

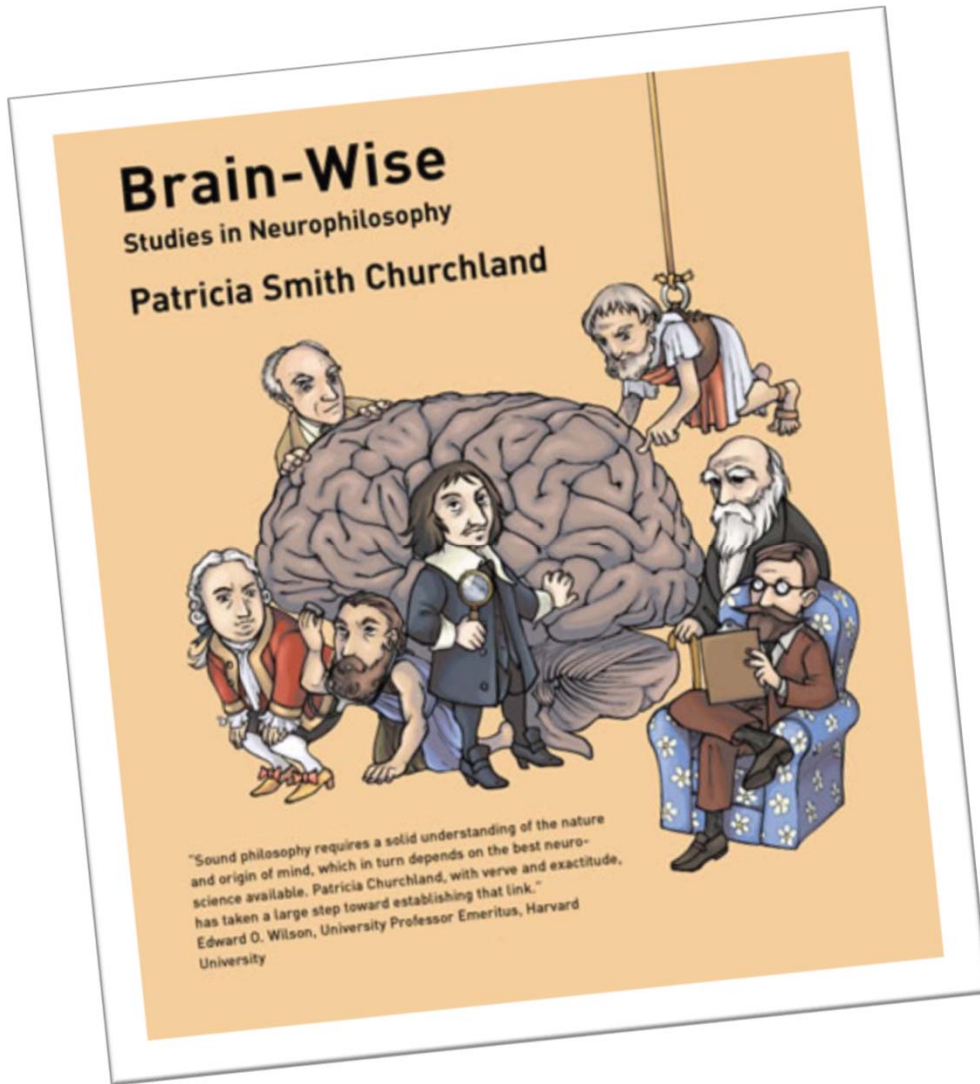


Introduction to **Metaphysics**

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LECTURE BASED ON READINGS FROM:



WHY NEUROPHILOSOPHY?

Nature of the mind

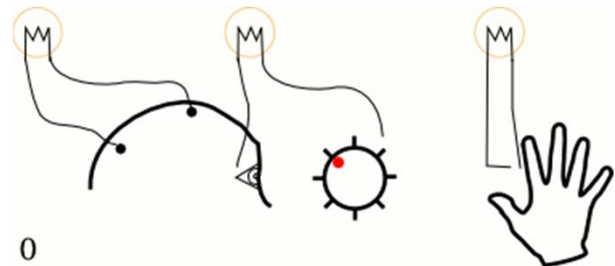
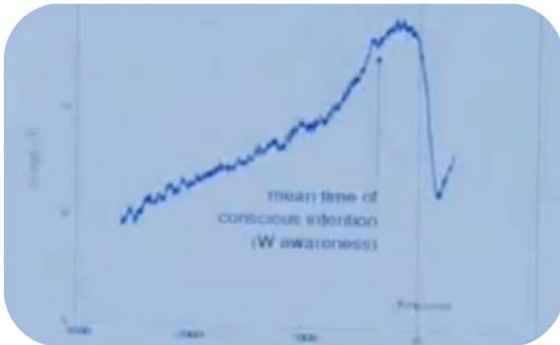
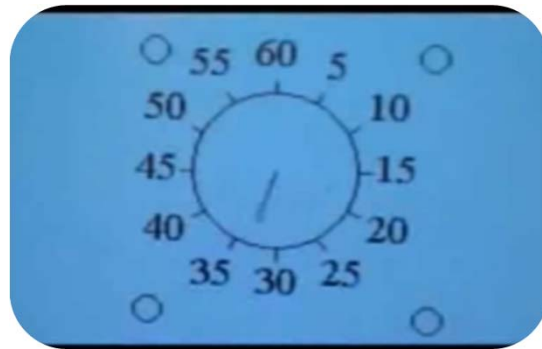
- Classically part of philosophy
- Thought about without insight from neuroscience.
- Topics traditionally included:
memory and learning
consciousness
free will

Intersection of Philosophy and Neuroscience

- Integrating the knowledge from neuroscience to answer questions posed by philosophers.
- Neuroscience techniques are at a point that they can address some of these questions.



CONSCIOUS FREE WILL



Researchers carrying out Libet's procedure would ask each participant to sit at a desk in front of the oscilloscope timer. They would affix the EEG electrodes to the participant's scalp, and would then instruct the subject to carry out some small, simple motor activity, such as pressing a button, or flexing a finger or wrist, within a certain time frame. No limits were placed on the number of times the subject could perform the action within this period.

During the experiment, the subject would be asked to note the position of the dot on the oscilloscope timer when "he/she was first aware of the wish or urge to act" (control tests with Libet's equipment demonstrated a comfortable margin of error of only -50 milliseconds). Pressing the button also recorded the position of the dot on the oscillator, this time electronically. By comparing the marked time of the button's pushing and the subject's conscious decision to act, researchers were able to calculate the total time of the trial from the subject's initial volition through to the resultant action. On average, approximately two hundred milliseconds elapsed between the first appearance of conscious will to press the button and the act of pressing it.



