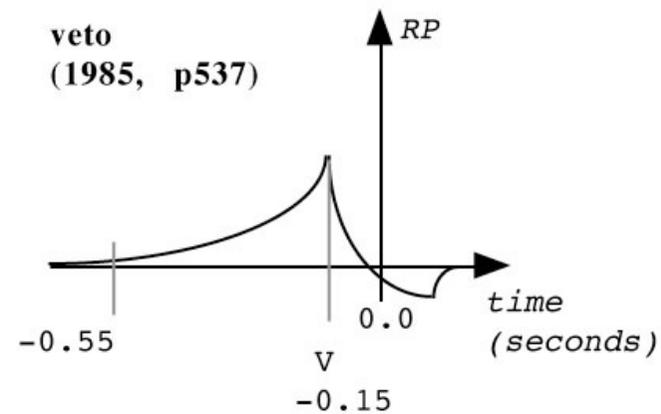
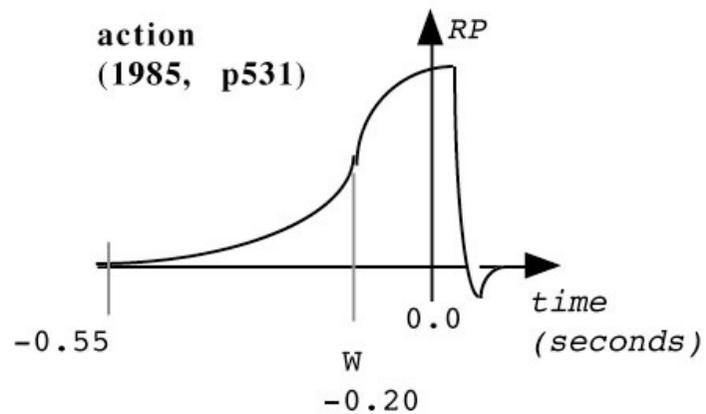
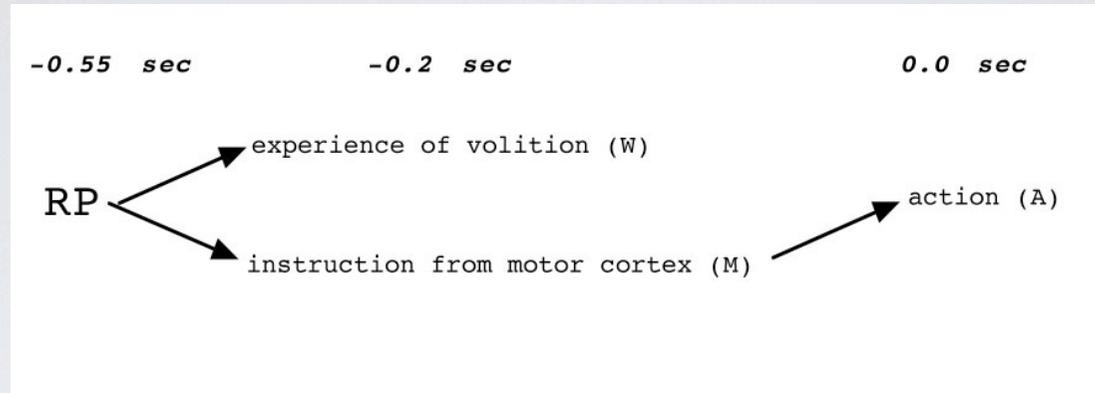
- Watch a moving spot/clock face. Subject was then told that she was at liberty to move her hand at any time and note position of the spot at the time that she became aware of the decision (W) to move.
- RP ramped up between 0.8 and 0.55 sec before the motion (M).
- W occurred about 0.2 sec before M.
- Libet (1982, 1987) found that a stimulus (S) has to exist for up to 0.2 sec before it achieves “neuronal adequacy” or awareness. Used S to calibrate W.
- Thus the decision to move was unconsciously initiated (Libet, 1985: 529).



