

# Can economici choose? Can homo sapiens?

Edward Morey: [Edward.Morey@Colorado.edu](mailto:Edward.Morey@Colorado.edu), [www.EdwardMorey.org](http://www.EdwardMorey.org)

040192020

**Abstract:** While the neoclassical theory of behavior is called choice theory, the behavior of an economicus (an entity that adheres to the assumptions) is out of its control: its ranking of bundles and which are feasible are both exogenous, so is the rule that it must experience its highest-ranked feasible bundle. Neoclassical behavior theory (NBT) would be a more appropriate name. An economicus has only feeble free-will, and its behavior is deterministic in a more restrictive manner than philosophers' sense of determinism. Advocates of neoclassical choice theory (NCT) are a subspecies of *compatibilists*: behavior is "compatible" with free will, but it's weak. Humans also live in a deterministic world (with some randomness?), unless you believe in dualism, so only have feeble free-will, no more than worms and mollusks. But! Humans have choosing experiences (cogitating about A vs. B, and deciding on B) and then experiencing B. Isn't that choosing? No! Mounting evidence in psychology and neuroscience indicates that what humans do (how we behave) is determined by an unconscious processes, and the choosing experience doesn't determine what we select.

**Keywords:** behavior, choice, choosing experience, illusion of choice, causal determinism, deterministic (in)compatibilism, free will, choice theory, action potentials, neuroscience, experimental philosophy, subliminal cues, and Benjamin Libet.

Economists assert that people make choices without thinking much about the distinction between behavior and choice (a chosen behavior). The first half of this note is about economici: a *behavioral species* defined as all entities whose behavior is consistent with the assumptions of NCT. The issue is whether they are capable of choice. [No claim is made that they exist or that humans are members.] The second half considers whether homo sapiens/humans choose. This note is not about whether either species chooses wisely. [Underlined terms are links.]

### **How would you define a *choice*? And the difference between a choice and the experience/sense of making a choice**

A choice is difficult to define, particularly if you feel compelled, as one must, to not use the word "choice" to define a choice.

### **Some necessary conditions for a situation to be a choice?**

(1) An entity is faced with  $N$  alternatives (an integer  $N \geq 2$ ). (2) The entity can and must experience only one of them. (3) It can influence which one is experienced. And (4), It is not constrained to experience a specific one. Many would say there is only a choice if the entity were free to experience an alternative different from the one experienced. While most people would not, unprompted, list these requirements for a choice, upon reflection they would likely agree with them, but not everyone would (including most economists), particularly if we get more specific about what (3) and (4) mean.

Note that this definition does not require that the entity has a *conscious choosing experience* (experiencing conscious thoughts about which alternative to choose): it does not even require consciousness.

### **Contrary to what economists believe and teach, the assumptions of NCT seem to make choice impossible?**

#### **Economists assert that economici make choices**

But we appear to contradict ourselves when we assert this. In explanation, since we assume an economicus is constrained to consume its highest-ranked bundle in its feasible set, the set of feasible bundles is exogenous, and the ranking of bundles is exogenous in that an economicus

can't alter its ranking in the decision/consumption period, there seems to be no real choice.<sup>1</sup> Behavior is axiomatically determined. Most people would say economici don't make choices. So, when economists say economici make choices, they must mean something different from what most think of as a choice.

### **Economists must define choice in a way that makes choice compatible with the assumptions of their theory of behavior (or drop the word "choice")**

Economists would say an economicus has no choice if there is only one alternative in its feasible set ( $N=1$ ), implying more than one alternative is a necessary condition of choice. But is it sufficient? That is, does an entity have economic choice if **external** constraints don't limit it to a specific bundle? Economists must think so, because it called "CT" even though internal constraints (an exogenous ranking and the requirement to experience the highest-ranked feasible bundle) constrain it to experience a specific bundle. Looking ahead, economists define choice as situations where external constraints don't limit the entity to a specific bundle, similar to the definition compatibilist philosophers use to make choice (free will in a weak sense) possible in a deterministic world. By this definition, other animals (even worms and mollusks) make choices whenever their behavior is not completely determined by external constraints: when there is both dry food and fresh meat in his bowl, my dog Giacomo always eats the meat first, but this is not dictated by external constraints, so he exhibits weak free-will.

### **So, what is *free will* and how does it relate to a capacity to make choices?**

Isabel Archer is on her way to Italy to pursue her destiny and is explaining to her suitor, Caspar Goodwood, her aversion to his suiting.

Isabel: *If there's a thing in the world I'm fond of it's my personal independence... [I want] To put as many hundred miles of sea between us as possible.*

Casper: *One would think you were going to commit some atrocity!*

Isabel: *Perhaps I am. I wish to be free even to do that, if the fancy takes me.* (The Portrait of a lady, [Henry James](#) 1917)

Isabel wants to be free to choose to commit one or more atrocities, but only if she fancies to so choose. Is Isabel free to will and choose?

---

<sup>1</sup> Maybe at some point in the past economicus could influence its future ranking, but now it's exogenous.

I have used the term *free will* without defining it, convenient since there is much disagreement as to what it means. The [Stanford Encyclopedia of Philosophy](#) defines it as a capacity “to choose a course of action from among various alternatives.” (Clarke and Capes 2014). Note the words “capacity” and “choice”. If you have free will, somewhere in your head are spirits or networks of neurons that give you the capacity to choose.

