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STUDI

A Pragmatic and Empirical Approach to Free Will

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Abstract The long dispute between incompatibilists (namely, the advocates of the contemporary version of the illusory nature of freedom) and compatibilists is further exemplified in the discussion between Sam Harris and Daniel Dennett. In this article, I try to add to the discussion by outlining a concept of free will linked to five operating conditions and put forward a proposal for its operationalization and quantification. The idea is to empirically and pragmatically define free will as needed for moral blame and legal liability, while separating this from the debate on global determinism, local determinism, automatisms and priming phenomena on a psychological level. This is made possible by weakening the claims of determinisms and psychological automatisms, based on the latest research, and by giving a well-outlined definition of free will as I want to defend it.
KEYWORDS: Compatibilism; Daniel Dennett; Free Will Quantification; Global Determinism; Local Determinism

Riassunto *Un approccio pragmatico ed empirico al libero arbitrio* – La lunga disputa tra incompatibilisti (vale a dire i sostenitori della versione contemporanea dell'illusorietà del libero arbitrio) e compatibilisti trova un'esemplificazione nel dibattito tra Sam Harris e Daniel Dennett. In questo articolo cerco di contribuire alla discussione delineando un concetto di libero arbitrio legato a cinque condizioni operative e proponendo la sua operazionalizzazione e quantificazione. L'idea è di definire empiricamente e pragmaticamente il libero arbitrio di cui abbiamo bisogno per trattare di colpa morale e di responsabilità legale, separandolo dal dibattito su determinismo globale, determinismo locale, automatismi e fenomeni di innesco a livello psicologico. Ciò è reso possibile indebolendo le pretese di determinismi e automatismi psicologici, che si basano su recenti ricerche empiriche, e dando una precisa definizione di libero arbitrio per come voglio difenderlo.
PAROLE CHIAVE: Compatibilismo; Daniel Dennett; Quantificazione del libero arbitrio; Determinismo globale; Determinismo locale

THE EXCHANGE BETWEEN DANIEL DENNETT and Sam Harris about the latter's book *Free Will* is very instructive, as it addresses some pragmatic aspects of the ideas of free will and responsibility.[1]

These pragmatic aspects, albeit based on rigorous scientific and philosophical underpinnings, are often neglected in the academic debate on the subject. In my opinion, when it comes to free will, pragmatic aspects related to our practical life (from interpersonal relations to the law) and scientific/theoretical aspects can and should be considered jointly. In this sense, Dennett's discussion of Harris'

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book is an excellent starting point.[2]

Harris and Dennett on free will

Do we have Ultimate Authorship? Do we have Absolute Responsibility? No, we don't, says Dennett. And this is his only point of agreement with Harris. Indeed, Dennett's compatibilism understands free will as follows:

> Freedom involves the ability to have one's choice influenced by changes in the world that matter under circumstances. Not a perfect ability, but a reliable ability.[3]

Dennett claims that Harris questions compatibilism because «what compatibilists mean by "free will" is not what everyday folk mean by "free will"» – a claim Dennett disagrees with. In fact, he believes that his position works for what people usually think about free will. Dennett writes:

> Those eligible for punishment and reward are those with the general abilities to respond to reasons (warnings, threats, promises) rationally. Real differences in these abilities are empirically discernible, explicable, and morally relevant. Such abilities can arise in a deterministic world, and they are the basis for a justifiable policy of reward and punishment, which brings society many benefits – indeed makes society possible.[4]

I agree with Dennett's "pragmatic" approach to free will and responsibility, but some important clarifications are needed. For example, if the abilities approach is strictly related to classical determinism and to naturalized psychology where the self is reduced to a mere narrative fiction – as seems to be the case in Dennett's position – then there might be some problems. For reasons of space I will only briefly outline my (provisional) idea of how to conceive of free will and responsibility for pragmatic purposes, noting some differences from Dennett's compatibilism.[5] I feel that, at least on occasion, we do have genuine free will, so I'll start with some challenges to the notion of free will that touch on Dennett's compatibilism.

