

Methods (Concl'd) & Psychological Science And The Brain



PSYCH 1101

PROF. DAVID PIZARRO
DAY 5

Using EEG & TMS To “Remote-Control” A Human Being

Direct Brain-to-Brain Communication in Humans: A Pilot Study

August 12, 2013



Neural Systems Laboratory (NSL)
Department of Computer Science
and Engineering

Cognition & Cortical Dynamics
Laboratory (CCDL)
Institute for Learning and Brain
Sciences (ILABS)

University of Washington, Seattle, USA

© 2013 R.P.N. Rao and A. Stocco

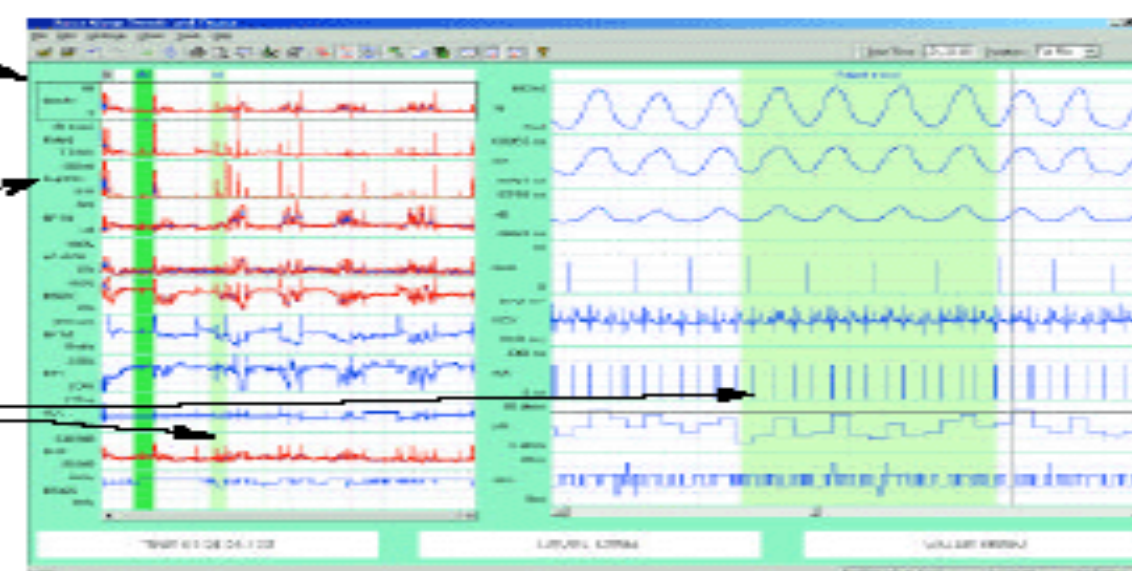
Physiological Methods



Trend view allows for an overall view of sleep study & gives indication of variability of ventilatory parameters throughout duration of study

delta EELV is a quality control measure & gives indication of movement during sleep

Shaded sections indicate areas of interest & allow user to focus on specific component while viewing entire file.