Consider the word “will” by itself, and what it means to say, for example, “I will that Event A happens.” (an archaic use of the word *will*), interpreted as I choose Event A over the other alternatives. Or, if A is a behavior, I am inclined to adopt it. It could also be interpreted as I prefer A, and because I prefer it, I choose it. *Choosing*, *willing*, and *preferring* are close imperfect synonyms. Put simply, free will is philosophical-speak for *the capacity to freely choose*, and the capacity to freely choose is economic-speak for free will.

But, what does *free* mean? [Immanuel Kant](#) (1724-1804) thought that if you are required to be rational, and if being rational determines what you will do, then you don’t have free will ([Uleman](#) 2010, [Rohlf](#) 2020). Kant would agree with my logic why NCT is incompatible with choice. You would have free will only if you could choose whether to follow the assumptions of NCT, but not if they are an immutable part of your nature, as it is for economici. If you adopt the highest-ranked feasible bundle rule, but didn’t have to, you have free will. For Kant, an economicus doesn’t have free will because it can’t reject the rule.

### **Doubts about free will go way back**

*Men are mistaken in thinking themselves free; their opinion is made up of consciousness of their own actions, and ignorance of the causes by which they are conditioned. Their idea of freedom, therefore, is simply their ignorance of any cause for their actions. As for saying that human actions depend on the will, this is a mere phrase without any idea to correspond thereto. (Spinoza 2001, partially quoted by [Wegner](#) 2002))*

*All theory is against the freedom of the will; all experience is for it. ([Boswell](#) 1791)*

[Baruch Spinoza](#) (1632-77), [Thomas Hobbs](#) (1588-1679), and [John Locke](#) (1632-1704 ) all rejected free will. Locke "concluded the human will is never free but is always determined by nature or reason: for Locke, 'free will' is a nonsensical thing" (Uleman 2010).

In contrast, [Rene Descartes](#) (1596-1650) understood free will as “a mental ability to endorse and set oneself on a course of action (or more simply, to assent to something, or not), rather than as a function of the grounds determining action or assent" (Uleman). You can will (choose) whatever you want, but that doesn’t mean you determined what you would will (would

choose) or that what you willed (you chose) will occur. In his view, no one will stop me from willing A will happen but that I willed A, rather than B, wasn't determined by me. Descartes' free will is limited free-will, at best.

### Modern definitions of free will fall along a continuum

At one extreme, for free will,

*One wants to be what tradition has it that Eve was when she bit the apple. Perfectly free to do otherwise. So perfectly free, in fact, that even God couldn't tell which way she'd jump. (Jerry Fodor (2003) philosopher and cognitive scientist))*

Fodor is providing one definition, not arguing for it. This is *extreme free-will*. Economicus doesn't have it.

At the other end of the continuum, an entity has free will if another agent is not controlling it, and, in addition, other agents, excluding God, cannot predict with certainty what it will do before it does it. You lack free will only if a mad scientist, or puppeteer, or God pulls your strings. Economicus has free will in this sense (*vacuous free-will*): while what it will do can be predicted, there is no puppeteer pulling its strings.

In between these two extremes, but closer to extreme free-will, is the ability, before the choice is made, to choose differently than you chose. You chose A but could have chosen B (you could have behaved differently than you behaved). And you have this ability even if God—assuming you believe in God—knew which one you were going to choose. This is *strong free-will*. An economicus doesn't have it: in economic-speak, economicus doesn't choose in this sense. Looking ahead, most homo sapiens believe they have strong free-will.

Also in between the two ends, but closer to vacuous free-will, is *weak free-will*. You lack it only if your behavior is completely determined by external constraints; that is, you must experience an alternative in your choice set and it includes only one alternative ( $N=1$ ). That is, the will is free if  $N \geq 2$ . Economicus has weak free-will: in economic- speak, choice, in a weak sense, is possible whenever  $N \geq 2$ . Economicus is constrained to do whatever it did, but two of the constraints (an exogenous ordering and must select highest-ranked feasible bundle) are internal constraints.

I have defined four variants on free will. Economicus only has the weak form: it can't behave differently than it does. The philosopher [Daniel Dennett](#) (2013) defines free-will as what

I have defined as weak free-will, arguing that strong free-will (so also extreme free-will) is “bonkers” given the laws of physics.<sup>2</sup>

*People care deeply about having free will, but they also seem to have misguided ideas about what free will is or could be ...Our decisions are not little miracles in the brain that violate the physics and chemistry that account for the rest of our bodies' processes, even if many folk think this must be what happens if our decisions are to be truly free. We can't conclude from this, however, that then we don't have free will, because free will in this bonkers sense is not the only concept of free will.*

Weak free-will is close to the legal definition, as in you signed the contract of your "own free will" if you were not "under duress or under the influence of hallucination or other mental derangement." He claims it

*... is probably the consensus [view of free will] not only among philosophers but also among judges, lawyers, and others who have to make distinctions about who is responsible for what and who is excused because they do not free will when they acted.*

Fodor assessment of Dennett's definition of free will is

*There's the lurking sense that what you got isn't quite what you ordered, and half an hour later you're hungry again.*

In Fodor's view, Dennett has simply defined all behavior as chosen behavior,—a bait and switch because what Dennett calls free will, most people wouldn't. Dennett would say economic exhibit free will, Foder is still hungry.

## Is choice (and economic choice) compatible with *causal determinism*?

Thinking about causal determinism and its implications for NCT informs on what it means to make a choice and whether people are responsible for their choices (both critical ethical issues).

