Sanjeev P. Sahni
Poulomi Bhadra *Editors*

Criminal Psychology and the Criminal Justice System in India and Beyond

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Preface

The role of psychology in the criminal justice system has been increasingly realized in the last few decades, with criminal psychology and behavioural profiling gaining prominence in public interest and media attention. Since the 1800s, criminal psychology and profiling has evolved as an investigative tool, whether in fiction, from Doyle's *Sherlock* to Poe's *Dupin*, or in academic practice, from Freud to Bowlby. Since then, many distinguished scholars have published many books in this field, their works documenting and furthering the interdisciplinarity between law, psychology, and crime studies. *Criminal Psychology and the Criminal Justice System in India and Beyond* attempts to advance this area of study by introducing a comprehensive resource for understanding the theoretical foundations of criminal psychology, and expanding the purview of discussion from the Global West to the Global South, specifically India, to illustrate how they apply to different investigative regimes.

This book is especially designed to convey the knowledge simply and succinctly, so that it may cater to the interests of all kinds of readers, whether it be the student interested in enrolling for criminal psychology or forensic psychology programmes or the professional intending to begin a career in law enforcement or looking to expand their knowledge in alternative investigative approaches. The need and use for criminal psychology in legal processes, criminal jurisprudence, and corrective rehabilitation is expanding in many countries and becoming increasingly interdisciplinary. At the same time, there is an increasing need for trained scholars and practitioners who are adept at translating various alternative approaches from theory to practice. The purpose of this book is to provide valuable contribution in training and education by proving to be an indispensable resource on important topics such as detecting deceit, eyewitness testimony, juvenile delinquency, jury and judiciary decision-making, cognitive biases in forensic examinations, and psychology as applied to law and policy. To this end, we have curated this volume with contributions authored and co-authored by accomplished scholars and practitioners in their respective areas. These authors have endeavoured to address the enduring issues at the interface of psychology and the criminal justice system, and frame these issues in the light of contemporary research and prevailing conceptual formations.

The content of this volume has been divided into three parts, preceded by an abridged introduction to the evolution of psychological theories, to set the background for an independent study. The sequence of the chapters has been framed in order of their relevance to the three aspects of the criminal justice process—investigation, prosecution, and rehabilitation. Statutory case laws and case studies have been abundantly incorporated to elucidate theories and emerging trends in forensic procedures. We hope that all readers of this book will appreciate the collaborative efforts of the authors and the editors to present an array of topics dealing with the theoretical, systematic, and scientific processes involved in fusing psychological theories and processes to criminal investigations and consequent restorative endeavours.

Sonipat, India

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It has been our pleasure and honour to work with many distinguished scholars from various institutions whose valuable contributions have resulted in this engaging publication. We sincerely thank our contributors for their hard work, extensive efforts, and commitment to deliver their chapters, despite the challenges that the pandemic has presented towards our productivity. In this regard, we would also like to thank the team at Springer Publication Singapore, especially Satvinder Kaur, Gowrishankar Ayyasamy and Lokeshwaran M., who have consistently supported us from the conception to the publication of this book.

As editors of the book and faculty members of O.P. Jindal Global University, we would like to take this opportunity to express our sincere gratitude to the founding Chancellor, Mr. Naveen Jindal, and to Dr. C. Rajkumar, founding Vice Chancellor, O.P. Jindal Global University, for their continued support of academic freedom and research opportunities. My appreciation also goes to those students and research assistants who have rendered helpful assistance in completing this book, both to the authors and to the editors. Editing a contributed volume can be an isolating and tedious process, made more so by the challenges of 2020. On a personal note, we would like to extend our appreciation to our families for their support towards our academic efforts and a special thanks to Bhadra's editorial companion, Cleo, for her motivating purrs.

As editors, we have strived our best to incorporate a comprehensive and substantiated outlook on the subject, while also valuing each author's perspective and work. We apologize for any shortcomings and hope that any errors made on our part do not compromise your educational experience of the book. We look forward to hearing any suggestions or feedback you may have for us or the authors.

Sanjeev P. Sahni
Poulomi Bhadra

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Editors and Contributors

About the Editors

Prof. (Dr.) Sanjeev P. Sahni is presently Professor at O.P. Jindal Global University and Principal Director of the Jindal Institute of Behavioural Sciences (JIBS), Director for the Center for Victimology and Psychological Studies and the Centre for Criminology and Forensic Studies, Member of the Governing Body and Advisor to the Vice Chancellor at O.P. Jindal Global University. He holds a Ph.D. in Psychology and possesses an extensive and rich experience of over 32 years in academia, industry and government sector. His work spans in the areas of criminal psychology, victimology, policing and law enforcement. He has trained over 75,000 professionals in over 50 countries and was a visiting professor in criminal psychology to China several times. Dr. Sahni has recently been nominated as Member of the Board of Directors to the International Society of Criminology. He is also a UN Liaison Committee Member of World Society of Victimology (WSV). Among his several academic endeavours, he has been regularly representing India at United Nations Office on Drugs and Crime (UNODC—Austria, Doha, Japan) and Academic Council on the United Nations System. He has published more than 35 research articles in international and national indexed journals and about 20 book chapters. He has also authored/edited 15 books, some of the recent ones being: The Death Penalty (Springer), Internet Infidelity (Springer), Piracy in the Digital Era (Springer).

