THE SKEPTIC ARENA.COM

March 1, 2016

New paper on “free won’t”

and its relevance to “free will”

by Jerry Coyne

*I’ve written quite a bit on experiments showing that one can, using brain scans, predict “decisions” before the human subject is conscious of having made them. These decisions include either things like deciding when to press a button, or “choice” experiments in which you decide to add or subtract, or to press a button with your right or left hand. In the “choice” cases, brain scans (EEGs or fMRIs) can predict which choice will be made with significant but not perfect accuracy (about 60-70%)*

Jerry, 60-70% is a lot closer to random chance (50%) than it is to "perfect accuracy" (100%), yet you choose to label that result "significant." Why do you think that a result which is far closer to random chance than it is to perfection ... is significant?

*but in some cases those predictions can be made up to 7 seconds before the subject is conscious of having made a decision.*

Jerry, as I just pointed out, that 7 seconds might be impressive ...

if those predictions weren't so far from 100%.

*The first one of these studies was published in 1985 by Benjamin Libet, who showed that a “readiness potential” (RP) for pressing a button could be seen in the brain about a third of a second (300 milliseconds) before the subjects were conscious of having decided to do the press. Since then the decisions have become more complex, the brain scans more refined, and the time of “readiness potential” pushed farther and farther back.*

Jerry, Libet was not a fan of Determinism, nor was he particularly pleased that Determinists hijacked his experiments and interpreted them the way they *needed* to interpret them.

[http://www.informationphilosopher.com/solutions/scientists/libet/#nondeterminism](http://www.informationphilosopher.com/solutions/scientists/libet/%23nondeterminism)

*These results won’t surprise any determinists or even free-will compatibilists, who all agree that our decisions are made not by some spooky “will,” but by the laws of physics.*

Jerry, your claim regarding the beliefs of free will compatibilists doesn't jive with the definition:

<https://en.wikipedia.org/wiki/Compatibilism>

According to that definition, they would *not* all agree that our decisions are only made by the laws of physics. Perhaps you can provide a link to the definition of "free will compatibilists" that you are using?

And what part of making a free choice do you find "spooky?"

And can you explain what you mean by your claim that the laws of physics can make decisions?

*And of course we all know of “decisions” we make that appear to derive from our unconscious (e.g., driving a well-travelled route, where you don’t think to yourself “turn here”, but where you seem to be operating on autopilot).*

Jerry, I would go with "subconscious" on that one. Driving while "unconscious" would probably get you about as far as the lobby of the Ritz-Carleton in Chicago ... upside down.

*But these brain-scan results are distressing to dualists and to those who believe in the religious (libertarian) form of free will, in which decisions are made by something detached from the physical brain.*

Jerry, name one decision made by something, or anything, that is detached from the physical brain.

Oh, that's right - you just gave an example: the laws of physics.

So it turns out that, in fact, you are the one who believes that decisions can be made by something detached from the physical brain (the laws of physics).

Do you still find it "distressing?"

*The implications of these studies—that decisions can precede consciousness of having made them—even disturbed Libet, who, though admitting that his studies did cast doubt on “free will”, still opted for something dualistic: “free won’t.” That is, although one’s decision to do something might be decided in the brain before coming to consciousness, there was still a form of dualism in the decision to cancel or override one’s action.*

*That doesn’t make much sense, since cancellation is still something that takes place in the brain.*

Jerry, I don't think you realize the corner you just painted yourself into: if it doesn't make sense because cancellation takes place in the brain, then it follows that the only way for it to make sense would be for cancellation to take place outside the brain.

See the problem Jerry?

You already admitted that cancellation takes place in the brain. Therefore, you are the one who isn't making any sense, not Libet.

*If you think about it for a minute, you can see that canceling or overriding a decision can in fact derive from simialar physical and neural antecedents as making a decision itself. That is, there’s no substantive difference between deciding to do something and then deciding not to do it.*

Jerry, one process initiates and implements a decision, while the other initiates and then halts the implementation of the decision. The initiation of the decision is not just similar, but identical in each case; but please explain the similarity you see between implementing a decision and halting one? Are you sticking with your defense: because both "take place in the brain?"

If a decision is finalized before the subject is consciously aware of the decision, how do you explain the subject's ability to cancel that decision?

And which physical and neural antecedents are you claiming are similar between implementing a decision and overriding one?

*After all, both are decisions*

Jerry, that's true: but decisions with opposite effects. In one case you fire the bullet; in the other case, you don't. I would venture that for the person standing in front of you ... that's a pretty significant difference.

*and both might be predictable in advance by brain scans.*

Jerry, "might be?" So now you bolster your argument with ... "might be?"

Very persuasive Jerry. I'm sure the researchers in Germany are already considering retracting their study.