Background: Libet's and other related work

- A motor instruction from the brain can take about 0.175 sec (Dennett, 1993: 103) to reach the muscles so W and M are almost simultaneous. And it is because of this, presumably, that we feel that we are the cause of our own actions. (This is important as Libet corrected W to -150ms using S).
- **VETO:** Libet also instructed his experimental subjects to periodically change their minds about whether to move or not. This he referred to as 'vetoing' the decision (V) (1985: 529).
- Graphs of V show that the RP drops off sharply after the veto event, which occurs around 0.15 seconds before action, i.e. slightly later than W. This, Libet concluded, was the "room" for free-will (1985: 538-9).
- Libet is at pains to point out (1987: 783) that although "W" is referred to as "wanting", W is not the actual choice. Rather, for Libet, choice is V (1987: 784).
- Choice therefore can only occur in the last 150ms or so of activity (1987: 785). In other words, free-will, as we know it, can at best be a matter of self-control. Obhi and Haggard: we should talk about "free won't" (2004: 360).

Background: Libet's and other related work



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Related Work

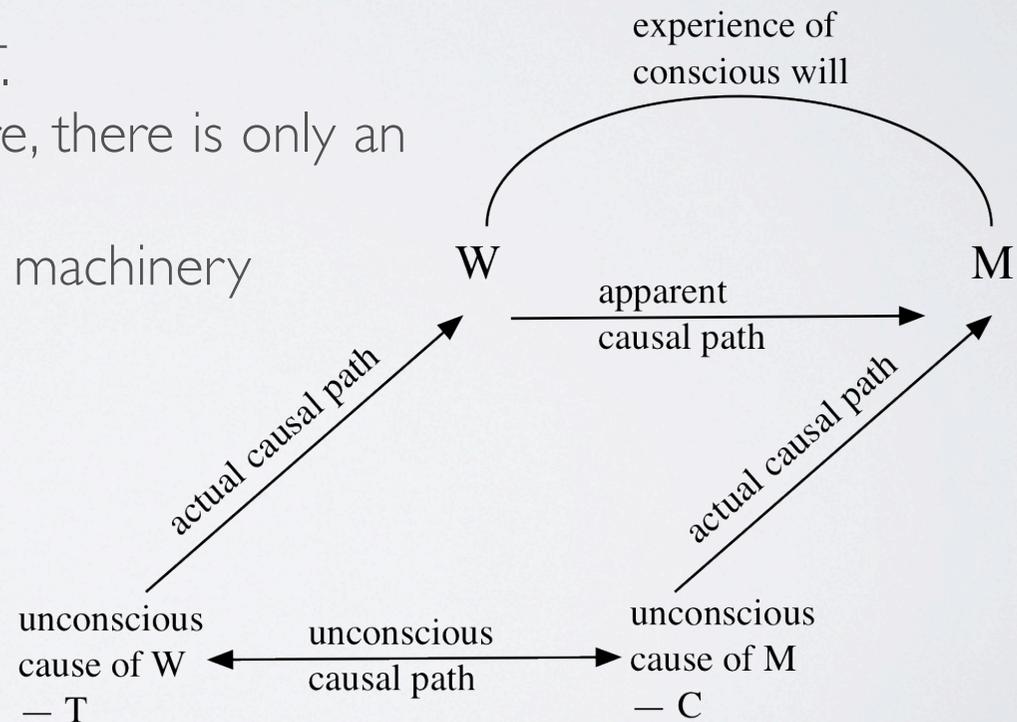
- Grey Walter: change a picture on a slide projector. RP signal changed the picture. The subjects reported alarm (Dennett et al., 1992: 199).
- Haggard and Brass (2007), Soon (2008), Wegner, and, Bode, Fried et al. (2011: 550) report times of 0.7 sec on EEG and more, even “several seconds” before W, and that it was possible to predict W (Fried et al., 2011: 553, 557).
- Newer experiments primarily use fMRI. Left/right hand movements encoding in fMRI patterns. Predictive accuracy of up to 57% @ 3 sec before movement. Soon et al. (2008) saw up to 10 sec
- Wohlschläger et al.: stimulating part of the brain caused W (2003: 586)
- Wegner et al. (1999:489): transcranial magnetic stimulation (TMS) can cause an a finger to move. Yet, the subject reported the finger movement as voluntary. Fried et al. (1999: 3658 et seq.) report the same via invasive electrodes: can induce W, can create illusion of movement, can predict W (Fried et al. 2011: 555, 557).