Poulomi Bhadra is presently an Assistant Professor and Assistant Director at the Jindal Institute of Behavioural Sciences (JIBS) and also Research Fellow at the Centre for India China Studies (CICS). She founded the Centre for Criminology and Forensic Studies (CCFS) at JIBS in 2020 in recognition of a need to integrate scientific and legal education. She holds degrees in Forensic Science from King's College London and Criminology and Criminal Psychology from University of Essex, UK. Prior to joining JGU, she has worked as a researcher with the Natural History Museum, London, and the London Metropolitan Police. She is presently associated with the South Asian Society of Victimology and Criminology, the International Society of

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Chapter 1
Psychology: The Science of Mental Processes

Kulpreet Kaur

Abstract The complexity of human behaviour has intrigued mankind because of its conscious and subconscious motivations. Psychologists try to find the causes for these complexities and reasons of individual differences. The best evolved definition of psychology is that it is a scientific study of behaviour and mental processes. To elaborate, psychology as a science uses systematic and objective scientific methods to study overt (observable) behaviour like facial expressions, gestures, endocrine reactions and such, and covert (hidden/unobservable) behaviour or cognitive or mental processes like thinking, remembering, feelings and so on. This chapter summarizes the fundamental theories of psychology to assist in understanding the chapters that follow.

1.1 Early Influencers and Followers

Psychology, as a discipline, was influenced by ancient Greek philosophers such as Plato (428-348 B.C.E) and Aristotle (384-322 B.C.E) who tried to explain the connection of human mind to the physical body. While Plato spoke about psychological problems which emphasized on innate characteristics rather than experiences, Aristotle, also Plato's favourite student, considered mind as a function of bodily processes and experience. Descartes (1596-1650), a French philosopher, propagated dualism by suggesting that mind and body are two distinctly different entities and interact through a gland located within the brain.

Wilhelm Wundt (1832–1920), a physiologist known as the 'founder of experimental psychology', established the first formal psychology laboratory in Leipzig, Germany, in 1879. This historic event gave psychology a modern experimental beginning. He introduced the process of objective introspection with which one's own thought and mental activities could be objectively examined. Edward Titchener (1867–1927) agreed with Wundt's views that every individual experience can be

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broken down into its emotions and experience. He added that introspection can be used on thoughts and sensations alike. He named his school as Structuralism. But introspection as a procedure soon lost its influence due to lack of scientific verification from outside observers.

Meanwhile, William James (1842–1910), who was influenced by Charles Darwin's theory of 'natural selection', came up with a different school of thought, Functionalism, which focused on explaining how the mental state is a function of sensory stimulation. Functionalism gradually faded away leaving behind only a few traces on evolutionary psychology—one of the contemporary perspectives.

Max Wertheimer (1880–1943), Kurt Koffka (1886–1941) and Wolfgang Kohler (1887–1967) devoted their efforts to study sensation and perception to propagate Gestalt principles that focused on the tendency of organizing perceptual experiences into whole rather than sum of its parts. Gestalt's ideas are an important part of a contemporary field of psychology called cognitive psychology. Cognitive psychology focuses on how people perceive, store, think, and use information, and became a widely accepted idea in 1960s. Extension of this view is the relatively new field of cognitive neuroscience which includes the study of the working brain and nervous system during various cognitive processes. Constructivism, a view in modern cognitive psychology, propounded that human beings are constantly building up their minds through continuous interaction and exploration into physical and social world. Jean Piaget (1896–1980) and Lev Vygotsky (1896–1934) further used this view to construct their theories of development.

While Structuralists, Functionalists, and Gestaltists were trying to promote their perspective on the study of human mind and behaviour to different corners of the world, Sigmund Freud (1856–1939), a neurologist, believed that unconscious leftovers of earlier experiences accounted for neurotic behaviour. Later, neo-Freudians like Alfred Adler (1870–1937), Carl Jung (1875–1961), Karen Horney (1885–1952), and Anna Freud (1895–1982) modified the psychoanalytic viewpoints. Freudian psychoanalysis has been the basis of modern psychotherapy. Contemporary psychodynamic perspective focuses on the influence of the unconscious mind on the development of self, social, intra-personal, and interpersonal relationships.

By the early 1900s, psychologist John B. Watson (1878–1958) challenged all the prevailing schools of psychology with his own school of Behaviourism which explained behaviour as an outcome of stimulus–response relationship. His 'Little Albert' experiment on the process of conditioning along with Ivan Pavlov's experiment on dogs called classical conditioning and B.F Skinner's Operant conditioning experiments became landmarks in the history of experimental psychology. Behaviourism is still a major perspective in psychology and has influenced the field of cognitive psychology and various techniques of psychotherapy.

A relatively new perspective focused on people's freedom to choose their own follow-up path and strive for self-actualization to unfold their inner potential. This Humanistic perspective was founded by Abraham Maslow (1908–1970) and Carl Rogers (1902–1987). Contemporary psychotherapy aimed at positive outlook of human nature is inspired by the Humanistic views.

