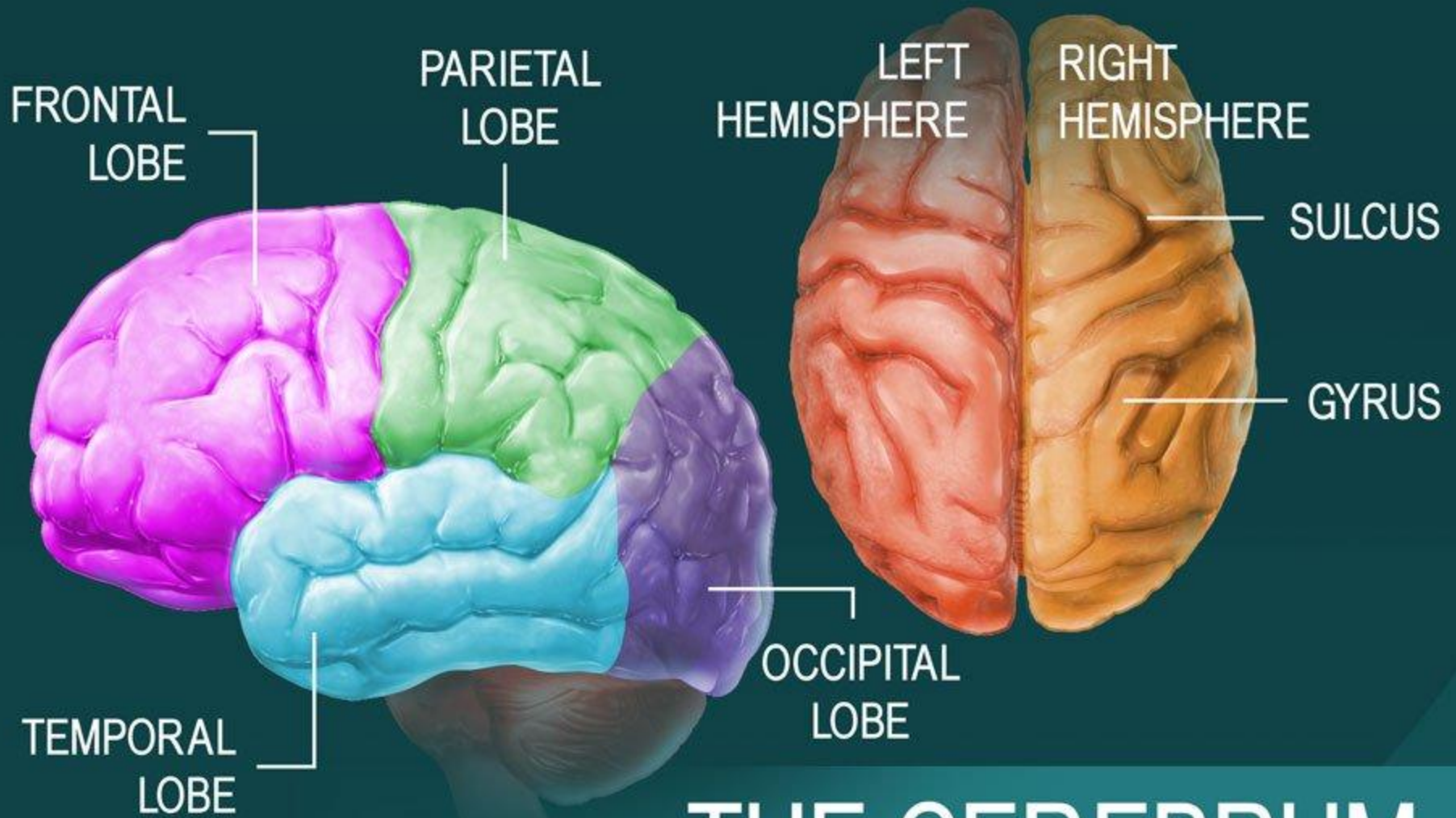


MOTOR LEARNING



objective

- At the end of the class, the participants will understand motor learning and its application in field of rehabilitation.



THE CEREBRUM

www.visiblebody.com

NEUROPLASTICITY HOW DOES IT WORK?

