

Human Psychophysiology Chapter

Experiments

Advanced Level

HP-1: The Electroencephalogram (EEG)

HP-2: The Galvanic Skin Response (GSR) and Emotion

HP-3: The Galvanic Skin Response, Deception, Cognitive Complexity, and Vigilance

HP-4: Skin Temperature, Stress, Calming, and Embarrassment

HP-5: Heart Rate, Blood Pressure, and Vagal Tone

HP-6: Cynicism/Hostility and the “Hot Reactor”

HP-7: The Stroop Effect

HP-8: GSR: Investigations

HP-9: Facial EMG

HP-10: Visual Evoked Potentials (VEP)

HP-11: Multisensory Reaction Times

HP-12: Rubber Hand Illusion

HP-13: Gaze Cue Paradigm

HP-14: Biofeedback

HP-15: Prepulse Inhibition

HP-16: Eriksen Flanker Test

Overview

In this chapter, you will have the opportunity to investigate various aspects of one of the most interesting questions ever posed in psychology: “What is the relationship between human psychological phenomena (the mind) and physiological states (the body)?”

The basic assumption in psychophysiology is that all human behavior, which includes perception, cognition, emotion, and action, is embodied. In other words, all human behavior has a physiological substrate. Experiments in psychophysiology involve non-invasive measurements of physiological events (dependent variables) under varying psychological conditions or characteristics of personality (independent variables). Ultimately, the goal is to identify reliable physiological indicators of psychological states and personality.

The physiological measures most often studied are EEG, skin conductance, heart rate, blood pressure, skin temperature, respiration, muscle tension, and eye movements. These responses are under neural control either voluntarily via the central nervous system (brain and spinal cord), or autonomically via sympathetic and parasympathetic nervous systems. This fact suggests that the bodily responses, that are under neural control, might be windows onto psychological processes, usually experienced only by individuals.

All of us have experienced the bodily sensations associated with emotions, such as anxiety, fear, anger, embarrassment and joy. We have also experienced the heightened mental focus associated with concentration and problem solving. Some of us are aware that we have a greater (or lesser) sensitivity to environmental stimulation compared to other persons that we know. These physiological events are adaptive processes, which can benefit our survival as biological organisms. In some cases, the physiological and psychological events are exaggerated and represent maladaptive learned, or innate trait, responses to the world. A psychophysiologicalist is interested in all aspects of the expression of psychological states. There are applications of psychophysiology to abnormal psychology, health psychology, developmental psychology, and cognitive psychology, as well as other branches of psychology.

This chapter contains experiments and exercises intended to demonstrate some of the interesting relationships between mind, brain, and behavior. You will be studying yourselves and asking questions such as:

- What is my EEG state when I am thinking relaxing thoughts?
- Do introverts have a higher level of cortical arousal?
- If I were being deceptive, could it be measured in my skin conductance?
- Are there personality traits that correlate to heart rate?
- Does my heart rate slow down when I concentrate?
- If I am a cynical person, is my blood pressure more likely to go up under stress?