SAARTHI IAS PSYCHOLOGY (PAPER-I)

SAATH TO SUCCESS

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INTRODUCTION TO PSYCHOLOGY

Concept and definition of psychology

Psychology can be defined as the scientific study of behavior and mental process. This definition contains three key ideas: scientific, behavior, and mental processes. Like many familiar terms, each to these is used in a specific way by psychologists.

Scientific refers to the fact that the study of psychology is based on information collected through a set as systematic procedures known as the scientific method. The information collected is referred to as data, specifically defined as records of the observations or measurements in a study. The heart of the scientific method is specifying publicly a precise set of procedures for collecting data so that others can collect data themselves using the same methods, or what they regard to be improved methods. For example, a psychologist studying dreams might specify that the subjects in sleep laboratories should be awakened and questioned about their dreams whenever during sleep their eyes make specific kinds of rapid movements. The psychologists follow set procedures for collecting dream data that are spelled out in detail for anyone else to follow, question, or improve. Knowledge in psychology is based on inferences from data that are open to inspection and criticism. We will discuss the scientific method further later in this chapter. The key point we want to make here is that the systematic procedures of the scientific method give psychologists data that can be clearly understood and evaluated.

Behavior is any activity that can be observed, recorded, and measured. This includes, first, what living beings do-that is, their actual movements in time and space. For example, smiling, sucking, and sleeping are all behaviors commonly seen in babies. Behavior also includes what people say or write. Their reports of their fears or their desires are behaviors. In addition, behavior includes physiological, or bodily, changes such as elevations in blood pressure or alterations in the electrical activity of the brain. For example, when equipment measuring electrical brain activity is attached to a person's head and it begins emitting more signals of the sort called alpha waves, we observe that a change in behavior has taken place.

Mental processes include thought, memories, emotions, motivations, dreams, perceptions, and beliefs. Although it may seem obvious that psychologists should investigate mental processes, the study of these processes presents a special problem in that they cannot be directly observed, recorded, or measured. Because of this, some psychologists once excluded mental processes from the study of psychology. Since then, however, psychologists have developed many methods for studying these processes. Most contemporary psychologists feel that mental processes can be studied by observing changes in behavior in specific situations and then inferring that a change has also occurred in a mental process. For Example, psychologists can study an individual's level of alertness by measuring changes in the electrical signals generated by the brain. Stress can be inferred by measuring changes in voice quality. Under certain conditions attention in newborn infants can be inferred from decreases in heart rate and slower breathing.

The study of behavior and mental processes poses many puzzles, puzzles that we can begin to solve through the scientific method. The practice of science requires intellectual curiosity, objectivity, determination, perseverance, and above all, a willingness to look beyond common sense and obvious answers. These qualities are necessary if psychologists are to achieve their goals. It should be noted that the definition of psychology has been evolving over the years, decades and century. Initially it was defined as the studies of soul, then of mind and consciousness like terms entered into the definition ,next it was replaced by the term unconscious which in turn by behavior, self and mental processes ...It is why someone has said "psychology first lost its soul then its mind finally its consciousness"

The Goals of Psychology

The goals of psychology are similar to those of any science. Science exists because people are curious, because they want to have accurate knowledge, and because they want to improve their lives. Psychologists attempt to describe, explain, and predict behavior and mental processes, and to use the

knowledge gained through study to promote human welfare.

The first and basic goal is to describe, that is, to observe and measure behavior and mental processes. For example, if we wanted to study children at play, we might begin just by watching them and recording who talks to whom how often and measuring the amount of time the children spend at each game. If we wanted to study alertness, we might use an instrument called an electroencephalograph (EEG), a device that measures the electrical activity of the brain, to look at the brain's activity in a variety of circumstances. The structure and functioning of the brain can be studied and measured through electronic brain scans. Personality and intelligence can be described and measured by administering specially designed tests. In each case, the primary purpose is to gather data in an objective and accurate manner.

The second goal of psychology is to explain what the data mean. Psychologists usually accomplish this goal by formulating a theory, a coherent group of assumptions and proposition that can explain the data. Forming theories in psychology is especially challenging because so many factors can influence behavior and mental processes. When a new neighbor doesn't answer when you say "good morning," a variety of explanations is possible. Maybe your neighbor is an unfriendly person, or perhaps he doesn't hear well. Maybe he's angry at you for not keeping your home tidy on the outside, or perhaps a passing truck drowned out your voice. Maybe this particular person just doesn't "wake up" until midday. Any one of these reasons, or some combination of these, might explain the neighbor's behavior. Psychologists have a variety of theories to explain that behavior and other much more complex behaviors. There are even theories about the way people come up with theories. Attribution theory is the theory that attempts to explain how ordinary people, and that includes all of us, formulate theories to explain how other people act. Psychologists continually generate theories to help them explain the most recent data about behavior and mental processes. However, before these theories are accepted they are subjected to rigorous tests based on the scientific method.

One test of a theory's accuracy and usefulness is its ability to predict behavior and mental processes. Given a particular set of circumstances, a theory should allow psychologists to meet their third goal; predicting what will happen in those circumstances. For example a theory of cognitive development should be able to specify the kinds of thinking a child can manage at a particular age. We will discuss Jean Piaget's well-known theory of child development, an attempt to do precisely this.

Psychology's final, and some feel ultimate, goal is the application of knowledge to promote human welfare. The most obvious application is in a subfield of psychology known as clinical psychology, where our knowledge of behavior and mental processes is used to help individuals with psychological disorders. But even if you never see a psychologist for this kind of help, most of you probably have been affected by psychological research. Knowledge gained through psychological research touches almost every aspect of our lives. It ranges from the way we raise and teach our children to the tests to gain admission to college, from the advertising we see on television to the design of airplane cockpits, and from the way leaders make decisions to the way nations resolve conflicts.

Historical antecedents of psychology

The present-day methods of psychology are quite sophisticated. They clearly make psychology a science. But the study of behavior and mental processes has not always been conducted scientifically. In this section we will explore the background and development of modern psychology and see that it has clear roots in field that belong to both the humanities and the sciences. Specifically, we will see that psychology is actually a hybrid science, resulting from the combination of philosophy, with its questions about human nature, and physiology –the branch of biology that studies living organisms.

Philosophy and physiology are ancient fields of study. Philosophy is often traced to the Greek philosopher Socrates (470-399 B.C.) Socrates and his followers, such as Plato and Aristotle, struggled with questions about human nature. Are people inherently good or evil? Are they rational or irrational? Can they perceive reality correctly? What is consciousness, and how does it work? How do people think, reason, and plan? How do they create? Are humans truly capable of free choice, or is all action determined by forces in the environment?

These and other questions are still widely debated by philosophers. How one answers these questions depends, in part, upon assumptions about human nature. These assumptions, in turn, underlie several of the perspectives on psychology that we will discuss in the next section. However, psychologists have attempted to go beyond these difficult either/or questions to study specifically when people behave in helpful, altruistic, and caring ways, how they are rational and irrational, and how much of their behavior is controlled versus how much is freely chosen. At the same time, psychologists push forward by trying to discover what can be known through the scientific analysis of other specific behaviors and events.

Physiology is as old as philosophy. The Greek Physician Hippocrates, who lived at the same time as Socrates, is often referred to as the father of medicine. Hippocrates studies the workings of the body extensively and can therefore be considered the first physiologist. Like today's physiologists, Hippocrates was curious about human anatomy, the functioning of human organs, and biological systems. He anticipated today's biopsychologists by considering the relationship between the body and mind. He learned from his observations that the brain was the most powerful organ of the human body in that it controlled other organs and parts of the body including the eyes, ears, tongue, hands, and feet. He also saw the brain as the "Interpreter of consciousness."

It was not until the nineteenth century, however, that researchers developed the techniques and methods needed to explore systematically the workings of the human body. One physiologist whose work was highly influential was Hermann von Helmholtz (1821-94). A pioneering neural scientist, Helmholtz conducted groundbreaking research on the nervous system and key aspects of vision, hearing, and perception. His breakthroughs contribute much to our knowledge of how human take in information about the external world, a question that had puzzled philosophers for centuries.

Given the common interests of philosophers and physiologists, it should be no surprise that many of the early psychologists, including founders Wundt and James, were both philosophers and physiologists.

The Emergence of Psychology: 1875-1900

Wilhelm Wundt and William James are usually credited with founding psychology, independently, in 1875. A quarter of a century later, in 1900, two other milestones in the history of psychology were passed: the Russian physiologist Ivan Pavlov began to study the learning phenomenon that came to be known as conditioning, and Sigmund Freud published his great work, The Interpretation of Dreams. In the 25 years between 1875 and 1900, psychology came into its own.

Wilhelm Wundt was born in a small village in western Germany in 1832. A studious child, he began to study medicine as a young man, probably with the intention of becoming a scientist rather than a practicing physician. He was an active scholar and published extensively in both philosophy and physiology. At one point he was a student of Helmholtz. His main interest, however, was the branch of philosophy that dealt with psychological questions such as perception, attention, and feeling. In 1874 he wrote the first of six editions of Principles of Physiological Psychology. Then in 1875, he became professor of philosophy at Leipzig and immediately opened one of the world's first laboratories for psychological research (1879). Within a few years he attracted many students from Europe and America to study with him. He was a popular lecturer with a talent for simplifying his material in order to make it interesting and clear to his audience. By 1881 he had established a psychological journal, which attracted even more students to an interest in psychology.

Wundt is most famous for his interest in introspection, a method of studying consciousness in which subjects report on their subjective experiences. Introspection involves long and difficult training. People were taught to achieve a state of "strained attention," in which they could closely examine their own conscious experience and report the smallest possible elements of awareness. The goal of introspection was to learn about the basic building blocks of experience and report the smallest possible elements of awareness. The goal of psychology was to learn about the basic building blocks of experience and the principles by which they combined to give us our everyday consciousness. Though introspection was not used by many psychologists after Wundt, Wundt's goal to "work out a new domain of science," was achieved. A man of many interests and abilities, Wundt was first and foremost a psychologist.

In 1879, the same year that Wundt opened his laboratory in Leipzig, William James founded psychology in North America at Harvard University. James, the brother of the noted novelist Henry James, was a physiologist, physician, and philosopher whose work touched on every area of psychology.

James was born in 1842. After finishing medical school he took a teaching appointment at Harvard. In 1875 he gave his first course in psychology, noting that the first lecture he ever heard on psychology was his own. He set up a psychological laboratory that same year. In 1889 his title was changed from professor of philosophy to professor of psychology. The next year he published his landmark two-volume text, Principles of Psychology. This work remains a highly readable classic with chapters on nearly every psychological topic ranging from vision and the brain to the self and will. It is interesting to note that in his later philosophical writings James distinguished between individuals who were "tough-minded," or scientific, and those who were "tender-minded," or philosophical. His work in psychology was both.

Early school of psychology: Evolutions and Revolutions in psychology

1. Structuralism: A school of psychology founded by Wilhelm Wundt (1832 - 1920) who opened the first formal psychological laboratory at Leipzig in Germany, in the year 1879. Titchner also contributed to this school of psychology at Crowell University in the U.S. Structuralism in brief refers to the images, sensation and feelings which contribute to form experience. It otherwise, deals with the mental structure. The structuralists tented to ask "what are the parts of psychological process? Structuralism developed and used the technique called introspection. Introspection refers to self – analysis or self – examination or looking within oneself.

2. Functionalism: functionalists such as William James (1869 - 1949) Harvey carr (1873 - 1954), at the University of Chicago proposed that psychology should study "what the mind and behaviour do". In brief, these early psychologists studied the functions of mind and behaviour. Functionalism addressed the ways in which experience permits us to function more adaptively in our environments; and it used behavioral observation in the laboratory. The functionalists tented to ask "what are the purposes (functions) of overt behaviour and mental process? What differences do they make?

3. Behaviorism: behaviorism, a philosophy of psychological study which holds that only observable behavior is the proper subject for psychological investigation. In that year Watson published an article, "Psychology as the Behaviorist Views It," that revolutionized psychology and made him one of its most important figures. At that time the chief method for studying mental processes was introspection. Watson pointed out that Wundt's introspective method had a serious flaw. When different people were asked to describe a certain conscious experience, they often disagreed. We can see this ourselves by asking five different people what the conscious experience of happiness consists of. We are likely to get five different answers.

Watson's solution to this problem was simple and direct- banish the study of consciousness and the introspective method from psychology. Instead, define psychology as the study of behavior and of the ways in which humans and animals learn to adapt to their environments. Watson suggested that psychologists set up various environments in the laboratory and then observe how subjects reacted. In this way, both the environmental stimuli and the subjects' responses could be objectively described and measured. Instead of asking people to describe happiness, for example, the behaviorist might count the number of smiles or belly laughs while subjects watched an amusing film.

Watson felt that Pavlov's studies of conditioned reflexes and Thorndike's studies of learning in cats were both major successes of the behavioral method. By carefully controlling environmental stimuli, both scientists had shown how behavior could be modified in predictable ways. Behaviorism provided a method that made scientific psychology a possibility. Without it, psychology as a science might never have developed. In subsequent years, psychologists flocked to behaviorism's banner. Research on conditioning and learning flourished. Some psychologists developed elaborate theories of learning, while others applied behavioral methods of problems in education, child development, social psychology, and mental illness.

4. Gestalt psychology: This school was founded in Germany about 1912 by max Wertheimer (1880-1943) and his colleagues Kurt Koffka (1886-1941) and Wolfgang Kohler. The German word gestalt means "forms" or "configuration" and the gestalt psychologists maintained that mind should be thought of as resulting from the whole patterns of sensory activity and the relationships and organizations within this pattern. For example when look at the dots in the figure given below, your mental experience is not the just of the dots, or elements but of a square and a triangle. It is the organizations of the dots and their relationships that determine the mental experiences you have. Gestalt psychologists stated that mental experiences depended on the patterning and organization of elements. In other words, the mind is best understood in terms of the ways elements determine the mental experience a person has. Gestalt psychologists believed experiences cannot be broken down to separate elements. Gestalt psychologists laid their basis on perception, and believed that perception is a copy of objects or a "mental image" of what has been perceived and thinking is a mechanical combination of those images.

Gestalt is not a name of person, instead it is a school of psychology that behaviour cannot be studied in parts but must be viewed a whole. Parts make the whole or the whole is more important than the parts. That is, the overall behaviour or the total experience of the individual is important than the mere reflexes. The whole is more than the sum of the parts. Whole experience is essential, and the total experience is evaluated. For instance, there is a difference between if I tell you "come to my house" and "come home". House here merely refers to the parts-the tables, chair or the building but home includes the people at house and they really want you to visit them. It is a holistic approach. Wertheimer and his colleagues focused on perception and on how perception influences thinking and problem solving. Perceptions were more than the sum of their parts. Gestalt psychologists saw our perceptions as whole that give meaning to parts.

Gestalt psychologists illustrated how we tend to perceive separate pieces of information as integrated wholes, including the lowest in which they occur. For instance the symbol in second column at the above is identical, but in the top row, we may perceive it as B and in the bottom row as number. The symbol has not changed, only the context in which it appears has changed. The method used in Gestalt psychology is Introspection Method. Gestalt psychology, too had its criticism like, the responses may be biased, prejudiced, subjective, not consistent and not always reliable and valid. Thus exercising Gestalt psychology required rigorous training and practice.

5. Psychoanalysis: This highly influential school emerged in Vienna under the leadership of Sigmund Freud. As a neuro-physician Freud was puzzled with the suffering of his patients from mental conflicts that were manifested as physical disorders. He found that hypnotizing the patient and allowing him to talk out the problem was helpful in relieving the trouble-some experiences. He used hypnosis and free association, in which the patient freely told whatever came to his or her mind. To him dreams were of special significance as they revealed hidden wishes and provided access to unconscious processes. He developed the concepts of id. Ego and super ego to analyze personality structure. He considered human mind in terms of conscious, preconscious and unconscious processes. His work has also influenced the study of child rearing, personality development and unconscious motivation. Alfred Adler and Carl Jung were associated with Freud during early phase but later on developed their independent schools of thought. Neo Freudians like Fromm, Sullivan, Horney, and Erikson have modified and extended the ideas of Freud by attending to ego functions and the demands of social reality.

Current Status of Schools

The schools of psychology described above are historically important. There are no more schools in any orthodox sense. Today psychologists in different fields are using the ideas and assumptions rooted in diverse schools of thought. Their focus has now shifted from psychology as a whole to the development of special fields focusing on specific themes and sub themes,

The Cognitive Revolution: transition period

During the years following the Second World War a number of forces converged and paved the way for a major change in the perspective, amounting to an academic revolution. Psychologists were

impressed by communication engineering. The idea that human beings are limited capacity processors of information proved very attractive. The resulting information processing approach assumed that a mental process can be understood in terms of the flow of information through a series of stages. Jean Piaget in Switzerland studied cognitive development of children. He considered human beings as active interpreters of information using schemas. In England Frederick Bartlett was studying memory and found that long-term memory is not a passive process. People actively interpret events and their memories often change over time.

The complexity of human languages challenged many of the prevailing notions. Chomsky proposed that there is an implicit system of rules underlying people's language abilities. These rules help speakers to construct, and listeners to understand the sentences that are allowed in the language. Chomsky rejected the behaviorist approach to language acquisition and clearly indicated the inborn ability to master language.

All these developments culminated in the emergence of a new orientation named cognitive view. The conference at Massachusetts Institute of Technology was seminal to it. The direction provided by this conference in 1956 gave birth to human information processing model of cognition. It was considered possible to study mental processes scientifically within the framework of modern cognitive psychology. And in the process, psychology once again returned back to the study of mind as an important subject matter.

Trends in 21set century

The developments in contemporary psychology showing advances in theory and application are wide raging. The various schools, which were propagating one or the other paradigm, are no more operating as alternatives. They don't exist as mutually exclusive. With maturity the range of concerns has widened and critique and reconstruction of psychological theories are going on. The cultural context of psychological processes is being recognized. It is realized that the psychology based on the Euro-American ideals of individualism and capitalism is flawed. It was good at a time when industrialization was the key agenda. Today the developed countries are moving towards information age. The emerging post-industrial societies demand interdependence and sharing. The developing countries are also repositioning themselves by striking a balance between local realities and global concerns. These developments are posing new and exciting challenges before psychologists.

MAJOR PERSPECTIVES WITHIN PSYCHOLOGY

Psychology has come a long way in the century or so since the early efforts of Wundt, James, and Hall. It has gone beyond asking broad philosophical questions about human nature and abilities and has developed into a science. But even today, psychologists have different philosophical perspectives on their work. They have different ideas about the nature of humanity, the nature of science, and the topics and methods that psychologists should emphasize. For example, some psychologists believe we should only study behavior and leave "the mind" to philosophers. Others think that we must study human experience and feeling even if these are more difficult to observe and measure than action and reaction. In this section we will introduce the major perspectives in the field of psychology. We will explain the philosophical assumptions underlying each approach and how these approaches developed. The five perspectives we will consider are the biopsychological, psychodynamic, behavioral, humanistic, and cognitive approaches. Before we consider each perspective individually, there are a few general considerations that you should keep in mind. First, to a large degree, the perspectives are related. Often the limitations of one perspective have led to the creation of another. Then, at a later time, interest in the older perspective is frequently. Second, no single perspective is considered dominant or correct. Many psychologists incorporate the view of several perspectives into their thinking. Different perspectives may be more useful at one time than at another, but they all have something important to offer. It may be more productive to think of each perspective as a special vantage point for studying the complex puzzle of behavior and mental processes.

1. The Bio-psychological Perspective

As the name implies, biopsychology is really a combination of disciplines. It combines physiology, especially the physiology of the brain, with psychology, the study of mental processes and behavior. The underlying assumption of biopsychology is that for every behavior, feeling, and thought, there is a corresponding physical event that takes place in the brain. The goal of biopsychology is to understand the relationship between these two realms.

What changes occur in the brain during learning? What happens to the chemistry of the brain in

mental illness? How do drugs such as Valium act on the brain to produce their tranquilizing effect? What happens in the brain when a person commits a violent act? These are the kinds of questions biopsychologists address. Similarly, biopsychologists want to know why stimulation of certain areas of the brain causes rats that have just been fed to eat again, whereas surgery in other areas of the brain Induces animals to starve to death even though food is available. They want to understand why certain brain operations cause previously aggressive monkeys to become tame and docile.

We may recall Hippocrates' interest in the relationship between the brain on the one hand and behavior and consciousness on the other. After Hippocrates, the study of these questions was largely ignored until the eighteenth century. This was partly due to religious dogma that insisted that the body was separate from the mind or soul.

Since the eighteenth century, however, biopsychologists have once again pursued the remarkable insights of Hippocrates and have made dazzling discoveries about the functioning of the brain. Although much of their research has been conducted on animals, some of the most intriguing studies have involved surgery on the human brain, conducted in a daring effort to help patients with severe brain disorders.

In addition to operating on the brain in order to change behavior, biopsychologists also study the changes that occur in the brain during certain behaviours. For example, they have identified electrical changes that occur in the brain during the learning process. They have also found that different patterns of electrical activity occur during relaxation, sleep, and waking. Still other researchers have found that certain drugs can control the symptoms of schizophrenia, suggesting that biochemical activity in the brain is related to schizophrenia. And recently, Roger Sperry was awarded the Nobel prize for his work on the split brain. His research suggests that the two halves of the brain perform different functions.