TERMINOLOGY-METAPHYSICS

origin

- The book after *Physica* by Aristotle

physica

- nature
- Questions on the nature of things.
- “Why do things fall?”

metaphysica

- Relevant for all sciences
- First philosophy
- *A priori*
- Pure



earth, air,
fire,
water



atoms



numbers

← BASIC ITEMS →



METAPHYSICS - METHODOLOGY

○ *Pure Metaphysics:*

- Metaphysical answers are beyond the reach of scientific methods - Churchland



Rock Bottom
Foundation
for all of
science.

function

- Purpose: to be the absolute foundation for all of science.

methods

- Pure reason, reflection, introspection, & meditation

status

- Science itself depends on how metaphysics turns out.



**ERROR FREE BEYOND SCIENCE
METAPHYSICS**

Advancements
in
Science

**CURRENT
DOMAIN
OF METAPHYSICS**



THE PRAGMATISTS



- Charles Sanders Peirce (1839 – 1914)
- No such thing as “rock-bottom” foundation for all of science.
- Scientific method is all that is needed.

• Scientific method

- Observation
- Experimentation
- Hypothesis formation
- Critical analysis

Use reason and introspection to guide initial impetus to study something.





- Willard Van Orman Quine (1908 – 2000)
- “There is no first philosophy.”
- Science is the bedrock of knowledge.



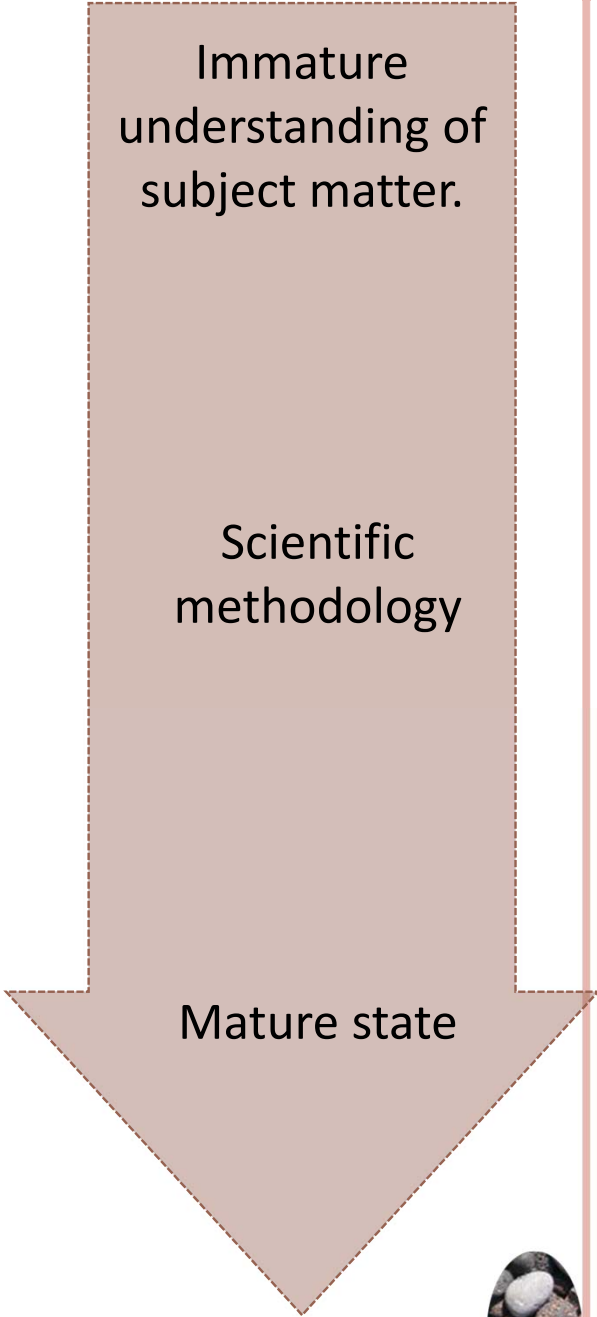
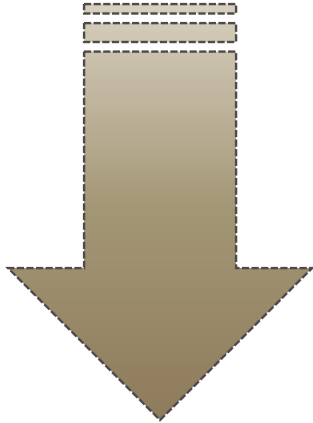
- “Nothing is more fundamental than science itself.”

Scientific
method

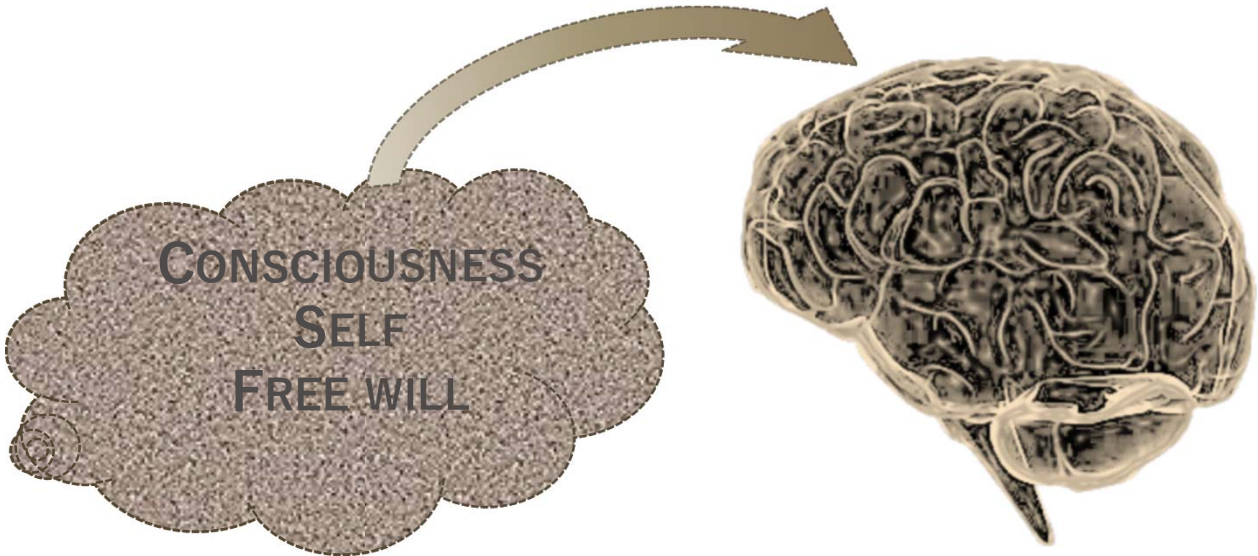
- There is no independent method for discovering the nature of reality than using science.