Questioning free will: Determinism

How can determinism and freedom coexist? This question goes back at least 2.500 years, but it seems to have recently come back to the fore.

> If determinism is true, then we are like: billiard balls, windup toys, playthings of external forces, puppets, robots, victims of a nefarious neurosurgeon who controls us by directly manipulating the brain states that are the immediate causes of our actions. Billiard balls [...] have no free will. Therefore if determinism is true, we don't have free will.[6]

I will not even try to summarize how compatibilists respond to this view – Dennett does so in his article and so do, at least implicitly, the majority of philosophers, according to the survey mentioned by Dennett himself. But there are at least two types of determinism that come into play against free will today, producing arguments like those used by Harris which lead to the conclusion that free will is an illusion.

The first is the classic well-known argument that initial conditions and physical laws affect every single state of the universe at any later time. This determinism, which I call *global*, is used by hard determinists or advocates of free will skepticism against compatibilists, as the adoption of a physicalist naturalism forces one to trace any observable behavioural difference back to a specific physical cause that can be at least potentially identified, as belonging to a causal chain determined by initial conditions and natural laws.

The second argument is that of *local* determinism and refers to recent Libet-like experiments, according to which our actions start in specific brain areas before we are consciously aware of them. This type of local

determinism is relevant to free will, because almost all characterizations of freedom include conscious or at least rational choice – as in Dennett's model. And a rational choice seems to imply a conscious consideration of the reasons why one should make that choice. Of course it can be argued that there is no need for a thorough examination, minute after minute, choice after choice, for an action to be free. But it is undeniable that control over the action in its full unfolding cannot be separated from a period of time, however brief, in which the subject is aware of her decision and execution. Otherwise, even for pragmatic aspects such as the law, one could not be held responsible for that action, insofar as it was performed by a person who did not have any conscious control over it. Before proposing my empirical and pragmatic view of free will, my aim is to try to weaken these two types of determinism, in order to make my position more solid with respect to its scientific and theoretical underpinnings.

Limitations of Global Determinism

The literature on determinism and physical causation, in both science and philosophy, is immense but, despite the progress made, none of the major issues seem to have been settled by unanimous consent.[7] An interesting recent attempt to unify some lines of research was made by Jenann Ismael. She purports to show «how the microlaws create the space for emergent systems with robust capabilities for self-governance» and to remove «threats to freedom that come from notions of causal necessity that physics has outgrown».[8]

Ismael takes her cue from Bertrand Russell and his interpretation of physical laws as not implying causal relations. Russell proposes two reasons to reject a causal interpretation of natural laws.[9] As Ismael explains,

> the first [reason] was that causal relations incorporate a temporal asymmetry that dynamical laws do not. The most fundamental laws appear in modern science as functional relations without any intrinsic direction of determination: rules that allow us to calculate the state of a system at one time from its state at another. And without an intrinsic direction of determination, we can no more say that our actions are determined by their antecedents than that their antecedents are determined by our actions. The relationship given by the equation has no implicit direction. The second reason was that the practical function of causal beliefs depends on the fact that they relate relatively localized events at a temporal distance from one another, such as the striking of a match and the appearance of a flame, or the turning of the key in the ignition of your car and the engine starting. The dynamical laws, by contrast, relate only states of the world as a whole.[10]

However, in line with Nancy Cartwright's criticism of Russell, Ismael notes that causal information plays an indispensable role in practical reasoning.[11] The laws of physics cannot play the role of causal relations in science because specifically causal information is needed to distinguish effective and ineffective strategies to achieve the desired results. Based on natural laws we cannot distinguish between cases of correlation between events and cases in which an event brings about another event. However, if causes seem to disappear from the fundamental level of physical description, they are still required to identify strategic routes to achieve given effects.

