

Introduction to Psychology

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Introduction

Psychology is the scientific study of behavior, cognition, and emotion.

Psychology is an academic and applied discipline involving the scientific study of mental processes and behavior. Psychology also refers to the application of such knowledge to various spheres of human activity, including problems of individuals' daily lives and the treatment of mental illness.

Psychology differs from the other social sciences — anthropology, economics, political science, and sociology — in seeking to explain the mental processes and behavior of individuals. Psychology differs from biology and neuroscience in that it is primarily concerned with the interaction of mental processes and behavior on a systemic level, as opposed to studying the biological or neural processes themselves. In contrast, the subfield of neuropsychology studies the actual neural processes and how they relate to the mental effects they subjectively produce. Biological psychology is the scientific study of the biological bases of behavior and mental states.

[Psychology](#) is an academic and applied field involving the study of behavior, mind and thought and the subconscious neurological bases of behaviour. Psychology also refers to the application of such knowledge to various spheres of human activity, including problems of individuals' daily lives and the treatment of mental illness. It is largely concerned with humans, although the behavior and mental processes of animals can also be part of psychology research, either as a subject in its own right (e.g. animal cognition and ethology), or somewhat more controversially, as a way of gaining an insight into human psychology by means of comparison (including [comparative psychology](#)).

Psychology is commonly defined as the science of behavior and mental processes.

Psychology does not necessarily refer to the brain or nervous system and can be framed purely in terms of phenomenological or information processing theories of mind. Increasingly, though, an understanding of brain function is being included in psychological theory and practice, particularly in areas such as [artificial intelligence](#), [neuropsychology](#), and [cognitive neuroscience](#).

Psychology describes and attempts to explain consciousness, behavior and social interaction. Empirical psychology is primarily devoted to describing human experience and behavior as it actually occurs. In the past 20 years or so psychology has begun to examine the relationship between consciousness and the brain or nervous system. It is still not clear in what ways these interact: does consciousness determine brain states or do brain states determine consciousness - or are both going on in various ways? Perhaps to understand this you need to know the definition of "consciousness" and "brain state" - or is consciousness some sort of complicated 'illusion' which bears no direct relationship to neural processes? An understanding of brain function is increasingly being included in psychological theory and practice, particularly in areas such as artificial intelligence, neuropsychology, and cognitive neuroscience.

The late 19th century marks the start of psychology as a scientific enterprise. The year 1879 is commonly seen as the start of psychology as an independent field of study, because in that year German scientist [Wilhelm Wundt](#) founded the first laboratory dedicated exclusively to psychological research in Leipzig, Germany.

Wundt combined philosophical [introspection](#) with techniques and laboratory apparatuses brought over from his physiological studies with [Helmholtz](#), as well as many of his own design. This experimental introspection was in contrast to what had been called psychology until then, a branch of philosophy where people introspected themselves.

Introspection is the direct observation or rumination of one's own heart, mind and/or soul and its processes, as opposed to extrospection, the observation of things external to one's self.

Early Systems of Psychology

Wundt's form of psychology is called [structuralism](#). It is in a class called systematic interpretations because it attempted to explain all behavior with reference to one systematic position. Some other systems of psychology are *functionalism, behaviorism, gestalt psychology, and psychodynamic psychology*.

[Functionalism](#) is concerned with the reason for behavior and not the structure of the brain. It allowed the study of new subjects including children and animals.

[Behaviorism](#) is an approach to psychology based on the proposition that behaviour can be studied and explained scientifically without recourse to internal mental states. Psychologists that use behaviorism are concerned mainly with muscular movements and glandular secretions.

[Gestalt Psychology](#) is a theory of mind and brain that proposes that the operational principle of the brain is holistic, parallel, and analog, with self-organizing tendencies. It has a particular interest in perceptual problems and how they can be interpreted. A Gestaltist believes that the whole is greater than or different than the sum of all of the parts. Trying to break up behavior into separate parts is simplistic because everything affects everything else.

[Psychodynamic psychology](#) was first practiced by Sigmund Freud, although he didn't intend it to be a system.

Perspectives

While the use of one system to solve all problems has been abandoned by most psychologists, these early systems were important in the development of new systems and ideas. There are eight major perspectives that psychologists usually take, although many use an eclectic approach instead of confining themselves to just one.

The [psychodynamic](#) perspective emphasizes unconscious drives and the resolution of conflicts, the [behavioral](#) emphasizes the acquisition and alteration of observable responses, and the [humanistic](#) approaches attempt to achieve maximum human potential as set in Maslow's hierarchy of needs.

The [biological](#) perspective is the scientific study of the biological bases of behavior and mental states, very closely related to [neuroscience](#).

[Evolutionary](#) psychology is a theoretical approach to psychology that attempts to explain certain mental and psychological traits such as memory, perception, or language as evolved adaptations, i.e., as the functional products of natural or sexual selection.

[Cognitive psychology](#) accepts the use of the scientific method, but rejects introspection as a valid method of investigation. It should be noted that Herbert Simon and Allen Newell identified the 'thinking-aloud' protocol, in which investigators view a subject engaged in introspection, and who speaks his thoughts aloud, thus allowing study of his introspection.

[Social psychology](#) is the scientific study of how people's thoughts, feelings, and behaviors are influenced by the actual, imagined, or implied presence of others (Allport, 1985).

Wundt argued that "*we learn little about our minds from casual, haphazard self-observation...It is essential that observations be made by trained observers under carefully specified conditions for the purpose of answering a well-defined question.*"

Many scientists threw away the idea of introspection as part of psychology because the observation of stimulation was speculative without an [empirical approach](#). However the case, an opposite to introspection called [extrospection](#) has been created with a relation to **Psychophysics**.

[Psychophysics](#) is the branch of psychology dealing with *the relationship between physical stimuli*

and their perception.

The important distinction is that Wundt took this method into the experimental arena and thus into the newly formed psychological field. Other important early contributors to the field of psychology include Hermann Ebbinghaus (a pioneer in studies on memory), the Russian Ivan Pavlov (who discovered the learning process of classical conditioning), and the Austrian Sigmund Freud.

The mid-20th century saw a rejection of Freud's theories among many psychologists as being too unscientific, as well as a reaction against Edward Titchener's abstract approach to the mind.

Edward B. Titchener (1876-1927) was an Englishman and a student of Wilhelm Wundt before becoming a professor of psychology at Cornell University. He would put his own spin on Wundt's psychology of consciousness after he emigrated to the United States.

At the turn of 19th century the founding father of experimental psychology Wilhelm Wundt tried to experimentally confirm his hypothesis that conscious mental life can be broken down into fundamental elements which then form more complex mental structures. Wundt's **structuralism** was quickly abandoned because it could not be tested in the same way as behavior, until now, when the brain-scanning technology can identify, for example, specialized brain cells that respond exclusively to basic lines and shapes and are then combined in subsequent brain areas where more complex visual structures are formed. This line of research in modern psychology is called **cognitive psychology** rather than [structuralism](#) because Wundt's term never ceased to be associated with the problem of observability.

The majority of mainstream psychology is based on a framework derived from **cognitive psychology**, although the popularity of this paradigm does not exclude others, which are often applied as necessary. Psychologists specialising in certain areas, however, may use the dominant cognitive psychology only rarely if at all.

Cognitive psychology is the psychological science which studies cognition, the mental processes that are hypothesised to underlie behavior. This covers a broad range of research domains, examining questions about the workings of memory, attention, perception, knowledge representation, reasoning, creativity and problem solving.

Cognitive psychology is radically different from previous psychological approaches in two key ways.

- It accepts the use of the [scientific method](#), and generally rejects [Introspection](#) as a valid method of investigation, unlike [phenomenological](#) methods such as [Freudian](#) psychology.
- It posits the existence of internal mental states (such as [beliefs](#), [desires](#) and [motivations](#)) unlike [behaviourist](#) psychology.

Regardless of the perspective adopted there are hundreds of specialties that psychologists practice. These specialties can usually be grouped into general fields.