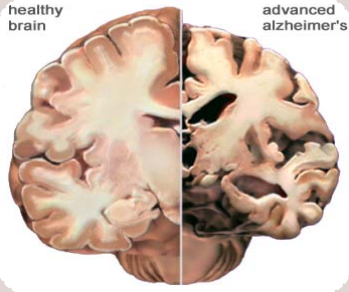
TODAY:
RE-CHARACTERIZE METAPHYSICS



IS THERE A MIND : BRAIN PROBLEM ?



DEPENDENCIES BETWEEN BRAIN STRUCTURES AND THE MIND:



Memory Loss
Alzheimer's Disease

Loss of Function
Motion Blindness

Shift in Consciousness
Sleep-Wake



SELECTIVE DISTURBANCE OF MOVEMENT VISION AFTER BILATERAL BRAIN DAMAGE

by J. ZIHL, D. VON CRAMON and N. MAI

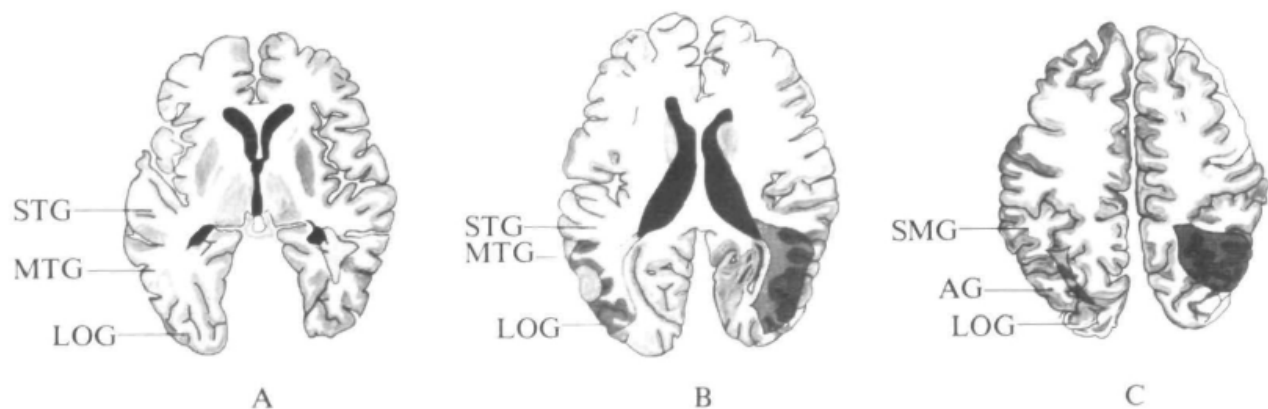
(From the Max-Planck-Institut für Psychiatrie, Kraepelinstrasse 10, D-8000 München 40, FRG)

SUMMARY

A patient who suffered bilateral posterior brain damage exhibited disturbance of movement vision in a rather pure form. The patient had no impression of movement in depth, and could only discriminate between a stationary and a moving target in the periphery of her otherwise intact visual fields. She had some movement vision in the central part of her visual fields, provided that target velocity did not exceed 10 deg/s. Neither did she possess visual movement after effects nor apparent (*phi*) visual movement. In addition, visually guided eye and finger movements were impaired. In contrast to the disturbance of movement perception in the visual modality, movement perception elicited by acoustic and tactile stimuli was not impaired.

On the basis of the localization of the cerebral damage (as judged by CT scanning and neuropsychological testing) it is concluded that the observed disorder in movement vision is due to bilateral cerebral lesions affecting the lateral temporo-occipital cortex and the underlying white matter.

The selectivity of the visual disturbance supports the idea that movement vision is a separate visual function depending on neuronal mechanisms beyond the primary visual cortex.



The visual disorder complained of by the patient was a loss of movement vision in all three dimensions. She had difficulty, for example, in pouring tea or coffee into a cup because the fluid appeared to be frozen, like a glacier. In addition, she could not stop pouring at the right time since she was unable to perceive the movement in the cup (or a pot) when the fluid rose.

Furthermore the patient complained of difficulties in following a dialogue because she could not see the movements of the face and, especially, the mouth of the speaker. In a room where more than two other people were walking she felt very insecure and unwell, and usually left the room immediately, because **'people were suddenly here or there but I have not seen them moving'**. The patient experienced the same problem but to an even more marked extent in crowded streets or places, which she therefore avoided as much as possible. She could not cross the street because of her inability to judge the speed of a car, but she could identify the car itself without difficulty. 'When I'm looking at the car first, it seems far away. But then, when I want to cross the road, suddenly the car is very near.' She gradually learned to 'estimate' the distance of moving vehicles by means of the sound becoming louder.

The patient, now 53-yrs-old, reported that her problems with moving objects and persons remained essentially unchanged since the first examination in 1980.

However, she now shows some adaptation to her disorder in that she tries to ignore visual motion as much as possible and especially avoids situations where many objects are moving simultaneously. In this way she is able to manage her household by herself (she lives alone), to go shopping and to use public transport. She has learned to cope to some extent with more than one person walking at the same time by trying intentionally to fixate on only one person at a time while ignoring all the others.