To reconcile the Russellian view of the fundamental laws of physics with the appearance and necessity of causation in our lives as free agents, Ismael embraces the *causalism* proposed, among others, by Judea Pearl, Clark Glymour and James Woodward. This is certainly not the position of most scholars, but it is becoming increasingly popular. Based on this new causalism and, specifically, on *interventionism* proposed by Pearl, causal information shows how the state of a system will be affected by interventions, where "in-

tervention" is understood as

> a formal operation that separates a variable from its own past causes so that changes in its values are uncorrelated with the values of earlier variables.[12]

Human actions, as the expression of self-governing entities, represent a class of effective intervention. At the individual level, says Ismael, willful manipulations by human agents effectively randomize the value of variables, separating them from their antecedent causes. So, causal structures indicate how manipulating the value of one variable induces changes in others.

The reason why causal information outruns the information contained in the global laws of evolution is that global laws tell us how the system as a whole evolves if not interfered with, whereas causal knowledge tells us what happens when it is interfered with. This is what Pearl refers to as a kind of practical know-how. The structural causal modelling framework developed by Pearl deals with type causation (which relates types of events) relative to networks (defined by collections of variables). Changes in the value of variables are "interventions", which explain causation and knowledge of it. As in scientific experiments, you can isolate a system, manipulate external inputs that relate to it and observe the effects of this intervention. Global laws do not provide complete causal information because they take the system as a unit without considering the substructures that can be isolated in it.

In this interpretation summarized by Ismael, global laws do not imply strict necessity nor do they impose a specific path on the universe given its initial conditions. This is because global laws have neither temporal asymmetry nor direction of influence. And the causal direction is given by modifying a variable in a subsystem that causes changes in another variable, within a framework in which there is a choice between exogenous and endogenous variables. As explained by Pearl,

> the scientist carves a piece from the universe and proclaims that piece *in*. The rest of universe is then considered *out* [...] This choice of ins and out creates asymmetry in the way we look at things and it is this asymmetry that permits us to talk about "outside intervention" and hence about causality.[13]

Ismael's argument, on the other hand, is much wider, also including an eternalist conception of time related to the idea of a Block Universe and, as Hoefer puts it, to

> an emergentism or pluralism about explanation, which allows us to see our *selves*, our deliberations and decisions as (normally) right factors to cite in explaining our actions, rather than something going on concurrently at the level of cells, or chemical compounds, or fundamental particles.[14]

Ismael states that:

> One event doesn't bring about another. Agents bring about events, and the projection of necessary connections into the relations between natural events is an understandable mistake, but not something one should think of as a part of a scientific worldview. All of science, from physics to psychology, I believe, is pointing the other way.[15]

Limitations of Local Determinism

What I call "local determinism" originates from the well known research carried out by Libet and Haynes on the beginning of action.[16] The scepticism about the existence of free will emerges from the comparison between the subjective "time" of a given decision and what happens in the brain. In fact, the readiness potential (the brain wave that is registered before the subject claims to be aware of starting the action) begins in the pre-frontal motor areas of the brain long be-

fore the time when the subject thinks he has made a choice: the volunteers in the above-mentioned experiments became aware of the intention to act about 500 milliseconds *after* the onset of this potential. The volitional process thus seems to start unconsciously. These studies seem to indicate that our actions (or, at least, the ones specifically tested) are caused by the activity of the brain, and enter consciousness only at a later time. The fact that we can predict the decision that the subject will take before the latter's knowledge seems to be a potential death blow to the idea of freedom as a conscious deliberation.

As is known, many arguments have been brought forward to limit the conceptual scope of these experiments.[17] The debate doesn't yet seem to have reached a conclusion, but recent experiments seem to reduce the importance of the readiness potential over free will. Schurger and colleagues, for instance, stress that the main new finding about the brain activity preceding the subjective voluntary movement

> is that the apparent build-up of this activity, up until about 200 ms pre-movement, may reflect the ebb and flow of background neuronal noise, rather than the outcome of a specific neural event corresponding to a "decision" to initiate movement.[18]

The model used is the bounded-integration process,

> a computational model of decision making wherein sensory evidence and internal noise (both in the form of neural activity) are integrated over time by one or more decision neurons until a fixed threshold-level firing rate is reached, at which the animal issues a motor response. In the case of spontaneous self-initiated movement there is no sensory evidence, so the process is dominated by internal noise.[19]