**SYNAPTIC
ACTIVATION**

**STRONG &
FREQUENT
ACTIVATION**

**WEAK
ACTIVATION**

**CHANGES
SYNAPTIC
STRUCTURE**

**CONNECTION
STRENGTHENS**

IMPLICATIONS

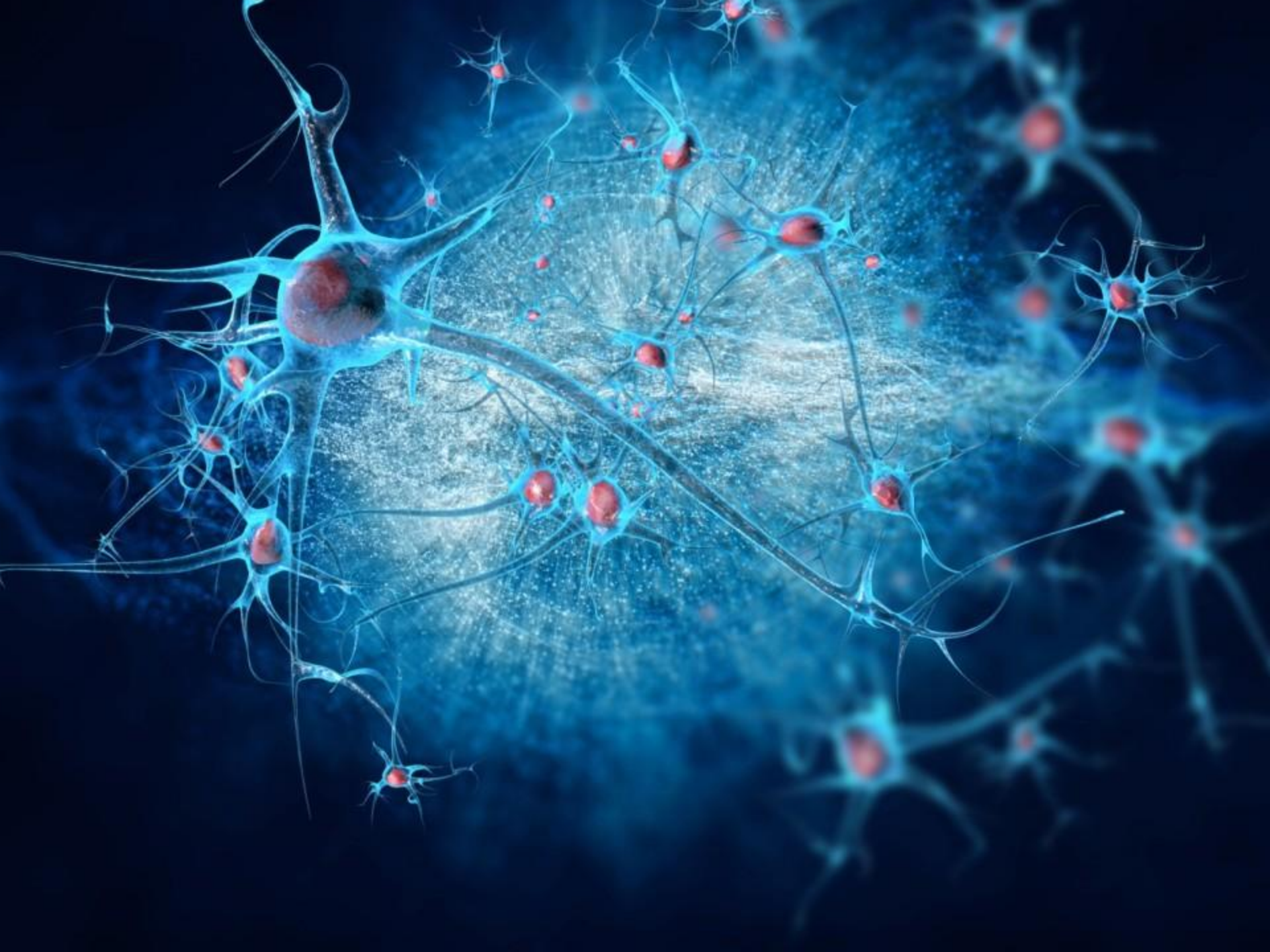
**DOES NOT
CHANGE
SYNAPSE**

**SEMINAR-STYLE
TRAINING IS NOT ENOUGH**

**LEARNING NEEDS
ONGOING REINFORCEMENT**