To be sure, we are a long way from a complete understanding of the relationship of the brain to human behavior and mental processes. Indeed, the complexity of both the brain-with its billions of cells-and human behavior makes this a tall order. Nevertheless, the biopsychological perspective holds great promise for understanding behavior and perhaps bettering the human condition.

2. The Psychodynamic Perspective

The underlying assumption of psychodynamic psychology is that unconscious forces have important influences on human behavior. Although the psychodynamic perspective is made up of both Freudian and non-Freudian theories, it actually grew out of the work of Sigmund Freud and his followers, called neo-Freudians. Freud's work is known as psychoanalytic theory. Psychoanalysis is the term Freud used to describe his psychological theories and his method.

Freud's ideas are consistent with philosophical viewpoints that see human beings as irrational and motivated by biological drives, not all of which are noble. His central assumptions were that human beings are born with unconscious drives that seek some kind of outlet or expression from the very start. Many of the drives that young children have, violate social conventions for proper behavior. For example, young children often enjoy smearing feces, masturbating, or hitting their playmates. Parents will typically forbid these behaviors and punish their children for performing them. As a result of these restrictions, many innate drives are repressed, that is, pushed totally out of conscious awareness.

An important idea in psychoanalytic theory is that repressed drives continue to demand some kind of expression or satisfaction. Since they cannot be expressed in behavior or even admitted into consciousness, they will be manifested indirectly. For example, Freud felt that many drives for socially unacceptable behavior were sublimated, that is, channeled into some kind of approved or even highly praised behavior. He argued that the highest achievements of civilizations, including painting, music, and architecture, were motivated by sublimated drives. Thus, a young man's drive for a forbidden intimate relationship with his sister may lead him to marry a women who closely resembles his sister. Similarly, dreams or slips in speech or memory may indirectly express repressed drives. For instance, sexual drives are often expressed in dreams. Hostile feelings may be expressed by forgetting a meeting with someone you do not like or whom you fear.

Freud was particularly interested in analyzing psychological disorders, and his writings stress the way parental treatment of children's behavior can lead to problems. At the same time Freud was quite optimistic about the power of psychological treatment to relieve psychological disorders. His goal in treatment was to make the patient aware of his or her own unconscious feelings. In this way, patients would understand themselves better and would be freer to choose effective responses to the problem they face.

Freud continued to refine and develop his theories throughout his lifetime. His ideas address human motivation, personality, personality development, psychological disorders, and methods of psychotherapy. Because his theories were based on the assumption that human nature is rooted in unconscious, and some feel, ignoble drives, Freud's theories spurred much controversy.

The development of Freud's theories is itself an interesting story. As a young physician Freud became interested in patients with physical symptoms that seemed to have a psychological basis. One such patient was a woman called Anna O., whose symptoms included occasional paralysis of her limbs, nausea, and speech disturbances. Freud and a colleague, Josef Breuer, found that when Anna O. was under hypnosis she was able to speak much more freely about intense emotional experiences. The expression of these emotions seemed to provide a catharsis, that is, a cleansing or reduction of a feeling through the expression of that feeling, and led to a dramatic improvement in Anna O.'s physical symptoms.

Freud was fascinated with hypnosis and the "talking cure" and pursued it vigorously. He soon discovered an alternative to hypnosis---free association, a method in which the patient learns to discuss embarrassing or painful thoughts simply by reporting whatever comes to mind. Freud also found that it was useful to have patients free associate about their dreams. Freud and the patient could then begin to unravel the tensions that were being expressed, often in disguised form, in these dreams. Using the techniques of free association and dream analysis, Freud began to explore how forgotten or unexpressed emotional experiences might relate to patients' symptoms. He believed that critical problems for many patients were related to sex. Few people supported Freud in these ideas, but he continued developing them in his own self-analysis, for which he used his dreams as an important tool. In 1890, the same year that Pavlov began to study conditioning, Freud published his major work, The Interpretation of Dreams. In that book we see the origins of Freud's theories of human functioning, which would eventually fill 23 volumes. His theories not only have tremendous influences in psychology, they have influenced our culture as a whole. Because of Freud's influences most educated people today believe that dreams reflect unconscious wishes, that slips of the tongue express hidden feelings, and that jokes betray hostile feelings. Similarly, we often assume that our feelings toward member of the opposite sex are related tour feelings about our mothers and fathers and that repressed childhood sexual feelings are responsible for sexual difficulties in adulthood. These ideas permeate our culture and strongly influence our interpretation of drama, literature, and the overall condition of society. They are a direct reflection of Freud's writings.

3. The Behavioral Perspective

The behavioral perspective emerged in part as a reaction to Wundt's method of introspection. Behavioral psychologists felt that studying consciousness through introspection was too unscientific. The key assumption of behavioral psychology is that if psychology is to be a science, it must study only that which is observable – namely, behavior. The followers of this perspective define psychology as the science of behavior and leave consciousness and other unobservable phenomena to the field of philosophy. Behavioral psychologists study behavioral response and the way these response are influenced by stimuli in the environment.

The behavioral perspective has its roots in the work that Ivan Pavlov began at the turn of the century. Pavlov was born in Russia in 1849, the son of a village priest. He was a promising student who studies animal physiology before attending medical school. Pavlov was, in his time, the most successful physiologist in Russia and made important advances in the study of digestion. His work on digestion was important enough to win him a Nobel Prize in 1904.

Pavlov discovered one of the most important findings in the history of psychology quite by accident. Pavlov had implanted a tube in the saliva ducts of a dog in order to collect the measure saliva for a study on digestion. In order to stimulate such secretions, Pavlov gave meat powder to the dog. He soon discovered that the dog often began salivating before it actually received the meat powder. In fact, Pavlov noted that the dog would begin salivating when it heard Pavlov or his assistant walking down the hall toward the laboratory.

Pavlov observed that the dog associated stimuli such as footsteps coming down the hall with the meat powder. By their association with meat powder, these other stimuli acquired the power to elicit salivation. Pavlov called this phenomenon as the conditioned reflex.

At first Pavlov was unsure whether to pursue conditioned reflexes. He believed that an independent

science of psychology was "completely hopeless," and he recognized that association and conditioning were psychological matters. However, in 1900 he decided to study conditioned reflexes for the remainder of his career, always holding that he was investigating the structure and physiology of the brain and simply using these unique responses as a tool.

A second important contribution to the behavioral perspective was the work of Edward Thorndike who was one of William James' brightest students. In 1898, at the age of 24, Thorndike published a famous paper on learning in cats based on experiments he conducted in James' basement. Thorndike found that when certain behaviors were rewarded with food, the cats were more likely to repeat them in similar circumstances later on. Behaviors that were not rewarded were less likely to be repeated. On the basis of these findings Thorndike proposed the law of effect, which holds that when a behavior is followed by satisfaction it is "stamped in," and when it is not followed by satisfaction it is "stamped out." Thorndike's work dominated debate in the field of learning for half a century (Hilgard, 1956). The idea that the consequences of behavior, reward or punishment, are critical in determining future behavior remains vitally important today in the work of B.F. Skinner and other modern behavioral psychologists. A third important figure in the development of the behavioral perspective was John B. Watson, a professor of psychology at Johns Hopkins University. Stimulated by the work of Pavlov and Thorndike, Watson launched in 1913 what is known today as behaviorism, a philosophy of psychological study which holds that only observable behavior is the proper subject for psychological investigation. In that year Watson published an article, "Psychology as the Behaviorist Views It," that revolutionized psychology and made him one of its most important figures. At that time the chief method for studying mental processes was introspection. Watson pointed out that Wundt's introspective method had a serious flaw. When different people were asked to describe a certain conscious experience, they often disagreed. We can see this ourselves by asking five different people what the conscious experience of happiness consists of. We are likely to get five different answers.

Watson's solution to this problem was simple and direct- banish the study of consciousness and the introspective method from psychology. Instead, define psychology as the study of behavior and of the ways in which humans and animals learn to adapt to their environments. Watson suggested that psychologists set up various environments in the laboratory and then observe how subjects reacted. In this way, both the environmental stimuli and the subjects' responses could be objectively described and measured. Instead of asking people to describe happiness, for example, the behaviorist might count the number of smiles or belly laughs while subjects watched an amusing film. Watson felt that Pavlov's studies of conditioned reflexes and Thorndike's studies of learning in cats were both major successes of the behavioral method. By carefully controlling environmental stimuli, both scientists had shown how behavior could be modified in predictable ways. Behaviorism provided a method that made scientific psychology a possibility. Without it, psychology as a science might never have developed. In subsequent years, psychologists flocked to behaviorism's banner. Research on conditioning and learning flourished. Some psychologists developed elaborate theories of learning, while others applied behavioral methods of problems in education, child development, social psychology, and mental illness.

4. The Humanistic Perspective

Just as the behavioral perspective developed as a reaction to introspectionism, so the humanistic perspective has developed over the last several decades as a reaction against perceived shortcomings in the psychoanalytic and behavioral perspective. The argument is that these two perspectives have theoretical elegance and impressive explanatory power, but that the person seems to get lost. Individuals are dissected into conditioned responses or unconscious drives while the whole human being- his or her feelings, experience, needs, and problems-seems to be pushed aside. This concern given rise to a "third force," called humanistic psychology, which emphasizes the whole person and the importance of each person's subjective experience.

Perhaps the central concept in humanistic psychology is the need for self-actualization. While recognizing that many motives affect behavior, humanistic psychologists believe the most important is the underlying needs to develop our full potential. Freedom is another key concern in humanistic psychology. According to behavioral psychology, people's actions are determined by the external environment. In psychoanalysis, people are largely governed by unconscious, internal drives. Humanistic psychology rejects the emphasis on these internal and external determinants of actions.

Instead, it emphasizes the fact that people can choose, and that if society gives them more freedom, people will ably and gladly takes responsibility for their own lives and make the best of them. Humanistic psychology also assumes that inner goodness in all human beings.

If it is true that people are inherently good, active, and responsible, and if they really strive towards self- actualization, why are so many people aggressive, frightened passive, and dissatisfied much of the time? Humanistic psychologists feel that the structure of society – its pressures and its restrictions – accounts for these problems. Consequently, people need help in discovering themselves and in starting on the path towards self-actualization. For this reason, many humanistic psychologists were active in the encounter group movements of the 1960s and early 1970s. An encounter groups is a form of group interaction that emphasizes becoming aware of one's inner feelings and experience, taking responsibility for one's life, and pursuing life actively and productively. According to humanistic psychologists, honest communication and the sharing of feelings and experience in encounter groups facilitates the self- actualizing tendencies within each of us.

Two important figures in humanistic psychology are Abraham Maslow and Carl Rogers. Maslow is known for his comprehensive hierarchical theory of motivation. This theory emphasizes that basic motives such as the need for food, water, safety, and affection must be satisfied before people can develop their potentials (Moslow, 1954). Rogers (1961) has written extensively about how people can become themselves and how they can relate to others in helpful and constructive ways.

5. The Cognitive Perspective

One of the newest trends in psychology is the intensive study of cognition, a broad term that refers to the ways we process or transform information about the world around us. Cognition includes the mental processes of thinking, knowing, perceiving, attending, remembering, and the like. The cognitive approach developed as a reaction to the behaviorists' exclusion of mental life and consciousness from their definition of psychology. It has its roots in wundt's introspectionism and, before that, in Aristotle's ancient writings on image and experience. Cognitive psychology is the psychologists want to know how we organize, remember, and understand everything we experience. For example, how do we turn the small lines of ink on this page into meaningful sentences? How do we translate the sound waves produced by a friend into the complex questions and statements that are a part of adult conversations?

Cognitive psychologists view human beings as extremely active processors of information. Cognitive psychologists Ulric Neisser states that "whatever we know about reality has been acted on by complex systems which interpret and reinterpret sensory information". The goal of cognitive psychology is to specify the mental processes involved in this interpretation and reinterpretation. For example, line of research, cognitive psychologists have used the computer to try to duplicate the features of human memory and problem solving (Kotovsky & Simon, 1973) in order to develop a model of how humans reason. To do this, researchers must produce a computer program that solves problems in the same sequence human do.

How do cognitive psychologists study human behavior? Frequently they create small experimental tasks that allow them to determine how past experience influence the way people think. For example, in one classic experiment subjects were given the objects pictured in a box of candles, a box of matches, some string, and some thumbtacks (Duncker, 1945). The subject's task was to mount the candle on a wall vertically, using any of the objects they were provided with.

Subjects typically had a difficult time solving this problem because they could not think of novel uses for the objects. One aspect that contributed to the task's difficulty was that the matches were presented in a box. This made subjects regard the box as a, rather than as a potentially important element in solving the problem.

What this brief experiment demonstrates is that the ways people think about objects is strongly affected by the ways they have thought about them in the past. The old ways can make it difficult to think in new ways. How people overcome familiar ways of thinking and devise creative solutions is

psychologist's central concerns.Like the other approaches to psychology, the cognitive perspective has been applied to helping people overcome psychological problems. For example, a cognitive therapy known as rational-emotive therapy (Ellis & Harper, 1975) emphasizes exactly the difficulty seen in the matchbox problem we just discussed becoming trapped by old, familiar ways of thinking. Sometimes people have irrational beliefs which adversely affect their entire view of themselves and their relations with others. Cognitive therapies emphasize changing these irrational beliefs so that people can achieve greater self-acceptance and improved interpersonal functioning.

APART FROM THESE, THERE ARE SOME OTHER PESPECTIVES LIKE

Developmental, Socio-cultural, evolutionary, etc. which also provide important frameworks for the understanding of behaviour and mental processes.

Psychological Settings and Specialties

Although psychologists do many different kinds of work in many different places, we can make on basic distinction between types of psychological endeavor. For the most part, psychologists are involved either in a combination of teaching and research in an academic setting, or in putting theory and research into practice in various settings such as schools, hospitals, clinics, and businesses.

Fields of Psychology: Modern Nomenclature

Contemporary psychology is made up of many specialized sub-fields, each with its specific subjects matter, theories and methods. Some of the major areas of psychology are mentioned below. Remember, these details are not exhaustive since many new areas are also emerging.

Biological psychology

also called physiological psychology or behavioral neuroscience the study of the physiological bases of behaviour. Biological psychology is concerned primarily with the relationship between psychological processes and the underlying physiological events—or, in other words, the mind-body phenomenon. Its focus is the function of the brain and the rest of the nervous system in activities (e.g., thinking, learning, feeling, sensing, and perceiving) recognized as characteristic of humans and other animals. Biological psychology has continually been involved in studying the physical basis for the reception of internal and external stimuli by the nervous system, particularly the visual and auditory systems. Other areas of study have included the physiological bases for motivated behaviour, emotion, learning, memory, cognition, and mental disorders. Also considered are physical factors that directly affect the nervous system, including heredity, metabolism, hormones, disease, drug ingestion, and diet. Theories of the relationship between body and mind date back at least to Aristotle, who conjectured that the two exist as aspects of the same entity, the mind being merely one of the body's functions. In the dualism of French philosopher René Descartes, both the mind and the soul are spiritual entities existing separately from the mechanical operations of the human body. Related to this is the psychological parallelism theory of German philosopher Gottfried Wilhelm Leibniz. Leibniz believed that mind and body are separate but that their activities directly parallel each other. In recent times behaviourists such as American psychologist John B. Watson moved away from consideration of the spiritual or mental and focused on observable human and animal behaviours and their relationship to the nervous system.

Developmental psychology

Also called Life-span Psychology, the branch of psychology concerned with the changes in cognitive, motivational, psychophysiological, and social functioning that occur throughout the human life span. During the 19th and early 20th centuries, developmental psychologists were concerned primarily with child psychology. In the 1950s, however, they became interested in the relationship between personality variables and child rearing, and the behavioral theories of B.F. Skinner and the cognitive theories of Jean Piaget were concerned with the growth and development of children through adolescence. At the same time, the German psychologist Erik Erikson insisted that there are meaningful stages of adult psychology that have to be considered in addition to child development. Psychologists also began to consider the processes that underlie the development of behaviour in the total person from birth to death, including various aspects of the physical-chemical environment that can affect the

individual during the intrauterine period and at birth. By the latter part of the 20th century, developmental psychologists had become interested in many broad issues dealing with the psychological process throughout life, including the relation of heredity and environment, continuity and discontinuity in development, and behavioral and cognitive elements in the development of the total person.

Cognitive Psychology: Cognitive psychology deals with how individuals acquire, store, transform, use, and communicate information. It covers our mental life. The major cognitive processes are: attention, perception, pattern recognition, memory, reasoning, problem-solving knowledge representation, language and decision-making. In everyday life we are constantly engaged in these processes. Many of them occur simultaneously or in close succession. In order to understand them cognitive psychologists conduct experiments in laboratory settings. Also, there is an ecological approach, which uses naturalistic observation. Cognitive psychologists often collaborate with neuroscientists, and computer scientists.

Comparative-physiological Psychology: comparative psychology deals with the study of similarities and differences between the behavior of various animals. The major issues in the area include heredity and behaviour genetics, evolution of behaviour, neural bases of behaviour, central nervous systems, neuro-psychology, the autonomic nervous system, endocrine system, and states of consciousness, sleep and dreaming, and the psychological effects of drugs. Neuropsychology and psychopharmacology study the psychological effects of drugs on mental life and behavoiur.

Abnormal Psychology: Mental health problems are widespread in contemporary societies. Abnormal psychology seeks to describe, explain, predict, and control behaviour that are considered strange or unusual. It's main focus is on classification, etiology, assessment, treatment, and prevention of mental disorders. Abnormal behaviour is one that departs from some norm and harms the affected individual and or others. Its subject matter encompasses a range of behaviours from the bizarre and spectacular to the more commonplace—from the violent homicides and perverted sexual acts to behaviours such as stuttering, anxiety, and depression. Psycho-diagnosis attempts to describe, assess, and draw inferences about a person's psychological disorder. It is important for treatment. Abnormal behavior can be understood in different ways. One may view abnormality in terms of behaviours that occurs least frequently in the population. In practical terms abnormality is defined on the basis of discomfort, either physical or psychological, suffered by the affected person, the bizarreness of the person's actions, and inability to play various roles. Perhaps a single criterion of abnormality is not enough. One has to take into account-combined perspectives of society, the individual, and the mental health professional.

Clinical and Counseling Psychology:

Clinical psychologists are professionally trained practitioners in the domain of diagnosis and treatment of psychological disorders. They also investigate the causes of these disorders. A large number of clinical psychologists are employed in hospitals, clinics, and are pursuing private practice. They work closely with psychiatrists in treating people with serious psychological in treating people with serious psychological disorders. Counselling psychologists usually help those with mild problems of social and emotional adjustment. Some counselling psychologists work in specialized areas like family, marriage, and career.

Cross-Cultural and Cultural Psychology:

It is the study of the ways in which social and cultural forces shape human behaviour and are also shaped by human behaviors. It assumes that human behaviour is not only a reflection of human biological potential but also a product of culture. It is argued that in order to fully appreciate and understand, behaviour should be studied in its socio-cultural context. Culture and behaviour are interdependent. Culture influences human behaviour in many ways and in different is degrees.

Educational and School Psychology: This field is concerned with all aspects of learning process. The factors influencing performance in the classroom, and evaluation of student performance are investigated. The school psychologists try to apply psychological knowledge in school setting. Teacher training, student counselling and helping children overcome their learning difficulties are important

activities undertaken by educational psychologists. Special education has become a significant area in terms of providing education to children with various types of handicaps.

Environmental Psychology: This field focuses on the interaction between the physical world and human behaviour. Environmental stressors like noise heat, humidity, pollution, and crowding, are studied, also physical arrangement of the work place, its influence on ability to work, emotional state 3, health and interpersonal behaviour are investigated. In recent years disposal of waste, alteration in climate, nuclear energy, population explosion, consumption of energy, use of community resources, and littering are becoming serious problems. An environmental psychologist address these and related issues systematically.

Health Psychology: This field explores the relationship between body and mind. The mind plays impotent role in many physical diseases ranging from ulcers, heart disease to common cold and cancer. As a field of study health psychology specializes in the study of how psychological factors influence the origin, prevention, and testament of physical illness, health psychologists are contributing to modern health care and disease prevention. They try to understand how psychological factors (e. g., stress, hostility) can have harmful physical effects. The causes of unhealthy behaviors such as smoking, ignoring early symptoms of a disease, and overeating etc. are studied. They also try to understand the psychological strategies for coping with illness.

Industrial and organizational (I/O) Psychology: It is one of the popular branches of psychology that applies the principles of psychology to the work place. Thus the principles of social psychology are used to promote leadership, and motivate the employees. Similarly the principles of learning are used to run training programmes. It tries to investigate the factors that affects the people working in an organization. By increasing the effectiveness of employee it reduces the cost of products and improve the quality of life. Some of the I/O psychologists focus on personnel psychology. They are interested in employee selection, job analysis, performance evaluation, and absenteeism. Those interested in organizational psychology deal with the issues like leadership, employee motivation, conflict management, group processes, and organizational change.

Some of them are interested in training and development. There are also psychologists who are devoted to human factors. They try to design work place, human machine interaction, and reducing physical fatigue and stress.