The stochastic decision model used by Schurger and colleagues[20] allowed them to claim that bounded integration seems to explain stimulus-response decision as relying on the same neural decision mechanism used for perceptual decisions and internal self-paced intention and decision as

> dominated by ongoing stochastic fluctuations in neural activity that influence the precise moment at which the decision threshold is reached.[21]

The philosophical implications of this experiment could be that

> when one forms an intention to act, one is significantly disposed to act but not yet fully committed. The commitment comes when one finally decides to act. The stochastic decision model reveals a remarkably similar picture on the neuronal level, with the decision to act being a threshold crossing neural event that is preceded by a neural tendency toward this event.[22]

But another recent study has brought back to the center of neuroscientific research the space of autonomy that the subject seems to have, as opposed to the idea of free will as an illusion supported by the experiments based on the alleged unconscious onset of the action. Schultze-Kraft and colleagues showed that people are able to cancel movements after elicitation of readiness potential if stop signals occur earlier than 200 ms before movement onset.[23] In the real-time experiment, «subjects played a game where they tried to press a button to earn points in a challenge with a brain-computer interface (BCI) that had been trained to detect their readiness potentials in real time and to emit stop signals».[24] The subjects had to press a button on the floor with their foot after a green light flashed: they could do so whenever they wanted after about 2 seconds. Participants earned points if they pressed the button before the red light (the stop signal) came back. The experiment was composed of three phases. In the first phase, the stop signals were lit at random and the movements

of the subjects were not predicted. In the second phase, the authors used data taken from the EEG on the participants in the first phase. In this way a classifier was trained to predict (with imperfect accuracy) the participants' movements (the When and the Whether, not the What). In this phase, the BCI could foresee the fact that the subject would press the button thanks to the detection of the readiness potential and therefore turned on the red light to earn points against the subject if the latter could not stop the movement. In the third phase, the subjects were informed that the BCI could "see their preparation of the movement" and they had to try to beat the computer by moving in an unforeseeable way.

In all phases of the experiment, there was no difference between readiness potentials. While in the first phase, in 66.5% of the cases, subjects won by pressing the button with the green light on, in stages two and three trials in which subjects were able to beat the computer, by not pushing the button with the red light on, decreased to 31%, and warning participants of the prediction of the BCI did not help them do any better. The authors could thus claim that

> despite the stereotypical shape of the readiness potential and its early onset at around 1000 ms before electromyographic activity, several aspects of our data suggest that subjects were able to cancel an upcoming movement until a point of no return was reached around 200 ms before movement onset. If the stop signal occurs later than 200 ms before electromyographic activity onset, the subject cannot avoid moving.[25]

The explanation of the minimum threshold of 200 ms could reflect the time necessary for the stop signal to light up, for the subject to perceive it and to cancel the movement that was already being prepared. It is therefore possible to state that there is no univocal unconscious brain process to onset an action, even if it is still to be clarified what triggers the order that leads to stop the action initiated at a brain level and signalled by the computer.

Questioning free will: Empirical psychology

In line with the research I have just considered, cognition sciences (including neuroscience) have been "deconstructing" the unitary conscious and rational self – the subject of free will. In particular, individuals seem unaware of the automatic processes that are at work and the true reasons for our conduct.[26] Essentially, more often than we would think, cognitive processing, when examined more thoroughly, is the result of subpersonal (unconscious) processes of which we are unaware. Those are automatic processes, triggered by the environment or by a given situation, bound to a repertoire that is partly innate and partly created by past experience and education, causing bodily responses due both to the tendency to homeostasis and to the search for whatever is functional to survival and physical/mental well-being.[27] There are several examples of this decomposition of the self into cerebral modules that reprocess information outside of consciousness, later reunified as a seemingly united stream of consciousness: one example is language, where all the processes leading to choosing our words are opaque to consciousness.