### Causal determinism

It is the hypothesis that your actions are completely determined by the laws of nature and what has come before (your genetics, your history, the current state-of-the world)—your actions are caused ([Hoefer](#) 2010). It is taken as fact by many (but not all) scientists and philosophers, but mostly rejected out-of-hand by most people, especially if anyone suggests it applies to humans.

---

<sup>2</sup> Also, how David Hume defined it.

With complete information and the ability to process it, I could predict everything you will do—all acts are causal and deterministic.<sup>34</sup> It follows from classical, deterministic physics. The opposite is *indeterminism*. Most neuroscientists and physicists are either determinists or indeterminists only because they believe behavior has a random component. Modern physicists accept quantum mechanics which adds a random component at the subatomic level, but no one knows whether it affects the behaviors of individuals.

Historically, many philosophers and mathematicians were determinists, including Locke, Baruch Spinoza, [Gottfried Leibniz](#) (1646-1716), [David Hume](#) (1711-76), and the mathematician [Pierre-Simon Laplace](#) (1749-1872). In 1814, Laplace articulated determinism in terms of a demon who could predict all future action.

Notable historical indeterminists include [George Berkeley](#) (1685-1753), Descartes, Kant, and [Jean Jacques Rousseau](#) (1712-78). For Berkeley, Descartes, and Kant, their arguments for indeterminism were all based on their belief in dualism (your mind is more than your brain: magic)—Rousseau’s argument is not.

Economicus’s behavior is deterministic and is consistent with a deterministic world but only one where the configuration of atoms at the start of time resulted in economicus having the built-in- rule that it must experience its highest-ranked feasible bundle, and that, at each point in time, it possess an exogenous ordering of bundles.

### Humans tend to believe causal determinism doesn’t apply to humans

Until recently this conjecture was untested. Quoting the experimental philosopher [Shaun Nichols](#) (2004):

*In a set of experiments exploring the lay understanding of choice, both children and adults tended to treat moral choices as indeterminant. Participants were presented with cases of moral choice events (e.g., a girl steals a candy bar) and physical events (e.g., a pot of water comes to a boil), and they were asked whether, if everything in the world was the same right up until the event occurred, the event had to occur. Both children and adults were more likely to say that the physical event had to occur than that the moral choice event had to occur. This result seems to vindicate the traditional claim that ordinary people in our culture believe that at least some human decisions are not determined.*

---

<sup>3</sup>Causal determinism is different from fate and predestination. Fate and predestination, like causal determinism, imply something is going to happen, but the reason it is going to happen is magical: inconsistent with physics.

<sup>4</sup> This doesn’t mean everything can be predicted: currently there isn’t enough potential computing power, and many believe there never could be.

Determinism conflicts with our sense of self—it's diminished if it you think your behavior is set. We have two views of how the world works: a mechanical view that applies to the behaviors of rocks, dogs, and all other non-human plants and animals, and a magical view that applies to people—your mind is more than your brain—the dualist view. Rejecting determinism make it easier to believe humans consciously set their course. People readily believe the behavior of lesser animals is deterministic (or random), that lesser animals are driven by instinct and stimulus so don't make choices in the sense people make choices.

### **Is choice consistent with causal determinism? *Compatibilists and Incompatibilists***

There are numerous schools of thought, varying on whether you believe in determinism and whether you believe choice is consistent with it. Behavior having a random component is a way to generate indeterminism but adding a random component to an entity's behavior doesn't mean it's making choices—choosing freely isn't the same thing as behaving randomly.

### **Most neuroscientists and physicists are incompatibilists, rejecting free will and choice**

As noted above, they are either determinists, or if indeterminists, indeterminists only because they believe behavior has a random component. And most don't believe free will is consistent with either, if free will is the ability to behave differently. [Dennett, a champion of compatibilism, lists the following as distinguished members of the *choice is illusion* camp (incompatibilists): the physicists Albert Einstein and [Stephen Hawking](#), the neuroscientists [Wolf Singer](#), [Chris Frith](#), and [Patrick Haggard](#), and the psychologists [Paul Bloom](#) and Daniel Wegner.]

### **What are philosophers? A lot of them are deterministic compatibilists**

According to both Dennett, a compatibilist, and the incompatibilist philosopher [Shaun Nichols](#), many (the majority?) of professional philosophers are compatibilists, including the determinists Hobbes, Locke, Leibniz and Hume. Hume even argues determinism is required for free will. Most compatibilists are determinists, but some noted determinist philosophers are not compatibilists.<sup>5</sup>

Why are there deterministic compatibilists? Cynically, according to Nichols (2007),

---

<sup>5</sup> These include Spinoza, and the enlightenment thinkers [Paul-Henri D'Holbach](#) (1723-1789), [Denis Diderot](#) (1713-84), and [Voltaire](#) (1694-1778). In addition, there are a few indeterminant philosophers who argue free will could exist even if the world were deterministic, but most who argue the world is indeterminant think determinism is inconsistent with free will.



*Many of us Incompatibilists think we know the answer to this: it's wishful thinking! Philosophers embrace compatibilism because they want it to be true. This view is, I think, common among Incompatibilists. Famously, [William] James dubs compatibilism a "quagmire of evasion." Even more famously, Kant says it is a "wretched subterfuge." We can put the incompatibilists' motivational hypothesis somewhat more precisely as follows: Philosophers embrace compatibilism despite its counter-intuitiveness because compatibilism is motivationally attractive.*

In summary, many philosophers believe in determinism, and most of them believe determinism is compatible with free will, given that they define it in the weak sense.<sup>6</sup>

Economists tend to be implicit, and unaware, *compatibilists*.