Background: Libet's and other related work

- Wegner's subjects chose a word by moving a mouse pointer. If the word was presented within an appropriate time frame (1-5 sec before it was heard), the subject reported the action as "theirs", whereas if the word came one sec later than that time frame, it was experienced as involuntary. But it was actually controlled by confederate (Obhi et al., 2004: 363-4, Wegner 2003: 6, Wegner et al. 1999: 488 et seq.).
- *"These data give the impression that conscious intention is just a subjective corollary of an action being about to occur."* (Fried in Haggard, 2011: 404).
- Thus what matters for a sense of agency is that we feel involved in the sequence, and that it is appropriately timed; it is not required that we actually cause the events.
- Therefore W (the feeling of having decided to do something) is epiphenomenal (cf. Dennett, 1993: 163, cf. Haggard et al., 2002, Searle, 2001: 505).

Wegner's Model

- Wegner's model (Wegner et al., 1999:483 et seq., Wegner, 2003:2-3) explains how this might work
- Unconscious cause of action C.
- Motion M.
- Unconscious cause of W is T.
- Between W and M, therefore, there is only an apparent causal path
- Both caused by unconscious machinery C and T respectively.



The key debate

- Is consciousness (W) causally required for free decisions or actions? If so, it seems that Libet's work refutes free-will.
- Shoe laces. Once you know how to do it, you start to become unaware of the steps involved in doing it. Does this mean that lace-tying is unconscious? Does it mean that it is not free?
- Only if we make reference to the reasons for actions and a conscious will or selves, Searle argues, can our explanations for our actions be adequate (Searle, 2001: 492, 499).

“This problem of automaticity, more than any other extant research, does challenge ordinary views of free will, since commonsense notions of free will are closely tied to consciousness, and seem to entail that behavior that issues from unconscious processes is ipso facto not free” (Roskies, 2012: 4).

Criticisms of Libet's and related work

Many objections to Libet's (and related) work have been made.

*1. That Libet misunderstands the nature of the **self** and its relations to its states and choices*

- Libet's claim that V is representative of "free will" implies he has some kind of dualism or a homunculus model of the self in mind. Why? Because why should V be efficacious and not W? Why can something — a **self** — stop action with V only?
- Pitman (2013) interprets Libet as offering a model of the mental in which the **self** stands in a separate homunculus-like relation to its states, and that the self somehow apperceives its states (W) when they "arrive" in consciousness.
- Pitman offers a different model in which the **self** is "occupies" its "world-directed" states (Pitman, 2013: Section II), rather than standing in a separate relation to states which exist as separate entities within our minds.
- But Libet does not (1982, 1985, 1987, 1989, 1990, 1992) discuss the **self**, or a separation of states the agent is in. Libet simply talks about W as an occurrent mental state. On a homunculus-like model, Libet would not be able to express his worry that W is epiphenomenal.

Criticisms of Libet's and related work

- Many writers have made this objection (Wood, 1985, Breitmeyer, 1985: 539, Nelson, 1985: 550).
- Even if W as a state of a **self**, or states that a **self** is in, does not make W causally efficacious. Is a state of a self sufficient for moral responsibility? E.g. memories? How much of our self states do we choose?
- Us being “whole psychological subjects and agents” (**self**) seems problematic in the light of the evidence of us being unaware of decisions' aetiology and initiation.
- Yet we presumably need a “whole psychological subject and agent” in order to be morally responsible
- Haggard and Clark (2003: 696 et seq.) give the example of a person with “anarchic hand and utilisation syndrome” — the person picks up objects and use them, and claim to be the **author** of the movement, or acknowledge it as his movement, but be unable to explain why he did it. Forces person to retrospectively claim/explain. (Haggard et al., 2003: 705) Gazzaniga confirms the above (2012).

Criticisms of Libet's and related work

2. *Libet's experiment method is itself questionable, too difficult, and artificial, to accurately establish that unconscious choice occurs before consciousness awareness of choice; it is inherently fuzzy*

- This complaint is raised by many critics — Pitman (2013, Section II), Bode et al. (2011: 1), Haggard et al. (2002: 384), Dennett et al. (1992: 198), Pockett et al. (2007: 250-252).
- The argument has two parts: Firstly, that the timing estimation of W could be inaccurate or fuzzy.
- Secondly, that it's hard for experimental subjects to divide their attention.