Basic Sleep Trends and Traces

Developmental Methods

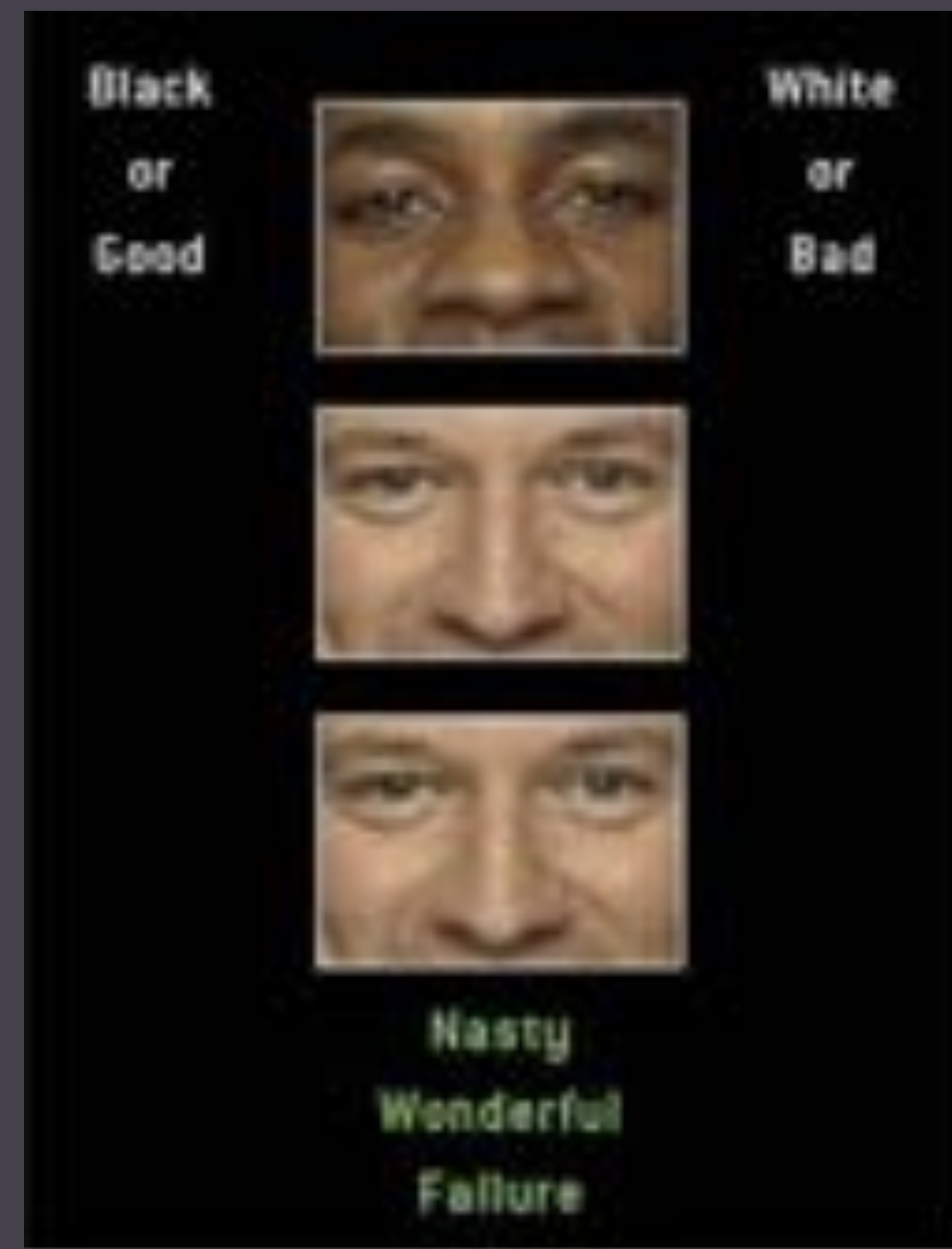
- Cross-sectional (e.g., compare 3 yr. olds to 5 yr. olds)
- Longitudinal (e.g., look at kids at age 3, then again at age 5).
- Twin Studies (identical vs. fraternal, reared together vs. reared apart)
- Experimental methods...

Example: Preferential Looking Techniques



Reaction Time Measures

- e.g, Implicit Associations Test (Greenwald, McGhee & Schwartz, 1998)
- Simple computer-based categorization task
- Measures association between concepts
 - e.g., race, age, gender and “good” vs. “bad”
- take one! <https://implicit.harvard.edu>