Table 1.1 Evolution and growth of psychology in India (Source: Baron & Misra, 2018)

Year	Events
1916	First psychology laboratory established in Calcutta university with Dr. N. N. Sengupta as founder in-charge
1922	Psychology was included in Indian Science Congress Association
1922	Indian psychoanalytic society was formed by Girindra Shekhar Bose
1924	Indian psychological association was founded by N. N. Sengupta
1940	Lumbini Park, The first Mental Hospital was founded at Calcutta
1954	Bureau of Psychology was established at Allahabad
1955	National Institute of Mental Health was founded in Bangalore
1968	Indian association of clinical psychologists is formed
1972	First survey of research in India is published by the Indian Council of social research
1989	National Academy of Psychology (NAOP) established
1997	National Brain Research Centre (NBRC) was established in Gurgaon, Haryana
2009	NAOP's Journal of Psychological Studies becomes international (springer)

Another modern perspective which combines social psychology and cultural psychology is the socio-cultural perspective. This perspective emphasizes on the effect of the social (groups, surroundings, social roles, and relationships) and the cultural (class differences, cultural ethnicity, cultural norms, values, and expectations) on the behaviour of an individual. It also studies the contrast and compares an issue between two or more cultures.

The evolutionary perspective, a combination of the sociocultural and the bio-psychological perspective (behaviour seen as a result of physiological changes in the body), focuses on the biological bases for explaining general mental strategies and traits. Some of these disciplinary changes happened simultaneously globally, and some ideas were slow in arriving to different parts of the world. Below is a summary of the landmarks in the evolution and growth of psychology in India (Table 1.1).

1.1.1 Various Fields of Psychology

Intense exploration of psychology has led to advent of several sub-fields of study, diversifying its scope. The American Psychological Association (APA), established in 1892 by G. Stanley Hall, is the strongest professional body of psychologists, and has more than fifty divisions of psychology. The major fields and their area of concerns are listed below (Table 1.2).

The interdisciplinary focus on research and application of psychological theories have found its way into varied areas like aviation psychology, military psychology, engineering psychology, and psychology of women.

Table 1.2 Overview of fields of psychology (Source: Baron & Misra, 2018)

Sub-fields	Area of concern
Clinical psychology	Studies diagnosis, causes and intervention of mental disorders
Cognitive psychology	Investigates all aspects of cognition-perception, sensation, learning, memory, language acquisition, thinking, decision-making, problem solving, and so on
Counselling psychology	Help people to deal with personal problems, mal adjustment, and career choices
Criminal psychology	The study of the views, thoughts, intentions, actions, and reactions of criminals and all others who are associated in the criminal behaviour
Cross-cultural psychology	Studies variability in behaviour among cultural groups around the world and investigates the mutual correlation. It also explains that meanings and practice of concepts not only vary across cultures but are rooted in cultures
Developmental psychology	Studies bodily, cognitive, social, and emotional changes throughout the life process
Educational psychology	Studies all aspects of teaching–learning process such as increasing attention and memory, training techniques for better understanding, improving the performance of all the stakes holders of an institute and so on
Experimental psychology	Studies all aspects of perception, attention, learning, perception based on experimental research
Industrial/organizational psychology	Studies all aspects of behaviour in work settings such as group dynamics, team work, improving the efficiency and so on
Positive psychology	Studies optimal human functioning with a focus on human virtues, well-being, and meaningful life. The role of positive emotions, happiness, etc., enhancing the quality of life is also its focus
Psychobiology and evolutionary psychology	Investigates biological bases of behaviour and role of evolution in human behaviour
Social/applied social psychology	Studies social interaction as a function of social thought and experiences and its application in various fields like education, work, health, and so on
Sports psychology	It applies psychological principles to improve sports performance by altering the perception and in turn the motivation of the players

1.2 Evolution of Psychology via Research

Psychology is a diverse field with professionals working in various subfields which require specialized trainings, focus, and entails different goals from the familiar professional umbrella of a psychologist. A psychologist does not possess any medical training but has advanced degrees (doctoral degree) in a specific area and undergoes intense learning about different areas of psychology before choosing their specialization. A psychiatrist, on the other hand, has a medical degree and specializes in diagnosis and treatment (prescription, medication, and therapy) of psychological disorders. Although many psychologists help people through therapy, there are many others who are involved in teaching and researching.

The goals of psychological enquiry are description, prediction, explanation, control of behaviour, and application of knowledge. Various research methodologies are used to generate these goals in an objective manner. All research methods used in psychology can be categorized as either quantitative or qualitative.

The aim of the quantitative research is usually to present trends and laws in form of numerical data that characterize behaviour of large groups of individuals. Qualitative research uses non-numeric data like texts and pictorial stimulations. Since internal characteristics are not overtly observable, like violence, love, anxiety, they are called 'constructs' because constructs are constructed or defined based on the theories which delineates it from similar constructs. For the purpose of research, these constructs need to be operationalised. Operationalization of the construct means expressing it in terms of observable behaviour. For example, to operationalize construct of aggression, one might look at the 'number of insulting comments per hour' or to operationalize anxiety, one might look at the scored on an anxiety questionnaire.

The three main types of quantitative research are Experimental research, Causal-Comparative/Quasi-Experimental and Correlational research.

Experimentation is the scientific method that establishes cause and effect relationship through manipulation of a variables to identify any changes in behaviour. The variable that is manipulated in the experiment is an independent variable (IV). The change in the behaviour of the participants as an effect of change in independent variable is known as dependent variable (DV). Besides independent variable, confounding variable are those variables that may interfere with the cause-and-effect relationship between IV and DV, and hence, they need to be controlled. The control of confounding variables, also called controlled variable (CV), can be done either by eliminating them or keeping them constant for all participants. Confounding variables can also be controlled by using two groups of participants, the experimental group and the control group. The experimental group is exposed to independent variable and controlled group gets no treatment or gets different treatment than the experimental group.

