

The Modern Problem with the Power of Agency¹

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DOI: [10.17421/2498-9746-03-10](https://doi.org/10.17421/2498-9746-03-10)

Abstract

This article focuses on the question whether humans have the power of agency. The modern version of this question is traceable to the 18th century, when Hume began to doubt the ability of human mind to cause events in the material world, and d’Holbach rejected it altogether. Since recent neuroscience has shown that certain neural events precede conscious experiences of agency (e.g. Libet 1983, Hallett 2008), many contemporary theorists of action follow d’Holbach in reducing the power of agency to illusion (e.g. Smilansky 2000, Wegner 2002, Dennet 2003). However, I shall suggest that there is also a non-reductive way to explain the human experience of agency that is compatible with the discoveries of neuroscience. The 18th century thinkers were concerned with the Cartesian conception of agency, according to which agency is an efficient causal power. However, a contemporary action theorist does not need to endorse this conception. A conception, according to which human agency does not have to involve efficient, but final causality would be an alternative that would not force the theorist to dismiss the power of agency as an illusion. I attempt to show, with help of Aristotle, that this conception suffices for asserting that we can cause events in the world, regardless of the efficient cause of those events.

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My article focuses on the question whether or not humans have the power of agency, the capacity to cause events by volition. In part I of the article, I show that in its present form, this question is traceable to Enlightenment philosophy. According to Hume, it is unexplainable how a mind could be a cause for events in the material world. D'Holbach further proposed that provided that all observable events can be reduced to interactions of matter, which he expected to become possible, there is no need for the power of agency. However, this reductively materialist theory did not achieve much success until the second half of the 20th c., not only because it would imply that humans cannot be free and spontaneous agents, but also because no convincing empirical evidence was found for it. In part II, I discuss the observations of the late 20th c. and more recent experimental psychology, which showed unconscious neural events to precede experienced volitions (e.g. Libet 1983, Hallet 2008), and the subsequent renaissance of reductive materialism in the theoretical explanations of agency. Those observations provided the needed evidence for d'Holbach-style reductive materialism, and encouraged many theorists of agency to explain our experience of agency as an illusion (e.g. Smilansky 2000, Wegner 2002, Dennet 2003). However, these theorists do not have a verifiable explanation to offer as to why we have such an illusion, and, moreover, their theories fail to offer remedy for the potential worries about the loss of freedom and spontaneity. To alleviate this uneasy situation, I suggest in part III that we in fact *can* explain the experience of agency in a way that does not render it epiphenomenal to interactions of matter, but is nevertheless compatible with the observations of experimental psychology. The Enlightenment thinkers such as Hume and d'Holbach were operating within the Cartesian conception of agency, according to which agency is an efficient causal power. However, a contemporary theorist of agency has no reason to endorse this conception. A conception, according to which human agency does not have to involve efficient, but *final* causality would be an alternative to the Cartesian conception that would not force the theorist to dismiss the power of agency as an illusion. I attempt to show by utilizing insights from Aristotle that this conception is a sufficient justification for

asserting that we can cause events in the world, regardless of the efficient cause of those events.

1 HOW THE POWER OF AGENCY BECAME PROBLEMATIC?

Ancient and medieval philosophers did not question our power of agency, the capacity of humans to cause events in the world as a result of an act of will.² This power is not identical to free will, although it is a necessary precondition for the freedom of will. Since antiquity, the freedom of will has been assumed to presuppose *more* powers of the mind than the power of agency – powers such as ‘choice’ or ‘assent’ – to preclude the possibility of our volitions being determined by forces beyond our conscious control.³ Although the freedom of will was much discussed in ancient and medieval philosophy, not even the Stoics that embraced universal determinism and the Epicureans, who considered volitions to emerge from random causal forces, seem to have doubted the causal connection between volition and action.⁴ Likewise, for St. Thomas Aquinas, the power of agency appeared to be so evident that he took it as his first premise for demonstrating the freedom of will.⁵