Life Span Developmental Psychology: This field focuses on the development of perception, cognition, language, skills, personality, and social relationship. It is related to psychological phenomena of all kinds among infants, children, adolescents, adults, and the aged. In fact they study the changes in physical and psychological domains that occur in people throughout the life cycle. They describe and explain the systematic changes that occur during the life course. They investigate how biological inheritance and particular experiences influences psychological characteristics such as intelligence, temperament, and social relationships.

Social Psychology: Social psychology attempts to understand the nature and causes of individual behavoiur and thought in social situations. It's interest lies in understanding the factors that shape the action and thoughts of individual human beings within social settings. The factors influencing social behaviors are many. Some of them are behaviors and characteristics of others, basic cognitive processes, ecological variables, cultural context, and biological factors. Social psychologists study attitudes, conformity and obedience to authority, interpersonal attraction, attribution processes, group processes, social motivation, intergroup relations, and so on.

Psychological Assessment: This is one of the most important areas of psychological applications. Measurement of aptitude, intelligence, personality, attitudes, values and many other psychological characteristics are useful in research, providing guidance to people, and selecting and training people for various jobs in different organizations. Assessment of human competencies in different domains is becoming a major focus of applied work and many new methods are being developed to achieve this goal. For instance, Assessment Centers and Dynamic Testing methods provides better ways to provide the profile of the people being tested.

Other Fields: Apart from the above specializations there are many new areas that are emerging like aviation psychology, military psychology, forensic psychology, rural psychology, engineering psychology, personnel psychology, behaviour medicine, managerial psychology, peace psychology, sports psychology, community psychology, and psychology of women, political psychology, work psychology, and neuro psychology. There are departments where full-fledged Master's and Ph.D. level courses are run in specialized areas. Books, scientific journals and professional bodies support teaching, research and applications of psychology in specialized areas.

Emerging Fields of Psychology [trends in 21st century.psychology and scientific method

The discipline of psychology is growing very fast in many directions. Its theoretical and methodological concerns as well as commitment to applications for improving the quality of life have widened to encompass many domains of human life. It is almost impossible to keep track to the voluminous research publications in the field. Researcher are showing increasingly greater interest in studying biological, social, cultural, cognitive, community, and health related issues. In each and every area new ideas and findings are coming up and it is difficult to provide even a comprehensive sample of these developments.

However, some major trends and themes may be deciphered. The new developments in psychology are characterized by the following trends:

- The study of psychological issues is becoming a multi-disciplinary endeavour.
- The developments in the sub fields of psychology are showing increasingly greater degree of specialization.
- The complexity of reality in human life requires use of multiple methods rather than single method.
- The role of culture in constituting as well as understanding psychological reality is being realized.
- Meaning, emergent properties of behaviour, cognitive flexibility, developmental context, and situatedness in the socio-cultural context make human science a more appropriate model for psychology than the physical science model.

• Looking at these developments we find a very exciting scenario within the discipline of psychology. In order to have a glimpse of the developments that are taking place a sample of some recent works is presented. They, however, do not exhaust the kinds of activities that are taking place. Neuropsychology: In this emerging field researcher are interested in understanding the functioning of intact brain as it's relates to mental functions. Advances are being made in many directions. One of the new areas is the study of neural communication. Researchers are uncovering the working of neurotransmitters-a kind of chemical, which are responsible for neural communication. At present we know about 40 such transmitters. One category of transmitters is called monoamines. They play an important role in emotion, movement, learning and memory. Another type of transmitters is acetylcholine, which is important for memory. Still another, Gamma aminobutyric acid called GABA, is the major inhibitory transmitter. It is important for emotion, anxiety and arousal. Then, we have endorphins, which regulate pain, and pleasure. These neurotransmitters are found in different parts of brain particularly limbic system, thalamus, brainstem, and frontal cortex. Knowledge of mystery of mental function, helping to fight with various diseases and enhancing the well being of the people.

Non-Conscious Mental Systems: Many researchers are exploring the role of mental processes, of which we are not aware, in behaviour. It appears that most a person's everyday life is determined not by conscious intentions and deliberate choices but by mental processes that are put into action by features of the environment and that operate outside of conscious awareness. Regulating one's own behaviour, taking non-conscious or automatic processes are unintended, effortless, and fast. Several of them can operate at any given time. Automatic self-regulation involves one third less effort than what is required in regular thinking. It has been found that some of that automatic guidance systems are natural and don't need experience to develop. Other develops out of repeated and consistent experience. Studies show that mental representation that is involved in non-conscious processes do not care about the source of their activation. The mechanisms of automaticity in behaviour provide an important challenge for researcher.

Positive Psychology: There has been a growing interest in topics like hope, optimism, happiness, and flow. Taken together these construct deals with the positive side of human existence. Optimists are the people who expect to have positive outcomes, even when things are difficult. This yields a mix of feelings that is relatively positive. It is positively related to coping, health, and advancement. Happiness is a enduring positive emotional state that includes satisfaction with one's life and self as well as active pleasure and accomplishments. It has been noted that spending time with loved ones, seeking challenging and meaningful work, helping others, keeping physically fit, and thinking positively are a key to happiness.

Flow is a state of unselfconscious concentration, in which one focuses on a task or activity while losing track of time. When a person's relevant skills are needed to cope with the challenge of a situation, that person's attention is completely absorbed by the activity. As a result, one of the most distinctive features of optimal experience takes place: people become so involved in what they are doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the action they perform. The key element of an optimal experience is that it is an end in itself. It's a self- contained activity. Its experience is intrinsically rewarding. It lifts the course of life to a different level. A dancer, a rock climber, a chess player, and a user of computer, a mother spending time with the small daughter all report a seemingly effortless movement or flow. By being in flow one can cast off the shackles of mortal existence, because no matter what has happened in past, and regardless of what awaits you in the future, you can be in flow now.

Ethical Principles of Psychologists

As we have stated, the goals of psychology are to describe, explain, and predict behavior and to use this knowledge to promote human welfare.

In pursuing these goals psychologists subscribe to a number of ethical principles. As you read about psychological study and consider how you might use psychological knowledge, you should keep these ethical principles in mind. The psychologists' general ethical position is stated in the preamble of the American Psychological Association's statement of ethical principles. This preamble reads, in part, as follows:

- Psychologists respect the dignity and worth of the individual and strive for the preservation and protection of fundamental human rights. They are committed to increasing knowledge of human behavior and of people's understanding of themselves and others and to the utilization of such knowledge for the promotion of human welfare. While pursuing these objectives, they make every effort to protect the welfare of those who see their services and of the research participants that may be the object of study. (APA, 1981)
- Among the ten specific principles declared by the APA, three are worth special mention. First, psychologists have an obligation to protect the confidentiality of information provided by others. This applies to information provided by persons seeking counseling or psychotherapy, to people who are studied in their place of work, to students, and to participants in psychological research. Second, a more general principle protects the rights of persons who participate in psychological research. This principle states that such research must always consider both the benefits to society and the dignity and welfare of the subjects themselves. There is a specific obligation to determine the advantages of and alternatives to any concealment of the purposes of an experiment or to any deception.
- The principle of protecting the rights of persons who are research participants states that psychologists must consider the benefits of their studies. What are some of the practical benefits that have been derived from psychological research? The APA recently presented to Congress some of the benefits to society that have come from psychological research. A number of these benefits are quite interesting. For example, the application of research on perception has benefited aviation safety by helping pilots learn to recognize common optical illusions. This has contributed directly to a decrease in airplane accidents. Second, applications of research on personality and assessment have contributed to improved objective techniques of personnel selection in business. Third, techniques for changing attitudes and behavior have been applied to many health issues. Such techniques have helped people with high blood pressure changes their diets. Other benefits include measuring consumer sentiment, motivating school children,

and suggesting less stressful physical environment in hospitals.

The third ethical principle deserving special comment concerns the care and use of animals in . psychological research. There has been a great deal of discussion about using animals in behavioral research during the past several years. This discussion falls within the larger consideration of the use animals in science and medicine. For example, in 1984 there was prolonged controversy about the morality of transplanting a baboon heart into the human infant known as Baby Fae. That same year psychologists at the annual APA convention considered in great detail the ethics of research with animals. Psychologists pointed to the numerous contributions made through animal research- including studies pertaining to the rehabilitation of people suffering from stroke, anxiety control without drugs, and the use of biofeedback to reduce high blood pressure and the risk of heart attack (APA, 1984). The APA mandates that psychologists who conduct research with animals safeguard the health, comfort, and humane treatment of their animal subjects. Furthermore, psychologists must make every effort to minimize the chances of pain, illness, or discomfort in the animals. In short, the APA strongly believes that research with animals is necessary in order to make scientific progress and to benefit the human condition, but it insists that such research be conducted as ethically and humanely as possible.

With psychology's emphasis on helping human beings, it may seem odd that conducts so many experiments on animals. The reasons for using animals are actually good ones. There are many similarities between human and animals' behaviors.Researchers can, however, manipulate the environments of animals in ways that would be repugnant and unethical for human subjects. Similarly, researchers can perform physical experiments on animals and gain much knowledge about the working of the brain.

There are tremendous benefits to be derived from psychological research. Still, such research must always be conducted with the welfare of both human and subjects carefully safeguarded.

We noted earlier that most psychologists today are practicing psychologists rather than research psychologists. This simple fact makes it clear that psychology not only can be applied, but that it is being applied, every day. Most of the practitioners of psychology are involved in the effort to alleviate psychological disorders and improve personal functioning. The range of techniques that therapists use and the numbers of psychological disorders they treat are ample evidence of the wide applicability of psychology. But in addition to clinical uses, psychology has been widely used in other settings. Here we mention just a few of them in order to give our an understanding of the many ways that psychological application affects everyday life and the range of psychologically related activities with which you might want to get involved in the future. Even if you do not pursue a career in psychology, psychology will touch your life in many ways.

Application of Psychology

Research in psychology, as in all fields of sciences, has two focuses of interest basic and applied research. Basic research is concerned with the quest for knowledge regardless of whether it has immediate practical value. Psychologists who study learning in the laboratory may not be concerned with improving teaching methods, although their findings may eventually have application in education. They aim at satisfying their curiosity about the laws that govern learning. The results may have practical consequences, but they are not their chief concern. Applied research seeks to improve the human condition by discovering something that can be put to practical use. A psychologist trying out the different methods of teaching algebra in a school classroom is concerned with finding the most effective way of teaching mathematics. The result may have implications for a more basic or fundamental understanding of learning. But the goal is a practical one of improving teaching methods. Of course, the methods that the psychologist wants to test in the classroom may be suggested by the basic research of the laboratory scientist. Thus, both basic research and applied research are equally important, for any research aims at scientific curiosity and the practical goals at the same time. Some psychologists do basic research, some do applied research, and some provide professional services.

Picture a psychologist at work and you would begin to visualize. A white-coated scientist probing a rat's brain. An intelligence researcher measuring how quickly an infant becomes bored with (looks away from) a familiar picture. An executive proposing a new "healthy life styles" employees-training programme. Someone at a computer keyboard, analyzing data on whether adopted teens have

temperaments more like their adoptive parents or like their biological parents. A traveler in route to collecting data on human values and behaviours in different cultures. A therapist listening carefully to a client's depressed thoughts.

Psychology is a meeting ground for different disciplines, and thus a perfect home for those with wide ranging interests. In their diverse activities, from biological experimentation to cultural comparisons, psychologists share a common quest: describing and explaining behaviour and the mental processes. About half the people who have advanced degrees in psychology, work in colleges; universities, although teaching is not always their primary activity. Thy may devote much of their time to research or counseling. Other work in public schools, in hospitals or clinics, in government agencies or in business and industry. Those in private practice, who offer their services to the public for a fee, represent a relatively small but growing fraction of the field. Psychologists do a variety of things in a variety of locations.

Psychology is also a helping profession devoted to such practical issues as how to have a happy marriage, how to overcome anxiety or depression and how to raise children. Clinical psychologists study, assess and treat troubled people. After graduate school training, they administer and interpret tests, provide psychotherapy, manage mental health programmes and conduct research. By contrast, psychiatrist, who also often provide psychotherapy, are medical doctors licensed to psychological disorders. Some practitioners who are influenced by Sigmund Freud's psychoanalytic perspective, are called as psychoanalysts who deal with problem arising from unconscious desires and unresolved childhood conflicts.

With perspectives ranging from the biological to the social, and with settings from the clinic to the laboratory, psychology has become a meeting place for many disciplines. More and more psychology connects with fields ranging from mathematics and biology to sociology and philosophy. Also, psychologists teach in medical schools, law schools, theological seminaries, Teacher's Training Colleges for B.Ed. and M.Ed. students, Nursing Colleges etc. They also work in hospitals, factories and corporate offices. They engage in interdisciplinary studies, such as psychohistory-psychological analysis of historical characters, and psycholinguistics-the study of the relationship between language and its user's thinking and behaviour. The influence of psychology also penetrates into modern culture. Knowledge transforms, learning to read, to understand the solar system, and to comprehend how people think and act. Learning the findings of psychology also changes people. People no longer judge psychological disorders as a moral failing, treatable by punishment. They less often regard and treat women as men's mental inferiors. They no longer view and rear children as ignorant beasts in the need of taming. In each case, knowledge has modified attitudes and through them behaviour.

Some psychologists conduct basic research that builds psychology's knowledge base. In the pages to follow you will find a wide variety of such researchers. Biological psychologists explore the links between brain and mind. Developmental psychologists study our changing abilities from womb to tomb. Personality psychologists investigate our inner traits. Experimental psychologists find the cause and effect relationship.

Physiological psychologists find out the relationship between biological processes and behaviour. Other psychologists conduct applied research that tackle practical problems. For example, industrial or organization psychologists study and advise on behaviour in the workplace. They use psychology's concepts and methods to help organizations select and train employees, boost morale and productivity, and design product and assess people's responses to them. Clinical psychologists deal with assessment and treatment of psychological disorders. Counseling psychologist deal with less serious psychological problems.

Having said psychology has its applied side, it aims solving 'real life' or practical problems. Let us read a interesting example. Were you afraid of the dark as a child? This is one of the most common childhood problems. Psychologists have developed a number of methods to help children overcome these fears. Psychologist Jean Giebenhain and Stan O'Dell put some of these methods together into a parent-training manual and then tested how well the manual worked. They located the parents of six children who were sleeping with their lights on, or were unable to go camping or spend the night with friends. The manual taught the parents the following procedures:

Giving the child control via a rheostat: A rheostat allowed the child to set the illumination level of a room lamp which was placed inside the child's bed. The rheostat levels set by the child were recorded every night.

Relaxation training: Every night before bed time, the parents and children practiced procedures for getting very relaxed.

Positive self-statements: At the same time, the parents helped their children memorize and repeat positive statements about themselves and their ability to get along in the dark. Some sample statements were "I am brave" and "I can take care of myself when...I am in the dark."

Record keeping and feedback: Every night, the children set their rheostat at the lowest level they thought they could tolerate. the levels were numbered from I (total darkness) to 11 (maximum brightness). The goal was to make the light dimmer by one-half number every night. A graph showed the child's setting for each night. Every morning, the parents and children recorded the child's setting from the night before and cheeked the child's progress.

Rewards for success: Whenever the children's morning entry showed progress, the parents responded with praise, hugs and sometimes special treats.

Phasing out rewards: Whenever the child reached the low level of illumination that the parents and experiments had agreed to aim, for the rewards were gradually phased out. The hope was that being brave in the dark would become its own reward. The hope was apparently well founded. Within two weeks, all the children were sleeping all night with their light at or below the goal level. And the children's reports on a "fear thermometer" indicated that they were not afraid. The experimenters checked up on the children were doing as well as, or better than, they had at the end of training. Psychology in Industry. Industrial psychologists is concerned with selecting people most suitable for a particular job, by using intelligence and aptitude tests, developing training programmes and management consultancy with industries and businesses situations. Industrial psychologists also deal with promotion, supervision, and interpersonal relationship among the employees and between the employees. They study such aspects as fatigue, accidents and working conditions and their improvements in industry that involve the morale and welfare of employees. Industrial psychologists are also called as organizational psychologists.

Today, many industries use many psychological tests in their placement and training programmes. Private and public organizations also apply psychology to counsel employers, and to alleviate industrial strike. The applied psychologists who do this work are sometimes called personnel psychologists. And for still another, may do research on consumer attitudes towards the company's products, by applying the psychological principles to minimize practical problems of work and commerce. These are a few dimensions of Industrial psychology like the engineering psychologist who seek to make the relationship between people and machines as satisfactory as possible- to design machines so that human errors are minimized. For example, engineering psychologists were involved in developing space capsules in which astronauts could live and function efficiently. Designing underwater habitats for oceanographic research and developing artificial limbs and other devices for handicapped individuals are other examples of their work. Along with engineering psychologists there is a group of psychologists called environmental psychologists who are concerned with problems of noise, air and water pollution, overcrowding and the psychologically optimal design of working and living areas. Yet another type of psychologists, called the consumer psychologists, deal with techniques of marketing, advertising and propaganda.

Ultimately, industrial psychologists aim at increasing productivity, improving the performance of the employees and finding good market for the products, which is essential for building greater productivity and industrial peace.

a. Psychology in Community

Community psychologists deal with human behaviour problems with a new approach. They emphasize that a great deal of environmental factors is responsible in causing adjustment difficulties. Amelioration or minimizing of man's problems to a great extent rests with the manipulation of these

environmental causes, instead of passively waiting for these problems to be solved. The development of community psychology started in 1965, when a group of psychologists headed by Hersch, engaged in developing mental health programmes. The community psychologists were expected to make use of their scientific training to create knowledge and programmes for better mental health, by assuming decision making roles in the society and by being political activists.

Community psychologist's prime aim is to promote mental health at the community level, by preventing and treating psychological problems. They evaluate and improve community organizations and involve in public programmes such as employing the physically handicapped, rehabilitating the juvenile delinquents and caring for the elderly.

b. Psychology in Family

The application of psychology in family deals with certain personal problem among the family members like is everyone happily married? Does every couple have children? What happens to adults and children when committed relationships end? Aside from marriage, what kind of intimate relationship is possible? How does family vary for those from different social classes and ethnic groups? When asked what they want from a partner, they indicate that they are looking for someone with whom to share affection, intimate secrets and companionship. They strive to obtain and maintain secure, lasting relationship-but which may not always be possible. This results in problems in family like low frustration tolerance among the partners, diverse or separation, extramarital relationships, widowhood, infertility, conflict, role strain due to psychological distress and contradictory responsibility etc.

Apart from the problems between the husband and wife, the children without whom one cannot call it a family, sometimes pose the greatest threat. The child in the family may be mentally retarded, physically handicapped, a spastic child, slow learner, have learning disability etc. The psychologists play a vital role in dealing with such serious problem and help the child with various intervention strategies, depending on the intensity of the problem. The adolescents in the family may be under stress and storm, for they are neither a child nor an adult. Related to this, there may be communication gap or generation gap, leading to misunderstanding or adjustment problems. Effective guidance and counseling by the family counselors prove successful in reducing such problems. The famous motherin-law or daughter-in-law problems or the problems of the elders in the family are the other side of the coin. The advent of crèche, orphanages, or home for the aged are all the outcome of family imbalances. Here comes the role of the marriage or family counselor who deal with the marital, family, personal or emotional problems. The application of various effective psychological techniques by the marriage or family counselor may minimize such haphazard in the family.

c. Psychology in Education

The elementary and secondary schools provide a wide range of opportunities for psychologists. Because the beginnings of serious emotional problem appear in the early grades, many elementary schools employ psychologists, whose training combines courses in child development, education and clinical psychology. These school psychologists work with individual children to evaluate learning and emotional problems; administering and interpreting intelligence, achievement and personality tests is part of their job. In consultation with parents and teachers, they plan ways of helping the child both in the classroom and in the home. They also provide a valuable resource for teachers, offering suggestions for coping with classroom problems.

Educational psychologists are specialists in learning and teaching methods. They help to train teachers with effective psychological techniques. They may work in the schools, but more often are employed in colleges, universities, or other institutions of higher learning, where they do research on teaching methods. Educational psychologists are usually involved with more general, less immediate problems, and are concerned with increasing the efficiency in learning by applying psychological theories of learning and motivation to the curriculum. Much of the school psychologists job consists of diagnosing leaning difficulties and trying to remedy them. Using tests and information gained from consultations with the student and his or her parents, the school psychologists tries to pinpoint a problem and suggest action to correct it. For instance, a school psychologists suggests that a poor reader be assigned to a remedial reading class. School psychologists are involved in vocational and other forms of counseling. They are the school counsellors.