Experimental design refers to allocation of participants to the different groups or treatments (or IV levels) in an experiment. These are of three types:

1. Independent measures/between groups: Random distribution of different subjects in each condition of the independent variable.

2. Repeated measures/within groups: The same subjects take part in each condition of the independent variable. This design is vulnerable to order effects (results may differ depending on which condition comes first). To overcome this effect, researchers use the techniques of counter-balancing.
3. Matched pairs: Each condition uses different subjects, but they are not randomly distributed, instead they are grouped under various characteristics, e.g., gender, age, intelligence, and other variable relevant to the experiment.

In causal–comparative/quasi-experimental, naturally formed, or pre-existing groups are used to establish cause–effect relationships among the variables. An independent variable is identified. The effects of the independent variable on the dependent variable are measured without any manipulation of the independent variable.

When two or more variables are measured and the relationship between them is mathematically quantified, it is a correlational research. A positive correlation indicates the tendency for one variable to increase with increase in another variable. A negative correlation signifies the inverse tendency: when one variable increases the other decreases. When plotted on a graph, a perfect correlation of 1 or -1 is a straight line with the slope of 45°. This happens when one variable increases or decreases by exactly same unit as the other variable. A correlation close to zero is a flat line which shows no relationship between two variables.

The most common qualitative methods are participant observation, in-depth interviews, case studies, and surveys. Each method is particularly suited for getting a specific type of data.

Observation technique enables a researcher to gain first-hand knowledge by observing into the studied phenomenon in depth, and at times, even becoming part of it. Observation can be laboratory versus naturalistic, structured versus unstructured, or participant versus non-participant, each of which will have broad implication on credibility, reflexivity, generalization, and ethics. Participant observation is appropriate for collecting data on natural behaviours in their natural settings.

In-depth interview is one of the most popular qualitative research methods that enables direct contact between the interviewer and the interviewee. The sequence of the question determines if the interview is structured, semi-structured, unstructured, open-ended, or closed-ended. In-depth interviews are optimal for collecting data on individuals' personal histories, episodes, perspectives, and behaviours, particularly when delicate topics are being explored.

A case study is an in-depth investigation of an individual and/or a group. Case studies can involve a variety of other methods (observation, testing, interviews and so on), which deepens the understanding of an individual.

Research in human development faces a constant challenge of age. Since the scientific study of human development involves studying the changes that occur in people throughout their lifetime, three special designs are used to study the age-related changes. In longitudinal design, same group of subjects is repeatedly studied, observed, and assessed to notice the changes over time as the group ages, whereas the cross-sectional design can be used to study different age groups at one given time.

Features of both longitudinal and cross—sectional design are used in the cross-sequential design.

1.3 Fundamentals of Psychological Theories

From the moment of foetal conception, we are each headed down individual pathways of physical, cognitive, and social changes. These changes are an interplay of nature and nurture. The contribution of each has given rise to long-lasting debate in psychology that attempts to establish whether human behaviour is determined primarily by biological factors such as genetics and brain structure (nature) or environmental factors such as education, parenting styles, friends (nurture), and how it contributes towards the individual differences among each one of us. Genes provide a distinguishable combination for the development of individual differences. Not only genetics, but development occurs in relation to an individual's environment as well. This is what makes each one of us unique in the way we organize information, interpret our world, and react to stimulus and sensations.

1.3.1 Reaction to Stimulus

Sensation occurs due to activation of receptors in the sense organs. The stimulus from sense organs is converted into the neural signals in the brain through the process of transduction. Based on one's interests and motivations, as well as the nature of the stimuli which impinge on us, we pay attention to a few things out of the innumerable stimuli with which we are bombarded. Sensory modality, clarity of the stimulus, temporal uncertainty, and spatial uncertainty can facilitate or inhibit an individual's sustained attention to what one hears, sees, smells, tastes, and otherwise experiences. Furthermore, it is influenced not only by stimulating circumstances, but also by our past experience and present psychological state. The process by which we identify, organize, recognize, interpret, understand the information provided by the sense organs is called perception. No matter how individually determined perception might be, there are some similarities in how people perceive the world around them. These similarities are called perceptual constancies of shape, size, and brightness.

Prominent Gestalt psychologists like Köhler et al. (1925) indicate that human analytic processes are generally focused towards making the complex figures appear simple through the perception of good figure or *pragnanz*. They explained basic principles of human perceptual tendency to group objects into meaningful forms and perceive the object as whole instead of sum of its parts. Humans' impressive capability to see the world in three dimensions is called depth perception. Different monocular and binocular cues are used in forming the judgement of depth and distance.

Several psychologists have studied the processes of perception in different socio-cultural settings. Sinha and Mishra (1996) have carried out several studies on pictorial presentation using a variety of pictures with people with diverse cultural settings, such as hunters and gatherers living in forests, agriculturists living in villages, and people employed and living in cities. Their studies indicate that interpretation of pictures is strongly related to cultural experiences and learning of people.