**USE TECHNOLOGY
TO KEEP ACTIVATING
SYNAPSES**





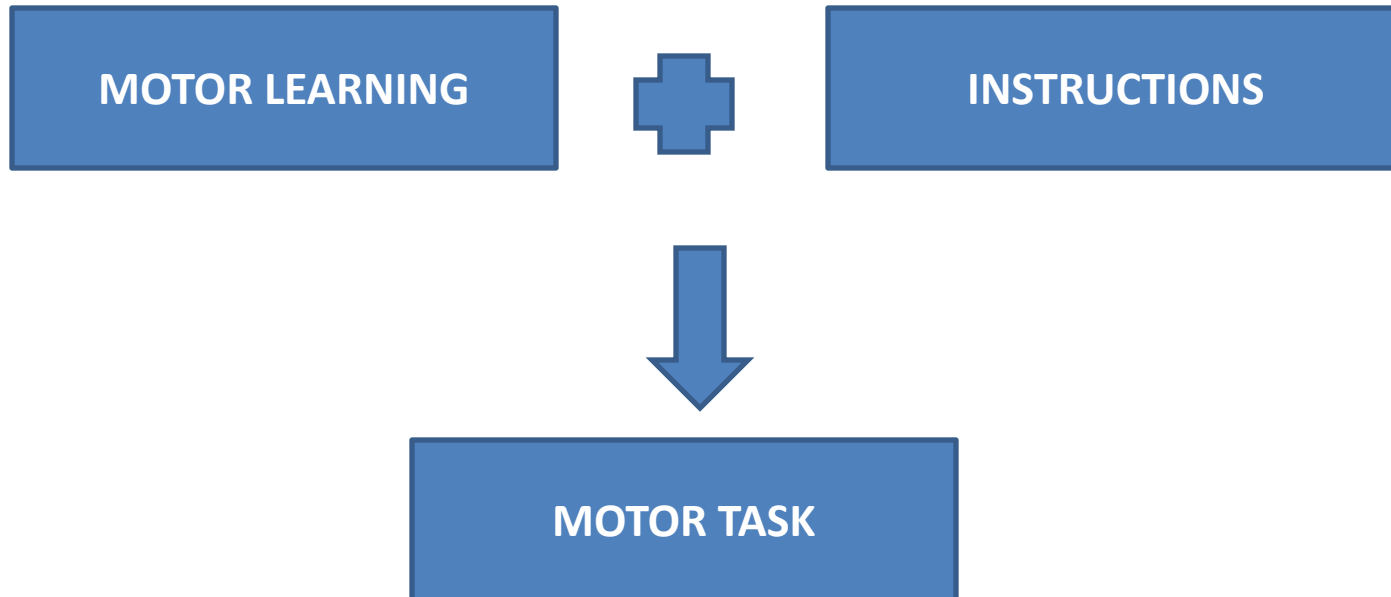


Motor learning

- Motor learning is a complex set of internal processes that involves the **acquisition and relatively permanent retention of a skilled movement or task through practice.**

