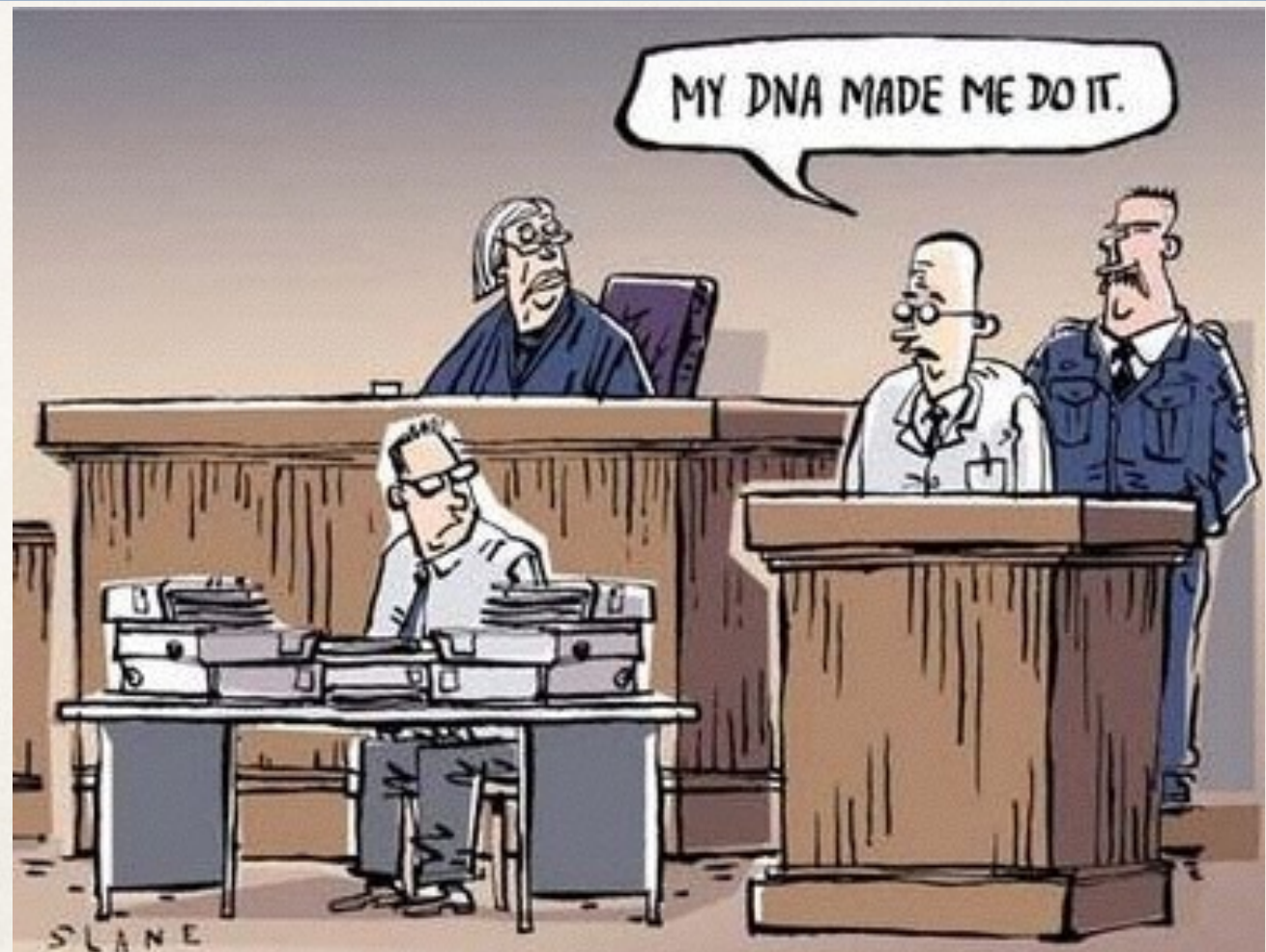


Are the Future and Our Actions Predetermined in Advance?



What Does it Mean That Everything Is Predetermined in Advance?