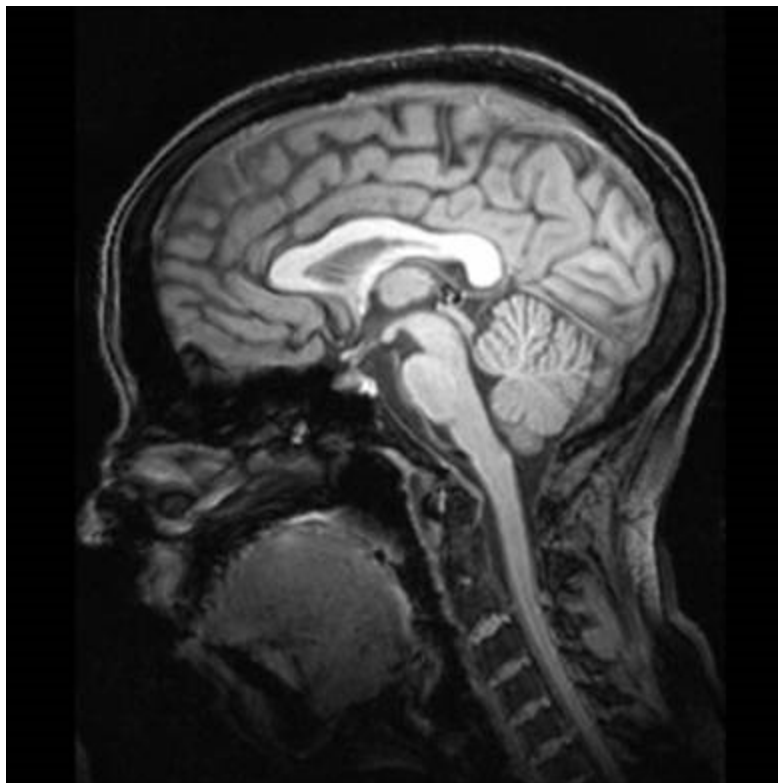
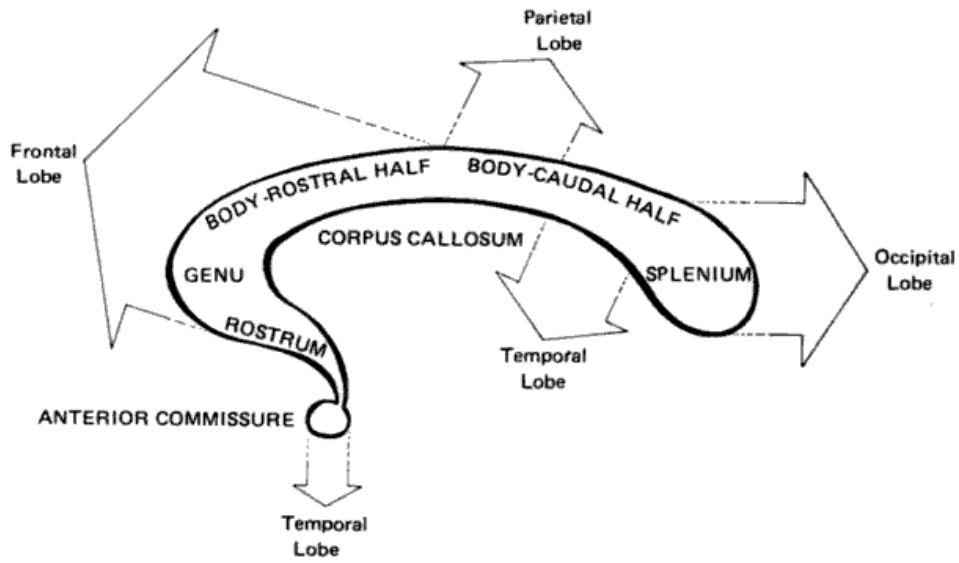
She uses a similar strategy in listening to a speaking person. She looks away from the face of the speaker, concentrating just on listening and thus not being disturbed by the unrest of the speaker's mouth. In contrast, she has never reported any difficulties in perceiving simultaneously several objects or persons when at rest.

Despite her efficient coping (verified by two of the authors several times outside the laboratory and the hospital), she cannot, for example, cross a road without traffic lights, because she is still unable to judge the speed of a car. If more cars are approaching, the situation is even more difficult and she gets extremely worried. Furthermore, she totally avoids crowded places and streets because 'the more people walk the more difficult and unpleasant it is'. The above mentioned improvement in coping with the movement vision disorder is, however, not sufficient to allow her to work.