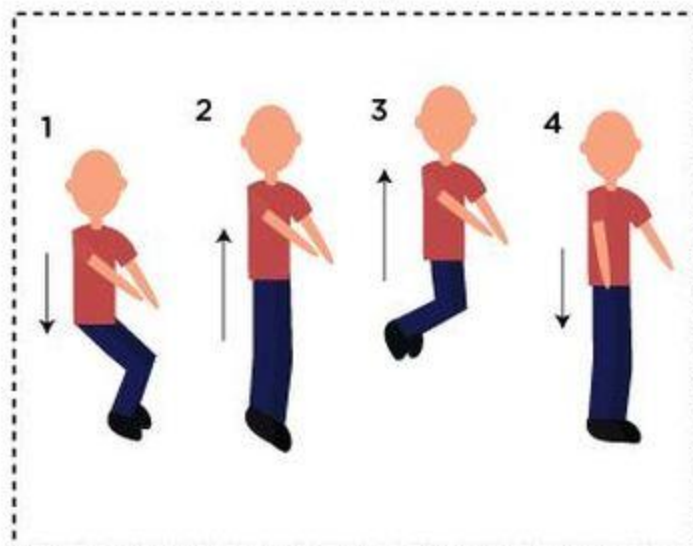


Acquisition
permanent retention
practice

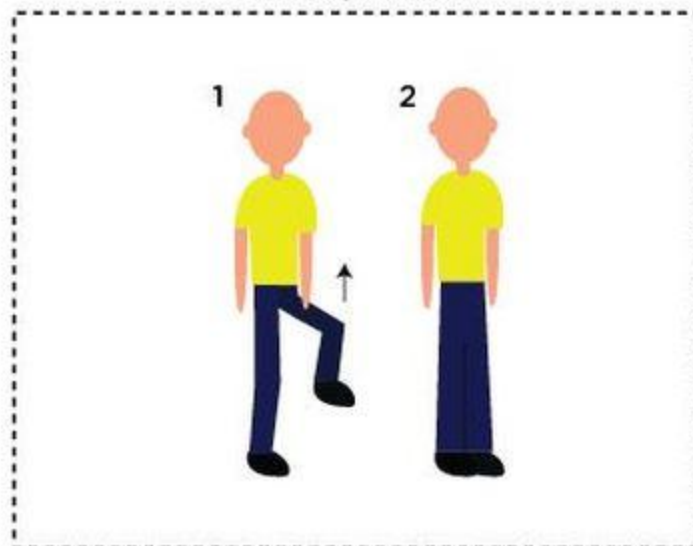


- **An exercise is simply a motor task (a psychomotor skill) that a therapist teaches and a patient is expected to learn**

Jump



Stomp Feet



MOTOR PERFORMANCE AND MOTOR LEARNING

- **Performance** involves **acquisition** of the ability to carry out a skill, whereas **learning** involves both **acquisition and retention**
- Motor learning probably modifies the way sensory information in **the central nervous system is organized and processed and affects** how motor actions are produced

Types of Motor Tasks

There are three basic types of motor tasks:

- Discrete,
- Serial
- Continuous

DISCRETE TASK

- A discrete task involves an action or movement with a recognizable **beginning and end**.
- Isolating and contracting a specific muscle group (as in a quadriceps setting exercise), grasping an object, doing a push-up, locking a wheelchair, and kicking a ball are **examples of discrete motor tasks**.
- Almost all exercises, such as lifting and lowering a weight or performing a self-stretching maneuver, can be categorized as **discrete motor tasks**.



SERIAL TASK

- A serial task is composed of a **series of discrete movements** that are combined in a particular sequence.
- For **example, to eat with a fork**, a person must be able to grasp the fork, hold it in the correct position, pierce or scoop up the food, and lift the fork to the mouth.

CONTINUOUS TASK

- A **continuous task** involves **repetitive, uninterrupted** movements that have no distinct beginning and ending.
- **Examples** include walking, ascending and descending stairs, and cycling.

IMPORTANCE OF RECOGNIZING THE TYPE OF TASK

- To self stretch the hamstrings, a patient must learn how to position and align his or her body and how much stretch force to apply to perform the stretching maneuver correctly.
- As flexibility improves, the patient must then learn how to safely control active movements in the newly gained portion of the range during functional activities.
- This requires muscles to contract with correct intensity at an unaccustomed length

