ChAPTER 1: INtroducing Psychological Science

# The Science of Psychology

Psychology is the scientific study of behavior, thought, and experience, and how they can be affected by physical, mental, social, and environmental factors.

## The Scientific Method

* The scientific method is a way of learning about the world through collecting observations, developing theories to explain them, and using the theories to make predictions.
* A hypothesis is a testable prediction about the processes that can be observed and measured
* Pseudoscience is an idea that presented as science but does not actually utilize basic principles of scientific thinking or procedure.
* A theory is an explanation for a broad range of observations that also generates new hypotheses and integrates numerous findings into a coherent whole
* Theories are not the same thing as opinions or beliefs
* All theories are not equally plausible
* A measure of a good theory is not the number of people who believe it to be true
* The biopsychosocial model is a means of explaining behavior as a product of biological, psychological, and sociocultural factors
* Biological – focus on genes, brain anatomy and function, and revolution
* Psychological – focus on behavior, perception, thought, and experience
* Sociocultural – focus on interpersonal relationships, families, groups, societies, and ethnicities

## Building Scientific LIteracy

* Scientific literacy, the ability to understand, analyze, and apply scientific information.
* Knowledge gathering, scientific explanation, critical thinking, application
* Masses vs spaced practice
* Spaced remembered more words
* Critical thinking involves exercising curiosity and skepticism when evaluating the claims of others, and with our own assumptions and beliefs
* Be curious
* Examine the nature and source of the evidence
* Examine assumptions and biases
* Avoid overly emotional thinking
* Tolerate ambiguity
* Consider alternative viewpoints and alternative interpretations of the evidence

# How Psychology Became a Science

## Psychology’s Philosophical and Scientific Origins

* Empiricism is a philosophical tenet that knowledge comes through experience
* Determinism is the belief that all events are governed by lawful, cause-and-effect relationships
* Free will against determinism

### Influences from the ancients: PHilosophical insights into Behavior

* Physician Hippocrates developed world’s first personality classification scheme
* Blood
* Yellow bile
* Black bile
* Phlegm
* Galen of Pergamon create temperaments
* Sanguine, a tendency to be impulsive
* Choleric, a tendency to be ambitious
* Melancholic, a tendency to be independent
* Phlegmatic, a tendency to be quiet
* Zeitgeist refers to a general set of beliefs of a particular culture at a specific time in history
* Materialism, the belief that humans, and other living beings, are composed exclusively of physical matter
* Dualism

### Influences from physics: Experimenting with the mind

* Gustav Fechner
* Studied sensation and perception
* Psychophysics, which is the study of the relationship between the physical world and the mental representation of that world
* Perception
* Right hand 1kg, left hand 3 kg, same weight is added, right hand can feel more noticeable

### Influences from evolutionary theory: The adaptive functions of behavior

* Darwin
* Natural selection
* Hereditary influence

### Influences from medicine: DIagnoses and treatments

* Clinical psychology, the field of psychology that concentrates on the diagnosis and treatment of psychological disorders
* Localization in mid-1800s
* Phrenology
* Franz Gall and Johann Spurzheim
* Brain consisted of 27 organs
* Identify the different traits measuring bumps on a person’s head
* Study of brain injuries
* Broca’s area
* Speech localized
* Wernicke’s area
* Language comprehension
* Franz Mesmer
* Using magnets redirect flow in the body to cure disease
* Psychosomatic medicine
* Hypnosis
* Sigmund Freud
* Cure Hysterical paralysis by psychoanalysis
* Psychoanalysis is a psychological approach that attempts to explain how behavior and personality are influenced by unconscious processes

### The Influence of social sciences: measuring and comparing humans

* Sir Francis Galton
* Heredity
* Eminence, a combination of ability , morality, and achievement
* Nature and nurture relationships, the inquiry into how heredity and environment influence behavior and mental processes
* Eugenics, good genes

## The beginnings of contemporary psychology

### structuralism and functionalism: the beginnings of psychology

* Wilhelm Wundt
* Introspection, to look within
* Link a person’s perceptions with concepts such as free will
* Edward Titchener
* Structuralism, was an attempt to analyze conscious experience by breaking it down into basic elements, and to understand how these elements work together
* William James
* The Principles of Psychology
* Functionalism is the study of the purpose and function of behavior and conscious experience
* Evolutionary psychology, and approach that interprets and explains modern human behavior in terms of forces acting upon our distant ancestors