The existence of the power of agency was not widely questioned in philosophy until the 18th century. This initial doubt towards the power of agency could not have arisen from any major change in the meaning of the concept of ‘volition’. Although the concept of *volitio* used by medieval philosophers is arguably broader than the modern concept of ‘volition’, and although the Latin *volitio* does not have a literal equivalent in ancient Greek – though Aristotle’s *prohairesis* comes close⁶ – *volitio* nevertheless refers to desire towards (*pro*) realising one’s choice (*hairesis*),⁷ which is what ‘volition’ means also in modern philosophy. Rather, the source of the doubt is in the advent of empiricist epistemology, according to which only observation can justify assertions. On the grounds of this epistemology, David Hume argued that unlike the previous philosophers assumed, the *intuitive* connection between certain volitions and observable events does not suffice for asserting that a volition can cause events. There should be an *observable* connection. However, I can only observe that certain events, the ‘immediate causes’ of which lie in the movement of my ‘muscles and nerves and animal spirits’, ‘accompany’ my volitions.⁸ For example, if I want to flex my fingers, my fingers move. But mere co-incidence of certain volitions and events, Hume pointed out, does not yet amount to observing the power of

agency.⁹ Since it is possible that I want to flex my fingers, but they do not move, as in the case of paralysis, or that they move even if I have not willed to flex them, as with reflexes, my volition does not *necessarily* cause the movement of my fingers, and thus a force that I have yet to observe is can be the real cause.

Paul Henri Thiry, baron d'Holbach, was impressed by Hume's scepticism towards asserting the power of agency. All that we can observe is that some of our volitions are accompanied by certain events in our bodies. However, unlike his friend,¹⁰ d'Holbach was a convinced materialist. He was an outspoken supporter of a metaphysical thesis that everything is reducible to matter, the essence of which is motion. Hume had resisted endorsing such a reductive materialism by appealing to our inability to perceive whether our observations about matter (e.g. that certain movements occur in my body), mediated by ideas in our minds (e.g. that my volition causes those movements) are about matter or our own minds.¹¹ However, d'Holbach dismissed such doubts on account of his conviction that all ideas of the mind are potentially explainable as 'imperceptible modification[s] of the brain.'¹² This conviction, which Hume would have judged as 'obscure and uncertain speculation',¹³ has its origins in Spinoza, who had denied any real distinction between the mental and the material aspects of the world, and considered possible to describe either in the terms of another, for 'the order and connection of ideas is equivalent to the order and connection of things.'¹⁴ But in opposition to Spinoza, d'Holbach did not consider the language of mental events equal to empirical observation in describing the world. Talk about the ideas of the mind is 'vague',¹⁵ whereas empirical observations can be 'precise'.¹⁶ If there is no real distinction between mind and matter, we have thus a reason to think that the mind is ontologically reducible to matter, and therefore describe the events of the mind such as volitions by using the method of empirical observation.

A sensation or perception occurs, suggests d'Holbach, whenever the compound of matter that we conventionally identify as 'mind' is modified by some other 'pieces' of matter. 'Every sensation is nothing more than the shock given to the organs, every perception is this shock propagated to the brain'.¹⁷ We become conscious of a perception upon 'distinguishing' it from other perceptions on the basis of its unique qualities. Since movement, according to d'Holbach, is the essence of matter, matter has to be in constant movement, and since everything is matter, matter can only move in relation to itself. Hence matter constantly undergoes modifications in its qualities that make it appear as divided into particular pieces in our perceptions.¹⁸ An action occurs when those events in the brain that cause the sensation

of volition result in certain muscle movements. Thus, insofar as also they are reducible to the modifications of matter, volitions are not categorically different from any other material events such as the falling of a stone. Therefore, we can expect empirical sciences to eventually discover the forces of nature that determine volitions, just it has discovered e.g. the laws of gravity.