In general, there are some experiments supporting our supposed automatism and scarce awareness (which would reduce us to zombie-like creatures): in particular, those based on so-called priming, in which elements we do not pay attention to actually influence our choices. These choices we later tend to justify with other reasons, consistent with our preferences, but in reality they are dictated by factors that we would have tried to ignore if they had been presented to us explicitly. These elements seem to support "situationism", that is, the view that we are much more influenced by context than by our character or personality.[28] This has brought about a supposed shrinking of the agency or the self.[29]

This was a tricky situation for the supporters of free will, to the point that some compatibilists eventually admitted that «free will is at best an occasional phenomenon».[30] In other words, even if one believes that freedom and determinism can coexist, the deflationary view of the self and of consciousness, along with the opacity of the motivational states, constitutes a new, different and, probably, more pressing challenge for the defenders of freedom.[31] This has also been described as the bypassing effect, that is, the idea that mental states do not play a causal role with regards to our decisions and actions. For example, intentions, although considered *naturalistically* linked to their neural correlates, would prove ineffective if the evidence described so far were confirmed, because these intentions are not effectively linked to the neuronal processes that cause our conduct. This is a form of empirical epiphenomenalism which is still open to experimental confirmations or refutations.

The (controversial) conclusion is that higher mental processes that have been traditionally considered the cause of free will (pursuit of a goal, evaluation and judgment, reasoning and problem solving, personal interaction and social behavior, as well as the initiation and control of one's actions) can often occur in the absence of consciousness, which therefore exerts less control over our behavior than we usually think. Of course, one may wonder whether the lack of awareness means that those processes do not express ourselves and our wishes – the philosophical debate is still open. Provided that many phenomena of automatism and priming are undeniable, there are two possible answers to the challenge of empirical psychology. The first is that of experimental research itself, because it is still to be ascertained to what extent our behaviour is automated. The second is to distinguish *types* between the cognitive processes under consideration.

Take the example of language, which I mentioned earlier. Indeed it seems that we often don't know what words we'll use until we say them. Sometimes we adhere (consent *a posteriori*) to what we have said. At other times we regret our choice immediately and wish we had chosen different words. If we know a subject well, we will *voluntarily* let the speech flow. But there are cases in which we literally choose a word at a time, refusing to use the first that comes to our mind if we don't find it appropriate (with a second level conscious evaluation). Think of a politician being asked an unexpected question on a delicate topic: he will probably choose every word extremely carefully. Certainly, his education, knowledge of the subject, his temperament, the situation, and the other party will influence his answer, but we can probably say that the politician, if he chooses each word in a careful way that he feels appropriate, has conscious control of his response and that in this sense he is free in answering the way he does.[32]

Empirical free will

Although weakened, global and local determinism together with the results of empirical psychology pose real limitations to the scope of our free will. The free will that I think is plausible to defend may then be limited to five conditions.

The first condition is the "ability to do otherwise." This is an intuitive concept: to be free, one has to have at least two alternatives or courses of action between which to choose. If one has an involuntary spasm of the mouth, for example, one is not in the position to choose whether to twist one's mouth or not.

The second condition is "control over one's choices." The person who acts must be the same as the one who decides what to do. To be granted free will, one must be the author of one's choices, without the interference of people and of mechanisms outside of one's reach. This is what we call agency, that is, being and feeling like the "owner" of one's decisions and actions.

The third condition is "responsiveness to reasons": a decision can't be free if it is the effect of a random choice, but it must be ra-

tionally motivated. If I roll a dice to decide whom to marry, my choice cannot be said to be free, even though I will freely choose to say, "I do". On the contrary, if I choose to marry a specific person for their ideas and my deep love for them, then my decision will be free. Obviously, in this case "rationally motivated" is the decision to get married. For, if someone were to love two women equally, and could not decide which one to marry, they might as a last resort "freely choose" to roll the dice, and this would be more or less rational.

One can add the fact that the reasons by which one makes a choice have to be also recognized by others, otherwise they cannot be used as reasons, since free will in this perspective is something that others – with a more or less objective assessment – recognize in us, not something we claim for ourselves thanks to intuition or introspection (which often fail, as shown by Wegner's well-known experiments[33]).

These are three classical conditions that have often been accepted or rejected but are well represented in literature. In my view, two more conditions can be added to them.