### Do regular people think choice is consistent with causal determinism?

Nichols and [Knobe](#) (2007) started by asking college students to imagine two different universes.

*Imagine a universe (Universe A) in which everything that happens is completely caused by what happened before it. This is true from the very beginning of the universe, so what happened in the beginning of the universe caused what happened next, and so on right up until the present...*

*Now imagine a universe (Universe B) in which almost everything that happens is completely caused by whatever happened before it. The one exception is human decision making...*

Ninety percent of the respondents thought our world was more like B, consistent with Nichols' (2004) finding: determinism except for humans.

Everyone was then asked either:

*In Universe A, is it possible for a person to be fully morally responsible for their actions? Yes or No?*

Or

*In Universe A, a man named Bill has become attracted to his secretary, and he decides that the only way to be with her is to kill his wife and 3 children. He knows that it is impossible to escape from his house in the event of a fire. Before he leaves on a business trip, he sets up a device in his basement that burns down the house and kills his family. Is Bill fully morally responsible for killing his wife and children? Yes or No?*

[If you did not choose, you are not responsible.] 86% answered "No" (not responsible) to the first question, indicating that most respondents thought the person could not have acted differently. But only 25% answered "No" (not responsible) to the second question, so most people believed Bill could have chosen to not kill the family.

---

<sup>6</sup> An exception is the economist/philosopher [List](#) (2014) who argues that determinism is compatible with strong free-will.

The authors were concerned that they couldn't determine whether the difference in "No" responses was caused by the abstractness of the first compared to the concreteness of the second, or caused by the second, but not the first, viscerally affecting the respondent. So, they did a second experiment. Half of the people who got each question were told to answer assuming Universe A, half Universe B.

*As he has done many times in the past, Mark arranges to cheat on his taxes. Is it possible that Mark is fully responsible for cheating on his taxes? Yes or No?*

Or

*As he has done many times in the past, Mark stalks and rapes a stranger. Is it possible that Mark is fully responsible for raping the stranger? Yes or No?*

Both acts are concretely described but the second generates a negative visceral response. For those told to assume Universe B (the indeterminant universe), most concluded that both the rapist and tax cheater could have acted differently, so were responsible. Those told to assume Universe A (the determinant cash) believed the tax evader couldn't have not cheated, but the rapist could have not raped.

Summarizing, humans believe a determined act is consistent with free will (so attribute moral responsibility to the act) if the act is explicitly negative, is concretely described, was performed by a human, and makes them viscerally upset—but not when the nature of the act and actor is unspecified.<sup>7</sup> This result has been replicated in non-western populations. We are of two minds when it comes to the question of whether free will is consistent with determinism, a logical mind that concludes the deterministic actor is not responsible, and an emotional mind that concludes they are.

### Are homo sapiens capable of choice?

The answer depends on what makes human minds tick. An easy way to justify a "Yes" is to assume the human mind strays beyond the brain's border (beyond the physical, electrical and chemical stuff). That is, assume/believe the world is dualistic, at least with respect to humans, so the laws of physics don't apply when it comes to human choice. Many/most people are dualists. Here, I proceed assuming the world is not dualistic, not arguing for or against.

---

<sup>7</sup> "Indeed, concrete cases of bad behavior lead people to attribute responsibility, even when the action is caused by a neurological disorder [like a brain tumor]" (Nichols 2011)

If the world is deterministic (maybe with some random component), humans are in the same boat as *economici*: humans only have free-will, and choice, both in the weak and vacuous sense, but not in the strong or extreme sense. But for humans, unlike *economici*, the initial configuration of atoms is not required to be the configuration that would result in humans having an exogenous ordering of bundles, nor result in the immutable rule that they must experience their highest-ranked feasible bundle. No physicist nor evolutionary biologist would argue that the initial configuration must have been the one that would make humans *economici*, neither would many philosophers.

But! As I noted at the beginning, humans have choosing experiences and then experience what they consciously selected. So, aren't they choosing? Said another way, does the choosing experience followed by experiencing what was selected, demonstrate choice? The logical answer is "Not necessarily". The evidence-based answer is "No".

Two events of interest in terms of choice are *having the conscious experience of deciding to do something* (Type II events) and *doing what was consciously decided* (Type III). Examples of II are George experiences choosing to drink a Coke, and he experiences choosing to propose to Wanda. The actual drinking or proposing are Type III events. That II precede III doesn't mean it caused III. George only proposed after a choosing experience, but maybe what caused the proposal was a third event in their past (a discussion of their hopes and dreams a discussion he doesn't consciously remember, or maybe it was a red dress). The possibility that you did not cause III is a hard to swallow when it's obvious that it did, and you really want to believe it did. You want to believe that first consciously deciding to buy a new car was what caused you to buy it. [Note that there is nothing in NCT that requires or precludes choosing experiences.]

Another category (type IV) are behaviors that were not preceded by a choosing experience. We are all aware that many of our actions are not preceded by a conscious decision to take the action, so called automatic behaviors/involuntary act, so know action doesn't require a prior choosing experience. Examples of *automatics* include the different components of physical activities such as walking, skiing, driving and breathing—the mechanics are mostly produced unconsciously. Other examples are habits, instinctive reactions to things unexpected (touching hot stove), and impulsive acts driven by emotions. Research and experience demonstrate that if the spinal cord receives data that there will be bodily injury if immediate

action is not taken, it will send instructions to the muscles to immediately act even before you are consciously aware of any danger—only after you dive out of the way do you consciously register what happened. There is an evolutionary advantage to forego a choosing experience when delaying the action would get you run over. But danger is not required. You are more likely to win the tennis match if you don't consciously choose how to hit every ball flying your way. If some attractive other smiles as you pass on the street, you either react, or lose the opportunity. But circumstances that require quick response are not the only situations where we forego the choosing experience.