- [Clinical](#) and [Counseling](#) Psychology: Over half of all psychologists work in this field. Clinical psychologists are more likely to treat or conduct research into the causes of abnormal behaviors, while counseling psychologists more often work with mild social or emotional problems. Typically people seeking the help of a counselor are not classified as abnormal or mentally ill.
- [Educational](#) and [School](#) Psychology: Educational psychologists are concerned with the use of psychology to increase the effectiveness of the learning experience, including facilities, curriculum, teaching techniques, and student problems. A school psychologist works in a school environment to evaluate the structure and effectiveness of the learning environment. A school psychologist assesses, counsels or guides students who have academic, behavioral, emotional, and/ or guidance needs. A school psychologist consults with teachers, staff, and parents to help students adjust and learn most effectively in their learning environment.

- [Industrial/Organizational Psychology](#)(also known as I/O psychology, work psychology, occupational psychology, or personnel psychology) is the study of the behavior of people in the workplace. Industrial and organizational psychology applies psychological knowledge and methods to aid workers and organizations. I/O psychologists who work for an organization are most likely to work in the HR (human resources) department.
- [Consumer Psychology](#):Consumer behaviour is the study of how people buy, what they buy, when they buy and why they buy.
- [Engineering Psychology](#): See link
- [Forensic Psychology](#): Forensic psychology is the application of psychological principles and knowledge to various legal activities involving child custody disputes, child abuse of an emotional, physical and sexual nature, assessing one's personal capacity to manage one's affairs, matters of competency to stand trial, criminal responsibility & personal injury and advising judges in matters relating to sentencing regarding various mitigants and the actuarial assessment of future risk.
- [Sport Psychology](#): Sport psychology is a specialization within psychology that seeks to understand psychological/mental factors that affect performance in sports, physical activity and exercise and apply these to enhance individual and team performance.
- [Environmental Psychology](#): Environmental psychology is an interdisciplinary field focused on the interplay between humans and their surroundings. Areas of study include pollution effects, recycling efforts, and the study of stress generated by different physical settings.

History

Early development

The first use of the term "psychology" is often attributed to the German scholastic philosopher Rudolf Goeckel (Latinized Rudolph Goclenius), published in 1590.[1] More than six decades earlier, however, the Croatian humanist Marko Marulić used the term in the title of a work which was subsequently lost.[2] This, of course, may not have been the very first usage, but it is the earliest documented use at present.

The term did not fall into popular usage until the German idealist philosopher, Christian Wolff (1679-1754) used it in his *Psychologia empirica* and *Psychologia rationalis* (1732-1734). This distinction between empirical and rational psychology was picked up in Diderot's *Encyclopedie* and was popularized in France by Maine de Biran.

The root of the word psychology (psyche) is very roughly equivalent to "soul" in Greek, and (ology) equivalent to "study". Psychology came to be considered a study of the soul (in a religious sense of this term) much later, in Christian times. Psychology as a medical discipline can be seen in Thomas Willis' reference to psychology (the "Doctrine of the Soul") in terms of brain function, as part of his 1672 anatomical treatise "De Anima Brutorum" ("Two Discourses on the Souls of Brutes"). Until about the end of the 19th century, psychology was regarded as a branch of philosophy.

Early modern era

In 1879, Wilhelm Wundt (1832-1920), known as "the father of psychology", founded a laboratory for the study of psychology at Leipzig University in Germany. The American philosopher William James published his seminal book, *Principles of Psychology*, in 1890, laying the foundations for many of the questions that psychologists would focus on for years to come. Other important early contributors to the field include Hermann Ebbinghaus (1850–1909), a pioneer in the experimental study of memory at the University of Berlin; and the Russian physiologist Ivan Pavlov (1849-1936), who investigated the learning process now referred to as classical conditioning.

Meanwhile, during the 1890s, the Austrian physician Sigmund Freud, who was trained as a neurologist and had no formal training in experimental psychology, had developed a method of psychotherapy known as psychoanalysis. Freud's understanding of the mind was largely based on interpretive methods and introspection, and was focused in particular on resolving mental distress and psychopathology. Freud's theories became very well-known, largely because they tackled subjects such as sexuality and repression as general aspects of psychological development. These were largely considered taboo subjects at the time, and Freud provided a catalyst for them to be openly discussed in polite society. Although Freud's theories are only of limited interest in modern academic psychology departments, his application of psychology to clinical work has been very influential.

Partly in reaction to the subjective and introspective nature of Freudian psychology, and its focus on the recollection of childhood experiences, during the early decades of the 20th century behaviorism gained popularity as a guiding psychological theory. Championed by psychologists such as John B. Watson and Edward Thorndike (and later, B.F. Skinner), behaviorism was grounded in studies of animal behavior. Behaviorists argued that psychology should be a science of behavior, not the mind, and rejected the idea that internal mental states such as beliefs, desires, or goals could be studied scientifically. In his paper "Psychology as the Behaviorist Views It" (1913), Watson argued that psychology "is a purely objective [emphasis added] experimental branch of natural science," that "introspection forms no essential part of its methods", and that "the behaviorist recognizes no dividing line between man and brute."

Behaviorism reigned as the dominant model in psychology through the first half of the 20th century, largely due to the creation of conditioning theories as scientific models of human behavior, and their successful application in the workplace and in fields such as advertising.

Modern era

However, it became increasingly clear that although behaviorism had made some important discoveries, it was deficient as a guiding theory of human behavior. Noam Chomsky's review of Skinner's book *Verbal Behavior* (that aimed to explain language acquisition in a behaviorist framework) is considered one of the major factors in the ending of behaviorism's reign. Chomsky demonstrated that language could not purely be learned from conditioning, as people could produce sentences unique in structure and meaning that couldn't possibly be generated solely through experience of natural language, implying that there must be internal states of mind that behaviorism rejected as illusory. Similarly, work by Albert Bandura showed that children could learn by social observation, without any change in overt behavior, and so must be accounted for by internal representations.

Humanistic psychology emerged in the 1950s and has continued as a reaction to positivist and scientific approaches to the mind. It stresses a phenomenological view of human experience and seeks to understand human beings and their behavior by conducting qualitative research. The humanistic approach has its roots in existentialist and phenomenological philosophy and many humanist psychologists completely reject a scientific approach, arguing that trying to turn human experience into measurements strips it of all meaning and relevance to lived existence.

Some of the founding theorists behind this school of thought were Abraham Maslow who formulated a hierarchy of human needs, Carl Rogers who created and developed client-centered therapy, and Fritz Perls who helped create and develop Gestalt therapy.

The rise of computer technology also promoted the metaphor of mental function as information processing. This, combined with a scientific approach to studying the mind, as well as a belief in internal mental states, led to the rise of cognitivism as the dominant model of the mind.

Links between brain and nervous system function were also becoming common, partly due to the experimental work of people such as Charles Sherrington and Donald Hebb, and partly due to

studies of people with brain injury (see cognitive neuropsychology). With the development of technologies for accurately measuring brain function, neuropsychology and cognitive neuroscience have become some of the most active areas in contemporary psychology. With the increasing involvement of other disciplines (such as philosophy, computer science and neuroscience) in the quest to understand the mind, the umbrella discipline of cognitive science has been created as a means of focusing such efforts in a constructive way.

Biological basis of behavior

The physical structure of the body plays an important role in the behavior of an individual. The most important physical structure for psychologists is the nervous system. The nervous system carries orders from the brain and spinal cord to various glands and muscles, it also carries signals from stimuli receptors to the spinal cord and brain. If you wanted to blink your eye a signal would be created in the brain, then it would be transported by neurons to the muscle controlling the eyelid.

Neurons

The base of the nervous system is the [neuron](#). Neurons are cells that are specialized for communicating information. They are the basic tissue and element of the nervous system.

Neurons have a basic structure of:

- One *cell body*
- One *axon*
- One or more *dendrites*

The [cell body](#) (or soma) is the bulbous end of a neuron, containing the cell nucleus. The soma makes use of nutrients to supply energy for neuronal activity.

[Axons](#) are [organelles](#) that carry information away from the cell body. Axons may be as small as several microns or as long as several meters in giraffes and whales. The axons main job is to send a signal to the dendrites of another neuron, but some say that they may also receive signals in certain situations. Each neuron has only one axon, but the axon may have branches with what are called terminal buttons at its end.