In a reductively materialist system like d'Holbach's, there is *no* possibility that volitions could cause events. There is only matter, the essential modifications of which give us all our ideas, including volitions. The power of agency is not needed to account for our movements, because movement is the essence of matter. Instead of speculating about 'invisible powers', philosophers, d'Holbach declares, should rather focus on discovering the principles of nature that govern human actions.¹⁹

2 THE PROBLEM DEEPENS: AGENCY AND EXPERIMENTAL PSYCHOLOGY

The reductive materialism of the Enlightenment spearheaded by d'Holbach's system failed to achieve any immediate success. In defiance to d'Holbach's expectations, during the 18th and 19th centuries, empirical science did not make much progress in revealing the supposed laws according to which humans are determined to act in virtue of their material constitution. Even newly developed psychology failed to find aspects of human behaviour that would manifest even nearly similar regularity as Newtonian mechanics. Moreover, since determinism was unable to accommodate our deeply held intuitions about the freedom and spontaneity of will, the philosophy of action took a different direction than d'Holbach had envisaged. Kant proposed a response to Hume's scepticism that overturned the claims of reductive materialism, while respecting the freedom and spontaneity of will: the fact that the causal connections between mind and matter are unobservable does not have to lead one to doubt the existence of such connections, which are needed to sustain the power of agency, rather, the fact can show that this power is a construct of our own minds like the entire perceptible reality.²⁰

However, in more recent times, reductive materialism has experienced a renaissance in the study of agency. This development began in the first half of the 20th century, with the introduction of empirical methods for mapping correlations between one's neural events and muscle movements, i.e., electroencephalography (abbreviated as EEG) and electromyogram (abb. EMG). The former method utilizes a network electrodes attached to scalp to record

neural activity on the surface of brain, whereas EMG registers neural activity in muscles through electrodes attached to skin.

In 1964, Hans Helmut Kornhuber and Luder Deekle demonstrated that neural events in muscles (recorded by EMG) are preceded by an increase in the activity of the brain (recorded by EEG) before the occurrence of action. They named this correlation as *bereitschaftspotential* ('readiness potential', abbreviated as BP).²¹ In 1983, Benjamin Libet published the results of an experiment on the relationship between volitions and BP. In the experiment, EMG and EEG electrodes were attached to participants that were asked to flex their fingers. They were also asked to note the position of a moving pointer on a display at the moment they consciously will to flex their fingers. The results of the test showed that the participants consistently formed a volition before they flexed their fingers, but some time *after* EEG had registered increase in the neural activity of their brains.²²

The results of Libet have been successfully replicated.²³ The introduction of functional magnetic resonance brain imaging (fMRI) from 1990s onwards has allowed the scientists to locate the neural events that precede intentional actions within the brain.²⁴ In their 2007 version of the Libet experiment, Masao Matsushashi and Mark Hallet revised the test setup to depend less on the subjective time perception of the participants by replacing the moving pointer with a 'pseudo-randomly'²⁵ occurring tone as the measurer of time.²⁶ Also this revised test confirmed the conclusion of Libet – i.e. that unconscious neural events *precede* conscious volitions.

After these experiments, it was no longer speculative to assume that volitions are reducible to modifications in matter. In fact, assuming anything else in the theory of agency began to seem problematic. The conclusions of experimental psychology made conscious mental states such as volitions and intentions only *consequences* of the modifications of matter, and thus ontologically reducible to those modifications.²⁷ This implication resulted in difficulties to both Spinoza and Kant. Neither the assumption of the former, that the empirically perceptible reality is equivalent to the reality accessible to human consciousness, nor the theory of the latter, that it is a construct of human consciousness, seemed tenable any more.