Determinism

According to the laws of nature, every event is caused by another event which in turn is caused by yet another event and so on.

The causal chain that leads to the occurrence of an event is such that the event in question must happen (or it cannot *not* happen).

Think of an object falling down. If I am holding an object at a certain height and I let it go, the object will fall down because of gravity. It is predetermined that it would fall downward. When the object is let go, it must fall—it cannot *not* fall.

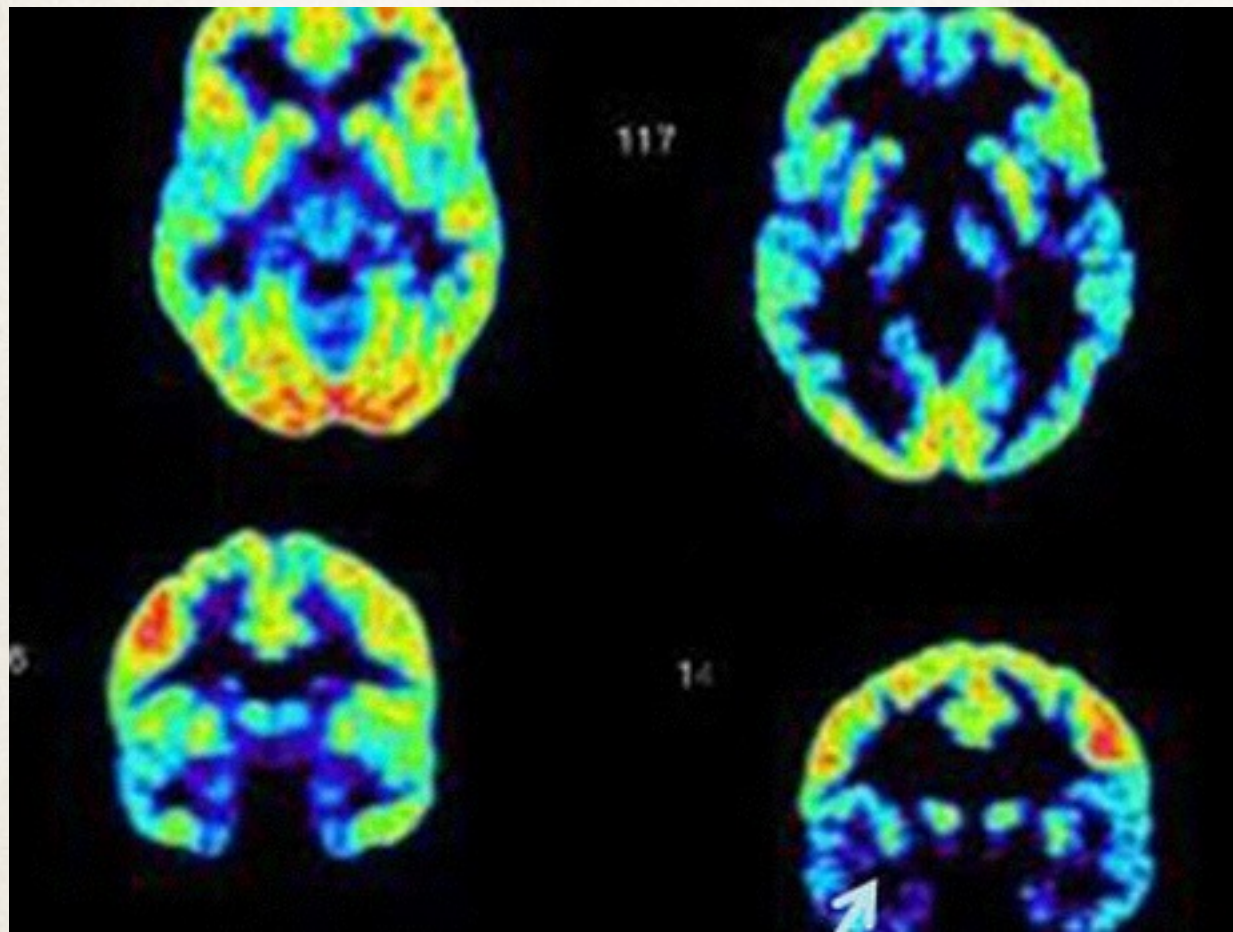
Now, if you extend this picture to everything that happens, even to human actions, that's determinism.