Another category, a Type I event, is a neurological event that you unconsciously experience that determines you will acquire B rather than A (a Type III event) and, before you acquire B, you will have the conscious experience of choosing B (a Type II event). If I causes III, II is simply window dressing, the *illusion of choice*, like the whistle on a steam locomotive which blows before the train crosses the road but does not cause the train to cross the road. By analogy, the sun rises in NYC before it rises in Chicago but the sunrise in NYC doesn't cause the sunrise in Chicago, both are caused by the rotation of the earth and its orbit around the sun.

More and more, the evidence suggests most, or all, of our behaviors are determined in the unconscious parts of our brain, and our conscious brain, later, but before the behavior occurs, sometimes has an *experience of choosing*. Our conscious brain, by consciously willing the action, tricks us into thinking this caused the action. However, this doesn't mean conscious thought plays no role: those conscious thoughts can affect the unconscious, so influence future behaviors.

## The evidence on conscious choice

### The neurological evidence:

Starting with the famous [Benjamin Libet](#) (1989) experiment, an increasing number of neurological studies (see e.g. [Haynes](#) 2007, [Blackmore](#) 2007, [Soon](#) et al. 2008, [Itzhak Fried](#) et al. 2011, and [Smith](#) 2011) indicate that before you consciously decide on a voluntary action (whether to flick your wrist, push button A or B), neural activity can be observed that predicts

the action, brain activity you are unaware of.<sup>8</sup> I and III are separated by milliseconds, or even a few seconds. I is also necessary and sufficient to cause the experience of deciding how to voluntarily act (II). I is a *readiness potential* because your unconscious is getting ready to cause the voluntary act.<sup>9</sup> Paraphrasing Wegner (2002) choosing is an experience, not a cause.

Some caveats: Many neuroscientists and philosophers have questioned whether the experiment really demonstrates what it suggests. There are reasonable answers supporting the conclusions, but these answers are not bombproof. However, as noted above, the fundamental finding that the occurrence of an act can be predicted based on unconscious brain activity before you consciously decide to act has been replicated multiple times. Keep in mind that I being necessary and sufficient for II and III does not imply there wasn't some earlier event that caused I, maybe even yesterday's choosing experiences.

Additional support for the role of the unconscious in behavior is recent research that indicates that your brain can both formulate a goal (e.g. get you invited to a party), and cause you to take actions to achieve that goal, without you being aware of the goal or why you are taking these actions; that is, both are unconscious. Distinguishing between goals and actions/behavior, a goal often motivates actions (choosing to lose weight is a goal, skipping dessert is an action). [Custers](#) and [Aarts](#) (2010) summarize and interpret this recent research on unconscious goal-formation. The previous view, and what most of us want to believe, is that goals are consciously chosen. For example, my goal to write this paper must have been consciously adopted. But this doesn't have to be the case. Summarizing, you can be subliminally motivated to adopt a goal and then unconsciously take actions to achieve it. For example, in labs the goal is brought to the attention of your unconscious subliminally or, outside the lab, by environmental cues that you

---

<sup>8</sup> Neuron activity is observed by observing electrical activity, initially, and crudely, by attaching electrodes to the scalp, more recently with fMRI and now, sometimes, by directly implanting tiny electrodes in the brain that isolate on specific groups of neurons.

<sup>9</sup> A readiness potential doesn't precede every action; it only precedes voluntary actions. It doesn't precede reflex actions, or other uncontrolled actions. For example, when people with Tourette's syndrome involuntarily swear, the swearing is not preceded by a readiness potential, but their voluntary actions are preceded by readiness potentials. So, a readiness potential is not necessary for an action to occur because all actions are not preceded by readiness potentials, but they are necessary and sufficient for voluntary actions.

are not aware of.<sup>10</sup> You then unconsciously evaluate the rewards associated with that goal (in the lab with a subliminal reward cue, or because you already unconsciously associate that goal with a reward). Then, depending on how your unconscious assesses the magnitude of the associated reward, you adopt the goal and take actions to achieve it.

Despite such findings, most people believe consciously choosing is what causes you to perform an action or adopt a goal.

### **So, does the Libet and related findings imply that conscious thought, including the experience of choosing, has no effect on behavior?**

No! Even if your unconscious is the determining step before an action is taken, it leaves open the possibility that earlier (right before, or much earlier) conscious thinking influenced what you now do.<sup>11</sup> For example, the choosing experience—after your unconscious has decided, while not affecting whether you now go with A or B in the current choice set can influence what the unconscious will select in future choice sets. Supporting the conjecture that conscious thought has influence, [Baumeister](#), [Masicampo](#) and [Vohs](#) (2011) argue that “The evidence for conscious causation of behavior is ...empirically strong. However, conscious causation is often indirect and delayed, and it depends on the interplay with unconscious processes.”<sup>12</sup>

### **Imagine if we never had choosing experiences**

The choosing experience informs on the unconscious, telling the conscious part of you what you are going to do next. Imagine our brains evolved absent choosing experiences. In which case, we would not know what we were going to do until we did it. Without choosing experiences, your sense of self (conscious identity) would be lessened: believing that consciously choosing determines what happens next conveys an evolutionary advantage, even if it is not true—we are

---

<sup>10</sup> People speak more softly when seeing a picture of a library, are more likely to clean their table if there is vague whiff of cleaner in the air, and get more competitive when they enter an office if there is a leather briefcase on the desk (Henk Aarts and Ap Dijksterhuis (2003), [Holland](#) et al. (2005), and [Kay](#) et al. (2004))

<sup>11</sup> Keep in mind that while consciously thinking about what to do is a type of conscious thought, much conscious thought is not an experience of choosing. For example, you consciously realize you are reading this footnote.