Psychology in Health:

"Health is wealth" – no doubt. Here health is referred in both physical and psychological well-being. The human beings is a product of both the body and mind, where one cannot exist without the other. Both are equally important for the smooth functioning of the individual. Deficiency or disorder in either the body or the mind results in various complications in the individual within and without. In psychology, these disorders are called as psychosomatic and somatapsychic problem, which are dealt in detail in the field of abnormal psychology. The influence of the mind on the body or vice versa, which leads to mentally ill health in the individual. Thus, it is the role of the psychologists to promote mental health, or mental hygiene and maintain stability among the human race. On the other hand, the physical or the bodily health problems are usually dealt with by the physicians or the psychiatrists where they would prescribe appropriate medicines and treatment. What is meant by mental health? Mental health may be defined by the ability to function effectively and find satisfaction in life, in spite of all stress and strain. It also refers to absence of disease, feeling of well being and well adjusted, and the people with mentally ill heath may be helped to restore mental health at least to some extent.

d. Psychology in Self-Development

The aim of psychology, as already mentioned, is to understand, predict and control behaviour. It is easier to say than to do. Self-understanding or answering the question 'who am I ?' is not referred to merely your name, age, education or occupation. Only if the individual understands oneself, he/she can develop. Development refers to the qualitative aspects rather, than merely the quantitative aspects as in growth. The qualitative aspects may be the individual's sincerity, punctuality, honesty, assertiveness, dominance etc. which put in a nut shell, we call it as personality in psychology. Personality is decided by both the physical and psychological qualities and gratifying relationship with friends, spouse, parents or children. The individual should be able to work effectively, productively, laugh, play, relax and have fun which is becoming a rare phenomenon in the present day mechanical and competitive world. The most important characteristic of a mentally healthy individual is the realistic appraisal of his/her strength and weakness. They would feel worthy member of the human race and freedom from psychological handicap, and should be able to control one's thoughts, feelings and actions. Check out for yourself whether you have the above mentioned characteristics, at least a few, though not all, for you should be mentally healthy first, and then promote them to others. Not all individuals may be cent percent mentally healthy, and it is much worse among the mentally disordered. Hence with the fascinating field of psychology, by providing various treatment measures such as relaxation, systematic desensitization, cognitive restricting, aversion therapy, biofeedback, guidance and counseling, mental health may be promoted. Self-development deals with self-concept, self-esteem, self-awareness, self-analysis or self-profile. Now, how do you develop yourself?

Let us work out a small exercise by using the principles of psychology which we are indebted to always, for us to know and develop ourselves. But as a preliminary requisite, you should first have an open mind to come out with your strengths and weaknesses and readiness to change should be promoted and reluctance to change should be evaded. Now get ready, go....Take out a fresh plain paper, divide into two columns, and one side write your strengths and on the other your weakness, (or points to improve-for as psychologists we want to be optimistic). Feel free to write whatever comes to your mind, be sincere and do not think for a long time or manipulate. Is the list ready? Now, take another fresh page, and give it to your close friend, who knows you well, and ask him or her to write your strengths and weakness from their point of view. You may give 5-10 minutes for instance. Is the second list over? Now, you compare the first and second list, and find out the common characteristics among both the strengths and weakness. Whichever is the common is the answer to "Who am I?" Now you know who you are? For the self to develop, you should try to strengthen your strengths and weaknes your weakness. Now you will agree that psychology is interesting and applied?

e. Psychology in Human Relations.

Psychology plays an important role in human relations. No man is in isolation and we need to relate with human beings, at least to vent their feelings and ease themselves though not aiming to help others, which is also equally important. Human relations may be both expressed-where we express our thoughts and feelings to others, or wanted-where we may want affection, care, love, warmth etc. from others. But there are times, when human beings land up in some frictions, due to faulty communications, not being assertive when the need arises, but rather aggressive etc.

By the vast application of psychological principles and techniques, human relations may be promoted in a variety of ways like,

(1) generating a personal agenda where the individuals may reveal their feelings

(2) sensitizing the interpersonal dimensions by making the individuals aware of their interpersonal relations,

(3) checking self-understanding him/her and

(4) making individual interpretation or get feedback from others, all of which promote social desirability and effective human relations.

The ultimate aim of psychology is to make adequate adjustments in the society, whatever may be the challenges, and this can be achieved successfully with good human relations.

The applications of knowledge to practical problems are both an art and a science. It is a skill, or a knack for doing things, which is acquired by study, practice and special experience. The psychotherapist talking to a worried client, the educational psychologist advising a school board on a new curriculum, the clinical psychologist supervising group therapy in a mental hospital, and the social psychologist trying to lessen tensions between management and workers in a large industry are all practicing psychology. Just as a physician or engineer develop skills in using scientific knowledge to solve practical problems, these psychologists have learned, through special training, the artisting or knack of applying psychology.

Of Course, the ability to apply psychological principle is a hard-won skill; you cannot expect to become an expert from reading this lesson. Special and practical experience is needed. But after reading this lesson, you should be able to apply psychological principles to at least some of the things that happen in your daily life.

Children's Television

From the point of view of psychologists, television in the US, despite its great potential, has not been beneficial to society. Psychologists worry not only the consequences of violent programming, but also about the negative effects of television on reading, stereotypes, and conceptions of morality. Despite these concerns, it is clear that television has the potential not only to teach, but also to engage youngsters in learning. One of the innovations of the Children's Television Workshop (CTW), the organization that produces the popular show, "Sesame Street," is a series of television segments aimed at improving mathematical performance. An especially engaging and effective series of segments is called Mathnet. It is made up of brief episodes featuring two police officers, whose mannerisms are modeled closely after the network television program and movie, Dragnet, solving mathematically related mysteries. The series is devised on the basis of input from mathematicians, psychologists, television producers, and educators. The Mathnet effort specifically, and Children's Television Workshop in general, are examples of the way psychologists can work cooperatively with other experts to make positive contributions to our society, make positive contributions to our society, and through their work with young people, our future.

The Jigsaw Classroom

One of our nation's most fundamental problems is overcoming ethnic conflict (Brown, 1986). Psychological research on cooperation and competition suggests that one way to overcome intergroup hostility and foster cooperation is to confront people with a task that can only be solved through joining resources and working together. Social psychologist Elliot Aronson (1978) has used this insight to build a problem-solving exercise for elementary school children, which can only be completed when each child participates. The problem that needs to be solved is like a jigsaw puzzle, and each child in the exercise has a piece. The correct solution depends on gathering all the relevant information, and each child has a critical portion of that information. All the children in the exercise need each other to devise the correct solution.

Research shows that children learn respect and cooperation after working together in "jigsaw classrooms." They also experience increase in self-esteem and morale as well as more liking and empathy for children from other racial and ethnic groups (Aronson & Bridgeman, 1979). By applying the insights of basic research on intergroup relations, psychologists have been able to make a dent in the otherwise seemingly intractable problem of ethnic conflict in our society. Nevertheless, it is clear that there is room for lots more work in this area.

Eyewitness Testimony

One of the most persuasive types of evidence in a criminal trial is the testimony of an eyewitness. However, psychological research demonstrates that eyewitness testimony is surprisingly unreliable. It is flawed by all the shortcomings of everyday human information processing. Although our memory has an enormously impressive capacity, it can be very inaccurate with respect to minor, but significant, details. Research by cognitive psychologist Elizabeth Loftus (1986) suggests that the working of questions by trial lawyers can lead people to reconstruct past events in erroneous ways. For example, people asked "How fast were the cars going when they smashed into each other" often mistakenly recalled that the accident involved broken glass. Subjects asked, "How fast were the cars going when they hit each other?" were less likely to make this error. Loftus' work has had a major impact on the way the criminal justice system regards eyewitness testimony. The chances of innocent people being falsely convicted on the basic of erroneous testimony may be considerably reduced.

Psychology as a science

A science is a body of systematized knowledge that is gathered by carefully observing and measuring events. Psychologists do experiments and make observations which others can repeat. They obtain data often in the form of quantitative measurements which they can verify. Thus experimentations and observation are the core of scientific psychology.

As a science, psychology is systematic. Data from experiments and observations are essential and they must be organized for us to understand the events. Scientific theories are general principles which summarize many observations and predict what can be expected to happen in new situation.

In the book 'introduction of psychology' by Worchel and shebilske, psychology is defined as "the study of me". That is, I am the center of attention, and its findings directly apply to me.

Presently psychology is defined as the "scientific study of behaviour (human being and lower animals) and mental process". When we say psychology is a scientific study of behaviour, it means that the behaviour can be proved with factual information. The use of scientific procedures includes systematic observation and experimentation by collecting and gathering data. The mental process in the above definition refers to any psychological or cognitive activity which takes place in the organism from birth to till the individual is alive.

The word behaviour refers to the activities of the organism that can either be observed by another person, or by using certain psychological tests. Most of the verbs such as eating, climbing, jumping, walking – the physical activities or thinking, remembering, forgetting – the mental activities, refer to behavioral elements that can be observed and described as they occur. The components of behaviour are :

(i) conscious experiences and

(ii) unconscious process.

The conscious experiences of the organism are those experiences of which the organism is aware, for instance, being hungry or having pain when injured. The unconscious processes include the desire, urges, fear, etc. The conscious or the unconscious behaviours are inferred from either the verbal report of the individual concerned or though inference of the manifest behaviour of the person. Thus, both the conscious experiences and the unconscious processes are both equally important for us to understand the total behaviour of the organism. Behaviour is further viewed as covert behaviour which is the inward behaviour and overt behaviour that is revealed outwardly. Behaviour may also be desirable behaviour that is, an individual being truthful, disciplined, punctual etc. or may be undesirable behaviour such as stealing, lying, being dishonest and so on.

Man is essentially a living organism. Psychology is primarily concerned with responses of these organisms to the outside world. The stimuli from the environment act upon these organisms which in turn respond to these stimuli. Hence psychology may be considered to be a biological science. Besides being a biological organism, man is also a social being. This behaviour is shaped by the behaviour of others too. Human beings live in groups and their behaviours are conditioned by the group in which they live. Thus, psychology may also be called a social science. Since psychology is based both on biology and social interaction, it may be called as a Bio-social science.

METHODSOF PSYCHOLOGY

Methods of research

Method is the systematic procedure involved in the investigation of facts and concepts. Methods are the special techniques in psychology such as experimental method or the clinical method used to collect facts. The term implies the special procedures utilized in the investigation of facts and the formulation of concepts from the points of view as stated.

The scientific method is emphasized as the basis for investigation. The founding of Wundt's laboratory marked the beginning of the formal application of the scientific method to problems in psychology. This method is neither identified with any particular kinds of equipment, nor is it associated exclusively with specific research procedures. The scientific method is something abstract. It is an approach to knowledge that is best described by distinguishing it from what might be called nonscientific or 'everyday' approaches to knowledge.

Several major differences between a scientific and a nonscientific approach to knowledge are outlined in Table A. Collectively, the characteristics listed under 'Scientific' define' what is called scientific method. The distinctions made in Table A. between a scientific and a nonscientific approach are intended to highlight differences that frequently exist between 'everyday' or informal kinds of thinking that is characteristic of the scientist's approach to knowledge.

Table	A: Characteristics	of Scientific	and	Nonscientific	(Everyday)	Approaches to
Know	ledge					

Nonscientific Scientific (everyday)			
General Approach	Intuitive	Empirical	
Observation	Casual, uncontrolled	Systematic, controlled	
Reporting	Biased, subjective	Unbiased, objective	
Concepts	Ambiguous, with surplus meanings	Clear definition, operationalspecificity	
Instruments	Inaccurate, imprecise	Accurate, precise	
Measurement	Not valid or reliable	Valid and reliable	
Hypotheses	Untestable	Testable	
Attitude	Uncritical, accepting	Critical, skeptical	

As an approach to knowledge, the scientific method is characterized by a reliance on empirical procedures, rather than intuition, and by an attempt to control (through manipulation, holding conditions constant, and balancing,) the investigation of those factors believed responsible for a phenomenon. Those factors that are systematically controlled in an attempt to determine their effect on behaviour are called independent variables.

The measures of behaviour used to assess the effect of the independent variable are called dependent variables. It is important to recognize when levels of an independent variable have been manipulated and when, as is the case for a subject variable, the levels have been selected.

Scientists seek to report results in an unbiased and objective manner. This goal is enhanced by giving operational meaning to concepts. Scientists also seek to measure phenomena as accurately and precisely as possible. Measurement involves both physical and psychological measurement. Scientists seek both validity and reliability of these measures. Hypotheses are tentative explanation of events.

To be useful to the scientist however, hypotheses must be testable. Hypotheses that lack adequate definition, that are circular, or that appeal to ideas or forces outside the province of science are not



testable. Hypotheses ar of end cived from here is Mare han nothing ese, scientists are skeptical. A skeptical attitude is not always found among nonscientist, who may rush to accept 'new discoveries' and extraordinary claims.

Thus, the scientific method is intended to meet three goals: Description, prediction and understanding.

There are two general types of methods commonly used by psychologists, descriptive and experimental techniques. Descriptive techniques are useful for developing precise descriptions of behaviour and the circumstance under which a certain behaviour might occur. Experimental techniques can be useful in determining which factors may actually cause which behaviour.

DESCRIPTIVE TECHNIQUES

Introspective method, Naturalistic observations, case history or case studies, and surveys can be clustered together as descriptive techniques. These methods provide different ways to describe behaviour, without any attempt to interfere with the behaviour under study. Descriptive techniques can provide useful information about how different techniques can provide useful information about how different events and behaviors are related to each other. However, descriptive methods do not allow us to say certainly, which events caused which behaviour. Only in experiments do researchers purposefully manipulate events to find out how they cause changes in behaviour.

1. Introspection

Introspection is one of the oldest methods used for investigating consciousness. It is a process of analysing a conscious experience by reporting the sensory qualities of the stimuli that are experienced, without the intrusion of meaning or interpretations. It is a method of describing one's experiences or patterns of behaviour.

The word Introspection means 'to look within.' In introspection, subjects were presented with a particular stimulus or task and asked to describe their mental state as thoroughly as possible. For example, subjects might be asked to report on their conscious experience while solving a problem in logic. Edward Titchner used the method 'introspection' to reveal the basic elements of consciousness by reporting the sensory qualities of the different stimuli they experience-qualities such as colour, size, and intensity and even feelings such as pleasure and pain.

William James also used introspection, but he used it in an informal way to analyze his own conscious experience. Following James, at the turn of the twentieth century, the use of introspection to study consciousness led to a dispute. There are two major reasons for the eventual failure of introspective method. The first is that there was no way of determining the validity of the subject's introspective reports. If, for example, subjects reported feeling sleepy during a certain task, it was impossible to confirm this statement with an objective measure of sleepiness. Scientific methods require objective evidence. The introspective method yields only subjective evidence and is therefore scientifically questionable.

The second reason is that different subjects often gave different reports of their conscious experience even though the stimulus or task remained the same. If results are not replicable from study to study, there can be no basis for scientific progress.

By the early twentieth century, psychologists recognized the inadequacies of introspection. This had two major consequences. First, psychologists began to develop other research methods, such as the behavioral method, that did not rely on subjective reports of inner experience. Secondly, the goal of establishing a science of human consciousness was abandoned and interesting the method of introspection quickly waned.

2. Naturalistic Observation

Naturalistic observation is a method within the descriptive research category that is often the beginning point of scientific research on a topic. Just as the name states, phenomena of interest are systematically observed as they occur in nature. The researchers strive to avoid adding, eliminating, or rearranging variables that would in any way impede the naturally occurring flow of events.

Although the researcher observes behavior in its natural setting, the researcher observes systematically. Systematic observation means that from the wide array of ongoing behavioural interaction, the researcher selects the focus and categories of her/his observations. In addition to the degree of control added by the systematic nature of the observations, in this method, the researcher need not rely on the ability or willingness of people to record their own behaviour. Questions of competence and throughness of record takers and possible misunderstandings of items are not issues

with naturalistic observation. The fail is Ktuplistic observation are records of observed behaviour and not people's reports of their own behaviour. This method, thus yields data of higher validity than self-report methods, especially when dealing with certain topics such as illegal behaviour (drug use, traffic violations or socially unacceptable behaviour).

Systematic observation, the means of the naturalistic observation method is probably the oldest and in some ways most basic form of scientific research. In addition to observing systematically, researchers with goals of description also organize systematically consolidating their data into readily usable forms.

Focusing Observations

Systematic observation means that there has been a decision made as to the focus of the researcher's observations of a researcher entered a situation and recorded the most entertaining, most unusual, or most boring events, this would be less than objective and scientific. A degree of focus or selective attention is necessary to yield scientifically usable data. Behaviour is a continuous series of actions and reactions: some degree of focus must be imposed on these complex interactions in order to record and analyse these behaviours. The focus of the observation can be based as in studies with a descriptive goal or narrow, as in studies with the correlational goal. The focusing decision is made as the researcher operationalized the hypothesis. For example, a researcher wants to gather data on the nature and frequency of peer interactions among preschool children. He may address a hypothesis such as; "Contemporary nursery school children spend atleast one-third of their school time engaged in positive peer interactions. Such descriptive data could be obtained by naturalistic observation. The researchers would sit quietly in the preschool classroom and record the frequency and content of all peer interactions. Although broad, this focus is systematic and the researcher would record only the events addressed in the hypotheses and would exclude other events. The intrusion of subjective judgments is minimized and objectivity is therefore facilitated by the systematic nature of the observations.

The Role of the Observer

In addition to the focusing of the observation and the development of a valid, reliable recording instrument, another major concern in naturalistic observation is the role of the observer. The observer strives to gather data as thoroughly and accurately as possible without disrupting the naturally occurring events. Baker and Wright used naturalistic observation as one part of a large study designed to describe life in a small town.

A few select children (age eight to ten) were followed from awakening to bedtime by any one of nine observers who rotated the job, recording all conversations and behaviours engaged in by the children during their waking hours. The physical presence of an observer can significantly reduce subjects activity levels even within a laboratory setting.

Since people's reactions are often altered by an awareness of being recorded, and since the researcher wants to approximate the natural environment as closely as possible, the observer needs to be as unobtrusive as possible, the observer needs to be as unobtrusive as possible. Ideally, the observer is so nonobvious that the participants view him/her as part of the natural environment. Several procedures have been designed toward this end with varying degrees of success

One Way Mirrors and Recording Equipment

One procedure for minimizing the effects of an observer is to avoid the observer's physical presence through the use of one-way mirrors or audio and/or video recorders.

Reactivity to audio or video recording equipment can be effectively avoided only if the placement of the microphone or the camera is unobtrusive. Another disadvantage of recording equipment is the difficulty of achieving high-quality tapes. The impact of recording equipment is at times less than the impact of the physical presence of an observer, but their use does not eliminate the reactivity question, nor are they functional in high activity settings.

Concealed Observers

Besides being concealed behind one-way mirrors or camera, observers can be physically concealed within the setting. A more feasible and much more ethical means of concealment is for the researcher to fade into the background.

Although low in reactivity, this procedure has serious problems in addition to the ethical question of using people for research without their consent; there is a high probability of not being able to record all that is desired because of the high mobility of the subjects.

Advantages of Naturalistic Observation

Naturalistic observation offers several advantages as a method of descriptive research. More than any other method in either the descriptive or experimental category, naturalistic observation provides procedures for viewing the world as it is without intervention or structure. Since the data are gathered as the behaviours occur, with a minimum of the researcher's control over research conditions, the results are more likely to be generalizable to everyday application than results obtained by other methods.

High in generality of results, this method of naturalistic observation is also recommended when descriptions of sequences or chains of behaviours are desired. The complex matrix of actions and reactions that constitute our daily lives is not restricted with this research approach. This method, is especially advantageous for use both as a beginning step in research on a topic and as a final check of the generality of causal results obtained in structured experimental settings.

Limitations

The Naturalistic observation is the data gathered with a minimum of control or manipulation and behavioural sequences that are allowed to flow in an uninterrupted fashion. Naturalistic observation like other descriptive method, cannot be used to test cause-and-effect statements. Within the matrix of human interactions, confident statements of cause cannot be generated with an absence of control over the environment. These control procedures are not features of naturalistic observation. The behavioural categories must do an adequate job of reflecting the world and the theory.

The observation instrument must be constructed in such a way to facilitate easy way of recording and inter- observer agreement. Insufficient observer training can decrease both reliability and validity. Consequently, this method is more time consuming to design and executes than other types of research.

Naturalistic Observation with Intervention

This category includes procedural options that are basically naturalistic observation but involve a higher degree of control by the researcher than naturalistic observation. The most common procedural options of naturalistic observation with intervention are the participant observation and structured naturalistic observation.

Participant Observation

This procedure was designed as a means of reducing peoples reactivity to an observer. Observers withhold their identity as researchers and become a participant in the group of interest. Once accepted as a group member, the researcher's opportunity for unobtrusive observation is excellent. People are unlikely to suspect that their behaviour is being recorded for research purposes by one of their own members. Consequently, they are highly unlikely to modify their normal behavioural patterns. In some situations, naturalistic observation data would be impossible to gather except by participant observers.

Advantages

The main advantage of the participant observer procedure is that it allows for the gathering of some data that would be quite difficult to obtain otherwise. In addition, the position of participant observer allows the researcher to record the behaviour of group members while potentially gaining insight into their feelings. This insight may result in a more accurate interpretation of events than would be possible by a less involved observer.

Disadvantage

As the participant observer purposely interacts with the objects of the study, it is possible that in such interactions the observer influences the group and becomes an agent to social change instead of an observer of social change. Another disadvantage is that the observer's own identification with the group may result in blindness to key behaviours. Therefore, the use of participant observation is not a recommended procedure for beginning students.