Response:

- The experimental design that Libet used is admittedly quite complex; one could easily be flustered. However, Pockett et al. found that subjects should be “naïve” for more accurate results (Pockett et al. 2007: 253)

Criticisms of Libet's and related work

- Moreover, Libet corrected for subjectivity using a skin stimulus (S) (Libet, 1985: 529).
- Pockett et al. found that Libet's method works. (Pockett et al., 2007: 241, 253).
- So it's not obvious, without a methodological argument about Libet's approach, that Libet's claims about W's timing is specious (cf. Dennett, 1992 who makes this claim).
- The timing of W may have been fuzzy for other reasons, like quantum indeterminacy. If that is the case, it may also be the case that W was sufficiently fuzzy to have started earlier than Libet recorded it, and that RP initiated later than Libet recorded it. There is some evidence that this might be the case (reported in Haggard et al.'s "tone" experiments, 2002: 382). However, the gap still exists. And if we're not to abandon physicalism, this must be the case.
- Libet is clear that there's no specific point in time that marks W (jagged graphs) (Libet, 1985: 535).

Criticisms of Libet's and related work

3. *If the brain is indeterministic, we may have free-will — the Libertarian objection*

We don't know if the brain is chaotic, **quantum**, or determined (Roskies, 2012: 1), so we don't know whether our choices are predetermined, thus we can't say that the neural cause of action rules out free-will, because we can't say whether the neural cause of action is deterministic (ibid, 2012: 2).

BUT

- Libet et al.'s evidence seems to show that the psychological level of the brain is 'bypassed' (Roskies, 2012: 3).
- If the neural was shown to be **quantum**, it would break the direct link from **self** or agent to choice. In order to be responsible for what we choose, we would need to be the authors of our choices (Roskies, 2012: 2). **Libertarian**-type free-will required.

Criticisms of Libet's and related work

4. *That W may contribute to the action occurring, and be a necessary cause thereof*

- It may be the case that W is necessary in the causal sequence.
- Libet suggests that V is causally efficacious qua mental.
- But many acts occur with RP and without W. Think of any automated action. Since W is not required for automated actions, it may never be required. Thus, if the RP or our antecedent brain states are sufficient cause for action, why do we need the additional conscious event (W) to explain it, or make it free? (Mortensen, 1985: 548). Hence W is epiphenomenal.
- Obviously, this raises an evolutionary question as to why we have W anyway. (Searle, 2001: 505, 509, Bridgeman, 1992: 206).

Criticisms of Libet's and related work

5. *Intention is crucial in distinguishing free actions from mere physical movement*

- Since an action by definition requires a conscious intention, it seems to follow from Libet that all our actions are merely movements, not actions. (Pitman, 2013, Section IV, and others, e.g. Gallagher, Searle (2001), and Haggard (2003: 696). Searle agrees. Explanations of what we choose to do, must provide causally sufficient conditions. (Searle, 2001: 493, 495, 499).
- But maybe there's another way to distinguish actions and motions in terms of whether something is caused by a being with a nervous system. Does a SpheX wasp act or move? What about nervous tics? Are they actions, then? Surely goal-orientation is required.

Criticisms of Libet's and related work

- *Intention vs Intention-in-action*. Compare planning to get coffee tomorrow to getting up now to get coffee. (Searle's distinction).
- Libet's cases all seem to be merely reflexive motions, cases of 'intention-in-action' (Searle, 2001: 498).
- It is not the *raising of the arm* that was the subject of the free choice; the intention or choice was to *summon a waiter* (Pitman, 2013). These are two different things. The objective of calling a waiter could be achieved by any number of means. The question is rather one of whether the choice to *summon the waiter* was free.
- Intention or choice is not predetermined by the RP, only the bodily motion is. RP seems therefore to be irrelevant to the fact that I freely chose to get the waiter's attention. RP is about intention-in-action.

Criticisms of Libet's and related work

- But prior intentions also have to be realised neurologically.
- “It is always possible that I might think I am raising my arm when in fact some other cause is raising it” (Searle in Wegner et al., 1999).
- But is intention causally efficacious qua mental? If it is, is intention also causally efficacious qua neurological, or overdetermined?
- A compatibilist would have to show that intentions are causally efficacious qua neurological, but that they occur phenomenologically, simultaneously, with the mental, and that the mental intentions are necessary contributory aspects of the intention, neurologically construed (does this raise the question of mind/body split?).
- If W is not causally efficacious qua mental, why would some other antecedent brain state, conscious preplanning or not, be causally efficacious qua mental?