The fourth condition is linked to time. Actions that are decided and / or carried out instantaneously or very quickly cannot count as free.[34] The reason is given by the fact that actions that are not consciously weighted can be affected by motives we have not evaluated and cannot control. Indeed, in this sense it might be possible to distinguish between proximal and distal mechanisms underlying our choices.

The fifth condition is strictly related to the fourth, and consists in being aware – at least roughly – of what research shows about priming and automatism. This is no self-psychology, but simply awareness that one's decisions might be strongly affected by such factors. If we know why we happen to systematically and unknowingly fall into cognitive traps, we can put in place – at least on some occasions – countermeasures to increase the freedom of our decisions and actions.

Thus defined, free will is a kind of freedom that we are willing to attribute, *as a potential ability*, to all human beings as a default condition. Of course, there are still exceptions: for example, people suffering from mental illness and people under the influence of psychotropic substances. Nevertheless, the attribution of free will as a general trend does not imply that all decisions are always taken in full freedom, as outlined by the five conditions illustrated above. We often act on impulse, against our interests, without being fully aware of what we are doing. But this does not imply that we are not potentially able to act freely or that we are not responsible for what we do.

My view is that a richer conceptualization of free will has to be linked to the idea of "capacity".

> By capacity, in the context of free will, we mean the availability of a repertoire of general skills that can be manifested and used without the moment by moment conscious control that is required by the second condition of free will we have previously seen.[35]

The concept of capacity is related to that of internal control, understood as the agent's "ownership" of the mechanism that triggers the relevant behavior and the reasons-responsiveness of that mechanism.[36] And reasons-responsiveness must involve a coherent pattern of reasons-recognition.

> More specifically, it must involve a pattern of actual and hypothetical recognition of reasons that is understandable by some appropriate external observer. And the pattern must be at least minimally grounded in reality.[37]

Used in this sense, and combined with the idea of reasons-responsiveness and with the abovementioned conditions for free will, the concept of capacity does not necessarily have to be seen as part of the compatibilist stances, because it sets free will as a property that manifests itself only under certain condi-

tions. In addition, the proposed operationalisation of free will in a quantifiable way, despite still requiring testing, allows one to consider free will empirically and pragmatically, outside of a metaphysical taxonomy such as the classical one.

In fact, cognitive abilities may be operationalized as a set of neuropsychological tests, which can be used to operationalize and measure specific executive functions, as they are strongly linked to the concept of control.[38]

Executive functions, also known as control functions, are essential to organize and plan everyday behavior – which is not the instant behavior found in Libet's experiments. Those skills are necessary to perform the greater part of our goal-oriented actions. They allow us to modulate our behavior, control its development and change it according to environmental stimuli (the environment being both physical and social). Also, executive functions allow us to change our behavior based on its effects, with a sophisticated feedback mechanism; finally, they are also necessary for tasks of abstraction, inventiveness and judgment. Those who, for whatever reason, have a deficit in their executive functions cannot respond to their social environment appropriately, and struggle to plan their behavior or to choose between alternatives based on their judgment or interest. Sufferers of these deficits in executive functions often fail to control their instinctive responses and to modify their regular courses of action, or are unable to concentrate or persist in the pursuit of a goal.

In general terms, executive functions refer to the set of mental processes necessary for the development of adaptive cognitive-behavioral patterns in response to new and demanding environmental conditions. The domain of executive functions includes:

- the ability to plan and evaluate effective strategies in relation to a specific purpose related to the skills of problem-solving and cognitive flexibility;
- inhibitory control and decision-making processes that support the selection of a functional response and the modification of the response (behavior) in relation to changing environmental contingencies;
- attentional control referring to the ability to inhibit interfering stimuli and to activate the relevant information;
- working memory referring to the cognitive mechanisms that can maintain online and manipulate information necessary to perform complex cognitive tasks;
- and, with regards to free will, creativity and the ability to cope with environmental changes through new solutions.[39]

Those of empirical psychology are higher order concepts, which act as a bridge between free will, which is something that is not in the brain but can be observed in behavior (along with its causes), and the underlying brain processes. It has been convincingly suggested that in the construction of a hierarchy of mechanisms and explanations, one must go from inside to outside and from outside to inside. It is possible to go from measurable skills to their brain basis, and from the tentative index of free will to the underlying (real) mechanisms.[40]