1.3.2 Behavioural Conditioning

Learning is a key process in human behaviour. It refers to the gamut of changes that take place in behaviour because of one's own experience. These changes are relatively permanent. One type of learning is conditioning, which is a relatively simple modification of behaviour. Classical conditioning is a basic form of learning in which two stimuli when administered in a pattern gives rise to a new conditioned (learned) response. Basic vocabulary in the area of classical conditioning originated with Ivan Pavlov's work in 1927 on the process of digestion on dogs. Salivation in response to food placed is a natural response, an unlearned or unconditioned response (UCR). Because it elicited the unconditional response, the food is called unconditional stimulus (UCS). When Pavlov sequenced ringing of the bell followed by presentation of food repeatedly, the dog learned to salivate in response to the sound of the bell alone and this salivation was called conditioned response (CR), which indicated that arousal of the response was dependent upon a stimulus (bell) other than the natural one (food). Since salivation on ringing the bell was a conditioned response, hence the bell was labelled as conditioned stimulus (CS). Although, psychologist initially believed that conditioning was determined primarily by the number of conditioned–unconditioned stimulus pairing, several other studies revealed that delay conditioning, trace conditioning, simultaneous conditioning, backward conditioning, and familiarity can affect conditioning to a large extent.

Classical conditioning was concerned about involuntary responses elicited by specific identifiable stimuli, but in everyday life, much of our behaviour are voluntary or 'operant' or under one's control. Conditioning of operant behaviour is called operant conditioning. Edward L. Thorndike (1874–1949) was one of the first researchers to explore the laws of learning on voluntary responses but the procedure in operant conditioning is best illustrated by a typical training session used by B. F Skinner (1904–1990). He used the research device known as 'Skinner box' by placing the rat in this box and training it to press the lever inside the box to get the food. In Skinner's view, reinforcement or punishment is the reason that the rat learned to press the lever after several trial and errors. Reinforcement is any event or stimulus that increases the likelihood of reoccurrence of a response, whereas punishment is a procedure by which the application or removal of a stimulus decreases the strength of the behaviour.

Many behavioural psychologists further developed cognitive learning theories to study the influence of thinkings, feelings, and expectations on the observable

behaviour. Tolman (1932) in his experiments on rats concluded that the group who was given reinforcement soon after expected behaviour learned to navigate the maze quickly. However, although the unrewarded rats had also learned the way out of the maze during exploration, this unrewarded group never displayed their hidden leaning to find the way out faster until reinforcement was provided. This hidden learning was labelled as latent learning by Tolman. During the process of exploration, the rats developed mental representation of the locations, paths, and directions needed to reach the goal. These mental representations are called cognitive maps.

Another exploration of cognitive elements of learning that involved problem solving was given by Wolfgang Kohler (1887–1967) when he experimented with chimpanzees. In these experiments, when chimpanzee used boxes, tolls, and sticks to reach the food placed beyond the reach of the animal, learning not only occurred as a result of trial and error or reinforcement, but came out as sudden flashes of insight which Köhler (1925) labelled as insight learning. Insight learning is the sudden perception of relationship also called AHA experience among various parts of the problem, allowing the solution of the problem to come as a flash suddenly. Such rapid solutions depend upon the type of task involved, the subject's level of mental development, their prior experience, and their use of trial and error procedures.

Seligman (1975) discovered another form of avoidable situation caused due to repeated failures in the past known as learned helplessness. Another kind of learning through observing the actions of others is called observational learning. Albert Bandura's social learning theory refers to acquiring behaviour through social interaction. His bobo doll experiments showed that children displayed violent behaviour towards their toy after witnessing, and hence imitating, a violent role model. Bandura (1986) concluded from his studies that attention, memory, imitation, and motivation were the four important elements of observational learning.

1.3.3 Memory Retention

Once the information is paid attention to, perceived, processed, and learnt, it is important to retain and retrieve the information as well. Retention is one of the three processes of memory. Memory is an active system that receives information from the senses, organizes, and stores it away to retrieve when needed. Atkinson and Shiffrin (1968) noted that human memory must accomplish three basic tasks of encoding, storage, and retrieval. This approach focuses on the way information is handled and processed through three different systems of memory—sensory memory, short-term memory, and long-term memory. Sensory memory stores the information in form of iconic (visual) memory and echoic (auditory) memory. Long-term memory stores information of skills, procedures, habits, and conditioned responses and are called non-declarative (implicit) memory. Declarative (explicit) memory stores facts and knowledge which is conscious and known. Semantic memory and episodic memory are types of declarative memory. Each of these systems must deal with three tasks of encoding, storing, and retrieving the information (Fig. 1.1).