A central concern for many theorists of action today is to explain why we intuitively regard our volitions as capable of causing events in the perceptible reality, although they are not. According to Saul Smilansky, this intuition is an 'illusion' that is, however, the ground for 'the affirmation of [morally] responsible self'²⁸ and thus 'serves a crucial creative function, which is a basis for social morality and personal self-appreciation.'²⁹ Daniel Wegner argues that the illusion of agency is a 'moral compass', because 'if

you think you willed the act, your ownership of the act is established in your own mind.' Whether or not one's volition is the cause of the act does not matter to this experience that 'prompts us to feel emotions appropriate to the actions we find ourselves doing.'³⁰ The experienced connection between volitions and actions may derive, Daniel Dennet writes, from the evolutionary 'benefits' that the institution of moral responsibility has brought to us.³¹ According to Enrico Bignetti, the fact that 'both reward and blame are motivational incentives which foster learning and memory in us' keep us upholding the illusion of agency even today.³²

Above explanations seem to address d'Holbach's call for finding the the principles of nature that govern human actions. However, currently only the results of the experiments of Libet, with their possible implications to the power of agency, have been adequately verified, but the possible reasons why we live under an illusion of having this power remain elusive. All the proposed explanations are speculative and thus fall short of answering to d'Holbach's call. Moreover, even if there was an empirically adequate explanation, the moral implications of the denial of human agency would remain problematic: most of us would not like to regard spontaneity and freedom as illusions. Reductive materialism, which avoids the problems of Kant and Spinoza in the face of experimental psychology, thus fails to satisfactorily compensate for its denial of the power of agency.

3 SAVING THE POWER OF AGENCY: RETURN TO FINAL CAUSALITY

At this point, I would like to suggest that the recent theorists of action might have approached the discoveries of experimental psychology, which purportedly show volitions to be the consequences of unconscious neural events, from a mistaken angle. It seems to me that those discoveries do not necessarily imply the truth of reductive materialism, which still remains, over two centuries after its introduction, a speculative theory and incompatible with our intuitions about the freedom and spontaneity of will. Instead of refuting the power of agency, the test results of Libet and others can, I attempt to explain next, rather signal that the conception of agency used by the Enlightenment philosophers and contemporary theorists of action should be replaced with a more empirically adequate conception.

According to the theorists of agency studied in the previous section, an action is a bodily movement caused by a volition.³³ The power of agency, the capacity to cause actions, is likewise identified with the ability to move

one's own body at will. There is, however, an alternative to this conception. An action can be also conceived as a process towards realising an end that the agent consciously wills to realise — as Aristotle understood it.³⁴ In his definition, the causality that is relevant to demonstrating agency is not manifested in a bodily movement initiated by the volition of an agent, as the modern and contemporary theorists think, but in the attraction of the willed end in the agent's imagination.³⁵ According to Aristotle, these are two different causes, labelled as 'efficient' and 'final' in *Physics* book 2, chapter 3. They offer complementary explanations of the same occurrences, the former telling how movement is transferred from one substance to another, the latter for the sake of what the transfer occurs.³⁶

The centrality of conscious ends for agency is evidenced since the first lines of *Nicomachean Ethics* (*EN*), on which Aristotle states 'that every action and choice is thought to aim at some good' — i.e. at some *end*, because in Aristotle, goods and ends are synonymous.³⁷ In Aristotle, *choice* is what renders one's actions subject to moral assessment, and not 'the origin [of action] being in the agent,'³⁸ in contrast to the modern and contemporary theorists of action that regard versions of the latter assumption as the philosophical justification for moral responsibility. For even 'children and animals'³⁹ that do not choose their ends are the efficient causes of their own actions, but they are not morally responsible for what they do. 'We', says Aristotle, 'are of certain moral character on account of *choosing* good or bad things.'⁴⁰ Hence, for Aristotle, the power of agency is the capacity to choose ends for oneself, while an action is a process aimed at realising those ends.