Based on the evidence presented, I believe that a viable proposal is to construct an index related to compatible tests whose relevance can be uniformly ascertained. Such index would be a kind of IQ-like profile that would allow for the operationalization and quantification of a person's cognitive skills. All the tests used (for example, Stroop Test, Wisconsin Card Sorting Test, Weigl's Color-Form Sorting Test, Go-No Go Test) should be related to the subject's age and education and then transformed into new standardized scores (Equivalent Scores, ES) on an ordinal scale, e.g. ranging from 0 to 4, with 0 representing scores below cut-off point and 4 representing scores equal to or better than average. Specific standardized scores exist in many

countries or linguistic areas. The subjects would get for each test a raw score, given by the sum of the scores obtained in each item that makes up the test, which would then be standardized.

A synthetic index such as the one here proposed would measure a certain range of cognitive and behavioral control skills that configure a certain kind of free will at the psychological-functional level. These are potential capacities measured with standardized laboratory instruments that do not consider any other factors that may restrict the freedom of a subject in specific situations, such as those that are relevant in moral scenarios and legal contexts. The same goes for moral judgment. However, an index such as the one I'm proposing here could be the first step, albeit certainly imperfect, towards more objective measures to identify someone's more or less "free will" or, in other words, their capacity for self-control and rational choice (i.e., a reasons-responsive choice).

This way, one could have a first, albeit rough and imprecise, quantification method of the free will potential that each individual *can* have in general terms. The first warning, almost trivial, is that this index, however refined, can never fully capture the freedom potential of individuals, and will probably only measure a portion of the spectrum of the capacities underlying decision-making and free choice. That said, those who have a "score" of free will over a conventionally established cut-off do not necessarily always act freely: one still has to assess whether they meet the five conditions set out above. It could however be presumed that the previously described tool, if developed and validated, would be a step forward in the often vague discussion about how to qualify a decision or a choice as "free". This would also have positive effects for the areas in which the assessment of the freedom of the subject in a specific circumstance, which pragmatically coincides with the subject's free action, serves as a minimal condition for the attribution of responsibility for the given action.

Moral judgment and legal liability cannot do without the attribution of freedom, as rightly pointed out by Dennett, and those are things we need both as individuals and as a society. But Harris' objection is that this freedom, even if operationalised and quantified, remains illusory. It is something else that we measure, Harris would say, because freedom as we usually conceive it cannot exist (because of the determinism and automatisms I described). And yet it does exist to a certain extent, Dennett replies. It does exist, I dare say myself, but the objections of incompatibilists-illusionists *à la* Harris must be taken into account. That's what I have tried to do in this paper. There is much work left to do, but I do hope the idea I have outlined might pave the way to outlining some form of freedom that is more easily researched and handled.

Notes

[1] See T. HARRIS, *Free Will*, Free Press, New York 2012.

[2] See D.C. DENNETT, *Reflections on Sam Harris' "Free Will"*, in: «Rivista internazionale di Filosofia e Psicologia», vol. VIII, n. 3, 2017, pp. 214-230.

[3] *Ivi*, p. 224.

[4] *Ivi*, p. 228.

[5] It would be extremely presumptuous, as well as unrealistic, to propose a non-provisional idea of free will, provided it is not an illusion. Obviously, this does not exclude that progress in research may show that some positions deserve more consideration than others, as is the case with the reflection conducted by Daniel Dennett, regardless of whether one agrees or disagrees with it.

[6] K. VIHVELIN, *Arguments for Incompatibilism*, in: E.N. ZALTA (ed.), *The Stanford Encyclopedia of Philosophy,* 2011, available at URL: <https:// plato.stanford.edu/archives/fall2015/entries/incompatibilism-arguments/>.

[7] D. PEREBOOM, *Living without Free Will*, Cambridge University Press, Cambridge 2001; D. PEREBOOM, *Optimistic Skepticism about Free Will*, in: P. RUSSELL, O. DEERY (eds.), *The Philosophy of Free Will: Essential Readings from the Contemporary Debates*, Oxford University Press, New York 2013, pp. 421-449.