*I find this whole area of research fascinating because of its implications for how we make “decisions.”*

Jerry, that's an odd statement coming from a Determinist who doesn't believe we possess the ability to "make decisions."

*A new paper in Proc. Nat. Acad. Sci.by Matthias Schultze-Kraft et al. investigates how the brain works when it cancels a decision.*

Jerry, if Determinism is true, how could a decision get canceled?

If it were meant to be, then it couldn't be canceled, could it?

And if it were not meant to be (it gets canceled), why would your deterministic universe initiate it in the first place?

Did it just want to practice its canceling skills?

(now Jerry describes the experiment)

*Subjects were shown a green light, and then asked to push a button with their foot after counting (to themselves) two seconds after they saw the green light. An electromyogram (EMG) was connected to the button-pushing leg to detect when movement began. And an electroencephalogram (EEG) was connected to the head to monitor brain activity. (The average time to press the button after the green light went on was 5.4 seconds.)*

*After some human examination of the EEG’s, these brain readouts were analyzed and then programmed so that the scans themselves would flash a red light when the computer detected that the subject had started the “readiness potential” in the brain to push the button. The subject would then get “points” (towards a reward, I presume) if, after seeing the red light, they managed to NOT press the button. In other words, the subjects were asked to cancel a movement whose processing had already begun in the brain, but which had not yet produced a movement.*

*The readiness potential in the brain began about one second before the muscles gave an EMG reading from the leg muscle, and there was another 0.3 seconds before the button was actually pressed. The computer was trained for each subject based on their observed RPs, and when the RP crossed a threshold, the computer program turned on the red light, telling the subject “DO NOT PRESS BUTTON!”*

*Because of variations in threshold crossing and onset of an individual’s RP, the light went on at various times before the EMG lit up and before the subject pressed the button. Sometimes the red light didn’t go on, and subjects pressed the button. But sometimes the red light did go on but they still pressed the button, giving us the Big Result:*

 *If the red light went on 200 milliseconds or less before movement began, subjects could not help starting their move toward pressing the button.*

*In other words, there’s a “point of no return” that occurs about 0.8 sec after the RP has started (but before the muscles move), after which—even if the subject sees the red light—he/she cannot help but move. Now sometimes they can still avoid pressing the button itself, but their leg is still moving towards it.*

*What does this mean? Well, it doesn’t show that there’s “free won’t”.*

Jerry, what a shock. I never would have guessed that you would come to that conclusion. But actually, you didn't come to that conclusion, did you?

You *started* with that conclusion (google: "confirmation bias").

However, that is not the conclusion that the researchers came to, but then again, what would they know?

Just like Libet, they too misunderstood the results of their own experiment. Good thing you are here to correct them and tell them how to properly interpret their results.

*After all, the subjects are cancelling their movement (the “won’t”) as a reaction to seeing a light: an environmental stimulus rather than some conscious “decision”.*

Jerry, Libet already showed us that the conscious mind is not quick enough to initiate a decision to act. You have made it clear that you understand this. So for you to now claim that canceling a movement must be the result of a conscious decision ... is disingenuous.

Since the environmental stimulus could not possibly have stopped the movement by itself, perhaps you could tell us what you believe stopped the movement?

*What it does say is that there appear to be physical constraints in cancelling a decision, so that even if you “want” to to get your reward, you can’t. Now the constraint, I think, is likely to be the reaction time to the red light: that is, there’s a certain time you need to see the light, process the information in your brain, and then use it to send a signal to your leg to stop moving; and that time is about 200 milliseconds. In other words, you could still have “free won’t,” but this experiment says little about it. In fact, I’m not sure that this experiment CAN say anything about “free won’t”, since you are not making a “conscious” cancellation but are told to cancel in response to a light.*

Jerry, why do you think that free will can only be exercised by the conscious mind? Why do you exclude the possibility that the subconscious mind can also play a role? And when you say "told to cancel," what exactly is being told?

Jerry, when playing "Flight of the Bumble Bee" (a very fast tune) on the piano, there is simply no time to be conscious of every key stroke. Were we to try to consciously strike every key, the tune would probably sound more like "Amazing Grace."

<https://www.youtube.com/watch?v=3nayOQ8zZrA>

<https://www.youtube.com/watch?v=IzdwwX3_SI4>

How do you explain the pianists' ability to veto every errant keystroke?

Oh that's right, as a Determinist, you believe that free will is an illusion. Therefore, the pianist does not choose which keys to play.

(and remember sports fans: earlier Jerry called free will "spooky")

*But what it does show is that what is determined by unconscious brain activity is reversible by an external stimulus.*

Jerry, the external stimulus did not stop the action. The external stimulus was the signal upon which the mind acted ... to stop the action.

That was a pretty significant misunderstanding on your part, Jerry.