However, the Aristotelian understanding of agency and justification for moral responsibility was rejected by René Descartes. According to Descartes, a capacity to cause bodily movements by volition is the *only* justifiable conception of agency. Although he did not present an alternative to Aristotle's principle for excluding children from responsibility — thus leaving a gap in his theory of agency — he considered animal minds material and determined by external stimuli, a theory which d'Holbach applied also to humans (thus following the example of physician La Mettrie).⁴¹ The reason that Descartes had for rejecting the Aristotelian conception of agency was that according to him, we cannot investigate final causes 'by natural light' (i.e. empirically).⁴² Only causality that involves perceivable, i.e., bodily, movement can be empirically investigated; or, as Spinoza later summarized, 'all final causes are nothing but human fictions.'⁴³

However, Hume showed that also the supposedly empirically observable efficient causation does not exist in the perceivable reality: we can

observe only co-incidences. Nevertheless, d'Holbach and subsequent empiricist philosophers continued to keep efficient causation as the more or less explicit paradigm for defining agency: according to e.g. d'Holbach, acting is 'the communication of motion.'⁴⁴ Although the contemporary theorists of action often present themselves as *anti-Cartesian* — insofar as they follow d'Holbach in endorsing reductive materialism — paradoxically, also their conception of causality is Cartesian. It is an interesting question why this conception became so prevalent and continues to be so: perhaps, because Spinoza and the reductive materialists of the Enlightenment such as d'Holbach perceived that acknowledging final causality would lend support to certain transcendent commitments such as to the existence of God *qua* the final end, which they themselves rejected, and which continues to be rejected by many contemporary theorists of action. But *ad hoc* considerations like this would not be valid arguments against Hume's conclusion, the force of which has to be reckoned with. Therefore, we are entitled to repeat Descartes' critique of final causes against *also* efficient causes favoured by Descartes himself, and paraphrasing Spinoza, conclude that also they are 'nothing but human fictions'.

Provided both efficient and final causes are human creations, then we, in order to make sense of our experience of agency, have a presumptive reason to opt for the conception of agency built on the conception of causation that can explain the most aspects of our experience. Since the verified precedence of unconscious neural events to conscious volitions undermines the explanatory power of the Cartesian conception of agency as efficient causation by volition — insofar as its supporters cannot adequately explain our experience of agency as an illusion — we have a reason to attempt to replace that conception with a conception that does not introduce such an onerous explanatory requirement.

We can return to the Aristotelian conception of the power of agency. Since also the Epicureans, the Stoics, and Aquinas understood agency as a capacity to set ends for oneself — which everyone can experience themselves capable — it did not occur to them to doubt the power of agency. Were the power of agency a capacity to set ends for oneself, the existence of such a capacity would be compatible with the discoveries of experimental psychology, and hence have superior explanatory power to the alternative Cartesian conception of the power of agency. The conclusions of Libet and others do not question that we are able to act for the sake of ends, only that our volition is the efficient cause of the muscular movements that pursuing ends involves. And these are two different things: without the presence of a conscious end, a movement cannot be an action. We do not need to take only

Aristotle's word for this definition, because it also inheres in the meaning of the concept of action, i.e. it is an analytic truth. As Shaun Gallagher has pointed out, the 'the kinds of actions that we freely decide are not the kinds of involuted bodily movements [i.e. flexing fingers] described by Libet's experiments',⁴⁵ as shown by the observation that someone who is e.g. trying to 'to catch [a] lizard' with his fingers would *not* answer that he flexing his fingers when asked what he is doing. When we are asked to explain our actions, as default we construe the explanations with reference to the ends we have chosen to pursue.⁴⁶