VIDEO OF GISELA LEIBOLD

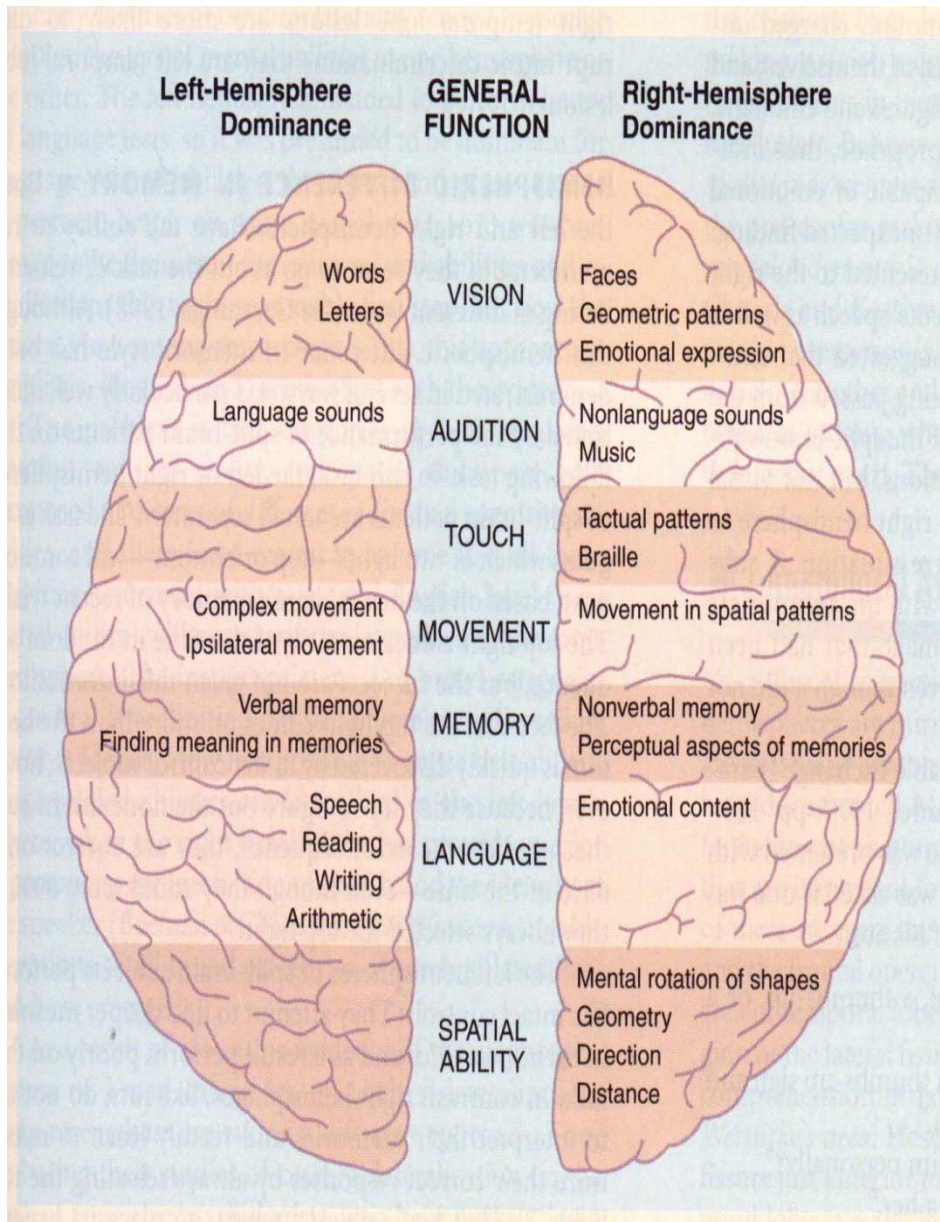


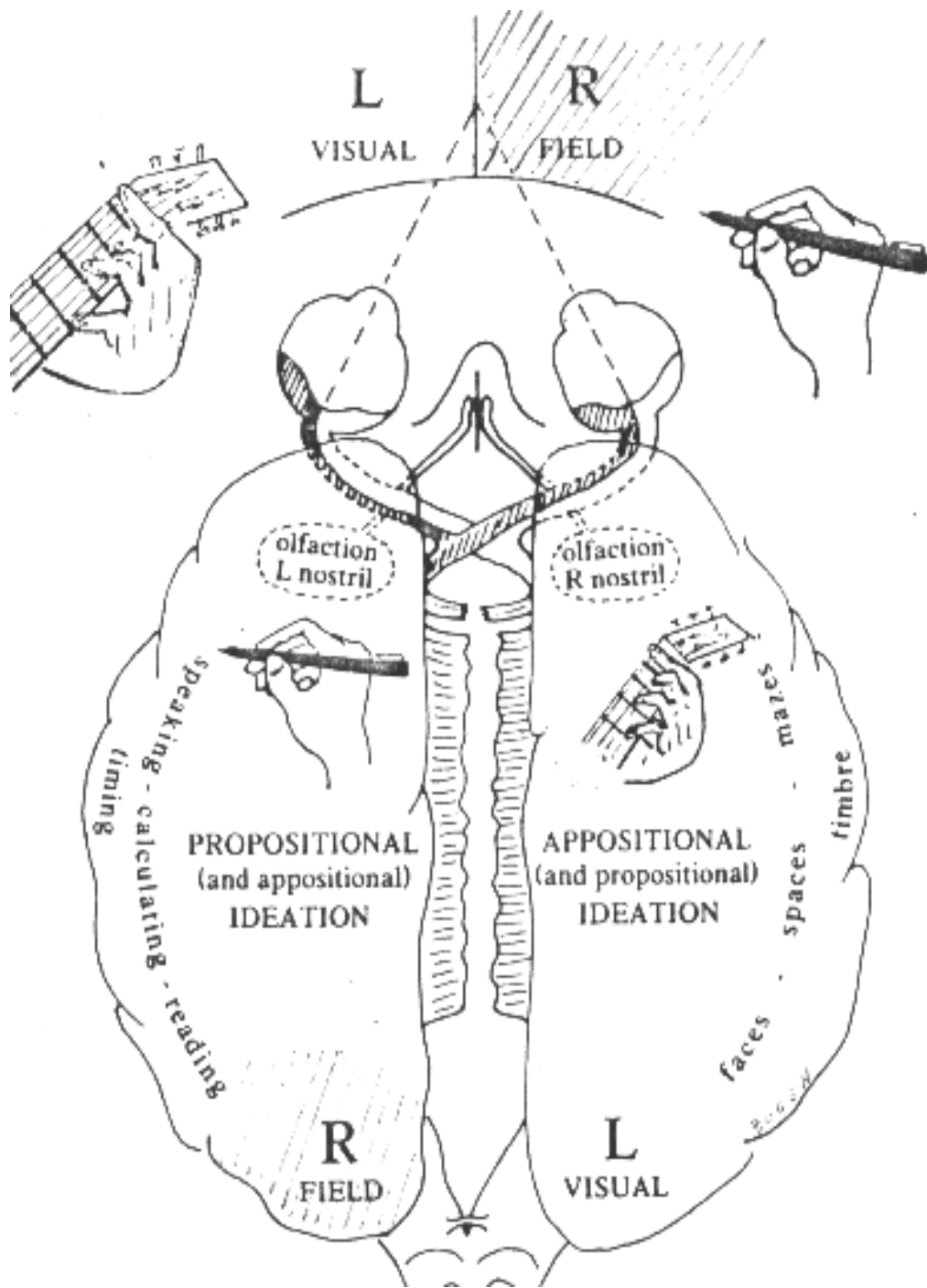
SPLIT-BRAIN = SPLIT-MIND?



Gazzaniga & LeDoux (1978) The Integrated Mind

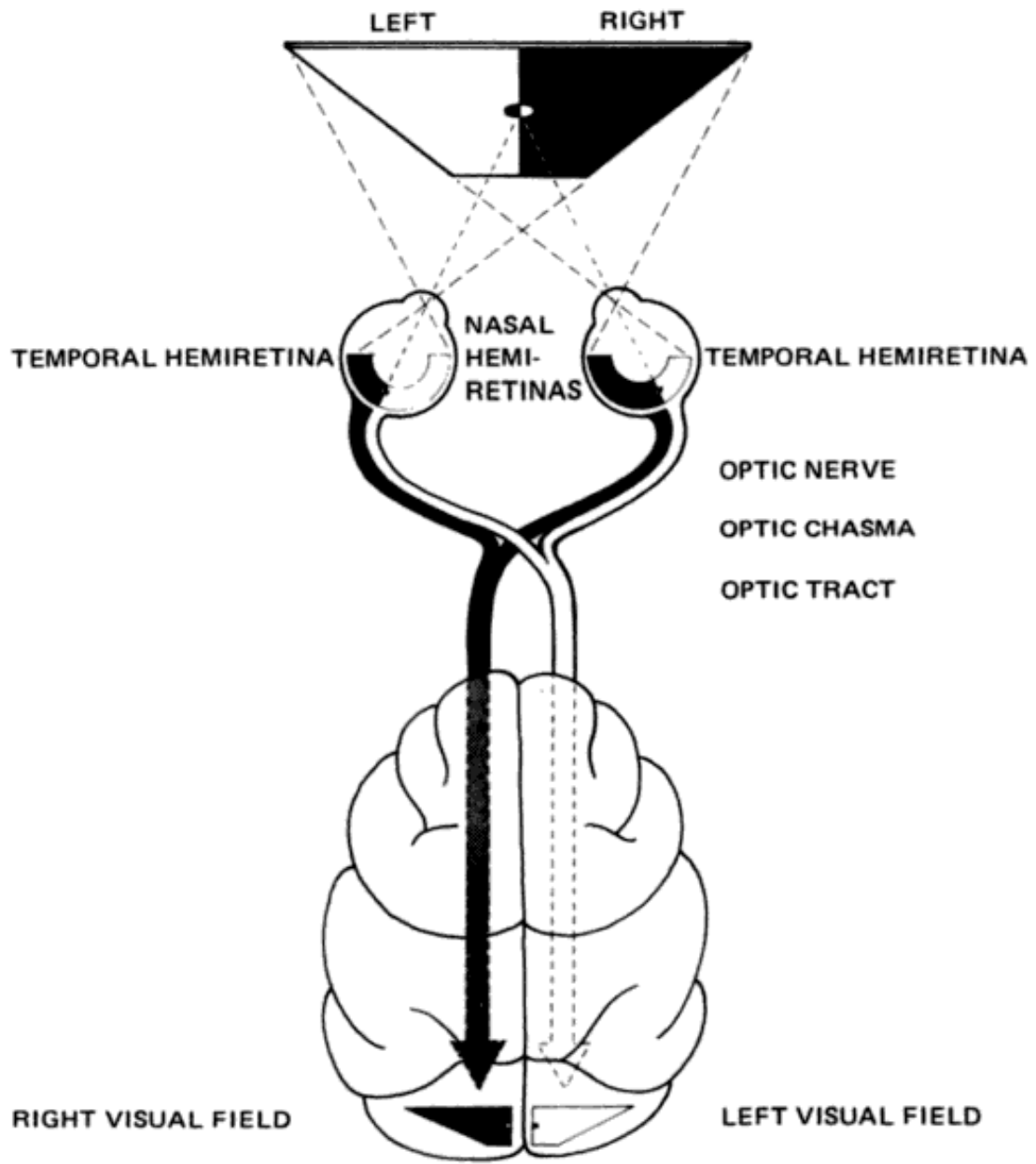
THE DIFFERENCE BETWEEN RIGHT AND LEFT...