<sup>12</sup> They reviewed experiments where conscious thought was manipulated (e.g. asking you to imagine a future action) and subsequent behavior was then observed, finding many studies where experimentally manipulating conscious thought influenced behavior (e.g. you are more likely to perform an action if you first imagine performing it). As [Baumeister](#) and [Bargh](#) (2014) note, none of the experiments contradict the Libet result that the immediate cause of behavior is unconscious.

programed to believe we consciously choose. In the 1890 words of William James, the father of American psychology.

*But the whole feeling of reality, the whole sting and excitement of our voluntary life, depends on our sense that in it things are really being decided from one moment to another, and that it is not the dull rattling off of a chain that was forged innumerable ages ago. (James, 1890, quoted by Wegner)*

James did not believe conscious choice is an illusion, but admitted it might be. If it is an illusion, as the evidence above suggests, it is, in the words of Wegner, the *illusion of choice*.

### **Other evidence on choosing experiences and subsequent actions**

An issue complicating the study of the relationship between a choosing experience and the subsequent action is you can't, by definition, consciously know whether your unconscious determined what you did—you cannot be conscious of your unconscious.

Consider how the perception of choosing to act, followed by the act, and finally an outcome can be distorted. Begin by deconstructing what Ralph said at the bar:

*Yesterday I decided to go duck hunting, saw a duck in the sky, chose to shoot, shot the duck, and my dog retrieved the now-dead duck that I shot.*

The sequence as Ralph perceives it is (1) he had two choosing experiences: to hunt and to shoot; (2) shot in a duck's direction; (3) choosing to shoot caused the shot duck; (4) he is in possession of a dead duck; and (5) he believes he committed duckicide. In Ralph's mind, he chose to shoot and this resulted in an outcome, dead duck in his possession. To be correct, all five of these implicit conjectures must all be correct. The neurological research throws conjecture (3) in doubt, even if (1) and (2) are correct. What about conjectures (1), (2), (4), and (5)? Much research in psychology indicates that our implicit conjectures are often wrong.

To keep things simple, assume 4) is correct. (1) is incorrect if his recollection is false; maybe he shot reflexively but, being a responsible gun owner, Ralph can't imagine shooting without first deciding to, so concludes he must have decided to shoot. Maybe (5) is incorrect: maybe another hunter shot at the same time as Ralph, or maybe the duck died in midflight of natural causes as Ralph shot his gun. Maybe (2) is incorrect: maybe he did not shoot in the direction of the duck and he only believes he did because after he shot, the duck fell from the sky.

Humans are great at (A) imagining we had a choosing experience when we didn't; (B) believing the choosing experience caused what we did; (C) believing we caused an outcome to occur when we did not (or believing we did not cause an outcome when we, in fact, we did); and (D) believing the outcome is different from what it is. Also, keep in mind that action doesn't require a choosing experience. This plus these four inclinations make it likely we will misinterpret the importance and influence of conscious choice—independent of (3).

**With respect to A (believing we had a choosing experience when we didn't)**

For example, in [Nisbett](#) and [Wilson](#) (1977), subjects memorized lists of word-pairs, and in one treatment the list included the pair "ocean-moon". Later they were asked to name a laundry detergent. Those whose list included "ocean-moon" were much more likely to answer Tide—not surprising. But, when asked why, the subjects said things like "Tide was the detergent their mother used." Or "It has a cool box," but hardly anyone said, "Because I memorized 'ocean-moon'." They imagined consciously choosing to say Tide because afterwards they felt compelled to self-rationalize their choice of words. I observe my behavior, and then create an explanation that I find plausible and works for me—sometimes my explanation is even correct.

**With respect to B (believing the choosing experience caused what we did)**

We all want to believe we exert conscious control over our lives, so are compelled to attribute many outcomes to our conscious reckonings, but choice experiments demonstrate that the probability of you choosing a particular alternative can be manipulated by messing with your unconscious, independently of what you consciously reason. This supports the neurological results discussed above.

Specifically, recent studies with subliminal cues ([Karremans](#), [Stroebe](#) and [Palmier-Claus](#) 2006; [Bermeitinger](#) et al. 2009; [Verwijmeren](#) et al. 2011, and [Milyavsky](#), [Hassin](#) and [Schul](#) 2012) demonstrate that choice can be influenced by these cues (information that never reaches conscious awareness). Subjects are shown a piece of information for a short period of time (msec.) followed quickly by, for example, a random letter which masks the information. Behavior is influenced, which demonstrates that the conscious is not always in charge, even when we think it is.



### With respect to C (believing you caused it when you didn't, and believing you didn't when you did)

The Denver Broncos football team lost the 2014 Super Bowl because I, stupidly, wasn't paying attention during the Bronco's disastrous first-play from scrimmage.

Exotic examples of things we cause but don't think we cause are the voices schizophrenics hear, the things hypnotized people do, and the words we spell out on Ouija boards. When we pray to God to give us strength to act, and then act, we attribute the act to God rather than to ourselves, problematic if God doesn't exist or doesn't care what we do.