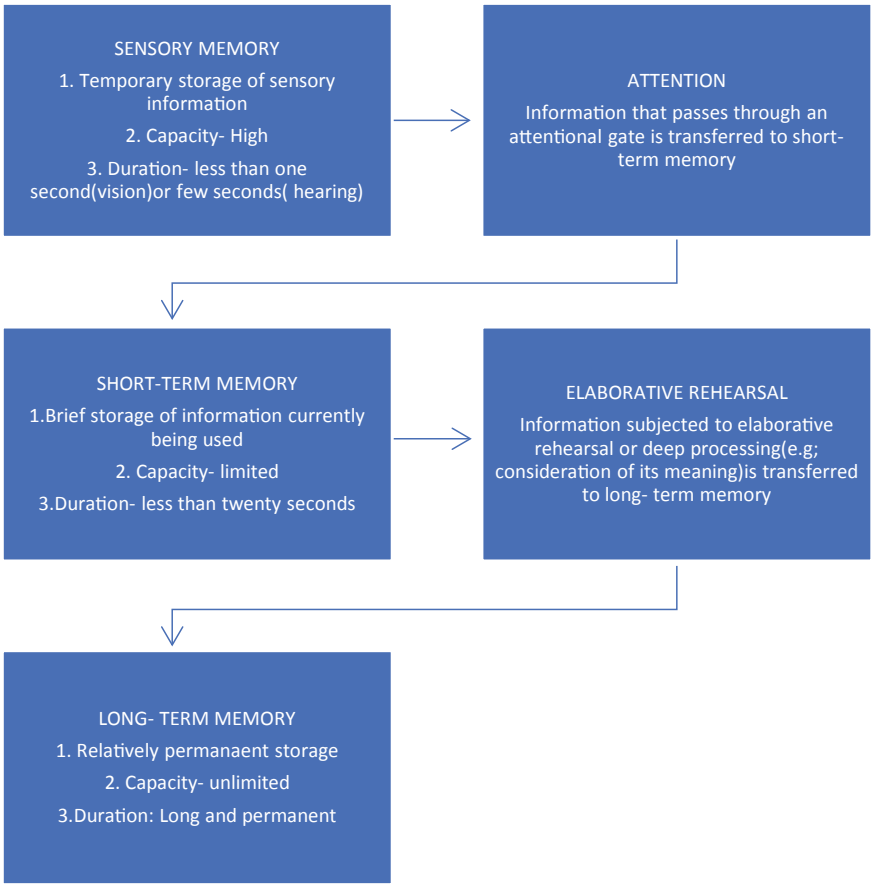

Fig. 1.1 Overview of information—processing model of memory (2016) (Source: Based on model by Atkinson & Shiffrin, 1968 mentioned in Baron & Misra, 2018)

The levels of processing view of memory were given by Craik and Lockhart (1972). This view suggested that level of retention of the information depends upon the depth to which an information is processed (deeper the processing, better the retention). This theory projects that the information can be encoded at the structural, the phonetic, and the semantic levels. Semantic encoding is considered as the deepest level of processing which leads to better retention (Fig. 1.2).

Parallel distribution processing model assumes that all memory processes take place at the same time over a large matrix of interwoven neural connections. This model, proposed by McClelland (1988), consists of simultaneous processing of the information that enables people to retrieve many and different information from memory all at once enabling faster reactions and decisions. Chunking method, deep-level processing, minimizing interference, and forming enough retrieval cues are

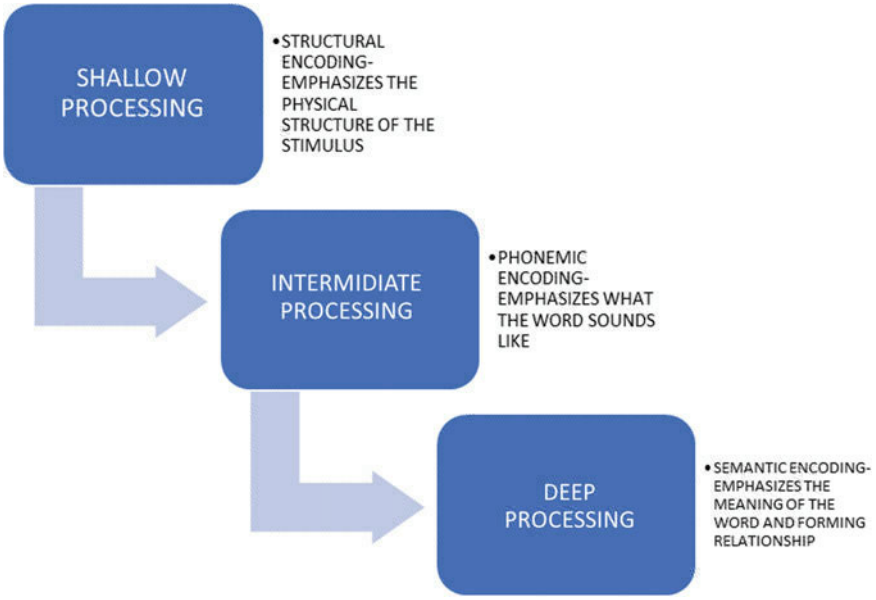

Fig. 1.2 Overview of level of processing model of memory (Source: Based on view by Craik & Lockhart, 1972 & suggested in Baron & Misra, 2018)

techniques of mnemonics using organization. These models formed the fundamental research in eyewitness testimony, as you will read later in the book.

One of the most important and ultimate tasks of memory is to retrieve the stored information. There are two types of retrieval of memory, recall and recognition. During recall, the information is retrieved from storage with fewer external cues, whereas recognition is an ability to match a piece of information with the stored fact.

Failure to retrieve an information is called forgetting. The first systematic attempt to understand the nature of forgetting was made by Ebbinghaus (1885). He presented forgetting in a graphical manner called forgetting curve, indicating a distinct pattern in which forgetting happens predominantly within the first hour after learning, and then the phenomenon tapers off gradually. One of the simplest views of forgetting is that some things fail to get encoded which is known as encoding failure, i.e., failure to process information into memory. The earliest view of forgetting was fading or decaying of information in long-term memory within due course of time if not put in use for a long time. Memory trace decay theory was not found verifiable on several occasions when less used information could be recalled successfully. A possible explanation of long-term forgetting is that though information in long-term memory is relatively permanent, it may not always be accessible due to interference cause by other information. Interference can come in form of retroactive inhibition or proactive inhibition. Besides the cognitive causes, forgetting can occur due to biological causes like amnesia and Alzheimer's disease. Short-term memory is encoded in the form of

sound and visual images, forming a mental image. These mental images or mental representations of an object form an important tool for thinking process.