Structured Naturalistic Observation

In this type of naturalistic observation, the researcher intervenes in the normal flow of events by

creating a standard situation the allocation of behavioural interactions. This created, the researcher does not intervene with the unfolding of behavioural interactions. This procedure is used to investigate hypotheses not testable through true naturalistic observation because of an inability to identify the important elements in the situation or because of the high mobility of the subjects.

For example, Jeffers and Lore used structured naturalistic observation to observe the play interactions of pairs of nursery school children in (1) an environment unfamiliar to both children and

(2) A familiar environment. The researcher recorded the verbal and physical interactions during the play, such as the objects played with and active or a passive roles of the children. The results indicate that children in familiar environment initiated more positive and more aggressive social interactions than in an unfamiliar environment.

Both this procedure and the participant observe procedure carry the same design issues, advantages and limitations as true naturalistic observation.

3. Case History Method

The detailed study of a single individual's behaviour over an extended period of time is called a case history or case study. In a typical case study, the researcher presents a detailed description of the personality and behavioural characteristics of an individual. The goal of this procedure is to provide a detailed description of a person over time as opposed to the naturalistic observation.

Data are accumulated in a series of interviews, generally gathered with in a therapeutic setting. Although naturalistic observation is rare in case-studies, an objective of this method is to describe as many aspects of one individual's life as possible. During treatment, the researcher/therapist records his/her repeated observations of the person as well as the person's own feelings and behaviour self-reports. From these sources, the therapist/researchers reconstructs the person's past and interprets the significance to the individual of those past and current events.

As with the other specific methods within the descriptive category, the researcher selectively observes and records. Once the data are complete, the researcher also creates a structure that is an organizational basis for the fact of the case. A case study is not just a reiteration of facts; it is also an organization and integration of the facts. This selectivity of observation, recording, and subsequent analysis of the data is guided by theory. Consequently, there is often more than one possibly accurate interpretation of the same facts. Thus the consumer of case study research must be aware of the difference between the facts and theoretical interpretation of the case. Each segment can be used for its own merit, but an awareness of the difference heightens the scientific utility of this procedure.

Use of Case Studies

Although case studies are one of the least systematic approaches to gather descriptive data, this method is useful in two main ways. First, the case study is the chosen research procedure when a particular case is unique, such as a person with multiple personalities. It is unlikely that a researcher could easily locate many number of people with this problem in order to conduct another type of research. A detailed description of unusual cases as they are encountered by professionals can collectively serve as a data bank for further speculation and understanding. One case history proves nothing, but a number of case histories that together can best be explained by a particular theory that can have a scientific impact. Second, case studies can be useful to illustrate theoretical points or therapeutic techniques. Clear representation are those in which abstract theoretical terms are exemplified with interesting examples, such as case studies.

Advantage and Limitation of Case Studies

The advantage of case studies is that they provide in-depth descriptions of individuals that can be useful for further speculation and theorizing. Case studies, more than any other procedure try to show the flow of human interactions. An attempt is made to describe individuals in their full complexity instead of in behavioural segments or categories. The resulting potential for multiple explanations and interpretations of case study data is both:

An advantage in the richness of hypotheses that can be generated.

1. A limitation in that the procedure is unlikely to supply conclusive evidence for the hypothesis

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Surveys study large and small population of selecting representative samples chosen from the population to discover the relative incidence, distribution and interrelation of psychological and sociological variables. In survey research, the researcher simply collects data about psychological and sociological variables or characteristics of a sample that represents a known population in natural settings. The survey research which involves samples usually is called as 'Sample Survey'. Survey researchers rarely study whole population.

Surveys research is concerned with conditions or relationship that exist, opinions that are held, processes that are going on, effects that are evident or trends that are developing. Surveys more often are employed to determine the number of people who have a certain opinion or attribute or engage in certain behaviour, and the degree of relationship if any between any of the preceding.

STEPS IN CONDUCTING A SURVEY

The important steps involved in survey research are (1) planning (2) collecting facts (3) Analyzing and presenting the findings.

1. Planning a survey

The task of planning a survey should preferably be assigned to a committee composed of representatives from various community organizations and agencies. The committee's role is to help in winning the co- operation of population in the field work and laying foundation for acceptance by the community of the recommendation of survey in future. The committee may be charged with drawing up a plan covering the following points (a) Statement of objective: A clear statement of objectives should always be the starting point in any survey. Objectives guide the researcher in a right direction. They define the area and scope of the survey. (b) Knowledge about similar studies: This is necessary to avoid duplication of the work and to gain a fresh method of approach from assessment pitfalls already suffered in the previous studies. (c) Preparation of a work schedule and budget (d) Arrangement of publicity (e) Determination of sample (f) Preparation of a questionnaire/schedule and selection, training and supervision of field investigators. The field investigators must be trained both in general interviewing procedures and in questions specific to a given survey. There should be effective supervision of all field work.

2. Collecting the factors

When planning is completed, the survey team moves into the field and undertakes the field work. The general principle of field work is to maintain good rapport with respondents. Misunderstandings of the respondents should be removed.

3. Analyzing the facts

This includes three states (1) Editing (2) Classifying and (3) Codifying the data. At first, any possible inconsistencies or incompleteness be checked. Attitude and opinion surveys require careful content analysis.

4. Presenting the facts

It is the last stage in which significant facts and comparisons are highlighted.

TYPES OF SURVEYS

There are three general survey methods: Mail surveys, personal interviews, and telephone interviews. As was true of sampling techniques, there is no one best method for all circumstances, each survey method has its own advantages and disadvantages. The challenge facing the survey researcher is to select the methods that best fits the problem under study.

1. Mail Surveys

Mail surveys represent the most common means of distributing self-administered questionnaires. A principal advantage of mail surveys is that they can be done relatively quickly. Because they are self-administered, mail surveys avoid the problems of interviewers bias. Among the three types of surveys mail surveys are the best for dealing with highly personal or embarrassing topics, especially when anonymity of respondents is preserved.

There are many disadvantages to mail surveys than the advantages. Some of these advantages are less serious than others. For instance, the respondent will not be able to ask questions if a portion of the questionnaire is unclear the questionnaire is not self-explanatory.

The second minor disadvantage is that the researcher has little control over the order in which the respondent proceeds through the questionnaire. Different respondents may follow different sequence, and the order of question may affect the way respondents answer certain of them.

When all respondents answer, some do not follow the same sequence; the variability among their responses to a given question is likely to increase. A major problem with mail surveys, is one of bias-namely response bias. Response bias is a threat to the representativeness of a sample because not all respondent complete the survey. The response rate in mail survey is generally low.

2. Personal Interviews

In personal interview, the respondents are usually contacted in their homes and trained interviews administer the questionnaire. The personal interview allows greater flexibility in asking questions than does the mail survey. In this the respondent can obtain clarification of unclear questions, and the trained interviewer can pursue incomplete or ambiguous answers to open-ended questions. The interviewer controls the sequencing of question and can ensure that all respondents complete the questionnaire in the same order. The response rate of personal interviews has been much higher than that to mail surveys.

The disadvantages of this method: the high cost, results because the use of trained interviewers is expensive in terms of both money and time. The second, disadvantage involves the potential for interviewer bias. Interviewer bias occurs when the interviewer tries to adjust the wording of a question to fit the respondent or records only selected portions of the respondent's answers. The best protection against interviewer bias is highly motivated well-paid interviewers who are trained to follow the wording of each question exactly, to record responses accurately, and to use probes judiciously. The interviewers should be closely supervised by the surveys director.

A frequently used variation of the personal interview is the focused interview. The focused interview is done in a group setting with the researcher trying to learn from the respondents more about the reasons for the attitudes of opinions that they hold. Focused interview is used extensively in market research to determine consumers' reactions to current or new products or services. Focused interviews are increasingly being used as part of the strategic planning process by civic organization. There is less of an emphasis in this approach on obtaining a quantitative summary of the views across all respondents. Instead, the goal is to obtain a qualitative description of the ideas that emerge from a guided group discussion.

Telephone Interviews

Telephone survey is the method of choice for most brief surveys. Interviews can be completed more quickly when contacts are made by phone. This method also provides access to dangerous neighbourhoods, locked buildings, and respondents would be available only during evening hours. Phone surveys usually have much higher response rates and provide greater flexibility.

The telephone survey is not without its drawbacks. There is a possible selection bias when respondents are limited to those people who have telephones and the problem of interviewer bias remains. There is a limit to how long respondents are willing to stay on the phone, and the fact that responses are being given to a 'faceless voice' may influence how people respond. In spite of these limitations, the high response rate and flexibility of the telephone interview make it the method of choice for nearly all brief surveys.

The Experimental Method

The experimental method is the technique of discovering information by means of experimentation. An experiment is a series of observations carried out under controlled conditions for the purpose of testing a hypothesis. In using the experimental method, the researcher systematically manipulates one or more variables to determine how those variables affect behaviour.

Researchers conduct experiments primary to establish cause and effect relationships.For instance, a researcher who wanted to know whether high sugar diets contribute to children's hyper activity might begin by finding similar hyperactive children and dividing them into an experimental group and a control group. The experimental group is a group for whom the experimenter alters some feature of the environment.

In this case, an experimental group could be a group of hyperactive children put on a low sugar diet. A controls group is a comparison group that is treated identically, except that it is not exposed to the crucial experimental manipulation. In this case, a control group might consists of a group of hyperactive children left on a normal diet. To determine whether sugar indeed played a causal role in hyperactivity, the activity levels of children in the experimental group would be compared to those of the control group.

In an experiment, the variable that is manipulated is called the independent variable while the behaviour that is measured is called dependent variable. Independent variables are manipulated and-dependent variables are measured. In a formal experiment, subjects must be assigned to treatment conditions randomly so that subject characteristics are evenly distributed across the different conditions.

Experiments are subjected to a number of threats, or biases. Experimenter bias occurs when an experimenter unintentionally transmits cues to subjects about their expectations regarding their behaviour in a given experimental conditions. Subject expectations can also bias an experiment. To help eliminate bias, researchers use placebos and double-blind procedures.

Advantages

In the experimental method, the experimenter has complete control over the laboratory situation. The extraneous variances are controlled. Measurements in a laboratory are more precise because they are made with precision instruments. Laboratory experiments have high internal validity. When some cause and effect relation is discovered between two variables in well executed laboratory experiment, one can have considerable confidence in the result because one knows that no other outside variable which was held under check can account for this relationship. Laboratory experiments can be replicated, that is, results of one study can be reproduced in a later study.

Limitations

Experimental method is in many ways the best method for gathering scientific information. But it has limitations. Obviously it cannot always be used, especially if the experiment might be dangerous for the subjects. A second limitations is that the method is restricted in its applications. The conclusion derived from an experiment may be limited to the artificial experimental situation. The third limitation is that the method sometimes with the very thing it is trying to measure.

Field Experiments and Quasi Experiments

A Field experiment is carried out in the natural setting of the people who are being studied. It tries to establish conditions that are as close as possible to those of a true laboratory experiment. Manipulation of independent variables and random assignment of participants to different groups does take place. Its goal is to allow causal conclusions to be drawn from research conducted in natural settings. In these studies the ecological validity is lesser than what we find in the laboratory experiments, it is more time consuming and expensive.

There are many variables, which cannot be manipulated directly. There are ethical problems in conducting experiments by manipulating conditions that may create gamblers, drug abusers and broken families, etc. There are obvious moral difficulties in undertaking studies within the truly experimental paradigm. However, study of these problems and issues is useful for making human life better.

The answer to this kind of problem is to adopt the strategy of quasi experiments. They utilize the qualities of observation and correlation and combine them with experimentation. Usually such studies have a subject variable as an independent variable. Such variables are selected rather than varied by the experimenter. Thus a quasi-experiment attempts to manipulate an IV in a natural setting using naturally occurring groups to form experimental and control groups.

For instance one may consider disaster exposed group exposed to some kind of special treatment as an experimental group and compare the same with another group who has not been exposed to similar treatment. It may, however, be noted that such studies lack the high degree of control over extraneous variables.

Correlation Method

There are many variables, which are important but cannot be directly manipulated. The variation in variables is obtained through some technique of selection. For instance if you are interested in knowing the relationship between intelligence and adjustment, you cannot create people with high or low levels of intelligence. You cannot manipulated intelligence of the people or vary their adjustment level. What you can do is to find out people who vary in the level of intelligence with the help of an intelligence test. Based on the performance on intelligence test you may select people with high and low levels of intelligence and then assess their levels of adjustment. The use of this kind of selection procedure is frequently used in many studies in which psychologists may be interested. Such studies use correlational method of inquiry.

In correlational studies the goal of a researcher is to describe the strength of the relationship between two or more variables. The more strongly events are correlated, the more effectively we can predict one from the other.

People often tend to confuse correlation with causation. For instance high blood pressure is related to inability to manage stress. In this situation one is often tempted to infer a causal relationship. However, the possibility is there that the relationship is not true or is due to operation of a third variable. Researchers measure different variables to see if change in one variable is related to change in another variables. Such studies are useful where direct manipulation of variables would be undesirable, unethical or impossible. Correlational analysis is better than simple observation in the sense that it allows the investigator to focus on specific aspect of the problem under study.

Usually when we want to understand the inherent properties of person (e.g., age, sex, aptitude, personality, ability etc.) or deal with background variables related to prolonged exposure (e.g., rural, urban, tribal background; socio-economic status, type of family, child rearing pattern) we need to use non-experimental studies.

Correlational study is preferred over other strategies when:

1. The focus of the investigation is new and we have very limited knowledge about the relevant variables.

- 2. It is impossible to manipulate the variables, and
- 3. It is unethical to manipulate the variables.

In Correlational studies, we cannot conclude that a factor produces or causes an other, because there are likely to be a number of factors that vary simultaneously. The word correlation comes from co-relation: literally, the relation between two variables. Correlations can be represented in a diagrammatic form know as scattergram or represented as correlation coefficient. The value of correlation, as determined by appropriate statistical test, ranges between +1(perfect positive correlation) to -1(perfect negative correlation).

Perfect correlations are rare phenomena. Values closer to either +1 or -1 indicate stronger relationship. Correlation helps the researcher to identify the direction and strength of relationships between two or more variables. They help to predict one variable on the basis of other variable. However, as pointed out earlier, one must not forget that a correlation does not indicate a cause.

Simulation

Simulation means having the experience or from of reality without the presence of actual reality. It involves imitation and pretension. In psychological research simulation is used as a method, which provides a way out to meet the problems in the use of deception to produce the effect of desired variables.

Deception involves providing wrong information and misguiding the participants to manipulate variables of interest and observing their effects on behaviour. This kind of method is ethically inappropriate. One option for deception is to study the behaviour in natural settings. Another alternative is simulation.

In simulation study the investigator designs a laboratory situation that evokes the psychological processes of interest that are present in a real life situation. Simulation involves active role-play. The participants take different roles and perform various activities. Aspects to situations can be varied to determine their effects on chosen variables to understand some phenomenon in a systematic manner.

RESEARCH DESIGN SAARTHI IAS

Meaning of research design: Research design is a plan or strategy for conducting the research. Research designs are specific to the types of research. Research is a serious enquiry into a problem. When research is conducted according to a well-designed structure it is most likely to be accurate and purposeful. Research is the process of attempting to answer researchable questions. A research design is a more general plan and that a single design may contain and require the use of several methods. Kerlinger (1973) has identified two basic purposes of research design: (1) to provide answers to research questions and (2) to control variance. Research design sets up the framework for adequate tests of relations among variables. Research problem suggests how many observations are to be made, which variables are active and which are attributes. A design tells us what type of statistical analysis to use. Finally an adequate design outlines possible conclusions to be drawn from statistical analysis. The research design ensures that a researcher obtains usable results.

The concept of controlling variance:

All research is conducted for the purpose of explaining variance- the fact that all individuals are not the same or have the same score. Also when the variance of any one variable is considered, it may be influenced by any number of factors. Variance in achievement, for example may be due to aptitude and motivation etc. The manifestation of variance can be explained by an example.

A high school teacher is studying the effects of three different methods of motivation on achievement in physics. The research problem is stated as follows: "A study of the effects of motivation on the performance of high school students". The problem implies that an experiment should be conducted since motivational training an independent should be conducted since motivational training an independent variable of primary interest will be manipulated by the experimenter.

Motivational training has three levels say M1, M2, and M3. The dependent variable is performance in the school subjects, physics which can be measured through achievement tests administered after training. Ninety students enrolled in the same school and taught by the same teacher are tested on achievement. There will be 90 scores. There scores will not be the same and hence the distribution will have variance and it may be due to different effects and since motivation is the independent variable, the researcher has to determine whether or not they have different effects. Some students may be more able to do then others and other physical and mental conditions may cause validity. Therefore it is important to study the effects of variables on the dependent variable. Controlling variance means being able to explain what is causing it.

Procedure for controlling variance:

There are four ways by which controlling variance can be done.

- (a) Randomization.
- (b) Building conditions on factors into the design as independent variables.
- (c) Holding conditions or factors constant.
- (d) Statistical adjustments.

(a) **Randomization:** In the above example the same person gives training to 90 students, having three groups of 30 students each, each group trained by different motivational method. Assume that the 90 students form a representative sample of some larger population, but they are a heterogeneous group with respect to ability level is randomly distributed to three groups and we expect its effect to be the same in each group of 30 students.

It can also be noted that in this example other variables associated with the students for examples anxiety is distributed randomly among the three groups. Mathematical knowledge related to performance in physics is also randomly distributed.

(b) **Building in factors as independent variables:** Of the 90 students, if the top 45 students are classified as 'Higher' and the remaining 45 as 'lower' ability level, then we will have ability level as independent variable with two levels. Fifteen students of each of the two ability groupings will be randomly assigned to each method.



Method Ability	Students R	andomly assigned	Dependent Variables
M_1	High	15	
	Low	15	
M_2	High	15	
	Low	15	Performance
M_3	High	15	
	Low	15	

(c) **Holding factors constant:** Holding a factor constant consists of reducing a variable to a constant. For example, the trainer could reduce ability level to a constant if only students with one defined ability say those scoring between 98 and 108 on an I.Q. test are included in the study. If ability level does not affect performance on the dependent variable, its effect would now be diminished. Only students within a particular I.Q. range would be randomly selected. This number will be less than 30 per group. Here the results arrived generalize only to the restricted group. (d)

(e) **Statistical control:** Statistical control is attained through computational procedures. When the data are analysed, the variable of ability level in physics assumes that an ability measure consisting of performance on I.Q. test is available for each of the 90 students. There may exist a relationship between I.Q. test scores and performance on the physics test such as high scores on one go with the high scores on the other. If physics test scores are adjusted ability on the physics test scores. This can be done using a sophisticated statistics and the specific statistics procedure commonly used is the analysis of covariance using procedures for control in combination. The four procedures for enhancing control can be used singly or in combination with each other.

The four variables (in addition to the independent variable, i.e., motivation) and their methods of control are as follows.

SAATH TO SUCCESS



Variable	Method of Control
Science background of the student.	Randomization
Trainer	Build in as an independent variable. The same trainer trains everyone in the sample. The same teacher teachesphysics.
School	Reduced to a constant. Students of only one school are included.
Ability level	Statistical control. The I.Q. test scores are based.

The purpose of controlling variance is to enhance the interpretation of results so that the researcher can tell what effects, if any, the variables are having. When the research design is developed, the researcher has to think about controlling variables. Careful designing is essential to enhance the validity of the results.

Characteristics of a Good Research Design

A good research design must not only be appropriate but must yield results from the research that can be interpreted with confidence. Four characteristics of a good research design are identified. However they cannot be considered mutually independent of each other. They are, free from bias, free from confounding, control of extraneous variables and statistical precision for testing hypotheses.

a. Free from bias: This means that the data and the statistics computed from them do not vary in any systematic way except as expected on the basis of random fluctuations. The differences that appear can be attributed to the independent variables under study. Bias can enter into the data in a number of ways, including biased assignment of the individuals to the experimental method.

b. Free from confounding: A good research design should eliminate confounding of variables or keeps it to a minimum so that we can separate effects and we can interpret results without confusion. Two or more variables are confounded if their effects cannot be separated. In the physics example, if there are three trainers instead of one, trainer and type have been confounded. If the students trained in one type of motivation score higher on the physics exam than those of the other two types, we will not know whether the higher performance is due to one type or to the trainer. The effects of trainer and type of motivation cannot be separated because each trainer uses only a single type.

c. Control of extraneous variables: the control of extraneous variables means that the influences of independent variables outside to the purposes of the study are minimized, nullified or isolated. In other-words, the variance of such variables is in effect reduced to zero or near zero. There are three ways to control extraneous variables. For example if we select only one sex for an experiment, then we can be sure that sex cannot be contributing independent variables. Here we lose the power of generalization. For instance, if we use only boys in the experiment, we cannot say anything about the relation understudy with girls.

The second method to control extraneous variance is through randomization. Theoretically randomization is the only method of controlling all possible extraneous variables. This does not mean that the group should be equal in all the possible variables. By chance, the groups can be unequal but the probability of their being equal is greater.