Arguments for the Conclusion that Everything is Predetermined

Finding from genetics

Findings from neuroscience

Findings from Neuroscience



Jim Fallon from the University of California at Irvine studied the brains of people who committed violent crimes. He compared their brains with the brains of non-criminals. *He found a correlation between brain activity and crime.* The brain on the right belongs to a criminal and the brain on the left belongs to a non-criminal.

Findings from Genetics

Jim Fallon from the University of California at Irvine also found that those who committed violent crimes typically have what has been called the "**warrior gene**"—a particular gene that is associated with violent behavior.

Jim Fallon, however, also found that he himself has the warrior gene, although he has never committed a crime!

So, one's genetic makeup is not sufficient to trigger violent behavior. The warrior gene simply *predisposes* one to violence.

Still, the combination of the warrior gene *plus* a certain social environment might very well cause criminal behavior.

Warrior Gene Predicts Violent Behavior in Response to Provocation

*“There is some evidence of a main effect for genotype and some evidence for a gene by environment interaction, such that MAOA [=warrior gene] is less associated with the occurrence of aggression in a low provocation condition, but **significantly predicts such behavior in a high provocation situation.**”*

“Monoamine oxidase A gene (MAOA) predicts behavioral aggression following provocation” by McDermotta, Tingleyb, Cowdenc, Frazzettod and Johnstone in Proceeding of the National Academy of Science of USA, 2009

In other words, people with the warrior gene are more likely to behave violently than people without the warrior gene, provided they are provoked.

The Warrior Gene in the Courtroom

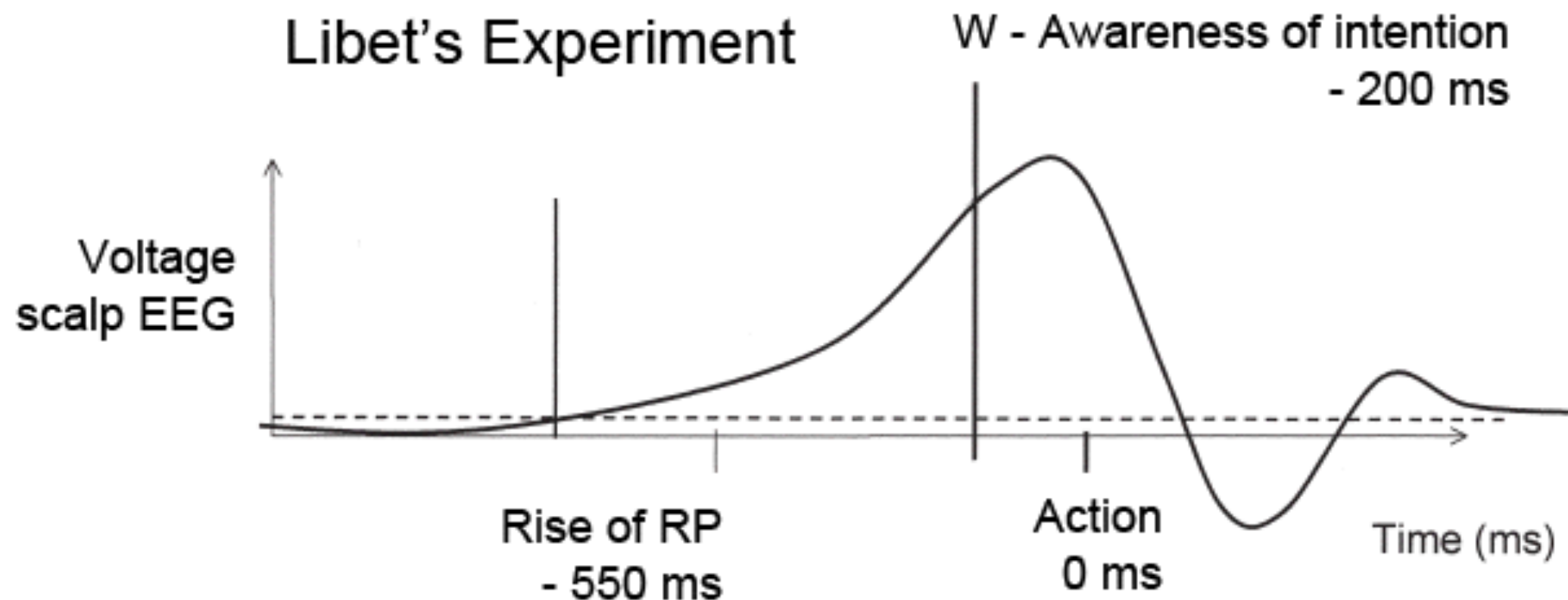
2009 Tennessee. Bradley Waldroup was accused of murder but the jury convicted him of a less severe crime because experts for the defense testified that Waldroup, first, had the warrior gene, and second, was abused as a child.