[Dendrites](#) are organelles that sense the neurotransmitter secreted by the axon of another neuron. Most neurons have more than one dendrite. Dendrites and axons do not directly touch each other; there is a gap, called a [synapse](#).

The Transmission of the Signal

The transmission of the signal is basically the same in all cells, the signal is sent across the synapse by the axon and the dendrite of the next cell picks up the signal.

Synapse

The [synapse](#) is a gap between two cells. Synapse are one way junctions between neurons and other cells. The neurotransmitter is emitted from the axon of one cell and usually goes to the dendrite of the next cell. Sometimes the signal goes to the soma or the axon of the next cell instead of the dendrite (Arnold Wittig 2001).

Neurotransmitter

The terminal button at the end of the axon holds the [synaptic vesicles](#). When the signal reaches the end of the axon the vesicles discharge a chemical called a neuro transmitter. Neurotransmitters are chemicals that are used to relay, amplify and modulate electrical signals between a neuron and another cell. There are approximately 40 to 60 different chemicals that are used as neurotransmitters. The neurotransmitters from the axon fit into receptors of the dendrite on the next neuron. They will then either *excite* the cell and make it fire or *inhibit* it and stop it from doing so.

The sum of the excitation and inhibition of the neuron is called the [graded potential](#). If the graded potential is greater than that cell's threshold then the cell fires, sending the message to the next cell. Goto [Here](#) to see a list of some neurotransmitters.

Resting Potential

When the cell hasn't fired for a certain amount of time it is considered at its resting potential. The resting potential of a neuron is approx. 70 mV because the membrane surrounding the cell lets in positive potassium ions (K⁺) and negative chloride ions (Cl⁻) and keeps out positive sodium ions (Na⁺). It is easier to fire a cell that is at its resting potential than one that is in the refractory phase.

[Action potential](#)

When the graded potential passes the neuron's threshold, an action potential takes place. The action potential sends the signal the entire length of the cell and never dies within the cell, which can be referred to as the *all-or-none-principle*. During firing the inside of the cell becomes positive, which is sometimes incorrectly called [Depolarization](#) and should be called the raising phase of the action potential. After the action potential hits its peak the cell starts the refractory phase.

[Refractory Phase](#)

After the action potential changes the neuron from negative to positive there is a refractory phase where it changes back to negative. At the beginning of this period it is impossible for another signal to be transmitted, this is called *absolute refractory phase*. After the absolute refractory phase is the relative refractory phase where it is possible to send another signal but more excitation than normal is needed.

Signal Strength

For the signal to be passed from one neuron to the next it must have enough energy to break a point called the threshold. Once the threshold is broken the signal is transmitted. The neuron fires at the same strength every time. The strength of a signal is decided by how many different neurons are being fired and at what frequency they are being fired.

Glial cells

The amount of [glial cells](#) to every neuron in the nervous system is disputed. Glial cells function as support for the neurons; they produce the myelin sheath which surrounds some neurons and also form part of the *blood-brain barrier*. The blood-brain barrier is a structure that prevents certain substances in the bloodstream from reaching the brain. Many axons are sheathed with tubes of [myelin](#), which is a fatty material. Myelin is produced by the *glial cells*. The myelin sheaths on axons have gaps, which are called the [nodes of Ranvier](#). Myelinated sheaths help transmit information quickly and efficiently.

Organization of the nervous system

The neurons can all be placed in one of two systems, the central nervous system or the peripheral nervous system.

[The Central nervous system](#)

The central nervous system has a fundamental role in the control of behavior. It contains the brain and the spinal cord which are both encased in bone which shows their importance. Both the brain

and spinal cord receive signals from the [afferent](#) neurons and send signals to muscles and glands through [efferent](#) neurons.

The peripheral nervous system

Any part of the nervous system that is not part of the central nervous system is part of the peripheral nervous system. The nerves in the peripheral nervous system is split up into the autonomic and somatic. The somatic connect the central nervous system to sensory organs (such as the eye and ear) and muscles, while the autonomic connect other organs of the body, blood vessels and glands.

The glandular systems

The body has two types of glandular systems, the endocrine, which generally secrete [hormones](#) through the bloodstream, and the exocrine which secrete fluids to the outer surfaces of the body, such as sweating.

Exocrine glands

Endocrine glands

Pituitary Gland Adrenal Cortex Adrenal Medula Thyroid Gland Parathyroid Gland Islets of Langerhans Gonads Placenta

Structure and function of the brain

The brain is split up into three major layers, the [hindbrain](#) is the first, the second is the [midbrain](#), and the [forebrain](#) is last.

Hindbrain

The hindbrain is a well protected central core of the brain and includes the [cerebellum](#), [reticular formation](#), and the [brain stem](#). The cerebellum plays an important role in the integration of sensory perception and motor output. It utilizes constant feedback on body position to fine-tune motor movements. The brain stem contains the pons, and the medulla oblongata. The pons relays sensory information between the cerebellum and [cerebrum](#). The medulla oblongata is the lower portion of the brainstem. It controls autonomic functions such as breathing and vomiting, and relays nerve signals between the brain and spinal cord. The reticular formation is a part of the brain which is involved in stereotypical actions, such as walking, sleeping, and lying down.

Midbrain

This part of the brain is located between the forebrain and the hindbrain making up part of the brain stem. All sensory and motor information going to and from the fore brain and the spinal cord must pass through the midbrain.

Forebrain

The anteriormost division of the developing vertebrate brain that contains the most complex neural network in the CNS. The forebrain has two major divisions, the lower diencephalon, which contains the thalamus and the hypothalamus, and the upper telencephalon, which contains the cerebrum.

Methods for observing or evaluating brain activity

In the past only two methods of observation were available. The first was observing individuals who have received brain damage and assume that the part of the brain that was damaged controlled the behavior or sense that had changed. The second was connecting electrodes to the outside of someones head and recording the readings.

Newer methods include computed tomography (CT scan), positron emission tomography (PET scan), magnetic resonance imaging (MRI), and superconduction quantum interference devices (SQUID).

Footnotes

(1) Voltage is the potential energy in an electric current. It can be either positive or negative. The flow of electricity is from negative voltage to positive voltage

Related Articles

- http://en.wikipedia.org/wiki/Evolutionary_psychology
- http://en.wikipedia.org/wiki/Natural_selection
- http://en.wikipedia.org/wiki/Behavioural_genetics
- <http://en.wikipedia.org/wiki/Psychobiology>

Sensation and Perception

Sensation and Perception

Sensation and perception are related but different concepts. **Sensation** is the input about the physical world that is produced by our sensory receptors. **Perception** is the process by which the mind selects, organizes, and interprets sensations. Our eyes see, our ears hear, our hands touch--or do they? Without interpretation, there is no point to sensation.

How many senses are there?

If you asked the person on the street how many senses there were, it is almost certain that you would hear "Five: sight, sound, taste, smell, and touch." This is the classical concept of human senses. However, researchers have identified two more:

- **Kinesthesia**, which is the sense of position of the parts of the body
- **Vestibular senses**, which detect gravity, linear acceleration, rotary acceleration, and overall provide balance

Taste and smell are related, and both use receptors located in the mouth and other tissues that line other cavities.

The sense of touch is actually a group of subsenses, which could be better-called the **somatic senses** (somatic means "body"). These subsenses include:

- Mechanoreception, which is the perception of pressure or vibration on the skin
- Thermoreception, which is the perception of heat
- Nociception, which is the perception of pain

Sensory receptors

Sensory receptors are cells that are specialized for the task of *transduction*, or converting physical energy into neural impulses. There are many different types of sensory receptors, such as:

- Rods and cones in the retina, which transduce light.
- Cilia in the ear, which transduce sound
- Pressure, vibration, heat, and pain receptors in the skin
- Chemical receptors in the nasal cavities and mouth
- Muscle spindles

Gestalt Effect

People have a tendency to see information and sensory images in tiny pieces. As pieces are sensed they form a larger pattern or picture.