According to the conception of agency that is found in Aristotle and in natural languages, the causes of actions – volitions – are categorically different from the causes of mere, sheer movements – unconscious neural events. At first sight, this distinction between final and efficient causality may seem a fertile ground for sceptical arguments, as it may seem to imply that there is a great divide between one's mental reality and the material reality. However, we can admit that both kinds of causality are on equal epistemic grounds – that neither of them is more real than another. Although events of the material world are, *pace* Kant, independent of our consciousness, the connections between them are, *pace* Descartes and Spinoza, not empirically observable. Thus, both efficient and final causality can be instruments created by us humans for explaining our experience of the world to ourselves and thus the worry would disappear. As Aristotle thinks, the experience of being able to choose ends for one's bodily movements could be what agency is. A theorist of action that abandons the Cartesian conception of agency, and endorses this, Aristotelian conception neither needs to think that the precedence of unconscious neural events to volitions render the power of agency an illusion, nor believe in the possibility of efficient causation by volition, but can assert that our volitions are capable of causing events in the world insofar as they provide our movements with ends.

NOTES

1. The article has been written as a part of the research project 'The Enlightenment Ideas of the Freedom of Thought and Conscience, and Contemporary Secularism' at Jagiellonian University in Kraków, funded by the National Science Centre of Poland, with a grant no. UMO-2014/15/D/HS1/02751.
2. The question whether we are capable of agency – whether our volitions have causal efficacy – and whether they are undetermined by other events in the world, i.e. whether will is 'free', are related, but *different* questions. In recent

- philosophical discussions, the question of the power for agency is, however, often called as free will –question, because the idea that our volitions could be undetermined by other causes is deemed incoherent (cf. S. Smilansky, *Free Will and Illusion*, Oxford University Press, Oxford 2000, p. 74. Even libertarians such as R. Kane, *The Significance of Free Will*, Oxford University Press, New York 1996, pp. 106-123, abstain from considering volitions undetermined).
3. Ancient Stoics were for assent (*katalepsis*) and St. Thomas Aquinas for choice (*electio*).
 4. At least some ancient Epicureans seem to have regarded volitions as random (see Lucretius, *De rerum natura*, edited by W.E. Leonard and S.B. Smith, University of Wisconsin Press, Madison 2008, 2.216–93).
 5. St. Thomas Aquinas, *Summa Theologiae*, abb. ST, translated by English Dominicans, Christian Classics, New York 1981, Ia, Q. 83, a. 1: ‘But man acts from judgment, because by his apprehensive power he judges that something should be avoided or sought. But because this judgment, in the case of some particular act, is not from a natural instinct, but from some act of comparison in the reason. Therefore, he acts from free judgment and retains the power of being inclined to various things.’
 6. The literal Latin equivalent of *prohairesis* is *preelectio*. However, in medieval philosophy, *preelectio* was used mostly in reference to the foreknowledge of God (cf. ST Ia Q. 19, a. 4, obj. 1), which was an aspect that Aristotle’s *prohairesis* did not have. The original core meaning of *prohairesis* continued to live in the Latin concept of *volitio*.
 7. For the range of meanings that *prohairesis* has in Aristotle, see C. Chamberlain, *The Meaning of Prohairesis in Aristotle’s Ethics*, «Transactions of The American Philological Association», 114 (1984), pp. 147-57.
 8. D. Hume, *Enquiry Concerning Human Understanding*, edited by J. Bennett, retrieved from <http://www.earlymoderntexts.com/assets/pdfs/hume1748.pdf> in Jan. 2017, 7.1, p. 31.
 9. Ibid. ‘The idea of power cannot be derived from our experience of bodies in single instances of their operation, because no bodies ever reveal any power that could be the origin of this idea.’
 10. When Hume lived in Paris in 1763-6, he was a frequent dinner guest to d’Holbach, and afterwards he had correspondence with d’Holbach for many years. The letters reveal their friendly terms.
 11. See D. Hume, *Treatise of Human Nature*, edited by L.A. Selby-Bigge, Clarendon Press, Oxford 1896, 1.4.4, p. 13: ‘Here is a kind of Attraction, which in the mental world will be found to have as extraordinary effects as in the natural, and to shew itself in as many and as various forms [cf. G. Berkeley, *Three Dialogues*, edited by J. Bennett, retrieved from <http://www.earlymoderntexts.com/assets/pdfs/berkeley1713.pdf> in Jan 2017, esp. I] ‘Its effects are every where conspicuous; but as to its causes, they are mostly unknown, and must be resolv’d into original qualities of human nature, which I pretend not to explain.’
 12. P. d’Holbach, *The System of Nature*, translated by H.D. Robinson, Batoche