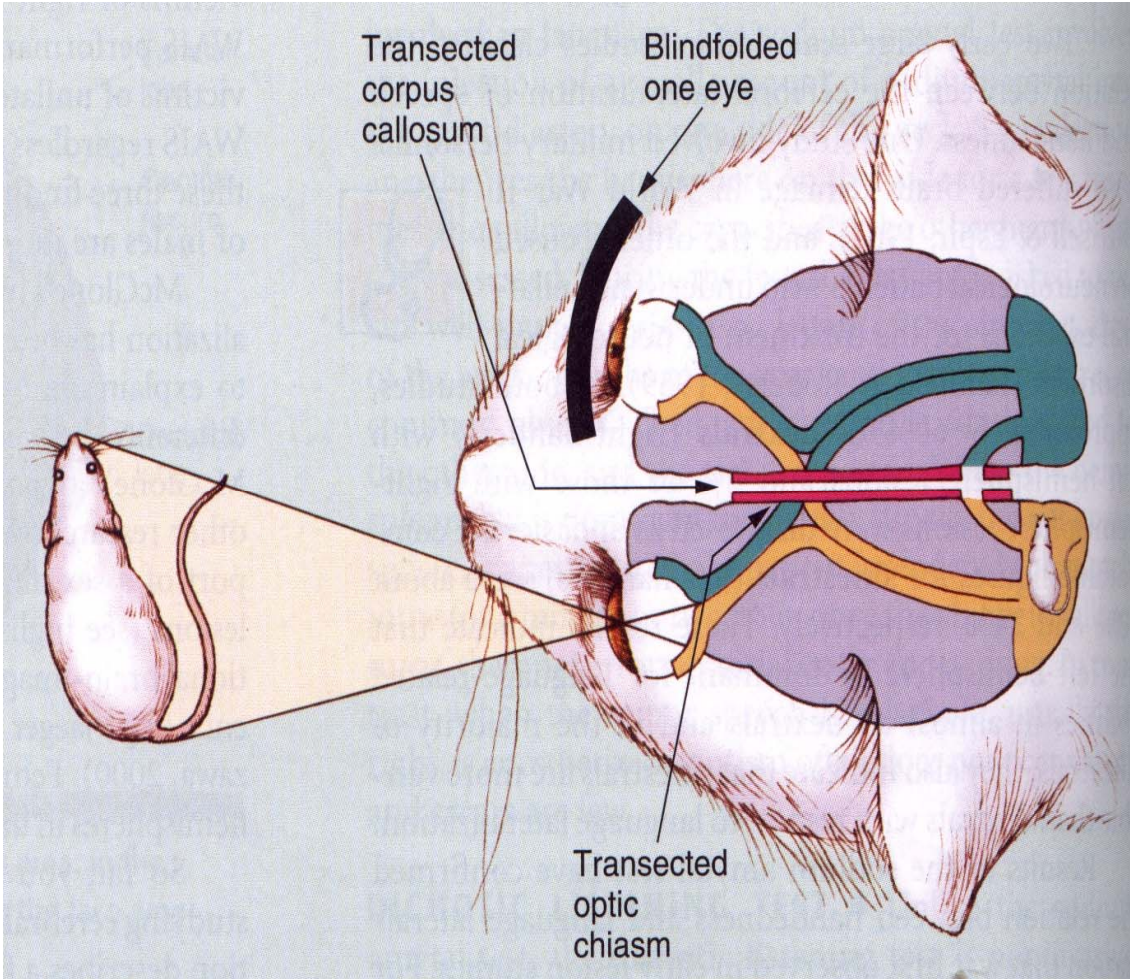


Joe Bogen

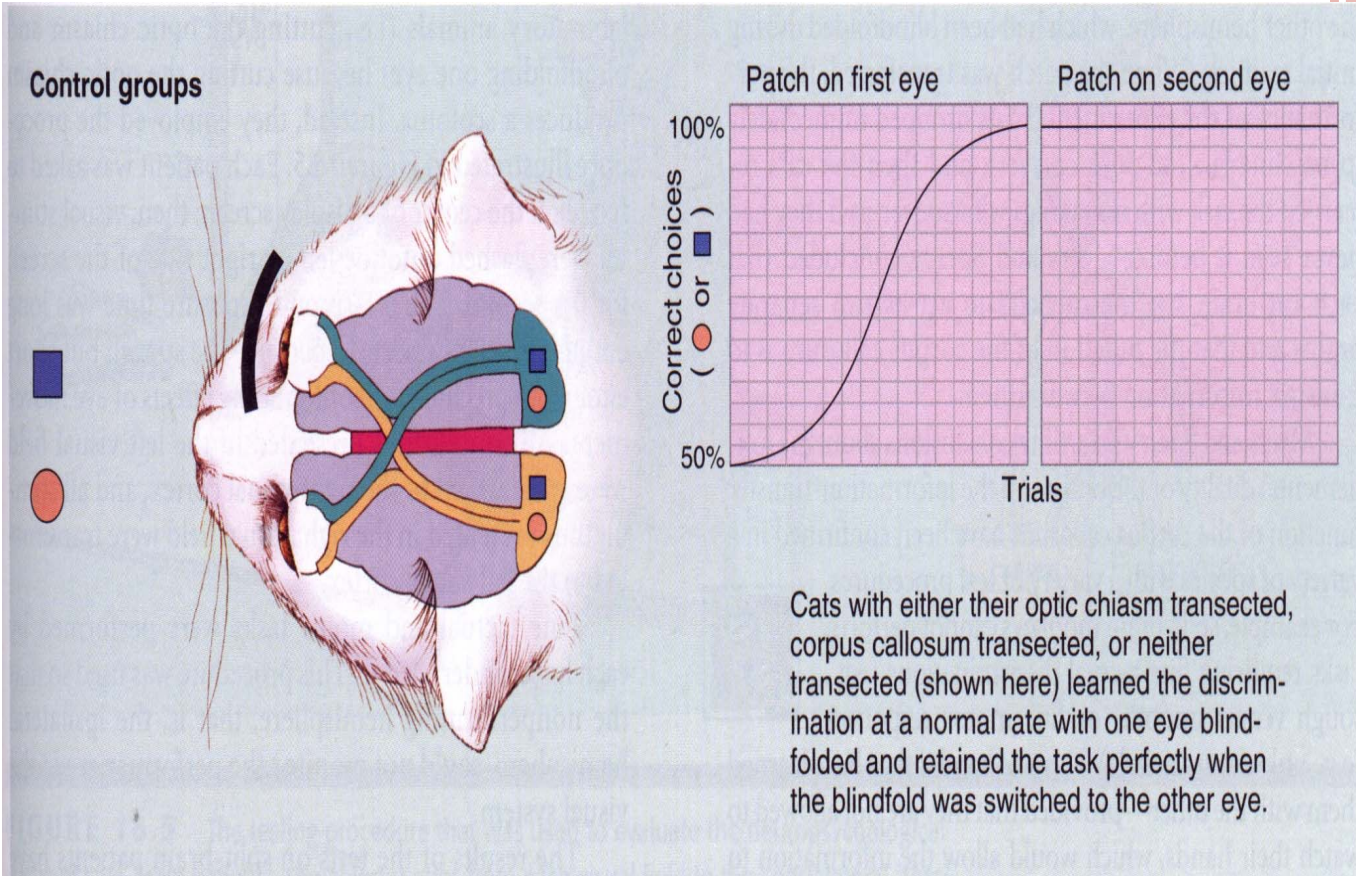




RESTRICTING VISION TO A SINGLE HEMISPHERE...

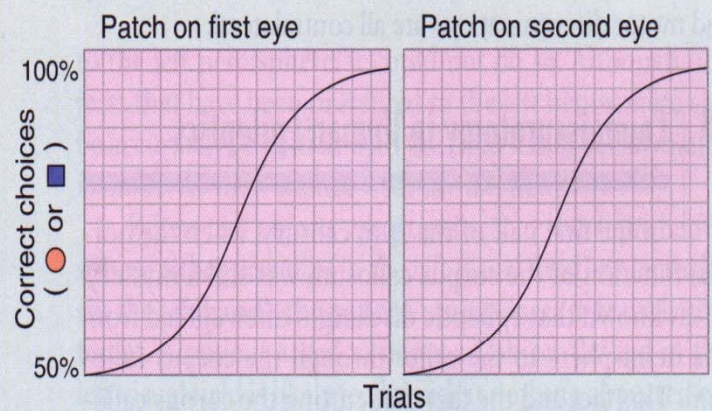
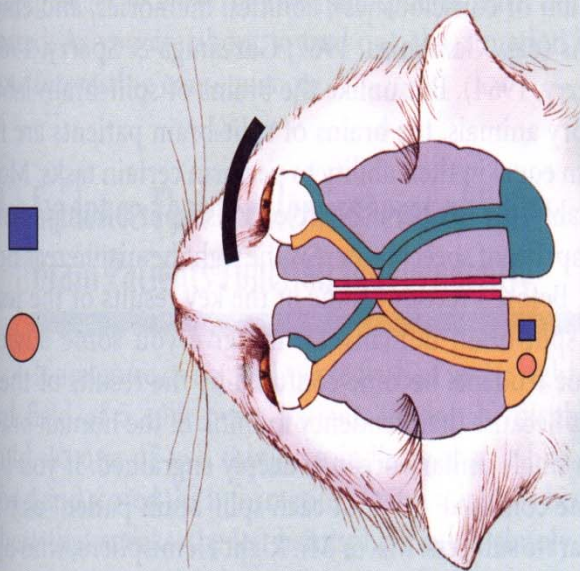


CONTROL GROUPS...



EXPERIMENTAL GROUPS...

