

FISHER'S TAXI MODEL OF BRAIN FUNCTION

Dr. Fisher's Taxi Model is a way to simplify complex brain functions by relating them to well-known mechanisms in a common taxicab. For example, information goes to the back of the brain (to the passengers), but all action comes from the front of the brain (driver, motor, controls, etc.)

This model is used to describe:

1. The differences between anterior versus posterior brain functions
 2. The differences between cortical and subcortical brain functions
 3. The differences between left and right hemisphere functions
1. Anterior versus posterior: Activation, inhibition, and planning are up front; information goes to the back where some decisions are made.
 - a. The front of the cab has the motor. Motor functions are organized in the frontal lobe.
 - b. The front of the cab also has the control systems (e.g.: brakes, accelerator, steering). The front of the brain is critical for behavior control. The prefrontal area acts like a "brake" in that it acts to inhibit action (e.g.: be cautious, stop before you act, consider consequences). The impulsive behavior of ADHD, for example, is like having poor brakes, or no brake fluid.
 - c. The frontal regions also act like an "accelerator" because they are critical for motivation (e.g. activation, drive, get up and go). No get up and go is characteristic of depression. Too much get up and go is characteristic of mania.
 - d. The driver in the front of the cab plans the route to the airport. The front of the brain contains the executive systems that control, orchestrate, and plan all action. Some decisions are being made by the passengers (where to go), but the action (when to go, how fast, what route to take, etc.) is controlled up front. With frontal lobe problems, the individual does not plan or organize well.
 2. Cortical versus subcortical: Thinking is in the cortical gray matter at the top of the brain; memory and emotions are in the deep, white matter, in the subcortical limbic system.
 - a. The processing of information is done by the driver and passengers, who are sitting up. The processing of information in the brain is done by the cerebral cortex, sitting up at the top of the brain.

- b. In the cab, the storage of information is done by the tape recorder and camera sitting on the floor of the cab. The storage of information in the brain is also deeper in the subcortical limbic brain (e.g. there is an auditory/verbal memory system – left hippocampus and a visual/spatial memory system – right hippocampus).
 - c. The gas tank located under the cab represents emotions. Emotions are also organized in the brain deep in the subcortical limbic system.
- 3. Left versus right: The left passenger has a mouth to talk, but cannot see. The left hemisphere (in most people) is specialized to process auditory/verbal information (e.g. language, not pictures). The right passenger has eyes but no mouth with which to talk. The right hemisphere is specialized to process visual/spatial information (e.g. pictures, not language).
- 4. Luggage? – Just a reminder that only a part of behavior can be understood in terms of brain function; the other part is psychiatric baggage.