[Kassin](#) and [Kiechel](#) (1996) were the first to make research subjects believe they had committed an act, which they had not committed, and confess to committing it. In summary, it is not difficult to make you think you did something you didn't, even if it's a bad thing. [Billy Wayne Cope](#) is in jail for raping and murdering his daughter, but he did neither. He confessed and provided gory details after the police told him the semen in her vagina matched his DNA.

Correctly attributing an outcome that results from a complex interaction between people (work, social, sexual) is difficult—exactly who initiated that kiss? And, if we like the outcome, we tend to attribute it to our efforts, but to others if we don't: *self-serving attribution*; it increases self-esteem.

There is the tendency to ascribe causation if physical action on our part immediately precedes an observed outcome. There are many light-switch experiments: a light that flashes on, or not, and a switch ( [Alloy](#) and [Abramson](#) 1979, [Tennen](#) and Sharp 1983). They demonstrate that the subject thinks she is controlling the light, even when the light is not attached to the switch. We believe we are causing things even when we aren't.

[Dijksterhuis](#) et al. (2008) have shown whether or not you take credit for an action can be influenced by subliminal cues that “direct attention to self” (“I”, “me”). Subject subliminally cued with the word “God” were less likely to take credit. [Aarts](#) (2007) demonstrated that in situations where causation is unclear “feeling of control and self-causation” are enhanced if success is subliminally conveyed.

### With respect to D (believing the outcome is different from what it is):

There is **it** and what **caused “it”**, this sub-section is about whether **it** is true, not what caused it. Was the dead duck really dead, or even a duck? People make mistakes about the facts on the ground.

Truth, like beauty, is in the beholder’s eye. The accused believes there was no rape because the accused believes the victim wanted to have sex, believing the victim chose to have sex and sent signals indicating this. The accused is attributing the sex to a choice made by the other party when, in fact, the other party did not necessarily make that choice, and, if she didn’t, the accuser caused the sex. The majority of Americans believe Barack Obama is a U.S. citizen, but many don’t. Some believe our planet is warming, some don’t, and everyone can’t be correct. We judge truth based on what is happening around us, filtered through personal perspective: “facts” reported to us by second-hand sources we trust and sources we don’t trust; our implicit biases; and what our group/tribe believes.

Finally, keep in mind the fact that your actions are influenced by your unconscious doesn’t, by itself, imply you are not making choices—it is **your** unconscious. But you don’t choose what is in your unconscious.

### Concluding:

Economici live in a world that is either deterministic, or indeterministic because of randomness. Either way, an economicus can’t behave differently than they do—it lacks free will in the strong sense. In addition, economicus’s behavior is only consistent with a deterministic world if the configuration of atoms at the beginning of time was such that it would cause economicus to have a fixed ordering of bundles and have inherited the rule that it must experience its highest-ranked feasible bundle, both highly unlikely.

But, research in experimental philosophy indicates that most humans believe the world is not deterministic when it comes to human behavior. And, if humans are asked to assume the world is deterministic, they still conclude that a human who has acted in manner they find viscerally upsetting could have acted differently. While experimental philosophers haven’t studied economists, most economists likely think this way. We all want humans to have choice, but interestingly specified a theory of behavior that implies little in the way of choice.

Starting with Libet (1989), a mounting body of neurological research indicates that while humans often have choosing experiences, they have no effect on which alternative we then experience. Rather, what you will experience was determined by your unconscious before you had the choosing experience. Of course, one could simply rename choosing to mean unconscious choosing, but that is not what most mean by “I chose B over A.” Note that there is nothing in NCT that implies or requires conscious choosing. With respect to humans, if they adhere to the assumptions of NCT, there is not much to think about behavior wise.

Much research in neuroscience and psychology supports the hypothesis that behavior is largely determined by the unconscious including behaviors not preceded by a choosing experience, researchers affecting behavior subliminally, and people making up reasons for why they choose A over B.

A reasonable solution would be to rename NCT, NBT, the adjective “neoclassical” to distinguish it from theories of behavior proposed by behavioral economists. I won’t see this in my life time but given that behavioral economists call themselves *behavioral economists*, and researchers in neuroscience, biology, business, and psychology, use terms like theories of behavior and decision theory, “behavior” should slowly replace “choice” in economic theories of behavior as economists get bombarded with more and more neurological and psychological evidence. The change will not be painless: free will and choice enhances our sense of self and what it means to be a human, and if your beliefs and ethical inclinations lean toward choice in a strong sense, absence of choice is a tough pill to swallow.

## References:

1. Henk Aarts (2007) Unconscious authorship ascription: The effects of success and effect-specific information priming on experienced authorship, *Journal of Experimental Social Psychology* 43: 119-126.
2. Henk Aarts and Ap Dijksterhuis (2003) The Silence of the Library: Environment, Situational Norm, and Social Behavior, *Journal of Personality and Social Psychology* 84(1): 18-28.
3. Lauren Alloy and Lyn Abramson (1979) Judgment of contingency in depressed and non-depressed students: Sadder but wiser? *Journal of Experimental Psychology: General* 108(4) 441-485.