States of Consciousness

Human Development

Like every other aspect of life, behavior is determined largely by an individual's [DNA](#) makeup. DNA can be considered as a "blueprint" for every aspect of life. [Evolutionary psychologists](#) study the role of natural selection in the passing on of behavioral and other psychological traits. Genetic makeup is generally believed to account for much of an individual's [temperament](#).

Structure and Function of DNA

The nucleic acids are the smallest of the organic molecules. DNA stands for deoxyribonucleic acid. It is made up of units called [nucleotides](#), which themselves are composed of an a deoxyribose 5-carbon sugar molecule, a nitrogen base, and a phosphate group. These nucleotides are bonded in columns by phosphate covalent bonds (very strong), and are laterally bound to other nucleotides with weaker hydrogen bonds. Nucleotides are arranged such that they form [genes](#), which are specific biochemical units that code for a characteristic. In [DNA replication](#), DNA is split and transcribed to form proteins, which are the basic structural units of life. Individual-to-individual variance, introduced in reproduction and meiosis, is the basis for different personality traits and differences in temperament between individuals.

Natural Selection in Behavioral Traits

The theory of natural selection may be applied to psychological, as well as biological traits.

Piaget's Theory of Cognitive Development

[Piaget's Theory of Cognitive Development](#)

The Nature-Nurture Controversy

One of the central debates in psychology involves the origin of human behavior. Is it, as theorized by many, caused by biological factors present in the human body, or is it caused by interactions between the individual and its environment (including other individuals of its species) that finally lead to changes in both behavior and even physical structure? This debate has often been termed Nature versus Nurture, and is not an easy one to solve.

Nature *Human behavior is the result of already-present biological factors*

Strict adherents of the nature philosophy often use genetic code as support for their theory. It contains the instructions for millions of protein commands that eventually determine our basic structure as human beings. But is it definitive? And can it be changed?

Nurture *Human behavior is the result of interaction with ones environment*

As for Nature adherents, there is also strong evidence that supports followers of the Nurture philosophy. It is well documented that interaction with ones environment can provoke changes in brain structure and chemistry, and that situations of extreme stress can cause problems like depression.

- http://en.wikipedia.org/wiki/Jean_Piaget
- * http://en.wikipedia.org/wiki/Piaget%27s_theory

http://en.wikipedia.org/wiki/Developmental_psychology

- http://en.wikipedia.org/wiki/Kohlberg%27s_stages_of_moral_development
- * http://en.wikipedia.org/wiki/Lawrence_Kohlberg

http://en.wikipedia.org/wiki/Erik_Erikson

- * http://en.wikipedia.org/wiki/Erikson%27s_stages_of_psychosocial_development
- * http://en.wikipedia.org/wiki/Attachment_theory

Learning

Learning

- Law of Effect
- Conditioning
- Classical Conditioning
 - Stimulus
 - Pavlov's Experiment
 - Watson and Rayner's experiment with Classical Conditioning
 - Summarized version of Watson and Rayner's experiment.
 - Operant Conditioning

Behavior Modification

- Observational Learning
- Experiential Learning

Kolb's learning theory hypothesizes that there are 4 major learning styles: activist, reflector, theorist and pragmatist. Each style means that individuals have a preferred way of learning.

An activist prefers to learn by doing - getting involved in activities in a hands-on way. A reflector learns best by thinking about actions and considering questions that have been posed. A theorist is a person who prefers to learn by considering ideas, concepts, models and theories. A pragmatist learns best by considering how an idea, concept, or experience would work best when applied in a new or different situation.

Memory

[Memory at Wikipedia](#)

1. Long-term memory and short-term memory.
2. Working memory
3. Storing Knowledge
4. Retrieval
5. Amnesia
6. Repression
7. Memory in Childhood
8. Eyewitness Testimony
9. [Flashbulb Memories](#)

Language and Cognition

Motivation and Emotion

An ancient, simplistic view of emotion was that positive-negative was the most interesting dimension. Magda Arnold (1969; see references chapter of this book) argued that active-passive was a more powerful conceptualization. This links the topics of emotion and motivation.

Eddie Harmon-Jones studied this issue with anger emotion. He asked whether it neurobiologically related to negative emotions or with active emotions. Is it more like the inaction of anxiety and depression or like the action tendencies associated with joy and love? Anger activates the left prefrontal cortex, like other action-oriented emotions (Harmon-Jones, Vaughn-Scott, Mohr, Sigelman, & Harmon-Jones, 2004).

This was supported by Drake and Myers (2006).

Personality

- Introduction: <http://en.wikipedia.org/wiki/Personality>
- Psychodynamic Theories
- Humanistic Personality Theories
- Trait Theories
- Cognitive-Social Learning Theories
- Personality Assessment

Intelligence

The concept of intelligence is, in many ways, culturally bound. Not all languages or cultural groups have a word equivalent to "intelligence;" to cultures in which academic work and achievement are unimportant, the idea of "intelligence" is moot.

IQ

In 1904, the French Ministry of Education asked [Alfred Binet](#) to come up with a way to identify children who would need remedial help with schoolwork. They wanted to identify these children as early as possible. In 1912, [William Stern](#) developed a formula often misattributed to Binet or [Lewis Terman](#) to capture the essence of Binet's work: Intelligence Quotient = Mental Age/Chronological Age x 100. This is typically written: $IQ = MA/CA \times 100$. In other words, if a child of 6 years (CA) is achieving at the same level as his 6-year-old peers (MA), his $IQ = 6/6 \times 100$, or 100. For this reason, the score of 100 became the "average" IQ, and remains so today.

Theories of Intelligence

Since Binet, psychologists have gone back and forth between believing intelligence is one thing and believing it consists of many talents or intelligences. Many of the most [reliable](#) modern intelligence tests are based on the idea of intelligence as one thing (in keeping with Binet's original mission, typically something that is highly correlated with academic achievement), but proponents of multiple intelligences argue that

One Thing or Many?

General (g), Crystallized (gc), and Fluid Intelligence (gf)

Assessment of Intelligence

The Bell Curve

The Flynn Effect

Cultural Biases in Intelligence Testing

Herrnstein and Murray's *Bell Curve*

Psychological Disorders

What Is Abnormal?

Abnormal Psychology is the study of psychological differences from the norm. Usually this means disorders, but also includes mental deviances that are still considered unusual, but do not seriously affect a person's functioning. A disorder is defined as a mental trait or other facet of mental functioning that occurs in the minority of the population and is detrimental to the well being of the self or of others.

See: [Criticisms of Psychology](#) for some critiques of this concept.

The diagnostic systems

What is the diagnostic systems?

Among the mental health professions (marriage and family therapy, clinical social work, professional counseling, psychology, and psychiatry) different diagnostic systems are used. The DSM (Diagnostic and Statistical Manual of Mental Disorders) is used in the USA. It is issued by the American Psychiatric Association (APA). Outside the USA the most used system is the ICD (International Classification of Diseases^[1]). This is issued by the World Health Organization (WHO).

The current editions of the systems are DSM-IV-TR (text revision) and ICD 10.

Types of Disorders

Disorders Diagnosed in Early Childhood

This category of disorders includes disorders that are usually diagnosed in infancy or childhood.

A.D.H.D

A.D.H.D stands for Attention Deficit Hyperactivity Disorder. The definition of A.D.D. (Attention Deficit Disorder) was merged with that of A.D.H.D in DSM-IV.

Tic Disorders

Tourette's Syndrome

Tourette's Syndrome (TS) is a disorder characterized by the presence of at least two tics, one motor and one physical. The vocal tic is, however, more critical to the diagnosis of Tourette's. Tourette's syndrome sufferers usually have faster reflexes than other people. Tourette's syndrome sufferers have a roughly 40% occurrence rate of involuntary swearing, known as coprolalia. This relatively rare symptom has been abused by the media and is a source of much misunderstanding about TS. Tourette's syndrome is also featured in a number of movies, such as 'What about Bob?', in which Bob, the main character, pretends to have Tourette's.

Anxiety Disorders

Phobias

Phobias are irrational fears.

