concerned with the relationship of mental processes to behavior. Cognitive psychology focuses on how people take in, perceive, and store information, and how they process and act on that information.

Additional psychological perspectives include the neurobiological approach, focusing on relating behavior to internal processes within the brain and nervous system, and the phenomenological approach, which is most concerned with the individual’s subjective experience of the world rather than the application of psychological theory to behavior. While all these approaches differ in their explanations of individual behavior, each contributes an important perspective to the psychological image of the total human being. Most psychologists apply the principles of various approaches in studying and understanding human nature.

Along with several approaches to psychology there are also numerous subfields in which these approaches may be applied. Most subfields can be categorized under one of two major areas of psychology referred to as basic and applied psychology. Individual psychologists may specialize in one of the subfields in either of these areas. The subfields are often overlapping areas of interest rather than isolated domains. Basic psychology encompasses the subfields concerned with the advancement of psychological theory and research. Experimental psychology employs laboratory experiments to study basic behavioral processes shared by different species, including sensation, perception, learning, memory, communication, and motivation. Physiological psychology is concerned with the ways in which biology shapes behavior and mental processes, and developmental psychology is concerned with behavioral development over the entire life span. Other subfields include social psychology, quantitative psychology, and the psychology of personality.

Applied psychology is the area of psychology concerned with applying psychological research and theory to problems posed by everyday life. It includes clinical psychology, the largest single field in psychology. Clinical psychologists—accounting for 40 percent of all psychologists—are involved in psychotherapy and psychological testing. Like clinical psychologists, counseling psychologists apply psychological principles to diagnose and treat individual emotional and behavioral problems. Other subfields of applied psychology include school psychology, which involves the evaluation and placement of students; educational psychology, which investigates the psychological aspects of the learning process; and industrial psychology and organizational psychology, which study the relationship between people and their jobs. Community psychologists investigate environmental factors that contribute to mental and emotional disorders; health psychologists deal with the psychological aspects of physical illness, investigating the connections between the mind and a person’s physical condition; and consumer psychologists study the preferences and buying habits of consumers as well as their reactions to certain advertising.

In response to society’s changing needs, new fields of psychology are constantly emerging. One new type of specialization, called environmental psychology, focuses on the relationship between people and their physical surroundings. Its areas of inquiry include such issues as the effects of overcrowding and noise on urban dwellers and the effects of building design. Another relatively new specialty is forensic psychology, involving the application of psychology to law enforcement and the judicial system. Forensic psychologists may help create personality profiles of criminals, formulate principles for jury selection, or study the problems involved in eyewitness testimony. Yet another emerging area is program evaluation, whose practitioners evaluate the effectiveness and cost efficiency of government programs.

Depending on the nature of their work, psychologists may practice in a variety of settings, including colleges and universities, hospitals and community mental health centers, schools, and businesses. A growing number of psychologists work in private practice and may also specialize in multiple subfields. Most psychologists earn a Ph.D. degree in the field, which requires completion of a four- to six-year program offered by a university psychology department. The course of study includes a broad overview of the field, as well as specialization in a particular subfield, and completion of a dissertation and an internship. Students who intend to practice only applied psychology rather than conduct research have the option of obtaining a Psy.D. degree, which does not entail writing a dissertation.

See also Behavior therapy; Cognitive therapy; Counseling psychology; Developmental psychology; Experimental psychology; Health psychology; Research Methodology

Psychophysics

The subfield of psychology that deals with the transformation from the physical to the psychological through detection, identification, discrimination, and scaling.

Psychophysics originated with the research of Gustav Fechner (1801-1887), who first studied the relationship between incoming physical stimuli and the responses to them. Psychophysicists have generally used two ap-
approaches in studying our sensitivity to stimuli around us: measuring the absolute threshold or discovering the difference threshold. In studying the absolute threshold using the method of constant stimuli, an experimenter will, for example, produce an extremely faint tone which the listener cannot hear, then gradually increase the intensity until the person can just hear it; on the next trial, the experimenter will play a sound that is clearly heard, then reduce its intensity until the listener can no longer hear it. Thresholds can also be ascertained through the method of constant stimuli. In this approach, stimuli of varying intensity are randomly presented. Although an observer's measured threshold will change depending on methodology, this technique gives an estimate of an individual’s sensitivity.

A different psychophysical approach combines the concept of sensory abilities with the decisions and strategies that an observer uses to maximize performance in a difficult task. Rather than try to identify a single point for the threshold, psychophysicists who employ the signal detection theory have developed ways to measure an observer’s sensitivity to stimuli in ways that go beyond the simple concept of the threshold. Some psychophysical research involves the identification of stimuli. There may be no question as to whether we can detect a stimulus, but sometimes we cannot identify it. For example, people can often detect odors but cannot identify them. Research in this area has centered on determining how much information is needed to allow a person to identify a stimulus. Identification constitutes a relatively small part of psychophysical research, although such research has important practical applications. For example, in the development of useful telephones, researchers had to assess how much “noise” or unwanted sound could accompany speech in a phone conversation so that a listener could understand what was said—that is, identify the spoken words accurately.

A third area of psychophysics involves discrimination of different stimuli, or difference thresholds. No two physical stimuli are absolutely identical, although they may seem to be. The question of interest here is how large must the difference be between two stimuli in order for us to detect it. The amount by which two stimuli must differ in order for us to detect the difference is referred to as the JND, or just noticeable difference. Research has indicated that for stimuli of low intensity, we can detect a difference that is small, as the intensity increases, we need a larger difference. Sometimes psychophysicists use reaction time as a measure of how different two stimuli are from one another. When two stimuli are very similar, it takes a longer time to decide if they are different, whereas large differences lead to fast reaction times.

The final area of interest to psychophysicists is scaling, the activity of deciding how large or small something is or how much of it is present. Any sensory experience can be scaled. For instance, if the attractiveness of a painting is rated on a scale of one to ten, it is being scaled. If the painting is rated nine, it is considered more attractive than a painting rated eight. This simple example gives the concept underlying scaling, but psychologists have developed more complicated techniques and sophisticated mathematical approaches to scaling.

### Psychosexual stages

Psychoanalytical theory of development based on sexual impulses.

Austrian psychotherapist Sigmund Freud described personality development during childhood in terms of stages based on shifts in the primary location of sexual impulses. During each stage libidinal pleasure is derived from a particular area of the body—called an erogenous zone—and the activities centered in that area. If the problems and conflicts of a particular stage are not adequately resolved, the child—and, later, the adult—may remain fixated at that stage. A fixation consists of a conscious or unconscious preoccupation with an area of the body (such as the mouth in a compulsive eater), as well as certain personality traits. Freud believed that some degree of fixation is present in everyone and that it is an important determinant of personality.

During the three pregenital stages that occur in a child’s first five years, sexuality is narcissistic: it is di-