1.3.4 Cognition, Decision-Making, and Problem-Solving

The base of all cognitive processes is thinking that clearly differentiates human from other species. Thinking is a higher mental process where already existing information is manipulated and analysed. Such manipulation and analysis occurs during formation of concepts and processes such as reasoning, imagining, problem-solving, judging, and decision-making. Convergent thinking is a type of thinking in which all paths of thinking lead to a single answer. Divergent thinking is a type of thinking in which diverse possibilities and ideas are run through mentally for solving a problem.

Besides mental images, another important aspect of thought process is concept. Concepts are the ideas that represent a class or categories of objects or events. Concepts help in thinking and act as an important instrument for problem-solving. Problem-solving is the process that occurs when a goal must be reached by thinking and behaving appropriately to the situation. The process of cognition that involves identifying, evaluating, and choosing among several alternatives is called decision-making. The simplest form of problem-solving is trial and error. A rule that guarantees a solution to a specific type of problem is called algorithm. Heuristics, unlike algorithms, are less time consuming. Heuristics are rules of thumb, guided by previous experiences. Finally, analogy is an approach of applying similar techniques of problem-solving that were previously successful to similar problems.

Creativity is the process of solving a problem by combining ideas in new ways. Study of creative thinking suggests four general aspects which are preparation—the gathering of relevant information, incubation—a period of relative inactivity, illumination—sudden insight and verification—the evaluation of idea. Sometimes despite our best efforts, certain problems cannot be solved. Our strong tendency to think of using objects only as they have been used in the past is one of the reasons for this. This is called functional fixedness. Another factor that interferes in problem-solving is mentality which involves sticking to tried-and-tested means even if better alternatives are available.

Solving problems involves using one's experience, knowledge, and resources effectively. How effectively one solves the problem indicates one's intelligence. Intelligence is the ability to understand, think rationally, and use resources effectively to adapt to new challenges. Several theories offer an explanation to a number of intelligence-related abilities. Spearman (1904) proposed general intelligence or g-factor as an ability to reason and solve problems where as specific intelligence or s-factor was related to task-specific abilities. Gardner (1999), on the other hand, proposed nine different types of intelligence. Sternberg (1988) proposed analytical, creative, and practical as three types of intelligence. PASS theory of intelligence by Das et al. (1994) proposes planning, attention, simultaneous, and successive as four kinds of competence for intelligence. The more recent Cattell–Horn–Carroll (CHC)

theory of intelligence includes general intelligence, sixteen major abilities, and many minor abilities within each broad area. Intelligence Quotient is a measure of intelligence which is calculated by dividing the mental age with the chronological age and multiplying by hundred. Individual tests of intelligence, such as the Standford–Binet or Wechsler Scales, help identification of children at the extremes of the normal probability curve. Extremes of normal distribution curves can be estimated through classification of intelligence quotient. Extremes of normal distribution curves can be estimated through classification of intelligence quotient which considers 90–110 as an average IQ. Increase in IQ depicted on the right-hand side of the normal probability curve ranges between high average to very superior. Below average IQ is depicted on the left side of the curve.

1.4 Motivation as a Causal Factor

Perceiving, memorizing, learning, thinking, and problem-solving using one's intelligence are all guided by the process of motivation. Motivation is the force that initiates the activities, gives them a direction, and pushes to be continued for the fulfilment of physical or psychological needs. When the motivation comes from outside of oneself like awards, salary, or appreciation, it is called extrinsic motivation. Intrinsic motivation is the type of motivation in which a person performs an action because the act itself is rewarding or satisfying to one's own self. Below are discussed several approaches to understanding the key elements of motivation. These form the foundational background on which theories of crime explained criminal tendencies.

Early attempts to understand motivation focused primarily on innate patterns of behaviour that were biologically determined called instincts. The next approach to understanding motivation focused on drive—reduction of inner physical needs. McClelland's (1961) theory of affiliation, power, and achievement need focused on importance of psychological needs. Another explanation for human motivation involves the recognition of the need for stimulation. Incentive approaches to motivation involves behaviour as a response to rewards. The most acceptable approach to motivation is the humanistic model based on Maslow's theory, and places the needs in a hierarchy of needs where primary needs are met before the higher order needs (Table 1.3).

Motives are often accompanied by emotions, and emotions have tendency to influence motivational. Motivation and emotions are closely related concepts because motives and the arousal of emotion activate behaviour. Emotions is the 'feeling' aspect of consciousness and includes affective, behavioural, and cognitive elements. Physical arousal is associated with activation of the sympathetic nervous system, and the amygdala plays a key role in emotional processing. Early theory of emotion was called common-sense theory as it believed that a feeling stimulates arousal, which is followed by a response. Ever since, several theories have been proposed by various psychologists. James–Lange theory proposed by James (1894) and Lange

Table 1.3 Overview of approaches to motivation (Source: Based on information given by Ciccarelli & White, 2018)