4. Roy Baumeister, E.J. Masicampo and Kathleen Vohs (2011) Do conscious thoughts cause behavior, *Annual Review of Psychology* 62: 331-61
5. Roy Baumeister and John Bargh (2014) Conscious and Unconscious: Toward an integrative understanding of human mental life and action, Chapter 3 in *Dual process theories of the social mind* (eds. Jeffrey Sherman, Bertram Gawronski and Yaacov Trope), York, Guilford Press.
6. Christina Bermeitinger, Ruben Goelz, Nadine Johr, Manfred Neumann, Ulrich Ecker and Robert Doerr (2009) The hidden persuaders break into the tired brain, *Journal of Experimental Social Psychology* 45(2): 320-326.
7. Susan Blackmore (2007) Mind over matter? *Pathos*
8. James Boswell (1791) *Life of Johnson*, Book 3
9. Randolph Clarke and Justin Capes (2014) SEP on *Incompatibilist (Nondeterministic) Theories of Free Will*
10. Ruud Custers and Henk Aarts (2010) The unconscious will: how the pursuit of goals operates outside of conscious awareness, *Science* 329.
11. Daniel Dennett (2013) *Intuition Pumps and Other Tools for Thinking*, Kindle Edition, New York, W. W. Norton & Company.
12. Ap Dijksterhuis, Jesse Preston, Daniel Wegner and Henk Aarts (2008) Effects of subliminal priming of self and God on self-attribution of authorship for events, *Journal of Experimental Social Psychology* 44: 2-9.
13. Jerry Fodor (2003) Why Would Mother Nature Bother? (Review of *Freedom Evolves* by Daniel Dennett). *London Review of Books* 25(5): 17-18.
14. Itzhak Fried, [Roy Mukamel](#) and [Gabriel Kreiman](#) (2011) Internally generated reactivation of single neurons in Human Medial Frontal Cortex Predicts Volition. *Neuron* 69:548-562.
15. Carl Hoefer (2010) SEP on *Causal Determinism*
16. Rob Holland, Merel Hendriks, and Henk Aarts (2005) Smells like clean spirit: Nonconscious effects of scent on cognition and behavior, *Psychological Science* 16(9): 689-93.
17. Henry James (1917) *Portrait of a Lady* (Vol. 1, Chapter XVI) A Project Gutenberg EBook
18. William James (1890) *The Principles of Psychology*, Vol. 1, New York, Henry Holt and Company

19. Johan Karremans, Wolfgang Stroebe and Jasper Palmier-Claus (2006) Beyond Vicary's fantasies: The impact of subliminal priming and brand choice, *Journal of Experimental Social Psychology* 42: 792-798
20. Saul Kassin and Katherine Kiechel (1996) The social psychology of false confessions: compliance, internalization, and confabulation, *Psychological Science* 107(3): 125-128.
21. Saul Kassin (2007). Internalized false confessions, In *Handbook of Eyewitness Psychology: Volume 1, Memory for Events* (eds. M. Toglia, J. Read, D. Ross and R. Lindsay), Mahwah NJ, Erlbaum.
22. Aaron Kay, [Christian Wheeler](#), John Bargh, and [Lee Ross](#) (2004) Material priming: The influence of mundane physical objects on situational construal and competitive behavioral choice, *Organizational Behavior and Human Decision Process* 95: 83-96.
23. Benjamin Libet, [Curtis Gleason](#), [Elwood Wright](#) and Dennis Pearl, (1983) Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (Readiness-Potential) - The Unconscious Initiation of a Freely Voluntary Act, *Brain* 106: 623-642.
24. Christian List (2014) Free will, determinism, and the possibility of doing otherwise. *Noûs* 48 (1): pp. 156-178.
25. Maxim Milyavsky, Ran Hassin and Yaacov Schul (2012) Guess what? Implicit motivation boosts the influence of subliminal information on choice, *Consciousness and Cognition* 21(3): 1232-41.
26. Shaun Nichols (2004) The Folk Psychology of Free Will: Fits and Starts, *Mind & Language* 19:473-502.
27. Shaun, Nichols (2007) The Rise of Compatibilism: A Case Study in the Quantitative History of Philosophy, *Midwest Studies in Philosophy* 31: 260-270
28. Shaun Nichols (2011) Experimental philosophy and the problem of free will, *Science* 331:
29. Shaun Nichols and Joshua Knobe (2007) Moral Responsibility and Determinism: The Cognitive Science of Folk Intuitions, *Nous* 41: 663-68.
30. Richard Nisbett and Timothy Wilson (1977) Telling more than we know: verbal reports on mental processes, *Psychological Review* 84(3): 231-259. This article has been cited more than eight thousand times.
31. Michael Rohlf (2020) SEP on *Immanuel Kant*.
32. Kerri Smith, (2011) Neuroscience vs philosophy: Taking aim at free will, *Nature* 477: 23-25.

33. Chun Soon, [Marcel Brass](#), [Hans-Jochen Heinze](#) and [John-Dylan Haynes](#) (2008) Unconscious determinants of free decisions in the human brain, *Nature Neuroscience* 11: 543 – 545.
34. Benedict de Spinoza (2001) *Ethics Part II: Of the Nature and Origin of the Mind*, *Blackmask Online* (translated from the Latin by R.H.M Elwes)
35. Howard Tennen and Jeanette Sharp (1983) Control orientation and the illusion of control, *Journal of Personality Assessment* 47(4): 369-374.
36. Jennifer Uleman (2010) *An Introduction to Kant's Moral Philosophy*, Cambridge UK, Cambridge University Press.
37. Thijs Verwijmeren, [Johan Karremans](#), [Wolfgang Stroebe](#) and [Daniel Wigboldus](#) (2011) The workings and limits of subliminal advertising: The role of habits, *Journal of consumer psychology* 21: 206-213.
38. Daniel Wegner (2002) *The Illusion of Conscious Will*, Cambridge MA. MIT Press