*What would truly refute the notion of “free won’t” is the demonstration that cancellation of a movement itself previously decided and predicted by brain activity can show up as a brain signal (i.e., the cancellation can be predicted) before you’re conscious of it.*

Jerry, so now you are betting all your nickels on the desperate hope that a hero will come along and refute veto power?

Jerry, you should google "wishful thinking."

*The authors report 2 studies of “spontaneous self-cancellation”, and one of them might indeed give evidence against “free won’t”, but I haven’t read it.*

Jerry, "might give evidence."

This is getting embarrassing. This isn't an argument - it's simply a desperate attempt at a rebuttal, to a study that came out, which contradicted what you believe to be true.

*Perhaps readers can and report back. But since cancellation is a brain output qualitatively similar to an “action” decision, I can’t imagine why there wouldn’t be libertarian free will but could be libertarian “free won’t”.*

Jerry, your argument has now added the all-powerful "I can't imagine why."

Compelling ... would be an understatement.

After reading this essay, I think those authors in Germany should retract their paper. Their work in their own field couldn't possibly stand up to the razor-sharp rebuttal that you just wrote.

*The authors of this paper themselves don’t appear to accept dualistic free will or free won’t (“free won’t”, of course, is just a form of free will), as is clear from their discussion.*

Jerry, as scientists, perhaps they don't choose to assert that they have discovered the answer to free will ... as you have.

*As you see below, they discuss their results in terms of naturalistic, materialistic brain phenomena, with cancellation associated with specific brain regions. Here’s an excerpt from the paper.*

Jerry, let's just skip over the excerpt and resume where you continue your essay.

*At least one article (in Gizmodo) has suggested that this study gives some evidence for dualistic, libertarian free will, arguing that “the ‘readiness potential’ doesn’t govern our brain.” But I don’t think this study gives any solace to advocates of libertarian free will. All it shows is that a decision made by the brain, and later arriving at consciousness, can be halted by an external stimulus that also impinges on the brain.*

Jerry, the movement was not halted by the external stimulus - it was halted by the reaction of the brain to the external stimulus.

At this point Jerry, I don't think retraction of the study is sufficient. This powerful essay of yours should be used to justify confiscating every single one of their lab coats.

*That’s exactly what we predict from the notion that the brain is a computer,*

Jerry, this was a classic case of confirmation bias. You obviously did not read their paper with the intention of objectively evaluating it, but rather, with the intention of finding weaknesses that you could exploit to promote your deterministic world view.

You have battled evolution deniers so long that you have become just like them. You have not offered a single piece of evidence to support your position; and that is the only fact that really matters.

*that consciousness is an epiphenomenon that often follows a brain’s “decision”,*

Jerry, you should check out this link:

<https://en.wikipedia.org/wiki/Calvinism>

The only difference I see is that they have a magic ghost and you don't. Otherwise ... it's the same shit.

*and that we can affect the working of the brain by changing the environment of the brain-owner.*

Jerry, we are not disputing that the environment affects our brain. What we are disputing is that you think that the environment ...

controls our brain. (NOTE: Jerry never did reply to this email)

<https://whyevolutionistrue.wordpress.com/2016/01/24/new-paper-on-free-wont-and-its-relevance-to-free-will/>

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

THE SCIENCE SEGMENT

The strength of brain connectivity in older adults

varies with fitness level

Age-related differences in brain health, specifically the strength of connections between different regions of the brain, vary with fitness level in older adults. The greater cardiorespiratory fitness (a measure of aerobic endurance) relates to stronger brain connections and likely improves long-term brain function in aging populations.

There are many ways to measure brain health across the lifespan. One popular technique measures the strength of connections between different parts of the brain while the person is completing a task or during wakeful rest. The latter is known as resting-state functional connectivity. Research has shown that some of these connections weaken with increasing age and indicate deteriorating brain health.

Using functional magnetic resonance imaging, researchers measured the strength of these connections throughout the brain in younger and older adults at rest. As expected, most connections were weaker for older adults when compared with younger adults.

Researchers then examined the role of cardiorespiratory fitness on resting-brain connectivity in older adults. Fitness is determined by how efficiently someone uses oxygen during physical activity such as running on a treadmill.

The benefits of fitness seem to occur within the low-to-moderate range of endurance, suggesting that the benefits of fitness for the brain may not depend on being extremely fit.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FAMOUS QUOTES

William James (1842–1910) 68 years

He was an American philosopher and psychologist who was also trained as a physician. The first educator to offer a psychology course in the United States, James was one of the leading thinkers of the late nineteenth century and is believed by many to be one of the most influential philosophers the United States has ever produced, while others have labeled him the "Father of American psychology."

"Thinking is what a great many people think they are doing

when they are simply rearranging their prejudices."