“Triangulating” Scientific Truth: Multiple Methods Yield Reliable Conclusions

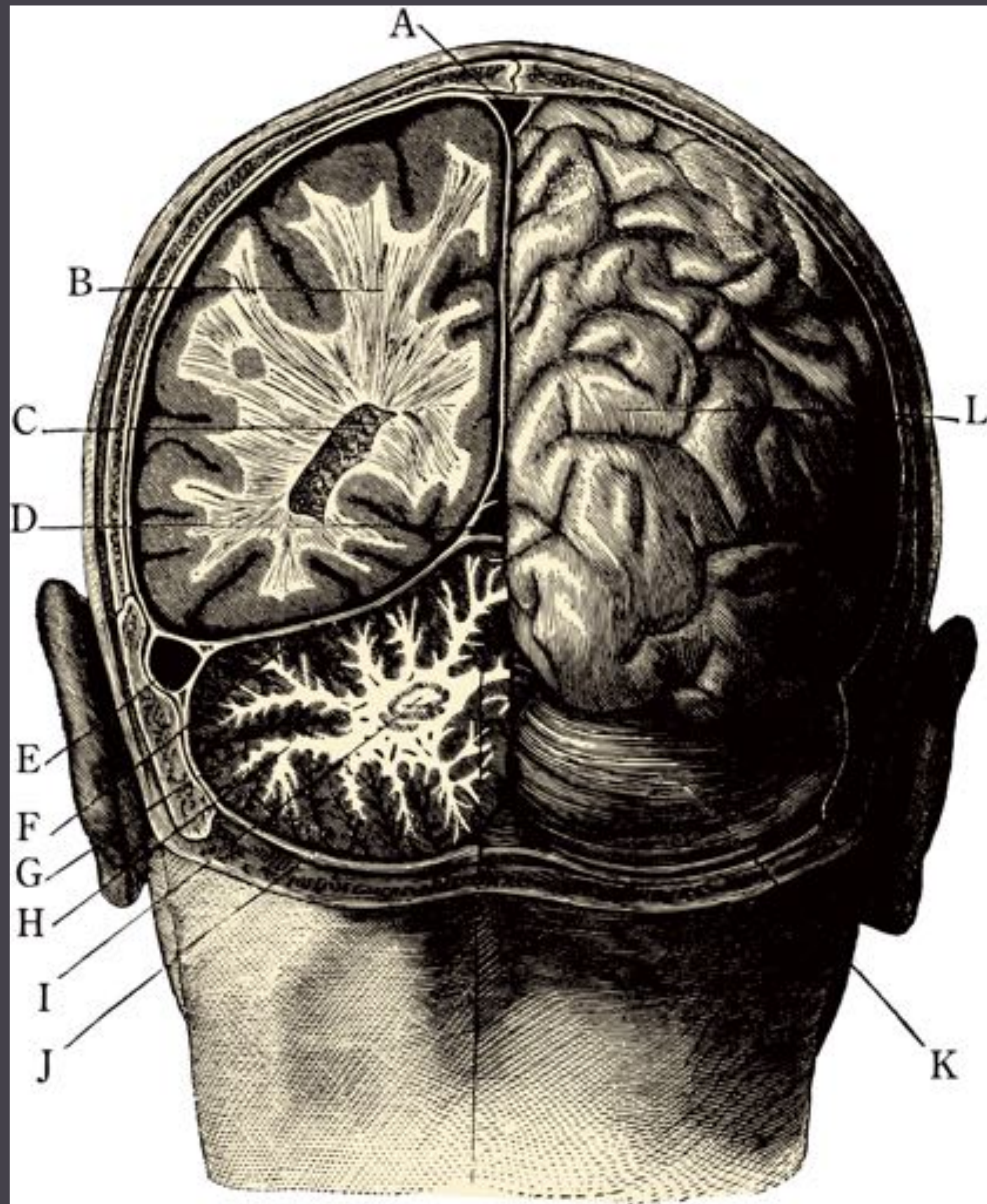
- Reliance on a single method yields limited ability to draw conclusion
- Progress comes from “triangulating”--looking across multiple levels of analysis, using various methods.
- We learn through poking, prodding, measuring, and repeating over and over again...

The Importance Of Paying Attention



ISAAC ASIMOV

“The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'That's funny...'”





V.S. RAMACHANDRAN

Psychology And The Brain: Some Basic Assumptions

- The brain is a *natural phenomenon*, and is therefore open to scientific investigation
- The brain is the immediate (i.e., proximal) cause of our thoughts, feelings, and behaviors--the things that psychologists study.
- Therefore:
 - Psychology is open to scientific investigation
 - To understand psychology (at one level of analysis, at least) we ought to understand the brain.