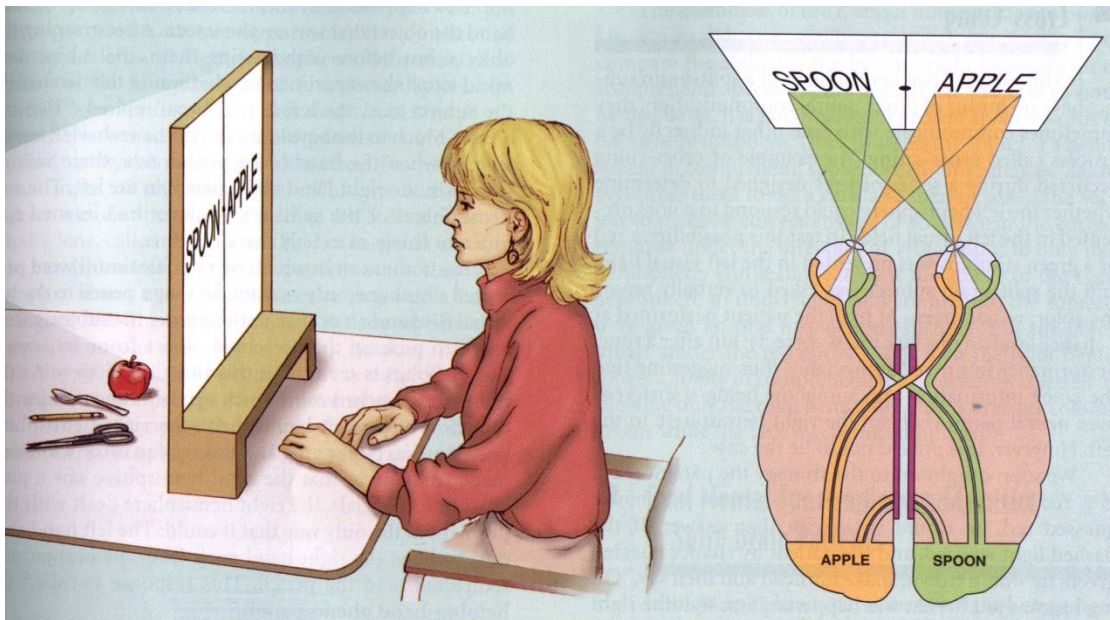
Experimental group



Cats with both their optic chiasm and corpus callosums transected learned the discrimination at a normal rate with one eye blindfolded, but they showed no retention whatsoever when the blindfold was switched to the other eye.



