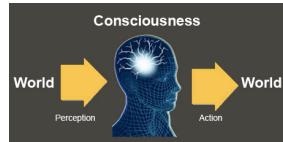


## 03- Neuroscience 1



Your brain constructs the internal mental world that helps you navigate through the environment. Along the way, there are shortcuts taken and tradeoffs made. In this class, we will explore whether the brain creates the ultimate illusion. Do humans have free will?

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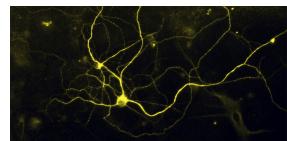
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## Neurons are communication cells.

A single neuron



A network of 302 neurons



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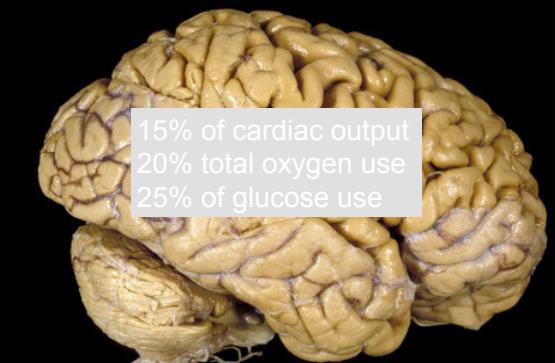
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## A network of 100 billion neurons.



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PNB is challenged with ancient puzzles from science and philosophy.

How does the mind-body create consciousness?

How is information coded in neural activity?

Are we living in The Matrix?

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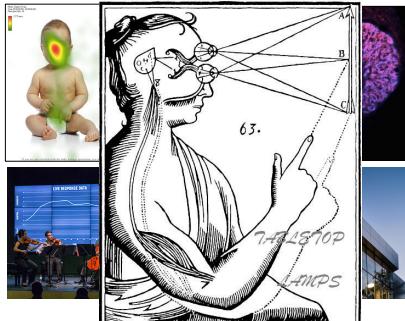


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Innovative tools allow researchers to scientifically investigate the brain.




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### The Matrix Problem

ARE YOU LIVING IN A COMPUTER SIMULATION?

BY NICK BOSTROM

[Published in Philosophical Quarterly (2003) Vol. 53, No. 211, pp. 243-255. (First version: 2001)]




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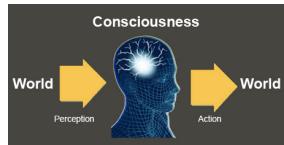
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**Naive realism** is the belief that we see reality as it really is (objectively and without bias); that the facts are plain for all to see; that rational people will agree with us; and that those who don't are either uninformed, lazy, irrational, or biased.

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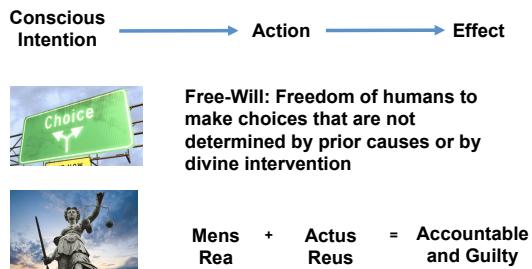
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### Mind – Body Flow of Causality




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### Do humans have free will?

- A. No. I agree with Determinists that free will is an illusion. Every event or action is the inevitable result of preceding events and actions and individuals are not in control of their fate.
- B. Yes. I agree with Libertarians that free will exists. Determinists are wrong. See, I chose this answer.
- C. Irrelevant. I am post-human.

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### Should you push the button?




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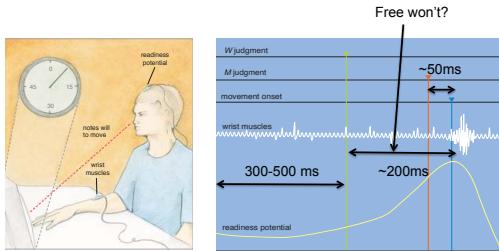


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### Libet's famous test of free will in the lab.