The third means of controlling an extraneous variable is to build it into the design as an independent variable. For example, if sex is to be controlled, then it can be added as another independent variable. The fourth way to control extraneous variance is to match subjects. The basic principle is to split a variable into two or more parts. (example high & low intelligence) and then randomize within each level, but care should be taken on the subjects which are matched. They should be related to the dependent variable.

d. Statistical Precision for testing hypothesis: Another characteristic of a good research design is that it will provide appropriate data with enough precision to test those hypotheses that require statistical tests. In statistical sense, precision is increased as random (or error) variance is decreased.

e. Experimental Design Terminology

The group in an experiment which receives the specified treatment is called the Treatment Group or

the experimental group Dover the tric Contro Goup refers to a other group assigned to the experiment, but not for the purpose of being exposed to the treatment. Thus, the performance of the control group usually serves as a baseline against which to measure the effect of the full treatment on the treatment group.

A variable refers to almost anything under the sun. There are only two kinds of stuff in the world for researchers: variables and constants. As a result, almost any concept, or thing, or event they are interested in, that varies or can be made to vary, and that is related to their research can be called a variable. Researchers pay particular attention to variables that may influence the results (this is of MUCH concern to researchers).

Extraneous variables (external to the experiment) are variables that may influence or affect the results of the treatment on the subject. A variable of specific experimental interest is sometimes referred to as a factor. Ordinarily the term factor. Ordinarily, the term is used when an experiment involves more than one variable. These variables are often identified as factors and are labeled "Factor A" and "Factor B," etc. Level refers to the degree or intensity of a factor. Any factor may be presented in one or more of several levels, including a zero level.

Randomness refers to the property of completely chance events that are not predictable (except in the sense that they are random). If they are truly random, examining past instances of occurrence should give the researcher no clues as to future occurrences. Thus, if we were to predict outcome from perfect pairs of dice rolled in an unbiased way (which are random events), previous rolls give no clue. Randomness becomes important in the design of the experiments primarily in the assignment of subjects to groups. Researchers feel more secure about the results of their studies if subjects have been randomly assigned to groups.

Random assignment of subjects to groups tends to spread out differences between subjects in unsystematic (random) ways so that there is no tendency to give an edge to any group.

Randomization, or random assignment, refers to a technique of assignment or ordering such that no consistent or systematic effect in the assignment is tied in with the method. Elimination of such systematic influence upon assignment or selection allows for chance assignment. Approved ways of generating chance assignments involve tables of random numbers or the use of computer software with random number generators. However, typically, researchers frequently resort to simple counting off, flipping a coin, and other short cuts.

Another way of selecting subjects is simply to use intact groups: such as all the students in a given classroom, or all of the patients in a hospital. Researchers are usually worried whether the students were assigned to the classroom in a non-random way, or whether certain patients self-selected a hospital for a particular reason. The problem is whether some subtle factors were operating to exert a bias of selection factors in the assignment to groups.

Ex post facto refers to causal inferences drawn "after the fact." For in the ex post factor study, the causal event of interest has already happened. These are known as non-experimental studies and are often contrasted with experimental studies. A typical example of this type of research would be to compare two groups of patients in a hospital, one treated with Drug A and the other treated with Drug B and then trying to infer a difference in the performance of the two drugs.

Variance refers to the variability of any event. If one uses a fine enough measuring device, one can find differences between any two objects or events. The inside logic of an experiment is referred to as internal validity. Primarily, it asks the question: Does it seem reasonable to assume that the treatment has really produced the measured effect? Extraneous variables which might have produced the effect with or without the treatment are often called "threats to validity."

External validity, on the other hand, refers to the proposed interpretation of the results of the study. If asks the question: With what other groups could we reasonably expect to get the same results if we used the same treatment? If Treatment X resulted in lowered blood pressure in middle age men, could you logically claim that it will produce the same effect in older women?

Blocks usually refers to categories of subjects with a treatment group. For example, we might divide the group into older, middle aged, and younger patients and further divide the groups into a group treated with Drug A and another treated with Drug B. The advantage is to enable us to discover how the treatment affects each of the age groups. For example, we might find that overall, Drug B out performs Drug A, except to folder parents, where Irug A ut performs Drug B. This phenomenon is known as an interaction between treatment (the Drug) and subject characteristics (age).

Interaction refers to variables in the treatment which may interact with each other. It may make a difference whether a variable is used by itself, with another, or with different levels or degrees of another. Higher order interactions are possible. One factor may depend on the presence or absence of two other factors; termed a second-order interaction.

The Hawthorne Effect refers to the behavior of interest being caused by subject being in the center of the experimental stage, e.g., having a great deal of attention focused on them. This usually manifests itself as a spurt or elevation in performance or physical phenomenon measured. Although the Hawthorne Effect is much more frequently seen in behavioral research, it is also present in medical research when human subjects are present. Dealing with this problem is handled by having a control group that is subject to the same conditions as the treatment groups, then administering a placebo to the control group. The study is termed a blind experiment when the subject does not know whether he or she is receiving the treatment or a placebo. The study is termed double blind when neither the subject nor the person administering the treatment/placebo knows what is being administered knows either.

There are six major classes of information with which an experimental designer must cope. They include:

- post -treatment behavior or physical measurement [P1]
- pre-treatment behavior or physical measurement [P2]
- internal threats to validity [I]
- comparable groups [C]
- experiment errors [E]
- relationship to treatment [R]

GROUNDED THEORY (GT)

Grounded Theory (GT) is a systematic qualitative research methodology in the social sciences emphasizing generation of theory from data in the process of conducting research.

Introduction

It is a research method that operates almost in a reverse fashion to traditional research and at first may appear to be in contradiction of the scientific method. Rather than beginning by researching & developing a hypothesis, a variety of data collection methods are the first step. From the data collected from this first step, the key points are marked with a series of codes, which are extracted from the text. The codes are grouped into similar concepts, in order to make them more workable. From these concepts categories are formed, which are the basis for the creation of a theory, or a reverse engineered hypothesis. This contradicts the traditional model of research, where the researcher chooses a theoretical framework, and only then applies this model to the studied phenomenon

Four Stages of Analysis

Development

It was developed by two sociologists, Barney Glaser and Anselm Strauss. Their collaboration in research on dying hospital patients led them to write the book Awareness of Dying. In this research they developed the constant comparative method later known as Grounded Theory.

Split in methodology

Since their original publication in 1967, Glaser and Strauss disagreed on 'how to do' GT resulting in a split in the theory between Glaserian and Straussian paradigms. This split occurred most obviously after Strauss published Qualitative Analysis for Social Scientists (1987). Thereafter Strauss in 1990 published Basics of Qualitative Research: Grounded Theory Procedures and Techniques together with Juliet Corbin. This was followed by a rebuke by Glaser (1992) who set out, chapter by chapter, to highlight the differences in what he argued was original grounded theory and why, according to Glaser, what Strauss had written was not grounded theory in its intended form. This divergence in the GT methodology is a subject of much academic debate, which Glaser (1998) calls a "rhetorical wrestle".

According to Kelle (20(5) "The control of between the astronomic and strates bills down to the question whether the researcher uses a well-defined "coding paradigm" and always looks systematically for "causal conditions," "phenomena/context, intervening conditions, action strategies" and "consequences" in the data, or whether theoretical codes are employed as they emerge in the same way as substantive codes emerge, but drawing on a huge fund of "coding families. Both strategies have their pros and cons: novices who wish to get clear advice on how to structure data material may be satisfied with the use of the coding paradigm. Since the paradigm consists of theoretical terms which carry only limited empirical content the risk is not very high that data are forced by its application. However, it must not be forgotten that it is linked to a certain micro-sociological perspective. Many researchers may concur with that approach esp. since qualitative research always had a relation to micro-sociological action theory, but others who want to employ macro-sociological and system theory perspective may feel that the use of the coding paradigm would lead them astray."

The Glaserian strategy is not a qualitative research method, but claims the dictum "all is data". This means that not only interview or observational data but also surveys or statistical analyses or "whatever comes the researchers way while studying a substantive area" (Glaser quote) can be used in the comparative process as well as literature data from science or media or even fiction. Thus the method according to Glaser is not limited to the realm of qualitative research, by Glaser called QDA (Qualitative Data Analysis). QDA is devoted to descriptive accuracy while the Glaserian method emphasizes conceptualization abstract of time, place and people. A grounded theory concept should be easy to use outside of the substantive area where it was generated.

Criticism

Critiques of grounded theory have focused on its status as theory (is what is produced really 'theory'?), on the notion of 'ground' (why is an idea of grounding the result important in qualitative inquiry?) and on the claim to use and develop inductive knowledge. With its quasi-scientific procedures, grounded theory seems to be aping the methods of the natural sciences and making claims to explanation and prediction that are unwarrantable in social science. These criticisms are summed up e.g. by Thomas and James (2006).

Grounded theory was developed in a period when other qualitative methods were often considered not scientific and became the main qualitative method accepted as academic enough. Thus, especially in American academia qualitative research is often equaled with grounded theory. This is criticized by qualitative researchers using other methodologies (such as traditional ethnography, narratology, storytelling, etc.).

FOCUS GROUP DISCUSSION OBJECTIVES

1. Identify the purpose, uses and limitations of the Focus Group Discussion (FGD) as a method of data collection in research.

2. Conduct a FGD, analyze the data and report on the results.

I. CHARACTERISTICS AND USES OF FOCUS GROUP DISCUSSIONS

A FOCUS GROUP DISCUSSION (FGD) is a group discussion of approximately 6 - 12 persons guided by a facilitator, during which group members talk freely and spontaneously about a certain topic.

A FGD is a qualitative method. Its purpose is to obtain in-depth information on concepts, perceptions and ideas of a group. A FGD aims to be more than a question-answer interaction. The idea is that group members discuss the topic among themselves, with guidance from the facilitator.

FGD techniques can, for example, be used to:

1. Focus research and develop relevant research hypotheses by exploring in greater depth the problem to be investigated and its possible causes. For example:

A district health officer had noticed that there were an unusually large number of cases of malnutrition of children under 5 reported from one area in her district. Because she had little idea of why there might be more malnutrition in that area she decided to organise three focus group discussions (one

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with leaders, one with moders combe at a add one with head by statistic on the area). She hoped to identify potential causes of the problem through the FGDs and then develop a more intensive study, if necessary.

2. Formulate appropriate questions for more structured, larger scale surveys. For example:

In planning a study of the incidence of childhood diarrhoea and feeding practices, a focus group discussion showed that in the community under study, children below the age of 1 year were not perceived as having 'bouts of diarrhoea' but merely 'having loose stools' that were associated with milestones such as sitting up, crawling, and teething. In the questionnaire that was developed after the FGD the concept 'diarrhoea' was therefore carefully described, using the community's notions and terms.

3. Help understand and solve unexpected problems in interventions. For example:

In District X, the recent national (polio) immunisation days (NID) showed widely different coverage's per village (50-90%) and in a number of villages a marked decrease in coverage was observed compared to last year. Eight FGD were held with mothers, two in town, three in rural villages with a marked decrease in NID coverage and three in villages with a high coverage throughout. It appeared that overall, the concept NID had raised confusion. Most people believed that this mass campaign strengthened the children's immunity against any (childhood) disease, including malaria and Respiratory Tract Infections. In the villages with a low NID coverage there had been a high incidence of malaria in children immediately after the previous NID campaign and several children died. Mothers therefore believed that the NID campaign was useless.*

[* This is an adapted version of an study carried out in Bushenyi District, Uganda, by Nuwaha et al.]

4. Develop appropriate messages for health education programmes and later evaluate the messages for clarity.

For example:

A rural health clinic wanted to develop a health education programme focused on weaning problems most often encountered by mothers in the surrounding villages and what to do about them. The focus group discussion could be used for exploring relevant local concepts as well as for testing drafts when developing the messages. The messages should be developed and tested in different socio- economic groups of mothers, as weaning practices may differ with income, means of subsistence and education of the mothers. Also ethnic differences may have to be taken into account.

5. Explore controversial topics. For example:

Sexual behaviour is a controversial topic in the sense that males and females judge sexual relations and sexuality often from very different perspectives. Sexual education has to take this difference into account. Through FGDs, first with females, then with males, and then with a mixed group to confront both sexes with the different outcomes of the separate discussions (listed on flip charts) it becomes easier to bring these differences in the open. Especially for teenagers, who may have many stereotypes about the other sex or be reluctant to discuss the topic openly (particularly girls), such a 'multi-stage' approach is useful.

Strengths and limitations

Implementation of FGDs is an iterative process; each focus group discussion builds on the previous one, with a slightly elaborated or better-focused set of themes for discussion. Provided the groups have been well chosen, in terms of composition and number (see below), FGDs can be a powerful research tool which provides valuable spontaneous information in a short period of time and at relatively low cost.

FGD should not be used for quantitative purposes, such as the testing of hypotheses or the generalisation of findings for larger areas, which would require more elaborate surveys. However, FGDs can profitably complement such surveys or other, qualitative techniques. Depending on the topic, it may be risky to use FGDs as a single tool. In group discussions, people tend to centre their

opinions on the most componed of the stand normal. It reality opinions ad behaviour may be more diverse. Therefore it is advisable to combine FGDs with at least some key informant and in-depth interviews. Explicitly soliciting other views during FGDs should be routine as well.

In case of very sensitive topics, such as sexual behaviour or coping with HIV/AIDS, FGDs may also have their limitations, as group members may hesitate to air their feelings and experiences freely. One possible remedy is the selection of participants who do not know each other (e.g., selection of children from different schools in FGDs about adolescent sexual behaviour), while assuring absolute confidentiality.

It may also help to alternate the FGD with other methods, for example, to precede it by a self-developed role play on sexual behaviour, or to administer a written questionnaire immediately after the FGD with open questions on sexual behaviour in which the participants can anonymously state all their questions and problems. This worked in Tanzania and Nepal.*

The Tanzania-Netherlands Support Programme on AIDS, Mwanza Region, Tanzania (1990-2000+) and the Family Planning Association of Nepal Project on adolescent health in five districts of Nepal (1999-2003). The adolescent health section of WHO/HQ has developed a Narrative Research Method which is very well suited to help adolescents develop narratives and role plays about their minterpretations of sexuality which can profitably precede the single sex and mixed FGDs: World Health Organization (1992) A story of the sexual experience of young people in eleven African countries; The Narrative Research Method. Geneva: WHO; World Health Organization (1993) The narrative research method; Studying behaviour patterns of young people by young people. A guide to its use, Geneva: WHO.

Another way to ensure confidentiality in a FGD on a sensitive topic is giving participants an option to introduce themselves under any name they would like to use (not necessarily their own). Further, before the discussion, it should be stressed that they may bring up experiences of friends and brothers/sisters as well as their own, and that it is not necessary to bring painful personal experiences in the open.*

II. HOW TO CONDUCT A FOCUS GROUP DISCUSSION

Determine the purpose

A FGD can be regarded as a mini-study. It therefore requires one or two clear objectives. These objectives will guide the research team in the formulation of discussion questions.

Situation analysis

Any FGD requires good knowledge of local conditions. Communities are seldom or never homogeneous. There are always differences between community members, for example in education, political power, gender, economic status and ethnic group. These differences will be reflected in their perceptions of the problems they suffer from and possible solutions. A researcher must be aware of these differences, otherwise (s)he may miss important groups of participants or obtain a hotchpotch of information. Similarly, (s)he must know which key persons or organisations could be good entry points for the selection of participants in the FGDs (e.g.: women's groups, parent associations, youth clubs, etc.). If a FGD forms part of a bigger study, or project, it may be easy to define target groups for the discussions. Otherwise, the first task of the researcher(s) will be to explore the area and identify possible target groups. Interviews with some key informants and a rudimentary situation analysis are then indispensable. The situation analysis should preferably be carried out in a participatory way, with representatives of the study population on which the FGD focuses.

For example:

In an intervention study on sexual health among out-of-school youth in an urban area, the researcher first planned some interviews with key informants. He selected the leaders of a political youth club and of a Christian youth club and some teachers, with whom he thoroughly discussed his research topic. Through them he came in contact with youth of different backgrounds. He let each of the three groups, separated into boys and girls, draw maps of the town and asked them to mark places which they thought riskful in terms of sexual behaviour (easy contacts, unprotected sex). The drawings formed a good basis for further FGDs but also helped him to identify wider networks of adolescents at risk who had to be included in the study.

Points to be considered when program and the program of the progra

Recruitment of participants:

• Participants should be roughly of the same socio-economic group or have a similar background in relation to the issue under investigation. The age and sexual composition of the group should facilitate free discussion.

Often you therefore need to obtain information on a topic from several different categories of informants who are likely to discuss it from different perspectives in separate FGDs, though in a later stage groups may be joined

* Always ensure confidentiality of opinions: Ask co-operation from the group members as well, to

* Keep what has been discussed confidential. If group members present very personal problems and need advice or help, this should be followed up after the FGD.

Participants should be invited at least a day or two in advance, and the general purpose and procedures of the FGD should be explained, in order to obtain their consent to join.

• Selection of participants:

If you are an outsider in the research area, you may have to rely on your key informants for the first selection of participants in FGDs. Your key informants to whom you have explained thoroughly the purpose and the process of the FGD might each suggest some individuals who could be invited to a focus group discussion.

Note that the key informants may select persons similar to themselves so that you do not get an adequate variety of views in your discussion group. So in your explanations be sure to emphasize that you want a group of people that can express a range of views, to be able to have a proper discussion. Participants in a first FGD may assist to find relevant participants for other groups.

Another way of getting participants is to conveniently select individuals in a systematic way, to try and ensure a range of views. You might, for example, ask every third or fourth person you find. This method might be more suitable in urban areas.

• Physical arrangements:

Communication and interaction during the FGD should be encouraged in every way possible. Arrange the chairs in a circle. Make sure that there will be no disturbances, sufficient quietness, adequate lighting, etc. Try to hold the FGD in a neutral setting which encourages participants to freely express their views. A health centre, for example, is not a good place to discuss traditional medical beliefs or preferences for other types of treatment.

• Preparation of a discussion guide:

There should be a written list of topics to be covered. It can be formulated as a series of open- ended questions. Guides for different groups gathered to discuss the same subject may vary slightly, depending on their knowledge or attitudes and how the subject should first be explored with them.

Conducting the session

One of the members of the research team should act as 'facilitator' or 'moderator' for the focus group discussion. One should serve as 'recorder'. The facilitator should preferably be as close as possible to the participants in their characteristics (same sex, roughly same age, etc.).

Functions of the facilitator

The facilitator should NOT act as an expert on the topic. His or her role is to stimulate and support discussion.

• Introduce the session

Introduce yourself as facilitator and introduce the recorder. Let participants introduce themselves with whatever names they wish to use. Put the participants at ease and explain the purpose of the FGD, the kind of information needed, and how the information will be used (for the planning of a health programme, an education programme, etc). Ask permission to use a tape-recorder, let people hear their own voices before the session starts. You might offer drinks and allow some informal discussion before the actual session starts.

Encourage discussion

Be enthusiastic, lively, and humorous and show your interest in the groups' ideas. Formulate questions and encourage as many participants as possible to express their views. Remember there are no 'right' or 'wrong' answers. React neutrally to both verbal and non-verbal responses.

Encourage involvement

Avoid a question-and-answer session. Some useful techniques include: —Asking for clarification:

'Can you tell me more about . . . ?'

— Reorienting the discussion when it goes 'off the track':

Saying: 'Wait, how does this relate to. . . ?' Saying: 'Interesting point, but how about . . . ?'

Using one participant's remark to direct a question to another, for example, 'Mrs. X said . . . , but how about you, Mrs. Y?'

— When dealing with a dominant participant, avoiding eye contact or turning slightly away to discourage the person from speaking, or thanking the person and changing the subject.

— When dealing with a reluctant participant, using the person's name, requesting his/her opinion, making more frequent eye contact to encourage his/her participation.

• Deal correctly with sensitive issues. If you notice that the discussion stops when dealing with a sensitive topic, you could ask participants (if literate) to anonymously write down their responses or opinions on the topic. Alternatively, you could summarise for the group some of the opinions from previous focus group discussions, focusing on one or two major contrasting opinions. Still another strategy is to form sub-groups, and to get a member of the sub-group to summarise and present the opinions of their sub-group members after which the whole group can still discuss these opinions.

• Build rapport, empathise

Observe non-verbal communication. Ask yourself, 'What are they saying? What does it mean to them?' Be aware of your own tone of voice, facial expressions, body language, and those of the participants.

Avoid being placed in the role of expert

When asked for your ideas or views by a respondent, remember that you are not there to educate or inform. Direct the questions back to the group by saying: 'What do you think', 'What would you do?' Set aside time, if necessary, after the session to give participants the information they have asked for. Do not try to comment on everything that is being said. Don't feel you have to say something during every pause in the discussion. Wait a little and see what happens.

• Control the rhythm of the meeting, but in an unobtrusive way

Listen carefully, and move the discussion from topic to topic. Subtly control the time allocated to various topics so as to maintain interest. If participants spontaneously jump from one topic to another, let the discussion continue for a while since useful additional information may surface; then summarize the points brought up and reorient the discussion.

• Take time at the end of the meeting to summarise, check for agreement and thank the participants

Summarise the main issues brought up, check whether all agree and ask for additional comments. Thank the participants and let them know that their ideas have been a valuable contribution and will be used for planning the proposed research, intervention, or health education materials.