### The rise of behaviourism

* Edwin Twitmyer
* Reflexes
* Classical conditioning
* Behaviorism, an approach that dominated the first half of the 20th century of North American psychology and had a singular focus on studying only observable behavior, with little to no reference to mental events or instincts as possible influences on behavior
* Ivan Pavlov actually discovering classical conditioning
* John B. Watson
* Advertising
* B. F. Skinner
* Reward and punishment

### HUmanistic Psychology emerges

* By mid -20th, psychology was dominated by behaviorism and Freudian psychoanalytic approaches
* Humanistic psychology, focuses on the unique aspects of each individual human, each person’s freedom to act, his or her rational thought, and the belief that humans are fundamentally different from other animals
* Carl Rogers and Abraham Maslow
* People could attain mental well-being and satisfaction through gaining a greater understanding of themselves
* Contrasted with psychoanalysis and behaviorism

### The brain and behaviour

* Karl Lashley
* Engram, the place in the brain where a memory trace was stored
* Long-term memories are stored throughout many parts of the brain
* Principle of mass action, larger lesions causing a greater impairment in performance
* Donald Hebb
* Cells that fire together wire together (Hebb’s Law)
* Wilder Penfield and Herbert Jasper
* Procedure removing cells from the brain region where the seizures began
* Electrically stimulated while patient was awake
* Create precise maps of the sensory and motor cortices in the brain

### The cognitive revolution

European psychologists formed the basis of the cognitive perspective

* Hermann Ebbinghaus
* Forgetting curves
* Frederick Bartlett
* Our memory is influenced by a number of outside factors including a person’s cultural knowledge and experiences
* Gestalt psychology, in early to mid-1900s, an approach emphasizing that psychologists need to focus on the whole of perception and experience, rather than its parts
* The whole is greater than the sum of its parts
* Cognitive psychology is a modern psychological perspective that focuses on processes such as memory, thinking, and language
* Cognitive neuroscience, a specialized field that is growing faster than any other area of psychology
* Social-cognitive neuroscience

### social and cultural influences

* Norman Triplett
* Experiment people can be effected by other people
* Social psychology, the study of the influence of other people on our behavior
* Personality psychology, the study of how different personality characteristics can influence how we think and act
* Kurt Lewin
* Modern social psychology
* Corss-cultural psychology

Chapter 2: Reading and evaluating scienctific research

# 2.1 principles of scientific research

* Objectivity, certain facts about the world can be observed and tested independently from the individual who describes them
* Subjective, their knowledge of the event is shaped by prior beliefs, expectations, experiences, and even their mood

## Five characteristics of quality scientific research

* It is based on measurements that are objective, valid and reliable
* It can be generalized
* It uses techniques that reduce bias
* It is made public
* It can be replicated

### Scientific measurement: objectivity, reliability and validity

* Objective measurements, the measure of an entity of behavior that, within an allowed margin of error, is consistent across instruments and observers
* Variable, the object, concept, or event being measured
* Operational definitions are statements that describe the procedures and specific measures that are used to record observations
* Validity refers to the degree to which an instrument or procedure actually measures what it claims to measure
* Reliability when it provides consistent and stable answers across multiple observations and points in time

### Generalizability of results

* Generalizability refers to the degree to which one set of results can be applied to other situations, individuals, or events
* Population, the group that researchers want to generalize about
* Sample , a select group of population members
* Random sample
* Convenience samples, samples of individuals who are the most readily available
* Ecological validity, meaning that the results of a laboratory study can be applied to or repeated in the natural environment

### sources of bias in psychological research

* Researcher bias
* Subject biases/ participant biases
* Hawthorne effect, a behavior change that occurs as a result of being observed.

### techniques that reduce bias

* Single-blind study, the participants do not know the true purpose of the study, or else do not know which type of treatment they are receiving
* Double-blind study, a study in which neither the participant nor the experimenter knows the exact treatment for any individual

### sharing the results

* Peer review

### replication

* Replication, is the process of repeating a study and finding a similar outcome each time

## five characteristics of poor research

* Falsifiable, the hypothesis is precise enough that it could be proven false
* Anecdotal evidence, an individual’s story or testimony about an observation or event that is used to make a claim as evidence
* Data selection bias
* Appeal to authority
* Appeal to common sense