Panic Attacks

Random panic

Obsessive Compulsive Disorder

Obsessive Compulsive Disorder is an anxiety disorder characterized by the presence of two things: Obsessions and Compulsions. Obsessions are defined as recurring or persistent thoughts, images, or actions that significantly interfere with a person's day-to-day functioning. Some common obsessions are cleanliness, symmetry/order, and fear of falling seriously ill. The person will attempt to minimize or eliminate these unwanted thoughts through the use of compulsions. Compulsions are the behaviors used to cope with obsessions. The most common compulsions are hand washing, checking (as in checking to make sure doors are locked several times a night), and counting.

While most people with OCD only have one to a few main obsessions, the disorder also interferes with many thoughts and actions unrelated to their obsessions. For example:

A person who obsesses over cleanliness will often be caught in a loop: First, they will wash their hands. As they finish, the thought occurs to them that the water may have been contaminated. So they wash again, and this time, upon finishing, they wonder if there were germs in the soap. Again, they wash their hands, and after drying, they will likely wonder who's been touching the towel. This goes on and on - if the person does not execute the compulsions, the obsessive thoughts won't allow them to focus on anything else.

But the pattern often shows in other situations: perhaps the person notices a knife laying out in the kitchen, and suddenly realizes that, if they wanted, they could use it to kill their entire family. This normally isn't a pleasant thought, and the person tries to push it from their mind. But the thought doesn't go away - it stays at the front of the person's mind until the person acts on it (hopefully by putting the knife away or going into another room). These thoughts aren't (or shouldn't be) nearly strong enough to make a person murder anyone, but they are very distracting, unpleasant, persistent, and often damaging. For reasons similar to this example, many people with OCD are uncomfortable around sharp objects or weapons.

Case studies to follow?

Psychotic Disorders

Schizophrenia

The schizophrenic disorders are characterized in general by fundamental and characteristic distortions of thinking and perception, and affects that are inappropriate or blunted. Clear consciousness and intellectual capacity are usually maintained although certain cognitive deficits may evolve in the course of time. The most important psychopathological phenomena include thought echo; thought insertion or withdrawal; thought broadcasting; delusional perception and delusions of control; influence or passivity; hallucinatory voices commenting or discussing the

patient in the third person; thought disorders and negative symptoms.

The course of schizophrenic disorders can be either continuous, or episodic with progressive or stable deficit, or there can be one or more episodes with complete or incomplete remission. The diagnosis of schizophrenia should not be made in the presence of extensive depressive or manic symptoms unless it is clear that schizophrenic symptoms antedate the affective disturbance. Nor should schizophrenia be diagnosed in the presence of overt brain disease or during states of drug intoxication or withdrawal. (from [WHO - ICD 10](#))

Sexual Disorders

Paraphilias

Pedophilia

Frotteurism

Other Paraphilias

Drug Related Disorders

Addiction And Dependence

Developmental Disorders

Autism

Asperger's Syndrome

Personality Disorders

Borderline Syndrome

Psychotherapy and Intervention

Branches of Psychology

Psychology is an extremely broad field, encompassing many different approaches to the study of mental processes and behavior. Below are the major areas of inquiry that comprise psychology, divided into fields of research psychology and fields of applied psychology. A comprehensive list of the sub-fields and areas within psychology can be found at the list of psychological topics and list of psychology disciplines.

Abnormal Psychology

Abnormal psychology is the study of abnormal behavior in order to describe, predict, explain, and change abnormal patterns of functioning. Abnormal psychology studies the nature of psychopathology and its causes, and this knowledge is applied in clinical psychology to treating patients with psychological disorders.

Biopsychology

Biological psychology is the scientific study of the biological bases of behavior and mental states. Because all behavior is controlled by the central nervous system, it is sensible to study how the brain functions in order to understand behavior. This is the approach taken in behavioral neuroscience, cognitive neuroscience, and neuropsychology. Neuropsychology is the branch of psychology that aims to understand how the structure and function of the brain relate to specific behavioral and psychological processes. Often neuropsychologists are employed as scientists to advance scientific or medical knowledge. Neuropsychology is particularly concerned with the understanding of brain injury in an attempt to work out normal psychological function.

The approach of cognitive neuroscience to studying the link between brain and behavior is to use neuroimaging tools, such as fMRI, to observe which areas of the brain are active during a particular task.

Behavior Analysis

Clinical Psychology

Clinical psychology is the application of abnormal psychology research to the understanding, treatment, and assessment of psychopathology. This primarily includes behavioral and mental health concerns. It has traditionally been associated with psychological treatment and psychotherapy, although modern clinical psychology may take an eclectic approach, including a number of therapeutic approaches. Typically, although working with many of the same clients as psychiatrists, clinical psychologists do not prescribe psychiatric drugs. Some clinical psychologists may focus on the clinical management of patients with brain injury. This area is known as clinical neuropsychology.

In recent years and particularly in the United States, a major split has been developing between academic research psychologists in universities and some branches of clinical psychology. Many research psychologists believe that many contemporary clinicians use therapies based on discredited theories and unsupported by empirical evidence of their effectiveness. From the other side, these clinicians believe that the research psychologists are ignoring their experience in dealing with actual

patients. The disagreement resulted in the formation of the Association for Psychological Science by the research psychologists as a new body distinct from the American Psychological Association.

The work performed by clinical psychologists tends to be done inside various therapy models. A popular model is the Cognitive-Behavioral therapy (CBT) framework. CBT is an umbrella term that refers to a number of therapies which focus on changing cognitions and/or behaviors, rather than changing behavior exclusively, or discovering the unconscious causes of psychopathology (as in the psychodynamic school). The two most famous CBT therapies are Aaron T. Beck's cognitive therapy and Albert Ellis's rational emotive behavior therapy (with cognitive therapy being, by far, the most extensively studied therapy in contemporary clinical psychology).

Counselling

Counselling psychology is a psychology specialty that facilitates personal and interpersonal functioning across the lifespan with a focus on emotional, social, vocational, educational, health-related, developmental, and organizational concerns. Counselling psychology differs from clinical psychology in that it is focused more on normal developmental issues and everyday stress rather than serious mental disorders. Counselling psychologists are employed in a variety of settings, including universities, schools, businesses, private practice, and community mental health centers.

The emerging field of relationship counseling, which characterizes ordinary human relationship successes and failures in concrete terms, has the specific appeal of avoiding psychology's practice of ascribing pathology to individuals who seek assistance. Current health insurance reimbursement for psychological services commonly involves the assignment of mental disease nomenclature (a feature that potential clients may find offensive, and that could potentially be iatrogenic).

Relationship counseling, also referred to as "relationship education", includes psychologists, psychiatrists, and social workers. It is based on decades of university-based research, drawing on knowledge gained through close observation and analysis of both successful and unsuccessful marriages and family units.

Cognitive Psychology

The nature of thought is another core interest in psychology. Cognitive psychology studies cognition, the mental processes underlying behavior. It uses information processing as a framework for understanding the mind. Perception, learning, problem solving, memory, attention, language and emotion are all well researched areas. Cognitive psychology is associated with a school of thought known as cognitivism, whose adherents argue for an information processing model of mental function, informed by positivism and experimental psychology.

Cognitive science is very closely related to cognitive psychology, but differs in some of the research methods used, and has a slightly greater emphasis on explaining mental phenomena in terms of both behavior and neural processing.

Both areas can use computational models to simulate phenomena of interest. Because mental events cannot directly be observed, computational models provide a tool for studying the functional organization of the mind. Such models give cognitive psychologists a way to study the "software" of mental processes independent of the "hardware" it runs on, be it the brain or a computer.