If a word (such as spoon) was flashed in the left visual field, which is exclusively *projected to the right hemisphere* in man, the subject, when asked, would say, “I did not see anything,” but then subsequently would be able, **with the left hand**, to retrieve the correct object from a series of objects placed out of view.

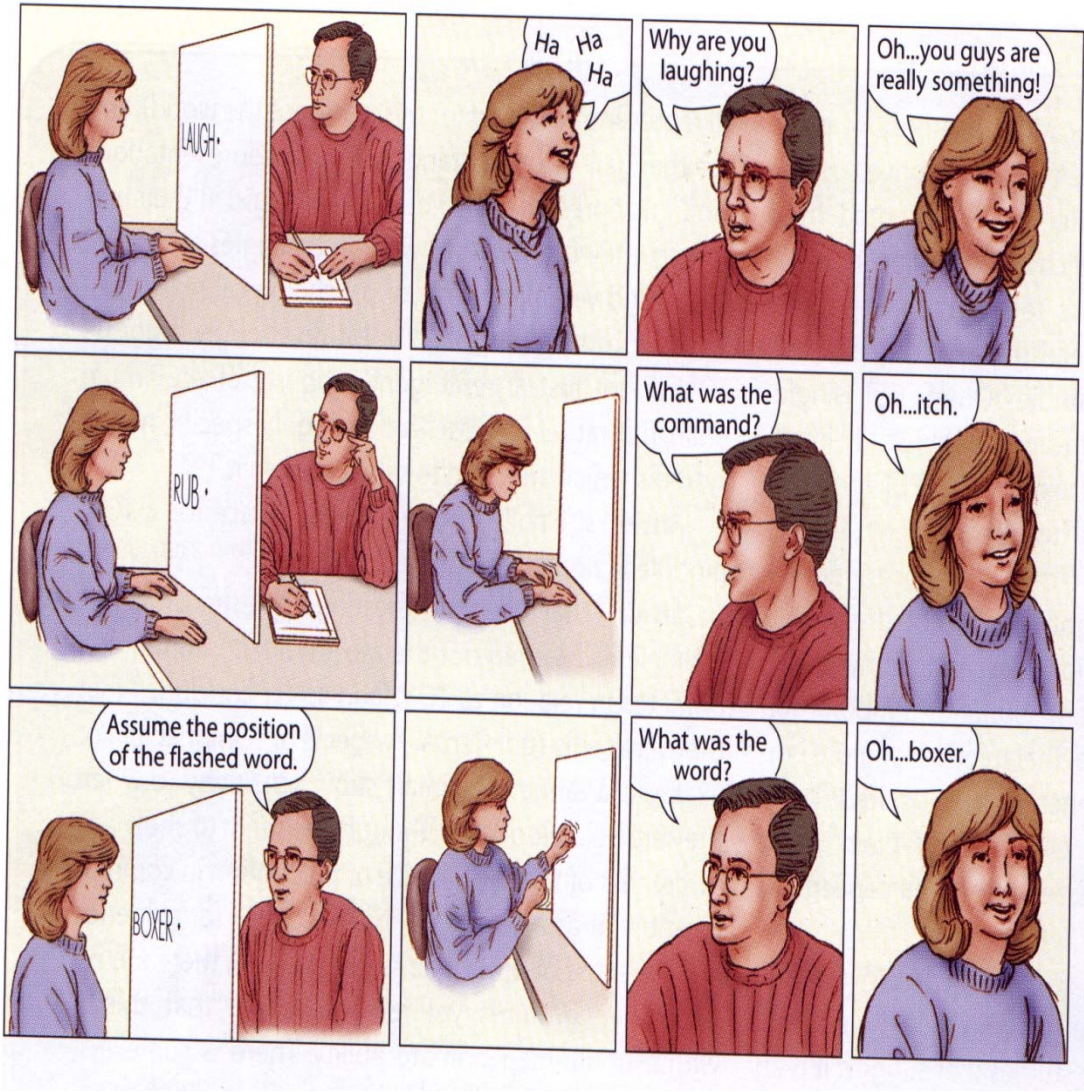


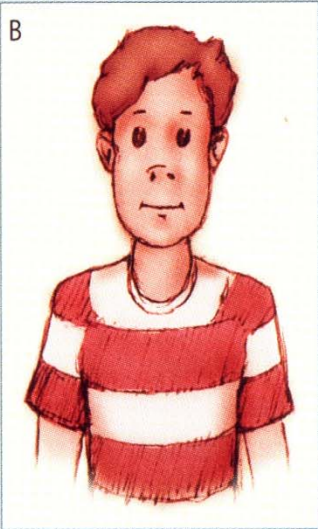
If the experimenter asked, “What do you have in your hand?” the subject would typically say, “I don’t know.” (**The left hemisphere did not have visual nor stereognostic information.**) Yet, clearly, the **right half-brain knew** the answer, because it reacted appropriately to the correct stimulus.



- Each hemisphere was shown four small pictures, one of which related to a larger picture also presented to that hemisphere. The patient had to choose the most appropriate small picture.
- The right hemisphere—that is, the left hand— correctly picked the shovel for the snowstorm; the right hand, controlled by the left hemisphere, correctly picked the chicken to go with the bird's foot
- When the patient was asked why the left hand—or right hemisphere— was pointing to the shovel. Because only the left hemisphere retains the ability to talk, it answered. But because it could not know why the right hemisphere was doing what it was doing, it made up a story about what it could see—namely, the chicken.
- It said the right hemisphere chose the shovel to clean out a chicken shed.

RIGHT HEMISPHERE IS COMMANDED...

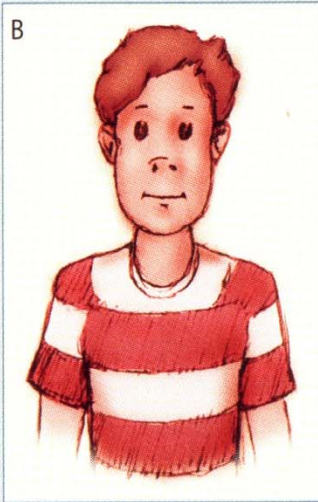




A2



B



A1



A2



B