Conditions and Progression of Motor Tasks

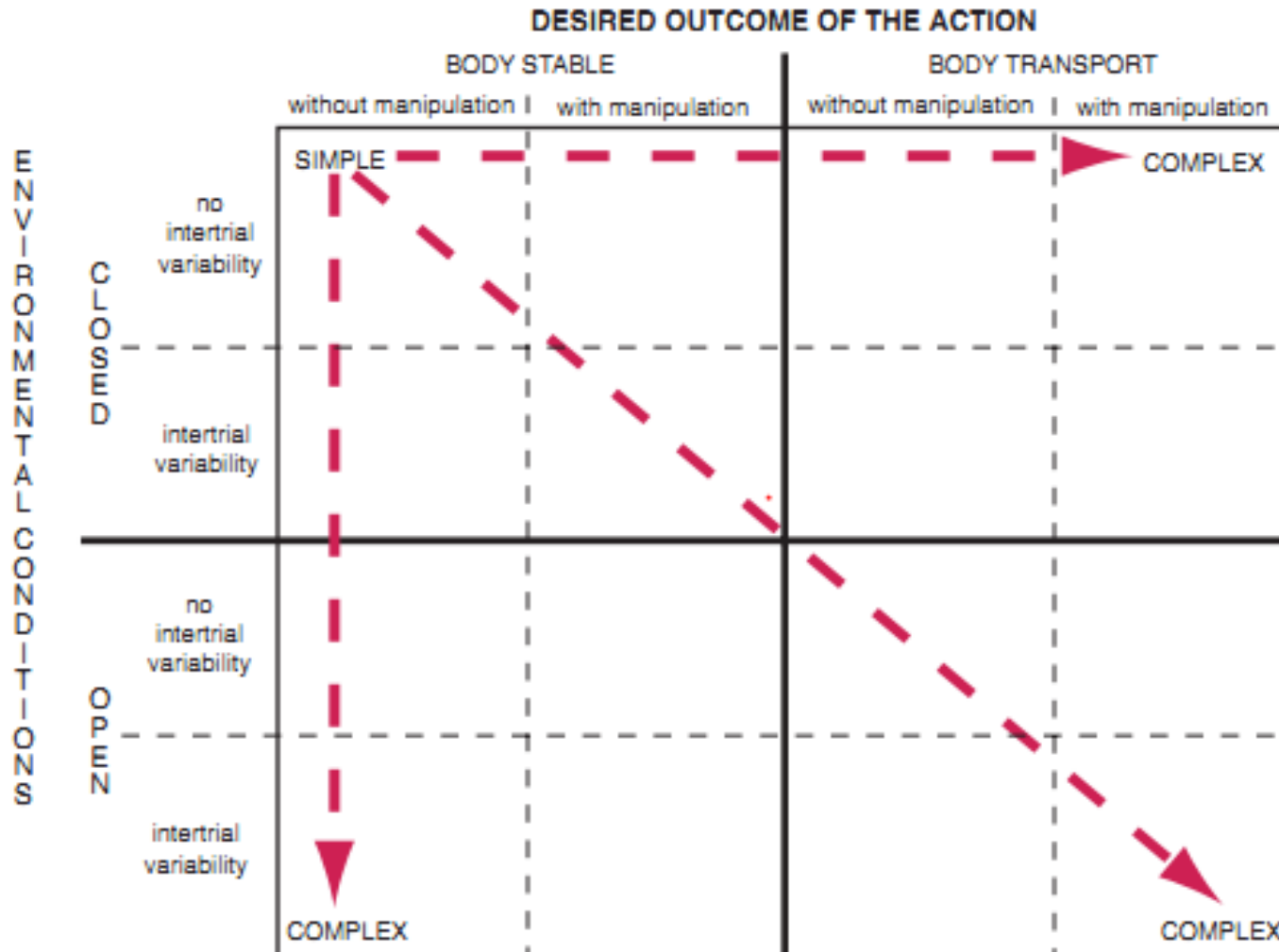
Progression of Motor Tasks



There are four main task dimensions

- (1) the **environment** in which the task is performed
- (2) the **intertrial variability** of the environment that is imposed on a task
- (3) the need for a person's body to remain **stationary or to move during the task**; and
- (4) the presence or absence of **manipulation** of objects during the task.

Conditions and Progression of Motor Tasks



DIMENSIONS

CONTEXT

		BODY STABLE		BODY TRANSPORT	
		without manipulation	with manipulation	without manipulation	with manipulation
without intertrial variability	Maintaining balance in sitting on bed while caregiver combs hair	Sitting at the table and eating a meal	Sitting doing household accounts	Rolling over in bed	Carrying a tray of food or drinks from the kitchen to the living room, using the same tray and same route each time
	Maintaining balance in standing in hallway as caregiver buttons coat	Sitting at desk to write a letter	Bed <=> bathroom, using same route daily	Sit <=> stand from bed	Tub transfers
with intertrial variability	Maintaining sitting balance on different chairs in the room e.g., rocker, straight-backed chair, sofa.	Standing in the kitchen unloading a dishwasher	Sitting on a low stool in the yard, bending over to weed the vegetable garden	Rolling over in a twin bed and a queen bed	Carrying a tray of food or drinks from the kitchen to the living room, using different trays and routes each time
	Maintaining standing balance on different surfaces: carpet, wood	Rearranging packages while standing in a moving elevator	Walking up or down a moving escalator or a moving sidewalk	Sit <=> stand from different heights and surfaces	Up and down curbs of different heights
without intertrial variability	Maintaining balance in a moving elevator	Drinking a cocktail on the deck of a cruise ship	Community ambulation	Rearranging packages while walking up or down the moving escalator	Shopping in the supermarket
	Maintaining sitting or standing balance in a moving bus	Walking through a living room where children are playing	Walking a precocious pet on a leash		

END

In the end,
everything
is a gag.

Charlie Chaplin