- Books, Kitchener 2001, retrieved from <http://socserv2.socsci.mcmaster.ca/econ/ugcm/3ll3/holbach/volume1.pdf> in Jan 2017, I.10, p. 86.
13. D. Hume, *Treatise of Human Nature*, 1.4.4, p. 13: ‘...Nothing is more requisite for a true philosopher, than to restrain the intemperate desire of searching into causes, and having establish’d any doctrine upon a sufficient number of experiments, rest contented with that, when he sees a farther examination would lead him into obscure and uncertain speculations [as with Berkeley’s thesis that God is the source of the mental world or with d’Holbach’s materialism].’
 14. B. de Spinoza, *Ethics*, translated by E. Curley, Penguin, London 1996, 2 p7.
 15. P. d’Holbach, *The System of Nature*, cit., I.10, p. 93.
 16. *Ibid.* I.9, p. 69.
 17. *Ibid.* I.1, p. 8.
 18. P. d’Holbach, *Good Sense*, translated by H.D. Robinson, J.P. Mendum, Boston 1856, retrieved from <http://history.hanover.edu/texts/holbach/holbtabl.html> in Jan 2017, § 39, pp. 22-24.
 19. P. d’Holbach, *The System of Nature*, cit., I.17, p. 181.
 20. See e.g. I. Kant, *Groundwork for the Metaphysics of Morals*, translated by J. Bennet, <http://www.earlymoderntexts.com/assets/pdfs/kant1785.pdf> retrieved in Oct. 2015, AA 4:411 and 4:452-3.
 21. H.H. Kornhuber and L. Deecke, *Brain potential changes in voluntary and passive movements in humans: readiness potential and reafferent potentials*. Translated from the original 1965 article by B.J. Kuper-Smith, «Pflügers Archiv – European Journal of Physiology» 468 (2016), pp.115-24.
 22. B. Libet, C. Gleason, E. Wright and D. Pearl, *Time of conscious intention to act in relation to onset of cerebral activity (readiness-potential). The unconscious initiation of a freely voluntary act*, «Brain» 109 (1983), pp. 623-42.
 23. See e.g. P. Haggard and M. Eimer, *On the relation between brain potentials and the awareness of voluntary movements*, «Experimental Brain Research» 126 (1999), pp. 128-33, and D. Rigoni, M. Brass, C. Roger, F. Vidal and G. Sartori, *Top-down modulation of brain activity underlying intentional action and its relationship with awareness of intention: an ERP/Laplacian analysis*, «Experimental Brain Research» 229 (2013), pp. 347-57.
 24. E.g. K.M. Stephan, M. H. Thaut, G. Wunderlich, W. Schicks, B. Tian, L. Tellmann, T. Schmitz, H. Herzog, G.C. McIntosh, R.J. Seitz and V. Hömberg, *Conscious and subconscious sensorimotor synchronization--prefrontal cortex and the influence of awareness*. «Neuroimage», 15/2 (2002) pp. 345–352.
 25. I.e. tones occurring at randomly within 2-10 second sequences. M. Matushahi and M. Hallett, *The timing of the conscious intention to move*. «European Journal of Neuroscience», 28/11 (2008), pp. 2344-51.
 26. *Ibid.* Cf. e.g. A. Guggisberg and A. Mottaz, *Timing and awareness of movement decisions: does consciousness really come too late?* «Frontiers in Human Neuroscience», 7 (2013), published online, available at <https://doi.org/10.3389/fnhum.2013.00385>, for the possible cognitive bias of Libet’s original experiment.
 27. For this conclusion, see e.g. D. Wegner and T. Wheatley, *Apparent mental causation. Sources of the experience of will*. «American Psychologist» 7/54 1999, pp.