Cognitive Psychology and Cognition Development

- <http://www.webrenovators.com/psych/GestaltPsychology.htm> (gestalt psychology)
- <http://psychology.jrank.org/pages/126/Cognitive-Psychology.html> (cognitive psychology)

- <http://social.jrank.org/pages/143/Cognitive-Development-Information-Processing-Theories.html>
- <http://www.mc.maricopa.edu/dept/d46/psy/dev/Fall98/Theories/Cog.html> (cognitive developmental theory)

Cognitive Information Processing

- <http://chiron.valdosta.edu/whuitt/col/cogsys/infoproc.html> (the info processing approach to cognition)
- <http://www.simplypsychology.pwp.blueyonder.co.uk/cognitive.html> (cognitive approach in psychology)

Metacognition

- <http://www.gse.buffalo.edu/fas/shuell/cep564/Metacog.htm> (metacognition: an overview)
- <http://members.iinet.net.au/~rstack1/world/rss/files/metacognition.htm> (thinking about thinking)

Developmental Psychology

Mainly focusing on the development of the human mind through the life span, developmental psychology seeks to understand how people come to perceive, understand, and act within the world and how these processes change as they age. This may focus on intellectual, cognitive, neural, social, or moral development. Researchers who study children use a number of unique research methods to make observations in natural settings or to engage them in experimental tasks. Such tasks often resemble specially designed games and activities that are both enjoyable for the child and scientifically useful, and researchers have even devised clever methods to study the mental processes of small infants. In addition to studying children, developmental psychologists also study aging and processes throughout the life span, especially at other times of rapid change (such as adolescence and old age). Urie Bronfenbrenner's theory of development in context (The Ecology of Human Development - [ISBN 0-674-22456-6](#)) is influential in this field, as are those mentioned in "Educational psychology" immediately below, as well as many others. Developmental psychologists draw on the full range of theorists in scientific psychology to inform their research.

Educational Psychology

Educational psychology is the study of how humans learn in educational settings, the effectiveness of educational interventions, the psychology of teaching, and the social psychology of schools as organizations. The work of child psychologists such as Lev Vygotsky, Jean Piaget and Jerome Bruner have been influential in creating teaching methods and educational practices.

The work and theories of the above mentioned psychologists will be linked from this site soon.

Evolutionary Psychology

The basic idea of evolutionary psychology is that psychological characteristics, like biological characteristics, may be passed on from one generation to another through hereditary material.

Present-day psychological traits may be analyzed in terms of their evolutionary advantage for our ancestors. For example, males today tend to desire many mates while females desire one. According to evolutionary psychologists, this continues on to this day because it was an evolutionary advantage for males of the past to attempt to spread their genetic material as widely as possible because it increased their likelihood of passing on their own traits for future generations.

Experimental Psychology

Forensic Psychology

Psychology and Law

Together, Forensic psychology and Legal Psychology compose the area known as Psychology and Law.

Most typically, forensic psychology is practiced by clinical psychologists, and involves a clinical analysis of a particular individual and an assessment of some specific psycho-legal question. Typically, referrals to forensic practices constitute assessments for individuals that have ostensibly suffered neurologic insult(s). These patients have sought legal recourse, and the job of the forensic psychologist is to demonstrate that there is or is not (depending on their employment by either the prosecution or defense) a cause-and-effect relation between the accident and the subsequent (again, ostensible) neurologic change.

Legal psychology is a research-oriented field populated with researchers from several different areas within psychology (although Social Psychologists are typical).

Health Psychology

Health psychology is the application of psychological theory and research to health, illness and health care. Whereas clinical psychology focuses on mental health and neurological illness, health psychology is concerned with the psychology of a much wider range of health-related behavior including healthy eating, the doctor-patient relationship, a patient's understanding of health information, and beliefs about illness. Health psychologists may be involved in public health campaigns, examining the impact of illness or health policy on quality of life or in research into the psychological impact of health and social care.

Neuropsychology

Neuropsychology involves the study of both healthy individuals and patients, typically who have suffered either brain injury or mental illness.

Cognitive neuropsychology and cognitive neuropsychiatry study neurological or mental impairment in an attempt to infer theories of normal mind and brain function. This typically involves looking for differences in patterns of remaining ability (known as 'functional disassociations') which can give clues as to whether abilities are comprised of smaller functions, or are controlled by a single cognitive mechanism.

In addition, experimental techniques are often used which also apply to studying the neuropsychology of healthy individuals. These include behavioral experiments, brain-scanning or functional neuroimaging - used to examine the activity of the brain during task performance, and techniques such as transcranial magnetic stimulation, which can safely alter the function of small

brain areas to investigate their importance in mental operations.

Computational modeling is a tool often used in cognitive psychology to simulate a particular behavior using a computer. This method has several advantages. Since modern computers are extremely fast, many simulations can be run in a short time, allowing for a great deal of statistical power. Modeling also allows psychologists to visualise hypotheses about the functional organization of mental events that couldn't be directly observed in a human.

Several different types of modeling are used to study behavior. Connectionism uses neural nets to simulate the brain. Another method is symbolic modeling, which represents many different mental objects using variables and rules. Other types of modeling include dynamic systems and stochastic modeling.

Industrial-Organizational Psychology

Industrial and organizational psychology (I/O) is among the newest fields in psychology. Industrial Psychology focuses on improving, evaluating, and predicting job performance while Organizational Psychology focuses on how organizations impact and interact with individuals. In 1910, through the works and experiments of Hugo Munsterberg and Walter Dill Scott, Industrial Psychology became recognized as a legitimate part of the social science [3]. Organizational Psychology was not officially added until the 1970s and since then, the field has flourished. The Society for Industrial Organizational Psychology has approximately 3400 professional members and 1900 student members. These two numbers combine to make up only about four percent of the members in the American Psychology Association but the number has been rising since 1939 when there were only one hundred professional I/O psychologists [3].

I/O psychologists are employed by academic institutions, consulting firms, internal human resources in industries, and governmental institutions. Various universities across the United States are beginning to strengthen their I/O Psychology programs due to the increase of interest and job demand in the field [3].

Industrial organizational psychologists look at questions regarding things such as who to hire, how to define and measure successful job performance, how to prepare people to be more successful in their jobs, how to create and change jobs so that they are safer and make people happier, and how to structure the organization to allow people to achieve their potential.[3]

Human factors psychology is the study of how cognitive and psychological processes affect our interaction with tools and objects in the environment. The goal of research in human factors psychology is to better design objects by taking into account the limitations and biases of human mental processes and behavior.

Personality Psychology

Personality psychology studies enduring psychological patterns of behavior, thought and emotion, commonly called an individual's personality. Theories of personality vary between different psychological schools. Trait theories attempts to break personality down into a number of traits, by use of factor analysis. The number of traits have varied between theories. One of the first, and smallest, models was that of Hans Eysenck, which had three dimensions: extraversion introversion, neuroticism emotional stability, and psychoticism. Raymond Cattell proposed a theory of 16 personality factors. The theory that has most empirical evidence behind it today may be the "Big Five" theory, proposed by Lewis Goldberg and others.

A different, but well known, approach to personality is that of Sigmund Freud, whose structural theory of personality divided personality into the ego, superego, and id. Freud's theory of personality has been criticized by many, including many mainstream psychologists.

Social Psychology

Social Psychology is the branch of Psychology or Sociology that deals with the study of individual behaviour in a society. Psychology is the study of mind and behaviour and the basic subject matter for the study of psychology is the individual difference. The individual becomes the part of a society by the process of socialization. The major and most determining part of socialization occurs in the early childhood. This is the time when the child learns all the social norms and values.

The social psychology can be divided into two major categories based on the emphasis given to either of the constituting disciplines, Psychology and Sociology. Psychological Social Psychology (PSP) emphasizes its study on the subject's mental processes, experiences and dispositions while Sociological Social Psychology (SSP) emphasizes its study on the individual's social order, roles and the historical base of social behaviour.

Social psychology is the study of the nature and causes of human social behavior, with an emphasis on how people think towards each other and how they relate to each other. Social Psychology aims to understand how we make sense of social situations. For example, this could involve the influence of others on an individual's behavior (e.g., conformity or persuasion), the perception and understanding of social cues, or the formation of attitudes or stereotypes about other people. Social cognition is a common approach and involves a mostly cognitive and scientific approach to understanding social behavior.

A related area is community psychology, which examines psychological and mental health issues on the level of the community rather than using the individual as the unit of measurement.

Social psychology studies how the presence or perceived presence of others impacts human behavior, emotion, and cognition.

Judgment and Decision Making

The psychology of judgment and decision making deals with numerous psychological factors and events, including moral intuitions and performance, intuitive and heuristic modes of evaluating and choosing, conscious reasoning modeled after Western logic, and the factors and biases that affect one's choice of choosing method and the performance of the method itself. As with all mental events, underlying this general topic are the neuroscientific and biological factors that modulate the uses of the various sub-mechanisms.