Approaches	Proposed by	Key elements
Instincts and the evolutionary approaches	McDougall (1908)	Human beings are governed by instincts which are biologically determined and are innate patterns of behaviour
Drive-reduction theory	Clark Hull (1943)	Approach assumes behaviour arises from internal drives that push the organism to satisfy the need to reduce the tension arising out of need
McClelland's theory	McClelland (1961, 1988)	Highlights the importance of need for affiliation (nAff), need for power (nPow), and need for achievement (nAch) in motivation
Dweck's self-theory	Carol Dweck (1999)	Suggests that the need for achievement is linked to a person's locus of control and view of self
Arousal approaches	Robert Yerkes and John Dodson (1908)	Suggests level of tension ranges from low to high depending on individual differences. Optimal level of stress leads to optimum performance. Yerkes–Dodson law states that when tasks are less complex and similar, a higher level of motivation leads to better performance; and when tasks are difficult and new, lower level of arousal lead to better performance
Incentive approaches	Tolman(1932) and Kurt Lewin (1936s)	Early works by Tolman and Lewin focused on expectancy values or how much importance one attaches to beliefs and thoughts affect our actions
Humanistic approaches (Maslow's hierarchy of needs)	Abraham Maslow (1943, 1987)	Based primarily on Maslow's hierarchy of needs; i.e., primary, basic needs must be met before higher levels can be fulfilled. Physiological needs are the most basic needs followed by safety, belongingness and love, esteem. This is followed by cognitive needs, aesthetic needs, and at the top of the pyramid, self-actualization needs

(continued)

Table 1.3 (continued)

Approaches	Proposed by	Key elements
Renovating the pyramid of needs	Kenrick et al. (2010)	This revision preserves several Maslow's ideas of need such as physiological, safety, and esteem and integrates life-history development with it. It studies human motives at three different levels of analysis (a) their ultimate evolutionary function, (b) their developmental sequencing, and (c) their cognitive priority as triggered by proximate inputs The model also outlines the subsequent developing goal systems as overlapping with earlier developing systems
Humanistic approaches (ERG motivation theory)	Alderfer (1969)	Condenses Maslow's needs into only three levels: existence, relatedness, and growth
Humanistic approaches (self-determination theory)	Richard Ryan and Edward Deci (2000)	Similar to Maslow's hierarchy. States that the three universal needs are autonomy, competence, and relatedness

(1885) suggests that environmental stimuli give rise in physiological arousal, which helps in labelling of the emotion. Later, Cannon (1927) and Philip Bard (1934) propounded the Cannon–Bard theory that suggests that emotion and physiological arousal occur simultaneously leading to a specific response. According to the cognitive arousal two-factor theory, physiological arousal and its interpretation are based on environmental clues known as labelling. Physiological arousal must occur before experiencing emotion. The facial feedback hypothesis (Laird et al., 1974) suggests that facial expressions (and other behaviours) provide estimation to the brain that can cause or escalate experience of a specific emotion. Lastly, the cognitive mediational theory by Lazarus (1991) suggests that the cognitive appraisal and interpretation of the stimulus cause the emotional reaction. These theories are useful in laying the background for lie-detection techniques in the future.

Motivation and one's interaction with the psychological environment determine the personality of the person. Personality is the unique and relatively stable ways in which people think, feel, and behave. Personality, unlike other constructs, is difficult to be measured precisely and scientifically, and hence, different perspectives on personality has arisen.

The psychodynamic perspective had its beginnings in the work of Sigmund Freud (1856–1939) and still exists today. It focuses on the influence of the unconscious mind in the development of personality. The structure of mind, divisions of personality, and

Table 1.4 Divisions of personality according to Sigmund Freud (Source: Based on structure of personality suggested by Freud, 1933)

Divisions	Level of consciousness	Principle
Id	Part of the personality from birth to early years and is completely unconscious	Pleasure principle-principle by which the id functions and aims for immediate gratification of needs without considering its consequences
Ego	Part of the personality that develops deals with reality in conscious, rational, and logical manner	Reality principle–principle by which the ego functions and enables gratification of the demands of the id only when it will not result in negative consequences
Superego	Part of the personality that acts as the moral police	Conscience part of the superego that produces guilt during unacceptable behaviour

the psycho-sexual stages given by Freud show the causes of differences in personality during the process of development. Defence mechanisms are sub-conscious, psychologically manipulative behaviour or thoughts that reduce the anxiety arising out of guilt and shame. These behaviours can be in form of denial or distorted reality to defend against unacceptable impulses.

According to the psychodynamic theory, the structure of the mind can be divided in threefold. The preconscious mind contains memories, information, and events of which one can easily become aware of through focusing. Conscious mind consists of one's present awareness, whereas the unconscious mind contains thoughts, feelings, memories, and information that are not easily brought into the consciousness. Id, ego, superego are in constant state of conflict in Freud's view of how personality works. When anxiety created by their conflict gets unbalanced, abnormal behaviour arises. In order to deal with stress, psychological defence mechanisms unconsciously distort one's perception of reality (Table 1.4).

Freud (1933) believed that personality is a product of tension and pleasure build around libido (sexual energy) and over or under satisfaction of the energy leads to fixation to a particular stage. While this may not be held true at the moment, the sexual tension Freud researched forms the basis of interrogating motivations and offender behaviour in sexual crimes.

1.5 Conclusion

The behaviourist and social cognitive perspectives are based on the theories of learning. This approach focuses on the effect of the environment on behaviour. For behaviourists, personality is a set of learned responses and habits, gained through classical and operant conditioning, including reinforcement and punishments, individual social learnings and imitation (social processes) and cognitive processes (such as anticipation and memory) are important. The humanistic perspective focuses on the