1. What are the implications of this study on free will?
2. What are criticisms that may limit the conclusions?

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Soon et (2008) followed up Libet used a more controlled design.

nature  
neuroscience

Unconscious determinants of free decisions in the human brain

Chun Siong Soon<sup>1,2</sup>, Marcel Brass<sup>1,3</sup>, Hans-Jochen Heinze<sup>4</sup> & John Dylan Haynes<sup>1,2</sup>

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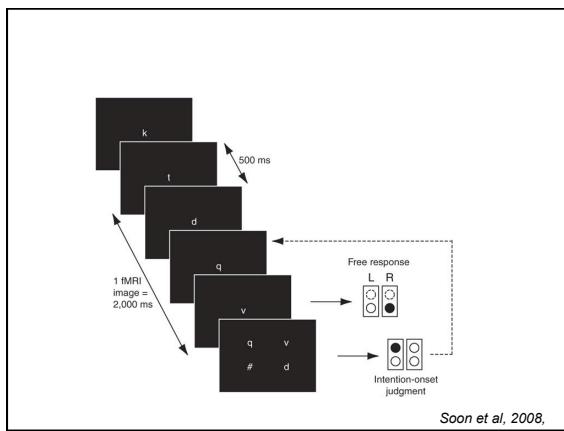
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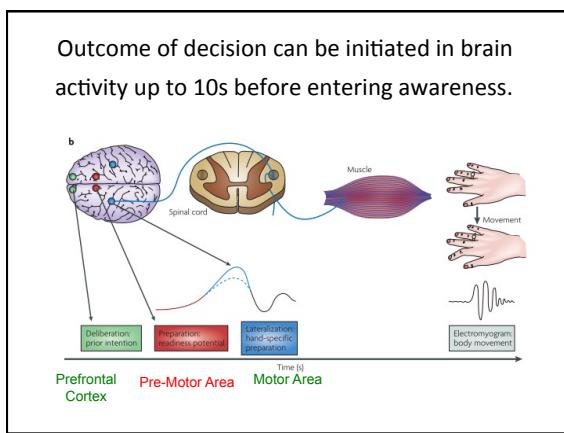
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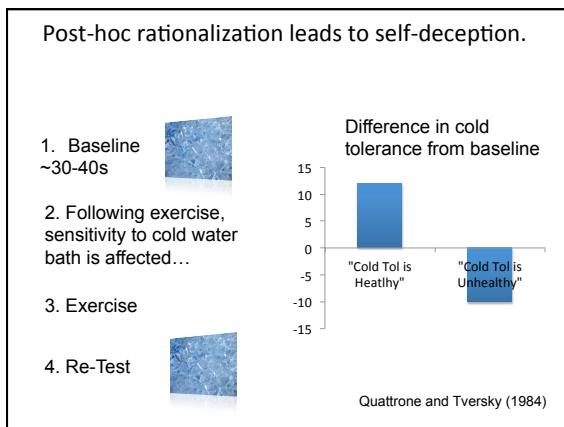
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## **Aside: Seductive Allure of Neuroscience**

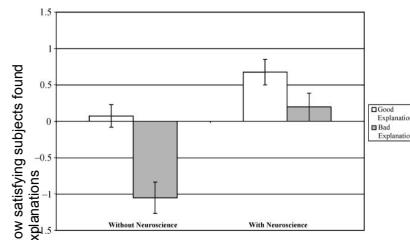
(Weisberg et al, 2008)

**Example:** Authors gave participants a story about how hard it is for people to estimate other peoples' knowledge without being biased by their own knowledge. They called it the "curse of knowledge"

**Sample Item**

	<i>Good Explanation</i>	<i>Bad Explanation</i>
Without Neuroscience	The researchers claim that this “curse” happens because subjects have trouble switching their point of view to consider what someone else might know, mistakenly projecting their own knowledge onto others.	The researchers claim that this “curse” happens because subjects make more mistakes when they have to judge the knowledge of others. People are much better at judging what they themselves know.
With Neuroscience	<b>Brain scans indicate that this “curse” happens because of the frontal lobe brain circuitry known to be involved in self-knowledge.</b> Subjects have trouble switching their point of view to consider what someone else might know, mistakenly projecting their own knowledge onto others.	<b>Brain scans indicate that this “curse” happens because of the frontal lobe brain circuitry known to be involved in self-knowledge.</b> Subjects make more mistakes when they have to judge the knowledge of others. People are much better at judging what they themselves know.

Neuroscience makes bad explanations more satisfying!



Weisberg et al, 2008, *Journal of Cog Neuroscience*

Do you have questions, comments  
and interesting links to share about  
this lecture?

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@ProfJoeKim