Fight or Flight Response.

Psycholinguistics

Social Psychology

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Social psychology studies how the presence or perceived presence of others impacts human behavior, emotion, and cognition.

Psychophysics

Psychophysics is the branch of Psychology dealing with the study of relationship between physical stimuli and individual perception. Perception is a general concept which refers to interpretation of a stimuli received by the senses. There are number of factors that affect the perception. Even the same stimuli can give different perceptions at different situations. Some of the factors that affect the perception are the individual's expectations, similarity, proximity, continuity and closure.

The propounder of the concept or discipline of psychophysics was [Gustav Theodor Fechner](#). The concept was first mentioned in his work *Elemente der Psychophysik* in 1860.

Research Methods in Psychology

Research psychology encompasses the study of behavior for use in academic settings, and contains numerous areas. It contains the areas of abnormal psychology, biological psychology, cognitive psychology, comparative psychology, developmental psychology, personality psychology, social psychology and others. All branches of psychology can have a research component to them.

Research psychology is contrasted with applied psychology.

Research in psychology is conducted in broad accord with the standards of the scientific method, encompassing both qualitative ethological and quantitative statistical modalities to generate and evaluate explanatory hypotheses with regard to psychological phenomena. Where research ethics and the state of development in a given research domain permits, investigation may be pursued by experimental protocols. Psychology tends to be eclectic, drawing on scientific knowledge from other fields to help explain and understand psychological phenomena. Qualitative psychological research utilizes a broad spectrum of observational methods, including action research, ethnography, exploratory statistics, structured interviews, and participant observation, to enable the gathering of rich information unattainable by classical experimentation. Research in humanistic psychology is more typically pursued by ethnographic, historical, and historiographic methods.

The testing of different aspects of psychological function is a significant area of contemporary psychology. Psychometric and statistical methods predominate, including various well-known standardized tests as well as those created ad hoc as the situation or experiment requires.

Academic psychologists may focus purely on research and psychological theory, aiming to further psychological understanding in a particular area, while other psychologists may work in applied psychology to deploy such knowledge for immediate and practical benefit. However, these approaches are not mutually exclusive and most psychologists will be involved in both researching and applying psychology at some point during their career. Clinical psychology, among many of the various disciplines of psychology, aims at developing in practicing psychologists knowledge of and experience with research and experimental methods which they will continue to build up as well as employ as they treat individuals with psychological issues or use psychology to help others.

When an area of interest requires specific training and specialist knowledge, especially in applied areas, psychological associations normally establish a governing body to manage training requirements. Similarly, requirements may be laid down for university degrees in psychology, so that students acquire an adequate knowledge in a number of areas. Additionally, areas of practical psychology, where psychologists offer treatment to others, may require that psychologists be licensed by government regulatory bodies as well.

Quantitative psychology involves the application of statistical analysis to psychological research, and the development of novel statistical approaches for measuring and explaining human behavior. It is a young field (only recently have Ph.D. programs in quantitative psychology been formed), and it is loosely comprised of the subfields psychometrics and mathematical psychology.

Psychometrics is the field of psychology concerned with the theory and technique of psychological measurement, which includes the measurement of knowledge, abilities, attitudes, and personality traits. Measurement of these unobservable phenomena is difficult, and much of the research and accumulated knowledge in this discipline has been developed in an attempt to properly define and quantify such phenomena. Psychometric research typically involves two major research tasks, namely: (i) the construction of instruments and procedures for measurement; and (ii) the development and refinement of theoretical approaches to measurement.

Psychology is a science and therefore, must be approached as such. This means that the scientific method must be used, especially in designing an experiment.

There are several research methods that psychologists employ:

Research Designs

Although there are many different kinds of research designs in psychology, the general kinds of studies are: descriptive or qualitative, correlational, and experimental. The method of data collection also varies, with self-report on one end of the spectrum and naturalistic observation on the other.

Descriptive Studies

Studies that do not test specific relationships between variables are called descriptive studies. In this research method, general or specific behaviors or attributes are observed and measured, without respect to each other. These studies are generally the design of choice for breaking into new areas, as the vast but often inconclusive amount of information collected can be drawn upon for future hypotheses.

An example of such a study would be a researcher inquiring into the quality of mental health institutions. This would be done by observation or measurements of various criteria, as opposed to relationships between variables. Alternatively, the study could be conducted without any specific criteria in mind.

Correlational Study

This method of statistical analysis shows the relationship between two variables. For example, research has shown that alcohol dependence correlates with depression. That is to say, the more alcohol people consume, the more depressed they become. On the other hand, it could be the other way around as well: the more depressed people become, the more likely they are to consume alcohol.

The attributes of correlations include strength and direction. The direction may be positive (both variables both increase or decrease together), negative (one variable increases while the other decreases) or unrelated (a random relationship between variables). The strength of a correlation ranges from -1 to +1 with a 0 reflecting no relationship between variables. A correlational study serves only to describe/predict behaviour and not to explain it. This is so because a third variable could be shown to cause the occurrence of one of the variables. Furthermore, only experiments can prove causation.

Experiments

Experiments are generally the studies that are the most precise and have the most weight to them due to their conclusive power. They are particularly effective in proving hypotheses about cause and effect relationships between variables. A hypothesis is a prediction of how one variable relates to another. There are two types of hypotheses, *null* and *directional*. The null is a prediction that there will not be any change in the dependent variable when the researcher changes the independent variable. The directional hypothesis states that the change in the independent variable will induce a change in the dependent variable. In a true experiment, all variables are held constant except for the independent variable, which is manipulated. Thus, any changes in the experimental groups can be solely attributed to the action of the independent variable. This is called being *objective*.

For instance, in an experiment to test whether music improves people's memories, we would have a sheet of paper with ten unrelated words on it for people to memorize. The control group would have no music playing in the background while the experimental group would have some music in the background. Because as researchers we have adhered to the scientific method and held all variables as constant as possible, if the experimental group does report better recollection of words, then we

could assume that the music had an effect on memory. However, we must be certain to do our best to ensure that any controllable differences between the two groups are eliminated in order to ensure that no confounding variable interferes with the experiment.

There are two main ways to pick, or *sample* the subjects in an experiment, *random* and *stratified*. In a random sampling each person has an equal chance at being picked. This means that if 90% of the population being sampled from are Christian then 90% of the sample will be Christian. If the researcher wanted all religions represented equally he would employ stratified sampling. For instance, the experiment could be performed only on women, or on mixed groups with equal numbers of each sex in them, to eliminate the possibility of biased results from one gender having better average memory than the other.

Steps must be taken to make sure that there is no *experimenter bias*. Two common forms of bias are *demand characteristics* and *expectancy effects*. If a researcher expects certain results from an experiment and influences the subjects response this is called demand characteristics. If the experimenter inadvertently interprets the information to be as expected in his hypothesis it is called expectancy effect. To counteract experimenter bias the subjects can be kept uninformed on the intentions of the experiment, which is called single blind. If the people collecting the information and the subjects giving it are kept uninformed then it is called a double blind experiment.

The experiment should also be reported so that other researchers can *repeat* it. If an experiment isn't repeatable it will not hold much weight in the scientific community. To help an experiment be repeatable the researcher should have the variables be measurable, this is called being *empirical*.

Whether researching humans or animals the experiment should be ethical. When humans are the subjects they should be *informed* of what the study is, *consent* to being in it, be *debriefed* afterwards, and their information should also be kept *confidential*.

Naturalistic Observation

Researchers study organisms in their natural environments or habitats without trying to manipulate or control anything. In this method, the researcher observes the behavior under study in its natural setting while attempting to avoid influencing or controlling it. The observations are done in a naturalistic setting without any preparation or participation of the researcher. Therefore, the behavior is observed in public places, streets, homes, and schools. Observing people from other cultures response in the same setting is a way to provide information for *cross-cultural research*.

Self Report

This method includes *tests*, *questionnaires*, and *interviews*. All of which do the same thing, give the subject a stimuli, i.e. the question, and get a response. The advantage of using these is the ability to inexpensively and rapidly collect vast amounts of data. This allows a psychologist to compare one person, or a group of people's results to thousands of others. The disadvantage is that they are not always telling what the subject's response is but what the subject says is the response.