• Listen for additional comments and spontaneous discussions which occur after the meeting has been closed.

Functions of the recorder

The recorder should keep a record of the content of the discussion as well as emotional reactions and important aspects of group interaction. Assessment of the emotional tone of the meeting and the group process will enable you to judge the validity of the information collected during the FGD. **Items to be recorded include:**

- Date, time, place **SAARTHI IAS**
- Names and characteristics of participants
- General description of the group dynamics (level of participation, presence of a dominant participant, level of interest)
- Opinions of participants, recorded as much as possible in their own words, especially for key statements
- Emotional aspects (e.g., reluctance, strong feelings attached to certain opinions)
- Vocabulary used particularly in FGDs that are intended to assist in developing questionnaires or health education materials
- Spontaneous relevant discussions during breaks or after the meeting has been closed

It is highly recommended that a tape-recorder be used to assist in capturing information. Even if a tape- recorder is used, notes should be taken as well, in case the machine malfunctions and so that information will be available immediately after the session for discussion.

If there is no reliable tape-recorder available, it is advisable to have two recorders.

A supplementary role for the recorder could be to assist the facilitator (if necessary) by drawing his or her attention to:

- missed comments from participants
- missed topics (the recorder should have a copy of the discussion guide during the FGD)

□ If necessary, the recorder could also help resolve conflict situations within the group that the facilitator finds difficult to handle on her own.

Number and duration of sessions

Number of sessions

The number of focus group sessions to be conducted depends upon project needs, resources, and whether new information is still coming from the sessions, (that is, whether contrasting views within and between various groups in the community are still emerging). If not, you may stop.

One should plan to conduct at least two FGDs for each sub-group (for example, two for males and two for females). Otherwise you have no way of assessing whether the information you get from the first FGD is representative for that group.

Duration

A focus group session typically lasts up to an hour and a half. Generally the first session with a particular type of group is longer than the following ones because all of the information is new. Thereafter, if it becomes clear that all the groups have a similar opinion on particular topics, the facilitator may be able to move the discussion along more quickly to other topics which still elicit new points of view.

III. PROCESSING AND ANALYSIS OF RESULTS

• After each focus group session the facilitator and recorder should meet to review and complete the notes taken during the meeting. This is the right moment to evaluate how the focus group went and what changes might be made in the topics when facilitating the next focus group.

Immediately afterwards a full report of the discussion should be prepared which reflects the discussion as completely as possible, using the participants' own words. List the key statements, ideas, and attitudes expressed for each topic of discussion.

• After the transcript of the discussion is prepared, code, following your topics, the participants' statements right away, using the left margin? Make finer sub-codes. Write comments (your first interpretation of the data) in the right margin. Formulate additional questions if certain issues are still unclear or controversial and include them in the next FGD. Further categorise the statements for each topic, if required.

• When you have all the data, summarise it in a compilation sheet organising the findings per topic for each. Number the FGD interviews and use key words to summarise group statements in the compilation sheet so that you can always go back to the full statement. If you have different categories of informants, e.g., male and female, you can summarise the information from the male and female groups on two separate compilation sheets. (

• You should then to do a systematic comparison between groups on all topics. Use your

objectives and problem pulysis diagram as a firme rook for an yets and o mparison.

• The next step could be to put the major findings for different study populations on one sheet. You may want to use some of these sheets in your research report.

• Sometimes you may also wish to use diagrams when summarising the causes or components of the problem understudy.

IV. ONLY NOW CAN YOU REPORT THE MAJOR FINDINGS OF THE FGDS IN A NARRATIVE.

V. REPORT WRITING

Start with a description of the purpose of the FGDs, the selection and composition of the groups of FGD participants and a commentary on the group process, so the reader can assess the validity of the reported findings.

Present your findings, following your list of topics and guided by the objective(s) of your FGD. Include quotations whenever possible as illustrations, particularly for key statements.

Brainstorming

Brainstorming is a group creativity technique designed to generate a large number of ideas for the solution to a problem. The method was first popularized in the late 1930s by Alex Faickney Osborn, an advertising executive and one of the founders of BBDO, in a book called Applied Imagination. Osborn proposed that groups could double their creative output by using the method of brainstorming.[1] Although brainstorming has become a popular group technique, researchers have generally failed to find evidence of its effectiveness for enhancing either quantity or quality of ideas generated. Because of such problems as distraction, social loafing, evaluation apprehension, and production blocking, brainstorming groups are little more effective than other types of groups, and they are actually less effective than individuals working independently. For this reason, there have been numerous attempts to improve brainstorming may not increase the productivity of groups, it may still provide benefits, such as enhancing the enjoyment of group work and improving morale. It may also serve as a useful exercise for team building.

Approach

There are four basic rules in brainstorming. These are intended to reduce the social inhibitions that occur in groups and therefore stimulate the generation of new ideas. The expected result is a dynamic synergy that will dramatically increase the creativity of the group.

1. **Focus on quantity:** This rule is a means of enhancing divergent production, aiming to facilitate problem solving through the maxim, quantity breeds quality. The assumption is that the greater the number of ideas generated, the greater the chance of producing a radical and effective solution.

No criticism: It is often emphasized that in group brainstorming, criticism should be put 'on hold'. Instead of immediately stating what might be wrong with an idea, the participants focus on extending or adding to it, reserving criticism for a later 'critical stage' of the process. By suspending judgment, one creates a supportive atmosphere where participants feel free to generate unusual ideas.
Unusual ideas are welcome: To get a good and long list of ideas, unusual ideas are welcomed. They may open new ways of thinking and provide better solutions than regular ideas. They can be generated by looking from another perspective or setting aside assumptions.

4. **Combine and improve ideas:** Good ideas can be combined to form a single very good idea, as suggested by the slogan "1+1=3". This approach is assumed to lead to better and more complete ideas than merely generating new ideas alone. It is believed to stimulate the building of ideas by a process of association.

Outline of the method Set the problem

One of the most important things to do before a session is to define the problem. The problem must be clear, not too big, and captured in a definite question such as "What service for mobile phones is not available now, but needed?". If the problem is too big, the chairman should divide it into smaller components, each with its own question. Some problems are multi-dimensional and non-quantified,

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for example "What are the steers invited to bring successful on rearranger?". Finding solutions for this kind of problem can be done with morphological analysis (problem-solving).

Create a background memo

The background memo is the invitation and informational letter for the participants, containing the session name, problem, time, date, and place. The problem is described in the form of a question, and some example ideas are given. The ideas are solutions to the problem, and used when the session slows down or goes off-track. The memo is sent to the participants at least two days in advance, so that they can think about the problem beforehand.

Select participants

The chairman composes the brainstorming panel, consisting of the participants and an idea collector. Ten or fewer group members are generally more productive than larger groups. Many variations are possible but the following composition is suggested.

- Several core members of the project who have proved themselves.
- Several guests from outside the project, with affinity to the problem.
- One idea collector who records the suggested ideas.

Create a list of lead questions

During the brainstorm session the creativity may decrease. At this moment, the chairman should stimulate creativity by suggesting a lead question to answer, such as Can we combine these ideas? or How about a look from another perspective?. It is advised to prepare a list of such leads before the session begins.

Session conduct

The chairman leads the brainstorming session and ensures that the basic rules are followed. The activities of a typical session are:

1. A warm-up session, to expose novice participants to the criticism-free environment. A simple problem is brainstormed, for example what should be the next corporate Christmas present? or What can be improved in Microsoft Windows?.

- 2. The chairman presents the problem and gives a further explanation if needed.
- 3. The chairman asks the brainstorming panel for their ideas.
- 4. If no ideas are coming out, the chairman suggests a lead to encourage creativity.
- 5. Every participant presents his or her idea, and the idea collector records them.

6. If more than one participant has ideas, the chairman lets the most associated idea be presented first. This selection can be done by looking at the body language of the participants, or just by asking for the most associated idea.

7. The participants try to elaborate on the idea, to improve the quality.

8. When time is up, the chairman organizes the ideas based on the topic goal and encourages discussion. Additional ideas may be generated.

9. Ideas are categorized.

10. The whole list is reviewed to ensure that everyone understands the ideas. Duplicate ideas and obviously infeasible solutions are removed.

11. The chairman thanks all participants and gives each a token of appreciation.

The process

• Participants who have r to a out in possibility to present are propriated to write down their idea and present it later.

• The idea collector should number the ideas, so that the chairperson can use the number to encourage quantitative idea generation, for example: We have 44 ideas now, let's get it to 50!.

• The idea collector should repeat the idea in the words he or she has written it, to confirm that it expresses the meaning intended by the originator.

• When more participants are having ideas, the one with the most associated idea should have priority. This to encourage elaboration on previous ideas.

• During the brainstorming session the attendance of managers and superiors is strongly discouraged, as it may inhibit and reduce the effect of the four basic rules, especially the generation of unusual ideas.

VARIATIONS

Nominal group technique

The nominal group technique is a type of brainstorming that encourages all participants to have an equal say in the process. It is also used to generate a ranked list of ideas.

Participants are asked to write down their ideas anonymously. Then the moderator collects the ideas and each is voted on by the group. The vote can be as simple as a show of hands in favor of a given idea. This process is called distillation.

After distillation, the top ranked ideas may be sent back to the group or to subgroups for further brainstorming. For example, one group may work on the color required in a product. Another group may work on the size, and so forth. Each group will come back to the whole group for ranking the listed ideas. Sometimes ideas that were previously dropped may be brought forward again once the group has re- evaluated the ideas.

It is important for the moderator to have received training in this process before attempting to take on the moderating task. The group should be primed and encouraged to embrace the process. Like all team efforts, it may take a few practice sessions to train the team in the method before tackling the important ideas.

Group passing technique

Each person in a circular group writes down one idea, and then passes the piece of paper to the next person in a clockwise direction, who adds some thoughts. This is repeated until everybody gets their original piece of paper back. By this time, it is likely that the group will have extensively elaborated on each idea.

A popular alternative to this technique is to create an "Idea Book" and post a distribution list or routing slip to the front of the book. On the inside cover (or first page) is a description of the problem. The first person to receive the book lists his or her ideas and then routes the book to the next person on the distribution list. The second person can log new ideas or add to the ideas of the previous person. This continues until the distribution list is exhausted. Follow-up "read out" meeting is then held to discuss the ideas logged in the book. This technique takes longer, but allows individual thought whenever the person has time to think deeply about the problem.

Team idea mapping method

This method of brainstorming works by the method of association. It may improve collaboration and increase the quantity of ideas, and is designed so that all attendees participate and no ideas are rejected. The process begins with a well-defined topic. Each participant creates an individual brainstorm around the topic. All the ideas are then merged into one large idea map. During this consolidation phase, the participants may discover a common understanding of the issues as they share the meanings behind their ideas. As the sharing takes place, new ideas may arise by the association. Those ideas are added to the map as well. Then ideas are generated on both individual and group levels. Once all the ideas are captured, the group can prioritize and/or take action.

Electronic brainstorming

Electronic brainstorming is a computerized version of the manual brain writing technique. It can be done via email. The chairman or facilitator sends the question out to group members, and they contribute independently by sending their ideas directly back to the facilitator. The facilitator then compiles a list of ideas and sends it back to the group for further feedback. Electronic brainstorming eliminates many of the rebland sa dar bein to min and as production blocking and evaluation apprehension. An additional advantage of this method is that all ideas can be archived electronically in their original form, and then retrieved later for further thought and discussion. Electronic brainstorming also enables much larger groups to brainstorm on a topic than would normally be productive in a traditional brainstorming session.Other forms of electronic brainstorming could be browser based, client / server, or peer to peer related software.

Directed brainstorming

Directed brainstorming is a variation on electronic brainstorming (brainwriting) described above. It can be done manually or with computer technology. Directed brainstorming works when the solution space (that is, the criteria for evaluating a good idea) is known prior to the session. If known, that criteria can be used to intentionally constrain the ideation, process. In directed brainstorming, each participant is given one sheet of paper (or electronic form) and told the brainstorming question. They are asked to produce one response and stop. At that point all of the papers (or forms) are randomly swapped among the participants. Each, then, has possession of someone else's form containing a single response. The participants are asked to look at the idea in front of them and create a new idea that is better than that idea on the first criterion dimension. For example, if the first criterion was "low cost" the participants might be asked to improve upon the idea in front of them by creating an idea that is lower in cost. The forms are then swapped again and respondents are asked to improve upon the ideas against the second criterion. The process is repeated for three or more rounds. In the laboratory, directed brainstorming has been found to almost triple the productivity of groups over electronic brainstorming.

Individual brainstorming

"Individual Brainstorming" is the use of brainstorming on a solitary basis. It typically includes such techniques as free writing, free speaking, word association, and the "spider web," which is a visual note taking technique in which a people diagram their thoughts. Individual brainstorming is a useful method in creative writing and has been shown to be superior to traditional group brainstorming. **Conclusion**

Brainstorming is a popular method of group interaction in both educational and business settings. Although it does not appear to provide a measurable advantage in creative output, brainstorming is an enjoyable exercise that is typically well received by participants. Newer variations of brainstorming seek to overcome barriers like production blocking and may well prove superior to the original technique. How well these newer methods work, and whether or not they should still be classified as brainstorming, are questions that require further research before they can be answered.

SAATH TO SUCCESS

RESEARCHMETHOD

Research has proved to be an essential and powerful tool in leading man towards progress. There would have been very little progress without systematic research. Now we have developed good and useful research and only in psychology but also in the fields like computer. The secret of our cultural development has been research. Looking back the areas of ignorance by discovering new truths, which in turn lead to better ways of doing things and better products. Research is nothing but a matter of raising question and them trying to find answer.

The sociologists, the anthropologists, economists, educationists and psychologists carry on research in their respective field. Each year new products, new facts, new concepts and new ways of doing things came into our lives due to the ever increasing significant research in physical, biological, social and psychologist's fields. All significant research leads to progress in some fields of life or the other. So, the goal of all research is progress and development for good and comfortable life.

Characteristics of Research

After having gone through the introductory part, you may know the importance of purpose of the research. Now you are going to learn the characteristics of research. They are two approaches-general and special to understand the characteristics of research.

General Approach to Understand Characteristics of Research

Research is a direct method to the solution of a problem. Research used to find out the relationship between two or more variables or variability. It gathers new knowledge and sometimes it replaces the old knowledge. It is characterized by carefully designed procedure. It is used to predict future occurrences. It is systematic, an expert, exact and accurate investigation. It is logical and objective. It is free from opinions and it needs empirical evidence for testing of hypotheses and therefore it involves formulation of hypotheses.

Conclusions and generalization should be carefully and cautiously recorded and reported. Research is based on imagination and insight. Research is a search for knowledge, it is rediscovering existing knowledge and it adds to the existing fund of knowledge of theory. Knowledge enables man to understand, explain, control, and hence cope with any situation. This means the human mind will always search knowledge. It is true yesterday, today, and tomorrow. It endeavors to data in quantitative terms. The objectives of any research are studied under two headings, namely,

(a) Academic and

(b) Utilitarian.

Research helps in decision making and action. The goal of research is to improve the level of living in society.

Special approach to understand characteristics of research:

In this approach, we consider two words, namely RESEARCH and MOVIE that explain the special approach to understand the characteristics of research. Each letter conveys not only significance of the research but also characteristics of each letter of the word.

The letters of the word. RESEARCH are explained here.

R stands for rational ways of thinking

E stands for expert and exhaustive treatment. S stands for search for solutions

E stands for exactness

A stands for analysis of adequate data.

R stands for relationships between facts and theories.

C stands for--constructive attitude--Critical observation--Condensed and compactly stated generalization-- Cautious and careful recording.

H stands for honesty and hard work in all aspects of the treatment of the data.

From this we can understand that the research is a rational way of thinking. It is an expert and exhaustive treatment. It is a research for solutions. Exactness is characteristics of research.

It is an analytical of the path data at Kinda relationships betwee Dets and theories. It is a constructive attitude and critical observation. It is condensed and compactly stated generalization. It should cautiously and carefully recorded. It involves honesty and hard work in all aspects of the treatment of the data.

Again we can see this significance of each letter of another work-MOVIE.

M stands for mathematical precision and accuracy.

O stands for objectivity

V stands for ability I stands for Impartiality

E stands for expertness and exactness.

From this, we can understand that research has mathematical precision and accuracy, objectivity, verifiability, impartiality, expertness and exactness. Thus we may learn the characteristics of research by means of special approach. So for, we have learned the general and special approach to understand the characteristics of research. Now, we are going to learn the definition of research.

Definition of Research

Craford writers, "Research is simply a systematic and refined techniques of thinking, employing specialized tools, instruments and procedure in order to obtain a more adequate solution of a problem that would be possible under ordinary means. It starts with problem, collects data or facts, analyses them critically and reaches decisions based on the actual evidence.

It involves original work instead of mere exercise of personal opinion. It involves from a genuine desire to know rather than desire to prove something. It is quantitative, seeking to know not only what, but how much and measurement is therefore a central feature of it".

Now we have general some of the definitions research stated by some great educationists as well as psychologists. From these definitions, we may come to an idea about research as summed up below. In fact, research in considered to be a formal, systematic, intensive process of carrying on the scientific method of analysis. It invoices a more systematic structure of investigating, usually resulting in some sort of formal record of procedures and results or conclusions.

Now we proceed to learn, what is research methodology? And what is psychological research?

What is Research Methodology?

It is a way to solve the research problem systematically. It is a science of studying how research is done scientifically. When we talk about research methodology, we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using a particular method or technique so that research results are capable of being evaluated how the research problem has been defined, in what way and why the hypos thesis has been formulated, what data have been collected and what particular method has undertaken, been adopted, why particular technique of analyzing data has been used and a host of similar other questions are usually answered when we talk of research methodology concerning a research problem or study.

What is a Psychological Research?

It is the process of applying the scientific method to the solution of psychological problem or any problems of life in general. The method of obtaining objective solutions to problem encountered in the theory or practice of psychology. The process of arriving at empirically verifiable principles or generalizations is at the root of psychological research.

What is Research Process?

Research process is a vigorous, impersonal mode of procedure dictated by the demands of logic and objectivity. It is systematic, logical, empirical and replicable. It involves various steps. The various steps involved in a research process are not mutually exclusive nor are they separate and distinct. They do not necessarily follow each other in any specific order and the researcher has to be constantly anticipating at each step in the research process requirements of the subsequent steps. In short, the research process in nothing but a scientific inquiry.

Steps Involved In a Research Process

The accuracy of research process depends on carefully and continuously carrying out the various steps. The steps are given below:

1) Research problem-Identification and statement of the problem. 2) Review of related literature-

Review of concepts, the is of reviews eserch findings, restrict to research problem. 3) Formulating hypothesis or hypotheses, if necessary. 4) Data collection. 5) Interpretation-including comparison of previous findings from review of related literature. 6) Solution and conclusion (including generalization.)

Such steps overlap continuously rather than following a strictly prescribed sequence. At times, the first step determines the nature of the last step to be undertaken. If subsequent procedures have not been taken into account in the early steps, serious difficulties may arise which may even prevent the completion of the study or research. Every researcher should remember that the various steps involved in a research process are not mutually exclusive; nor are they separate and distinct. They do not necessarily follow each other in any specific order and the research has to be constantly anticipating at each step in the research process the requirements of the subsequent steps.

1. Research Problem

Here we have to learn the meaning of Research problem. An individual or a group of persons can be said to have either a need felt problem or a problem which can be technically described as a research problem. Microscopically, they (individuals or group) have one or more desired outcomes which are confronted with two or more course of action that have same but not equal efficiency for the desired objective or objectives and are in doubt about which course of action is best.

Identifying and selecting research problem is a great problem for every researcher. The research must single out the problem he wants to study. He has to select the general area of interest or aspect of subject matter that he wants to study. Initially the problem may be stated in a broad general way and then it should be modified leaving ambiguities and irrelevant things. Then the possibility and feasibility of a particular solution have to be considered before selecting the problem. The selection and formulation of a general topic into a specific research problem is essential

In formulating the research problem the following steps are to be followed:-

To understand the problem thoroughly, it is good to discuss it with one's own guide, colleagues, and an expert who has research problems in mind. The researchers should review the available related literature of two-types- one the conceptual literature concerning the concepts and theories and another one is the empirical literature consisting of studies made earlier, which are similar to the proposed study. The research problem has to narrow it down and phrase the problem in operational term and rephrasing the same into meaningful terms from an analytical point of view. The statement of the objective is fundamental one because it determines the data which are to be collected and the techniques to be used. Above all, types of problem should also be considered in selection of the research problem. There are two types of research problem-one is states of nature and another one is relationship between variables.

2. Review of the Related Literature

It includes facts, concepts, theories, and previous research findings and it is a part of research process. The researcher should undertake the survey of literature related to the problem because it is an eyeopener for research work. Academic journals, conference proceedings, government reports, books, published or unpublished these should be studied, depending on the nature of the study. It is a source for research work for determining sample size, choosing tools and procedure for collecting data, selecting appropriate statistical tools and analyzing and interpreting results. It should be remembered that one source will lead to another. Thus the study of related literature is very useful research work.