[8] J.T. ISMAEL, *How Physics Make Us Free*, Oxford

University Press, Oxford 2016.

[9] B. RUSSELL, *On the Notion of Cause*, in: «*Proceedings of the Aristotelian Society*», vol. XIII, 1912-1913, pp. 1-26.

[10] J.T. ISMAEL, *How Physics Make Us Free*, cit., p. 114.

[11] N. CARTWRIGHT, *Causal Laws and Effective Strategies*, in: «Nous», vol. XIII, n. 4, 1979, pp. 419-437.

[12] J. PEARL, *Causality: Models, Reasoning, and Inference*, Cambridge University Press, Cambridge 2009.

[13] *Ivi*, pp. XIII-XIV.

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[20] A. SCHURGER, J.D. SITT, S. DEHAENE, *An Accumulator Model for Spontaneous Neural Activity Prior to Self-initiated Movement*, in: «Proceedings of the National Academy of Sciences», vol. CIX, n. 42, 2012, pp. E2904-E2913.

[21] A. SCHURGER, M. MYLOPOULOS, D. ROSENTHAL, *Neural Antecedents of Spontaneous Voluntary Movement: A New Perspective*, cit.

[22] *Ivi*.

[23] M. SCHULTZE-KRAFT, D. BIRMAN, M. RUSCONI, C. ALLEFELD, K. GÖRGEN, S. DÄHNE, B. BLANKERTZ, J.-D. HAYNES, *The Point of no Return in Vetoing Self-initiated Movements*, in: «Proceedings of the National Academy of Sciences», vol. CXIII, n. 4, 2016, pp. 1080-1085.

[24] *Ivi*.

[25] *Ivi*.

[26] See T.D. WILSON, *Strangers to Ourselves: Discovering the Adaptive Unconscious*, Harvard University Press, Cambridge (MA) 2004; L. MLODINOW, *Subliminal: How Your Unconscious Mind Rules Your Behavior*, Pantheon, New York 2012.

[27] See, for example, J. DORIS, *Talking to Our Selves*, Oxford University Press, New York 2015.

[28] See J.M. DORIS, *Lack of Character: Personality and Moral Behavior*, Cambridge University Press, Cambridge 2002.

[29] See G. CARUSO, *Free Will and Consciousness: A Determinist Account of the Illusion of Free Will*, Lexington Books, Lanham (MD) 2012; G. CARUSO (ed.), *Exploring the Illusion of Free Will and Moral Responsibility*, Lexington Books, Lanham (MD) 2013; T. NADELHOFER, *The Threat of Shrinking Agency and Free Will Disillusionism*, in: L. NADEL, W SINNOTT-ARMSTRONG (eds.), *Conscious Will and Responsibility: A Tribute to Benjamin Libet*, Oxford University Press, New York 2011, pp. 173-188; E. NAHMIAS, *Is Free Will an Illusion? Confronting Challenges from the Modern Mind Sciences*, in: W. SINNOTT-ARMSTRONG (ed.), *Moral Psychology. Vol. 4: Free Will and Moral Responsibility*, The MIT Press, Cambridge (MA) 2014, pp. 1-25.

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[32] It would be different to wonder whether the politician is free to respond other than following the key positions of his party, if he choose to because this reflected his personal beliefs. Was Luther free to retract his critical stance towards the Catholic Church, in Worms in 1521, given his religious path? (see D.C. DENNETT, *Elbow Room: The Varieties of Free Will Worth Wanting*, The Mit Press, Cambridge (MA) 1984).

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[35] A. LAVAZZA, S. INGLESE, *Operationalizing and Measuring (a Kind of) Free Will (and Responsibility). Towards a New Framework for Psychology, Ethics, and Law*, in: «Rivista internazionale di Filosofia e Psicologia», vol. VI, n. 1, 2015, pp. 37-55.
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[38] I am here partly drawing on A. LAVAZZA, *Free Will and Neuroscience*, cit.
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