Information Display

Statistics

Once the information is gathered it has to be put into some kind of form, usually numerical. *Statistics* deals with the collection, analysis, interpretation, and presentation of numerical data. The goal of statistics is to summarize the data and let *descriptions* or *inferences* be made. Inferences are

used when making predictions of the relationships of variables. Descriptions are concise displays, using *statistical symbols*, of the information in *frequency distributions*, *measures of central tendency*, or *measures of variability*.

Statistical Symbols

There are agreed upon standard symbols used in statistical displays. These symbols can be used by themselves or in equations.

N = number of scores

X = score (or scores)

M = mean

d = difference of a score from the mean

Σ = sum of

D = difference in rank

r or ρ = correlation

SD = standard deviation

Frequency Distribution

A frequency distribution is obtained by taking the score and splitting them into subgroups. The subgroups are then put on either a histogram (bar graph) or a frequency polygram (line graph). When a frequency distribution has most of the scores on one side of the graph it is considered skewed. If it has most of the scores in the middle with equal amounts on both sides it is considered symmetrical.

Measures of Central Tendency

In measures of central tendency there is one number that is used to represent a group of numbers. This number is either the mean, median, or the mode.

Measures of Variability

Variability is concerned with the dispersement of the scores, called *variability* i.e. are the scores clustered together or spread out. *Range* and *standard deviation* are the measures most commonly used. To find the range just subtract the number of the lowest score from the number of the highest score. This can be deceiving if most of the scores are bunched together and one of the scores is very far away from it. In this case standard deviation must be used. A formula commonly used for standard deviation is $SD = \text{the square root of } \Sigma d^2/N$.

Case Studies

In the course of treating a patient a psychologist will take records of problems, insights, and techniques that were important in the patient's treatment. When this is done it is called a *case study* or a *clinical case history* and may be drawn upon by researchers to expose a factor that is important for understanding a behavior.

BASIC CONCEPTS

- a. independent variable = variable that one manipulates in order to see if it has any effect on the dependent variable (eg. in the example above, the independent variable would be music and its effect on memory)
- b. dependent variable = variable that depends on the effect of the independent variable (eg. in the example above, the dependent variable would be memory and better recollection of words)
- c. double-blind procedure = procedure in which neither the researcher nor the subjects know which group (experimental or control) the subjects are in in order to minimize experimenter cues.
- d. single-blind procedure = procedure in which only the researcher knows which group which kind of subject is in.
- e. experimenter cues - subtle and often unintentional cues that the experimenter makes which implies which group which kind of subject is in. for example, if an experimenter believes that music does indeed improve memory, some cues would be the experimenter's smiling/winking at the experimental group. This smile/wink would imply to the subjects in the experimental group that the researcher is secretly implying that they're in the experimental group.
- f. placebo effect - a treatment works because of the patient's belief that it works and not because it actually does.

Scientific Experiment

Experimental psychological research is conducted in the laboratory under controlled conditions. This method of research attempts to rely solely on an application of the scientific method to understand behavior and mental processes. Examples of such measurements of behavior include reaction time and various psychometric measurements. Experiments are conducted to test a particular hypothesis.

As an example of a psychological experiment, one may want to test people's perception of different tones. Specifically, one could ask the following question: is it easier for people to discriminate one pair of tones from another depending upon their frequency? To answer this, one would want to disprove the hypothesis that all tones are equally discriminable, regardless of their frequency. (See hypothesis testing for an explanation of why one would disprove a hypothesis rather than attempt to prove one.) A task to test this hypothesis would have a participant seated in a room listening to a series of tones. If the participant would make one indication (by pressing a button, for example) if they thought the tones were two different sounds, and another indication if they thought they were the same sound. The proportion of correct responses would be the measurement used to describe whether or not all the tones were equally discriminable. The result of this particular experiment would probably indicate better discrimination of certain tones based on the human threshold of hearing.

Experimental psychological research is not restricted to the laboratory. In a natural setting, a manipulation of the situation can be made to see what is its effect on behavior. For example, one piece of research in environmental psychology measured the littering behavior of picnickers in a park as the result of litter already at the site. On random hours and random days, when the picnic area was vacant, the researchers made the area clean or left trash, and then observed how the site was left after the next picnickers visited.

The key phrase to describe an experiment is similar people in different situations. The similarity of the people is achieved by random assignment (This resembles the phrase 'random selection', but

they are very different in meaning and in practice). The different situations are created by manipulation of some situational variable. In the previous paragraph, that variable was the absence or presence of litter when the picnickers arrived.

Field Study

A longitudinal study is a research method which observes a particular population over time. For example, one might wish to study specific language impairment (SLI) by observing a group of individuals with the condition over a period of time. This method has the advantage of seeing how a condition can affect individuals over long time scales. However, such studies can suffer from attrition due to drop-out or death of subjects. In addition, since individual differences between members of the group are not controlled, it may be difficult to draw conclusions about the populations.

Surveys

The survey method of data collection is likely the most common of the four major methods. The benefits of this method include its low financial cost and its large sample size. The very large issue with the survey is its accuracy. More often than not, there is a large disparity between people's stated opinions and their expressed opinions. The survey is a reflection only of their stated opinions, and thus is fundamentally inaccurate. Properly interpreted, surveys may be used to understand a person's viewpoints on a matter, but this analysis is very difficult and also leaves much room for doubt. All in all, surveys have limited use in studying actual social action, but are inexpensive and are an excellent way to gain an understanding of a person's attitude toward a matter.

See Richard LaPiere's 1934 case study for further reading on the aforementioned disparity.

Criticisms of Psychology

Introduction

Psychology as normative

One question that arises in the study of [abnormal psychology](#) is the question "what is a disorder?" In medicine, it may be more obvious when a person has a disease. But when studying the depths of the human mind, who gets to draw the line between what is a disease and what is not? And who has the authority to decide who is "normal" and who is not? In all fields of medicine, the category of "normal" is widely used to describe

Controversy as a science

Although modern psychology attempts to be a scientific endeavour, the field has a history of controversy. Some criticisms of psychology have been made on ethical and philosophical grounds. Some have argued that by subjecting the human mind to experimentation and statistical study, psychologists objectify persons. Because it treats human beings as things, as objects that can be examined by experiment, psychology is sometimes portrayed as dehumanizing, ignoring or downplaying what is most essential about being human. This criticism has come from within the field as well, particularly by existential and humanistic psychologists.

A common criticism of psychology concerns its fuzziness as a science. Philosopher Thomas Kuhn suggested in 1962 that psychology is in a pre-paradigmatic state, lacking the agreement on facts found in mature sciences such as chemistry and physics. Because some areas of psychology rely on "soft" research methods such as surveys and questionnaires, critics have claimed that psychology is not as scientific as psychologists assume. Methods such as introspection and psychoanalysis, used by some psychologists, are inherently subjective. Objectivity, validity, and rigour are key attributes in science, and some approaches to psychology have fallen short on these criteria. On the other hand, greater use of statistical controls and increasingly sophisticated research design, analysis, and statistical methods, as well as a decline (at least within academic psychology departments) in the use of less scientific methods, have lessened the impact of this criticism to some degree.

Debates continue, however, such as the questioned effectiveness of probability testing as a valid research tool. The concern is that this statistical method may promote trivial findings as meaningful, especially when large samples are used.[5] Psychologists have responded with an increased use of effect size statistics, rather than sole reliance on the traditional $p < .05$ decision rule.

Research-practitioner gap

There is also concern from researchers about a perceived scientific gap between empirically based practices. Exponents of evidence-based approaches to psychological practice say that "over the past several decades, the fields of clinical psychology, psychiatry, and social work have borne witness to a widening and deeply troubling gap between science and practice" and "less and less of what researchers do finds its way into the consulting room, and less and less of what practitioners do derives from scientific evidence." Moreover there are many "unvalidated and sometimes harmful psychotherapeutic methods" that have been widely adopted by the profession. However, "the fields of clinical psychology, psychiatry, and social work have recently placed increased emphasis on evidence-based mental health practices." [1]

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