“Do Our Genes Excuse Immoral Behavior?”

<http://www.youtube.com/watch?v=4JldJFUgWyw>

But can we let pedophiles, rapists and murderers off the hook because they have the warrior gene and grew up in a violent environment?

Libet's Experiment in the 1980's



Brain activity in the form of the *Readiness Potential* starts 550 ms before the action, although the conscious intention to act occurs only 200 ms before the action. *Brain activity precedes our intention to act.*

How the Experiment Was Conducted

Box 1 | Measuring conscious intention

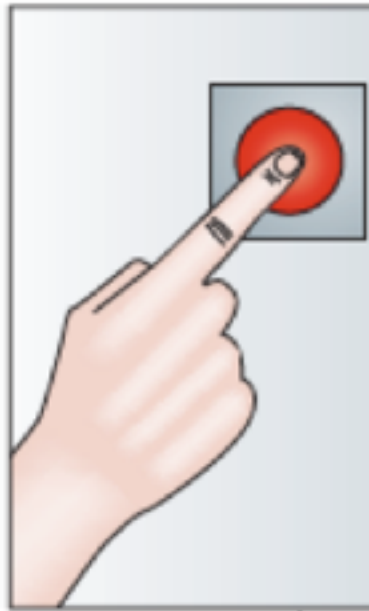
1 Observe clock



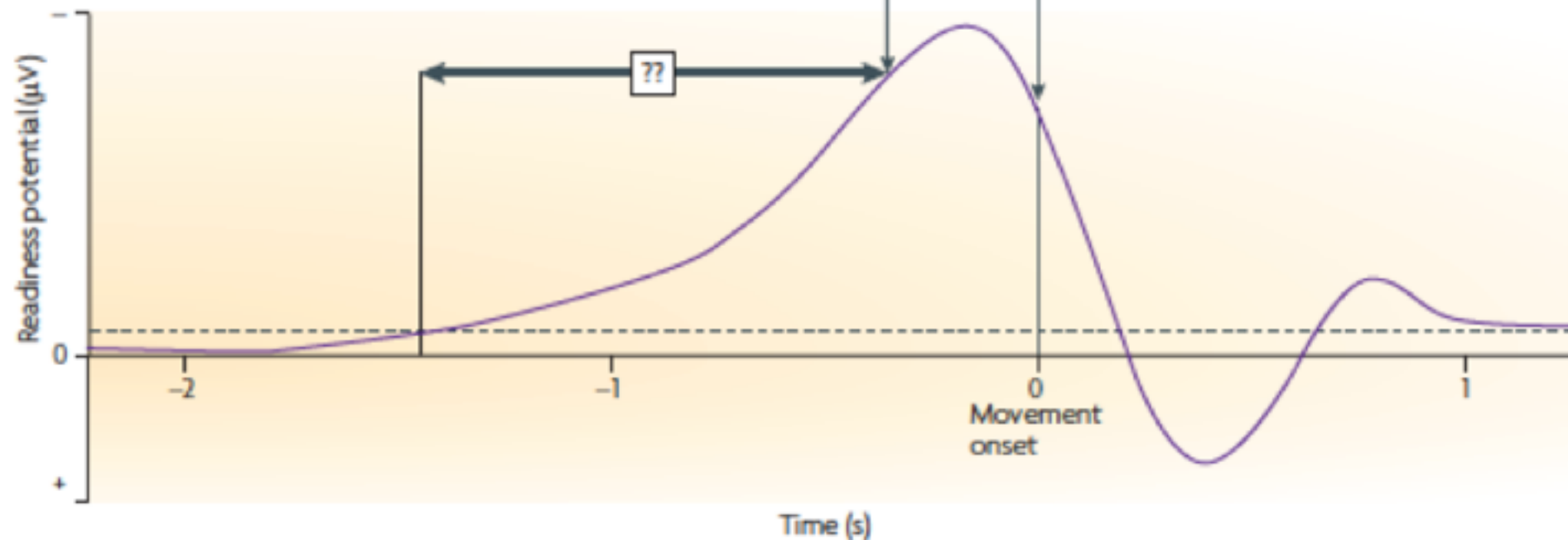
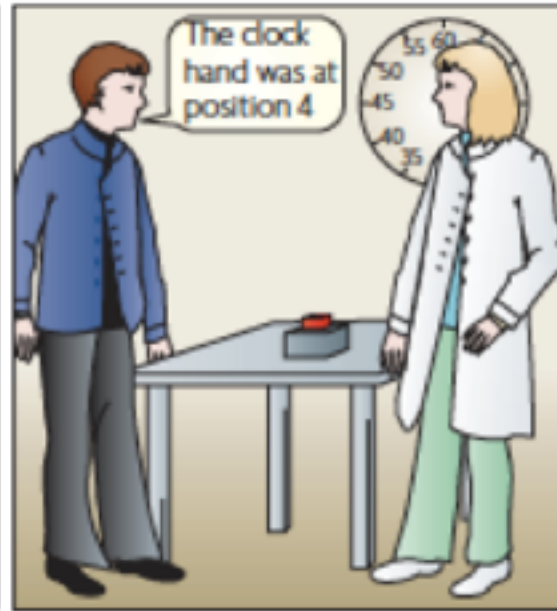
2 Note clock position at time of conscious intention (urge to act)



3 Perform action



4 Report clock position at time of conscious intention



Subjects were asked to report when they felt the intention to act by looking at a clock. The clock was not a normal clock but allowed greater precision.

Another Experiment

John-Dylan Haynes from the Bernstein Center for Computational Neuroscience in Berlin conducted an experiment that shook his view of life. In the experiment, subjects were put into a brain scanner and shown a series of random letters. The subjects were free to press a button with either their left or right index fingers whenever they felt the urge, but were told to note the letter showing when they made this decision.

... the *conscious decision* to press a button occurred about **a second before** the act was performed.

....the observation of *patterns of brain activity* could predict the decision up to **seven seconds in advance** with reasonable accuracy.

Unconscious determinants of free decisions in the human brain.

Soon CS, Brass M, Heinze HJ, Haynes JD.

Published in Nat Neurosci. 2008 May;11(5):543-5.

The Significance of the Libet's and Haynes' Experiment

These experiments suggest that our decisions are predetermined in advance.

1. Both experiments show that our conscious decisions are preceded by some electrochemical activity in the brain.
2. The patterns of electrochemical activity in the brain determine what our next action will be without us having any ability to change it; *see in particular the Haynes' experiment.*
3. Since the patterns of electrochemical activity in the brain are subject to the laws of nature, these patterns are predetermined in advance (just as it is predetermined that in letting an object go, it would fall toward gravity).

From John-Dylan Haynes' Website

“Decisions don’t come from nowhere but they emerge from prior brain activity. Where else should they come from?”

In theory it could be possible to trace the causal pathway of a decision all the way back to the big bang.

Our research shows that we can trace it back 10 seconds. Compared to the time since the big bang this is not very long.”