- 480-92 and M. Hallet, *Volitional control of movement: the physiology of free will*, «Clinical Neurophysiology» 6/118 2007, pp. 1179-92.
28. S. Smilansky, *Free Will and Illusion*, cit., p. 92.
 29. *Ibid.*, p. 93.
 30. D. Wegner, *The Illusion of Conscious Will*, The MIT Press, Cambridge, Mass. 2002, p. 621.
 31. D. Dennet, *Freedom Evolves*, Viking Press, New York 2003, e.g. p. 261.
 32. E. Bignetti, *The functional role of free-will illusion in cognition: "The Bignetti Model"*, «Cognitive Systems Research» Dec/31-2 2014, pp. 45-60, p. 45.
 33. Cf. S. Gallagher, *Where is The Action? Epiphenomenalism and The Problem of Free Will*, in S. Pockett, W. Banks and S. Gallagher (eds.), *Does Consciousness Cause Behavior?*, The MIT Press, Cambridge, Mass. 2006, p. 113, that notices the same, citing J. Proust 2003, *How Voluntary are Minimal Actions?*, in S. Maasen, W. Prinz and G. Roth (eds.), *Voluntary Action. Brains, Minds and Sociality*, Oxford University Press, Oxford 2003, p. 202: 'Standard philosophical approaches define action in terms of a particular psychological state causing a relevant bodily movement.'
 34. Notice that Aristotle does not have only one word for 'action'. He has at least two words that can be translated as action: *praxis* is an end-directed volitional process that is its own end, *poiesis* has its end outside itself (See Aristotle, *Ethica Nicomachea*, abb. EN, edited by I. Bywater, Oxford University Press, Oxford 1920, 6.4 1140b6-7).
 35. Aristotle's concept for imagining an end in such a way that it attracts one's will is *phantasia*. (See Aristotle, *De Motu Animalium*, edited by M. Nussbaum, Princeton University Press, Princeton 1986, 702a18-19).
 36. For Aristotle's account of four causes (also material and formal), see Aristotle, *Physica*, edited by D. Ross, Oxford University Press, Oxford 1951, 2.3 and *Metaphysica*, edited by W. Jaeger, Oxford University Press, Oxford 1957, 5.2.
 37. Aristotle, EN, 1.1 1094a1-2.
 38. *Ibid.* 3.1 1111a23.
 39. *Ibid.* 3.2 1111b8-9.
 40. *Ibid.* 1112a2.
 41. For La Mettrie's view, see K.A. Wellman, *La Mettrie: Medicine, Philosophy, Enlightenment*. Duke University Press, Durham, N.C. and London 1992., p. 128.
 42. By this concept, Descartes refers to the "effects we perceive by our senses." R. Descartes, *Principles of Philosophy*, translated by J. Vetch, retrieved from <http://www.gutenberg.org/ebooks/4391> in Feb. 2017, XXVIII, p. 15.
 43. B. de Spinoza, *Ethics*, cit., 1, app. Cf. P. Siwek, *Spinoza et le panthéisme religieux*, Desclée de Brouver, Paris 1937, p. 211, according to whom Spinoza's claim is an implication of his 'geometrical method' that treats the occurrences in nature as exhaustively describable and provable by mathematical analysis.
 44. P. d'Holbach, *The System of Nature*, cit., I.8, p. 63.
 45. S. Gallagher, *Where is The Action? Epiphenomenalism and The Problem of Free Will*, cit., p. 118.

46. Ibid. ‘If I am reaching to catch [a] lizard and you stop and ask what I am doing, I am very unlikely to say [...] “I am moving my arm.” Rather, I would probably say “I am trying to catch this lizard for my collection.”’
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