Sidenote: The Difference Between Neuroscience And Psychology

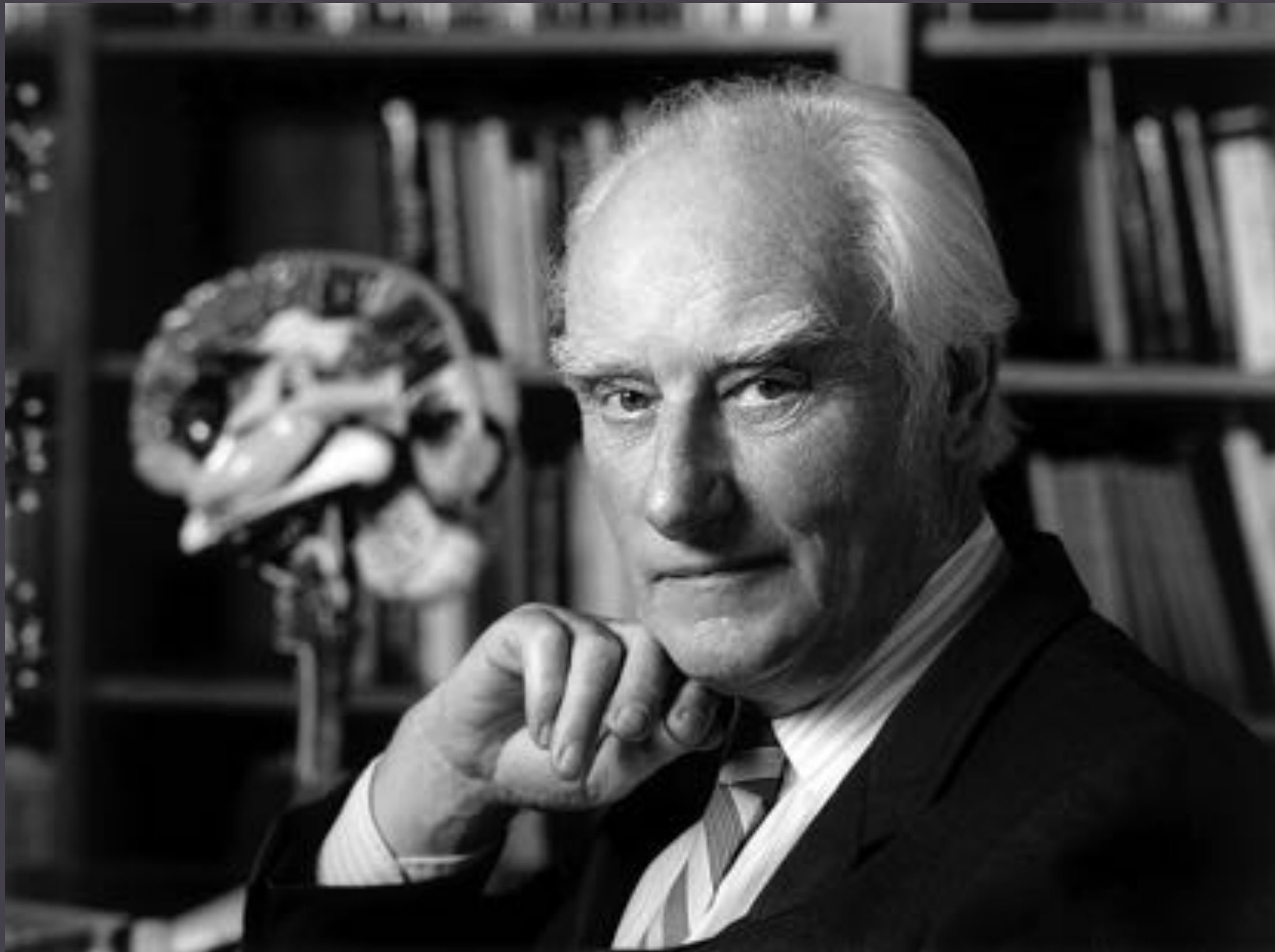
- Neuroscience is the study of the brain (the structure and function of the nervous system)
- Psychology is the study of the *mind*.
- Psychologists seek an understanding of how the brain works as a way to inform the working of the mind.
- Cognitive Neuroscience, Social Neuroscience, Clinical Neuroscience, Affective Neuroscience
- Important to note that many questions in psychology are not adequately answered at the level of analysis of the brain. (hardware vs. software)

Why did it take so long for
psychology to become a science?

One Answer:

It is very difficult to come to terms with the belief that we (our hopes, dreams, thoughts, feelings, desires, etc.) are the result of a 3 lb. lump of jelly lodged inside the bones of our head.

The “Astonishing Hypothesis”



“The Astonishing Hypothesis is that “You,” your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll's Alice might have phrased it: ‘you're nothing but a pack of neurons.’ This hypothesis is so alien to the ideas of most people alive today that it can be truly called astonishing.”

FRANCIS CRICK



Dualism

- The belief that while bodies are physical, minds are immaterial.
- “I knew that I was a substance the whole essence or nature of which is to think, and that for its existence there is no need of any place, nor does it depend on any material thing ... that is to say, the soul by which I am what I am, is entirely distinct from body.”

RENEE DESCARTES (1596-1650)