Criticisms of Libet's and related work

6. *Dealing with preplanned decisions*

- Suppose that although I want coffee, I simply do not raise my hand to ask the waiter to get it, even though I have “decided” quite firmly that I will do so. Suppose, further, that I continue to do nothing for an extended period of time. How long must I wait before that “decision” to get coffee passes its sell-by date, and becomes merely a “past wish”? How soon must I call a waiter before it's a different intention?
- For something to count as a choice, an action must follow appropriately soon after, to fulfil the goal (Wegner in Haggard, 2005: 293). We can't say that the intention was to call the waiter if we don't call him within reasonable time. Hence we only really call him when we raise our arms.
- Thus the *action* is still *arm-raising*, not *calling a waiter*. Intention/goal is not *constitutive* of free-will or choice; it is at most one of many antecedents of a free action. Perhaps, then, we have free intentions but no free actions?

Criticisms of Libet's and related work

- It is precisely Libet's point that an action is not a choice until I myself move relatively soon (which rules out the funnel case, or the coffee-later-at-home case). (Libet, 1985: 538).
- Movement that occurs soon after a motion decision is unconsciously initiated.
- For an action to be 'intentional', it seems as if there must be a prediction (or goal), cued by the environment or senses or some desideratum, a sensation of having an urge to do something, and finally, an actual movement (Haggard, 2005). Mere "constant conjunction" e.g. between intention and action is not enough (Haggard, 2005: 295). So even in a relatively long-term goal — a few minutes, say — it seems as if Libet's concerns are relevant.

"Intentional actions are typically made for the purpose of achieving a specific goal. Cognitive representations seem concerned with goals, and only secondarily with the movements used to achieve them." (Haggard, 2003: 696).

Criticisms of Libet's and related work

- “**Any** modulation, **including cancellation**, of a self-initiated act once the brain processes required to produce it are underway **could equally arise from unconscious mechanisms**. Awareness of that ‘change of intention’ could be subsequently represented in consciousness in the same way we are assuming occurs with the original experience of ‘intention.’ We have argued elsewhere that there is no need to assume that subjective experience, or consciousness, has causal properties.... In this we are adopting the view argued, we think persuasively, by Pockett ... that ‘consciousness may be epiphenomenal’ and ‘does not in fact cause behaviour’.” (Oakley & Haggard, 2006: 550).

Criticisms of Libet's and related work

7. *But W is not choice, it's awareness of choice*

- Here's the argument: Since *W* is just the awareness of having chosen, not choice itself, and since *W* is epiphenomenal, it doesn't follow that choice is not free or that choice is epiphenomenal, rather it follows that our awareness of having chosen is epiphenomenal. Perhaps choice is a conscious mental state, such as planning, before *RP* that causes *RP* and *W* and *M*.
- In Libet's work, *W* is not choice, as we normally understand it; Libet gives the role of choice to *V*. But *W* may well turn out to be, in fact, what we now call choice.
- Consider water. We have discovered that H_2O does not have properties of coolness, transparency, and fluidity, in and of itself; these properties are a function of the interaction of H_2O with light, the environment, gravity, air pressure, temperature, our senses, and how the water molecules interact with each other.
- The will may turn out to be a collection of causally determined unconscious neurological states. Our feeling of free choice (*W*) may just be a feeling of satisfaction at having our goals being met (Haggard et al., 2003: 696).

Conclusion

- All consciousness choice must ultimately be described by unconscious neurological mechanisms, if we are not to beg the question of what “conscious” means.
- Recall that lace-tying is largely unconscious, yet we want to say that we freely choose to perform it. But what about somnambulism? We do not hold someone accountable for what they do while sleepwalking.

“Your conscious mind is [like a] newspaper. Your brain buzzes around the clock... almost everything transpires locally: small groups are constantly making decisions and sending out messages to other groups. Out of these local interactions emerge larger coalitions. By the time you read a mental headline, the important action has already transpired, the deals are done. You have surprisingly little access to what happened behind the scenes.... You’re the last one to hear the information. However, you’re an odd kind of newspaper reader, reading the headline and taking credit for the idea as though you thought of it first.” (Eagleman, 2012: 33).

Thank you

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