3. Formulating Hypothesis

First you have to know the meaning of hypothesis. It is tentative solution or assumption made in order to draw out and test its logical or empirical consequences. It provides focal point for research. It directs researcher in collecting data and analyzing them (in testing the hypothesis). It delimits the area of research and keeps the research o the right track. Formulating hypothesis for any particular problems, requires the following steps:-

a) Understand the objectives in seeking a solution.

b) Review of similar studies on the same problem. Discuss the problem with colleagues and experts to formulate hypothesis.

c) Take original field interviews on a limited scale with interested individuals in order to secure greater insight into the real and practical aspects of the problem.

d) Frame the hypothesis in precise and clearly defined terms. With carefully following above

mentioned steps, one concerned profile of or formulate ypothesis arco ding to the nature of the problem. This is the basic step of the research process.

Finally you have to remember one thing that occasionally you may encounter, some where we do not need framing hypothesis, especially in the case of exploratory or formative researches which do not aim at testing hypothesis.

4. Research Design

After having formulated hypothesis, you need to know the condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. Here, you will have to state the conceptual structure within which research should be conducted. The preparation of such design will provide for the collecting of relevant data or information or evidence with minimal expenditure of effort, time, money, and materials. The effective research design depends mainly on the research purpose.

The research purpose may be grouped into four categories, according to the nature of the problem. **They are:**

- (1) Exploration
- (2) Description
- (3) Diagnosis and
- (4) Experimentation.

When the purpose happens to be an accurate description of a situation or of association between variables, the suitable design will be done that minimizes bias and maximizes the reliability of the data collected and analyzed. Research design includes sampling design, observational design (design or the tools or instruments), operational design and statistical design.

A sample design is a definite plan for obtaining a sample from a given population. It refers to the techniques or the procedure, the researcher would adopt in selecting items for the sample or the size of the sample.

An observational design is a preparation of unstructured or structured instruments tools for the collection of data.An operational design is advanced decisions about operational procedures. Statistical design is preplanned design for analysis of the data.

The designs are flexible and different according to the nature of the problem, hypothesis formulated and the purpose of the research. There are many research designs and the researcher must decide in advance as to which design would prove to be more suitable for his research work.

5. Data collection

It is very important step in the research process. According to research design, you are expected to collect data using reliable and valid tools or instruments, selecting required size of the sample and executing correct procedure. Sometime, the researcher would get training for collection of data and coding the data. Another very important thing that you have to remember is that the data to be collected should be adequate and dependable, and only then the result would be dependable and reliable. With the help of experts and guides, rigorous, and vigorous efforts can be made for collecting adequate and dependable data.

6. Data Analysis

The collected data are raw in nature and therefore they are called as raw data. They should necessarily be condensed into a few meaningful and manageable groups and classified into some purposeful and usable categories. The categories of data are transformed into symbols that may be tabulated and counted and it is called as a coding operation. Editing is the procedure that improves the quality of the data for coding and then classified data are put in the form of tables which are called as 'tabulations'. The tabulation is very useful is analyzing the data. Further analysis of work can be done by computation by applying various well defined statistical formulae.

Hypothesis testing is the next step in the process of analysis. The relationships or differences between or among variables can be tested by using coefficient of correlation and t-test in statistics respectively. In hypothesis-testing though the use of t-test, we can establish whether the difference between two groups is a real one or is the result of random fluctuations. If the difference happens to be real, the inference or the result will be that two samples came from different universes (populations). If the difference is due to chance, the inference or result will be that two samples belong to the same universe (population).

Similarly, other statistic Desistance that the base of the statistic the base of the statistical tests according to their requirements. The hypotheses may be tested through the use of one or more statistical tests, depending upon the nature and objectives of research work. Hypothesis-testing will result in either rejecting the hypothesis or in accepting it and it helps up to arrive at certain generalizations and conclusion. Therefore, analysis of data will be helpful for the interpretation of data.

7. Interpretation

After having tested the hypothesis, the investigator may arrive at generalization to build a theory. If the investigator had no hypothesis to start with, he might seek to explain his findings on the basis of previous studies done by some investigators in the same way or on the basis of some facts and theories. It is known as interpretation between present study and previous studies or findings which may support or against the present investigation or research work.

William Emory says, "In one sense, interpretation is concerned with relationships within the collected data, partially overlapping analysis. Interpretation also extends beyond the data of the study to include the results of other research, theory and hypotheses".

In short, the interpretation is comparing of present investigation with previous studies or findings done by some researchers in earlier times. The interpretation of the results is the original work of the present investigator and it helps to arrive at generalization. The generalization in turn provides solution to the problem.

Solution and Conclusion

From the interpretation, we can arrive at a generalization which leads to solution to the problem. The important findings are then discussed, interpreted and conclusions are drawn from the whole study. The findings are statement of factual information based upon the statistical analysis of data. From these findings, conclusions are drawn and stated in relation to the specific objectives of the problem and the proposed hypotheses of the study. Generally, the conclusion will be the essence of the whole study. The conclusion is nothing but the solutions to the problem.

CRITERIA FOR GOOD RESEARCH

The criteria for good research are:

- 1. The purpose or goal of the research should be clearly defined.
- 2. The simple and common concepts should be used.
- 3. The procedural design of research should be clearly planned and designed to get objective results as much as possible.
- 4. According to the nature of the problem the sampling design should be used.
- 5. The tools used for research should have reliability and validity and so that data will have reliability and validity.
- 6. The research procedure should be defined clearly and sufficiently in detail so that another researcher can repeat the same procedure for verification and advancement. This will maintain the continuity in research.
- 7. The research should have appropriate method of analysis for collected data.
- 8. The analysis of data should be sufficiently adequate to reveal its significance from the results: One conclusion should be drawn from the result and discussions because it is an essence of the research work.
- 9. The prepared research report should be without any bias, ferver and favour.

These are all ten important general criteria for good research. In addition to these, there are four indispensable or special qualities or criteria of good research. They are:

The good research is systematic

It is because that it rules out the use of guessing and intuition in arriving at conclusion or generalization. It is structured with specified steps to be taken in specified sequence in accordance with the well-defined set or rules.

Good research is logical

In fact logical reasoning makes research more meaningful in the context of arriving at conclusion or



Good research is empirical

It deals with one or more aspects of real situation with concrete data. Further it provides a basis for external validity to research result. So, we can say that the research deals with empirical evidence.

Good research is replicable

The repetition is allowed in the research because it is a social science. The research results can be verified by means of replicating the research. This will enable the researcher to take sound and strong decision, or conclusions or generalizations.

Finally you can say that good research is systematic, logical, empirical and replicable, which very important criteria for research are.

MORE ABOUT RESEARCH PROBLEM

The word "Problem" originates from a greek word "Proballein" meaning anything thrown forward, a question proposed for solutions, a matter of stated for examination. In research process, the first and foremost step happens to be that or identifying, selecting and properly defining or stating a research problem. We can discuss or define a research problem or hypothesis in case of descriptive or hypothesis- testing research studies" Exploratory or formulative studies do not start with a problem or hypothesis, their problem is to find a problem or the hypothesis to be tested.

Research is born out of man's problem and man's behaviour is always problem-solving behaviour which is universal in character. Life is a full of problems and the solutions of which demand research approach. In the process of research, identifying and selecting the problem is a problem for any researcher and it is a pre-requisite for him.

What is a 'research problem'?

In general a research problem refers to some difficulty which a researchers experiences in the context of either a theoretical or practical situations and requires a solutions to that particular problem.

Problem Identification and Selection

The identification and selection of problem is the first step in a systematic research activity and it involves five aspects.

They are: sources of problem, justification of the problem, criteria for selecting problem, definition of the problem, and statement of the problem. This can be represented by a flow chart.

Selection and Identification of Problem, Sources of problem

Justification of problem

Criteria for selection for problem

Defining the problem

Statement of problem

Source of Problem

The choice and identification of an appropriate problem is usually very difficulty because of one's limited knowledge of research process or unprepared ness for identifying and choosing the problem. Even an experienced researcher finds it difficult to list all the problems that need to be researched. Each researcher selects a problem because of one's own unique needs and purposes. But there are three important sources, which would help you to identify a suitable and significant problem. They are represented by a flowchart.

SOURCES OF PROBLEM

- professional Literature
- Professional Experience
- Inferences theories & other sources

Professional Experience

The professional experience of a researcher is one of the importance sources and it could suggest researchers problem. An experienced psychologist or teacher can more easily select a problem pertaining to certain components of teaching learning process than an ordinary researcher without researching experiences. The educational planners and administrators may select the research problem in the area concerning decision-making, scheduling teacher recruitment and instructional supervision. Contracts and discussion with research oriented people are also very helpful, useful and fruitful to the researcher, in identifying not only crucial problems but also important problems. The participation of the researchers in conferences, seminars, and workshops and listening to the learned and research oriented speakers are very useful in locating and selecting problem.

Professional Literature

The studies of professional literatures expose and suggest the way for selecting the problem and conducting research effectively. Research periodical, and abstracts, books, and articles, research guides. Research reports, year books, and dictionaries would suggest areas in which research is needed and demanded. These are some general resources for the identifying and selecting the problem.

Some specialized sources are the hand book of research or teaching, the Encyclo-pedia of Educational Research, Dissertations, Abstracts, International and psychological abstracts, and some similar publications, like research needs in the study of education (1968).

Readings (Research work) on different branches of psychology are also available for locating and identifying problem. There are many studies, in the field of educational psychology, industrial psychology, clinical psychology, and social psychology which are very useful in catering of the needs of researchers. These are some of specialized sources for identifying and selecting research problem.

Inferences from theories and other sources

The generalizations drawn from various theories pertaining to education and social sciences like psychology, sociology, and philosophy are the important sources of research problems, various theories of personality, intelligence, motivation and socio-economic status are very useful in identifying problem pertaining to classroom situations and practices. It is only through research that we can profitably test reliability validity, and scope or various theories in psychological situations. The inventions and innovations are other important sources of problem. Various innovations like teaching by television, programmed instruction, preparation of modules for instruction and self-learning devices are extremely good sources for choosing the problem. The innovations and inventions like technological changes, computer and curricular developments constantly give rise to not only new problems but also issues for research. Thus we can understand and that the professional experience, professional literature, and inferences from theories and other sources like innovations are real and important sources of identifying and choosing the problem.

Justification for Problem Selection

The identification and selection of problem should be justified on the basis of personal suitability and its general value. This can be represented by flow chart.

Personal suitability

The researcher should analyse the problem whether it is possible to find out the solution before the schedule, whether the research problem practically fulfill the objectives, whether the research problem suits the competence, capacity, courage, determination and interest of the researcher, whether the research is able to that proper guidance and financial help either from university or from U G C. Further we have to find out whether the researcher has tolerance to face unforeseen and expected constraints.

General Value

In identifying and selection of the research problem, it should be justified by general values-whether the research problem is relevant, important, new interesting, significant, feasible and possible to find out the solution within time limit. The research problem should have the creativeness, and utility value and originality. The researcher should also know whether the pertinent data are accessible to solve the problem wisely. Thus these are the justification in identifying and selecting the problem. Next we have



Criteria for Selecting Problem

The following criteria for selection of problem are very essential:

A problem should be related to professional work or psychological work. A selected problem and its solution should improve the psychological theories and practices. A problem must be relevant, important, new, significant, and interesting. It must be feasible and possible to find solution before the time schedule. It should be suited to the attitude, aptitude, interest, confidence, and competency of the researchers. It should practically achieve the objectives. It requires creativeness and extension of knowledge, novelty, originality and utility value. It should not be too broad or too narrow but it should be specific always. For a particular problem, whether a researcher is able to get proper guidance, and financial help to carry out the research work or project. Generally if a problem is considered to be in a higher order, it should be concerned with International level. National level, State level, District level, Town level, village level and it loses its significance and importance gradually. These are the criteria for selection of problem.

Defining the Problem

A proper definition or research problem will enable the researcher to be on the right track where as ill- defined problem may create confusion and hindrance in finding solution for it.

To define the research problem, the following conditions should be satisfied and followed:-

The need of the problem should be felt either by individual or by group. Objectives should be framed for the problem and they should be achieved. The subject areas which are already done or overdone should not be selected because it will not bring credit to the researcher. The way of defining problem will enable the researcher to formulate the hypothesis or hypotheses. The research problem should have utility value, moral value, social value, and cultural value or any one of them. The suitability of the time period should be considered before defining the problem.

Assumption, delimitation or fencing of the problem should be taken into account in defining the problem itself. When the researcher tries to define the problem, he should remember that the problem should be meaningful, realistic and specific but at the same time, there should not be hunches, hurdles and ambiguities.

Finally is defining a problem, a technique should be adopted that involves, the following steps:

- a) Stating the problem in a general way as a researcher thinks.
- b) Understanding the nature of his problem thoroughly.
- c) Surveying the available literature to determine and correct dimension of the problem.
- d) Developing ideas through discussions with guides and experts

e) Rephrasing the research problem into a working proposition by means of reflecting thinking. Researchers should remember and follow these steps in defining the problem.

Statement of the Problem

Keeping in view, some practical concern, some scientific interest and some intellectual interest, the problem should be stated in a broad general way. For this purpose, the research should be through in the subject matter in which he is going to select a problem and he may undertake a preliminary survey or a pilot study. Hence the researcher can himself state the problem and some time he seeks the help of the guide or the subject expert in this aspect. Often, the guide states the problem in general terms and it is the responsibility of the researcher to narrow it down and phrase the problem in operational terms. At the same time, the feasibility and possibility or a particular solution has to be considered positively, while stating the problem.

It is concluded that if the problem is stated in a general way, the ambiguities are resolved. Thinking and rethinking process results in a more specific formulation of the problem which is also analytically meaningful. A well-defined and stated research problem is meaningful and capable for the development or working hypotheses and solving the problem itself so easily.

Significance of the Problem

The psychological theories and practices as formulated from the solution to the problem or answer to the questions. These new solutions or answers can modify the psychological theories and practices. Findings from many studies provide evidence suggesting need for change in the existing theories and practices. These changes can be thoroughly validated and implemented in various contexts. Therefore replication or extension of complete studies or research works will serve as sources of research problems. Everyone understands that the life is full of problems. But only some people try to solve the problem and knew its significance. All people (before Newton) saw an apple falling to the ground. But it did not make them to realize any problem. At the same time Newton perceived a problem in falling of an apple and discovered law of gravitation which has a great significance in physics. Scientific, attitude, aptitude, and ability of Newton made him identify and formulate a meaningful and useful problem. It is an artistic gift and the whole world will not forget him because of his significant contribution. The worth of the study or research work is dependent on the significance of the problem. The significance of the problem is dependent on its necessity, urgency and utility value. So, you are expected to select a significant problem for your project work or research work.

Problem Delimitations

Delimitations are the fencing or boundaries of the study or research work. Whatever the problem chosen for a study (research work), the scope of the topics or titles has to be limited with reference to the availability of time, materials, money, men, and space. The period should be specified, say for a period of five years, 1991 to 1995. The investigator should concentrate his study on this particular period only. Availability or materials can also be considered one of the limitations of the study. The research may provide basic background materials for a new problem for future research. A study of "Attitude towards national Integration" may concern only with nation (India) and people (Indians) and conclusions are drawn only about Indian and Indians but not about any country and it people. The limitations in selecting sample is very essential for drawing conclusion of the study. Variables are defined with definite limits. The experimental group and control group are explained with limitations and difference.

If the problem is limited to a geographical area, that area should be clearly defined usually the coverage will be that of country, state, district, taluk village, in certain case that of a single institutions. The researcher always concentrates on a narrow area and limits his field or area. The problem should be limited and stated in, such a manner that its research in essentially feasible and possible. It is concludes that "a clear statement or the research problem and identification of the limitations of the research are very essential for the successful completions of the research. The next and last task for you is the "Scope of the problem selection."

Scope of the Problem Selection

The scope of the problem selection should be identified for stating briefly the kind of persons, materials and situations and the like to which the study is to apply. If we know to select and problem in one branch of psychology, we can apply the same procedure in different branches of psychology. For example it the effect of motivation in increasing productivity or the workers, is studied, the result of it will be used to enhance the achievement of the student in a particular students. This study can be used in the same way either in family or in a large organization concerned or in government. So, a solution to a particular situation can be applied to solve the problem in a similar or different situation. The problem selection has a vast scope in future research.

More about Hypothesis

The hypothesis is a powerful tool or instrument in research. It is a tentative solution to the problem of a researcher or it is tentative answer to the researcher's question. The researcher has to formulate a major hypothesis and possibly several, supportive and minor hypothesis, according to the nature of the problem. The formulation of hypothesis classifies not only the nature of the problem but also the logic underlying in the research and gives direction to the data-gathering process. A hypothesis is a tentative generalization or an assumption about the solution of the problem. A hypothesis is a conjectural statement of the relation between two or more variables. It is always in declarative sentence from and it relates either generally or specifically from one variable to another variable or variables to variables.

1. Sources of Hypothesis

To formulate hypothesis, the researcher has to find out the sources. A hypothesis can be formulated at



least from five source by the person leave leave and general culture. Here we can leave one by are.

a. Personal experience:

We know that experience is education and knowledge. Every researcher will have personal experience to get ideas to formulate hypothesis. So hypotheses are the results of personal experience of a researcher in some cases. A researcher may help his seniors in the completion of their theses. This experience will help him in formulating hypothesis for his research problem.

b. Professional literature:

If the researcher is in the habit of studying professional journals, he has the advantages of formulating hypothesis for his research problem. The study of professional literature will expose and suggest the ways for not only selecting problems but also formulating hypothesis and conducting research. Research periodicals, abstracts, articles, research reports, formulate hypothesis according to the nature of the problem.

c. Scientific theory:

Hypothesis originates in the science itself. Scientists continuously discuss current research and its problem and corresponding hypothesis through interaction and mode of thought. These in turn not only help to identify and select problems but also help to formulate hypothesis.

d. Analogies:

These are often a source of bringing useful and purposeful hypothesis. The source of a system in one discipline can be used in other discipline also. The hypothesis that resulted in the development of animal conditioning, for example, were an application of established theory of conditioning in human being.

e. General culture:

All the sources of hypothesis are value orientation of the culture. In U.S.A, the cultural value of polygamy is followed, where as in India the cultural value of monogamy is considered as an important one. In this context, the hypothesis is drawn on the basis of cultural value of different countries. Thus personal experience, professional literature, scientific theory, Analogies, general cultural are the sources for hypothesis.

Definitions and Meaning of Hypothesis

(1) Barr and Scates say "A hypothesis is a statement temporarily accepted as true in the light of what is, at the time, know about a phenomenon and it is employed as a basis for action in the search for new truth. When the hypothesis is fully established, it may take the form of facts, principles or theories. So, the hypothesis is statement temporarily accepted as true.

Characteristics of Hypothesis

A hypothesis should provide answer to the problem which necessitated the enquiry. It should be clear and precise. It must be stated in a simplest possible terms. It must be reasonable one. It should have empirical and reference and evidence. It must be specific in terms of the purpose. It must have power of clarity and testability. It must be testable within reasonable time. It should state the expected relationship between variables. It must be limited in scope. It should have explanatory power itself. It should be consistent with known facts and theories and might even be expected to predict or anticipate the previously unknown data. A hypothesis can explain the existing data in terms of simplest terms.

It can be tested for its being probably true or probably false, in order to arrive at conclusions in the form of empirical or operational statements. Lastly, it must be related to available technique and to a body of knowledge or facts or theory. Thus these are the characteristics or good hypothesis and should be remembered at the time of formulating hypothesis.

Types of Hypothesis

There are three types of hypothesis. They are (1) Null hypothesis (2) Alternative hypothesis. These can be represented by flow diagram.

HYPOTHESIS

• Alternative Hypothesis Ha

Non-directional SAARTHI IAS

• Directional Ha2

Null Hypothesis (Ho):

Null means nil which means zero. When a hypothesis is stated negatively, it is called "Null Hypothesis" (Ho). The objective of the null hypothesis is to avoid the personal bias of the null in the formulation of null hypothesis and in data collection. If the hypothesis is formulated with bias, then the result and the decision will be affected. Further it means that a reasoning for possible rejection is called "Null Hypothesis". It is very useful tool in testing the significance of differences. It is also called as a "statistical hypothesis'. It is always specific hypothesis.

Alternative hypothesis (Ha):

When a hypothesis is stated positively, it is called "Alternative Hypothesis" (Ha). In other words, it is an alternative hypothesis to null hypothesis. It is also called as 'research hypotheses. It has two types – Alternative non-directional (Ha1) and Alternative directional types (Ha2). The following are a few illustrations:

- Boys and Girls do not differ significantly in creativity. It is a null hypothesis (Ho). It should be tested. Ho Means of boys = Means of girls
- It means that there is no difference between boys and girls in creativity. In other words, mean scores in creativity of boys will be equal to mean scores in creativity of girls.
- Boys are girls differ significantly in creativity. It is an alternative hypothesis (Ha1). It means that there is a difference between boys and girls in creativity scores. In other words it is an alternative non- directional hypothesis (Ha1). The mean scores of boys will not be equal (+) to mean scores of girls. The direction, "Who is superior?" is not stated. So, it is a non-directional hypothesis (Ha1).
- Boys are superior to girls in creativity. (OR) Girls are superior to boys in creativity. In both statements; the directions are given, and these statements are called as an alternative directional hypothesis.
- The direction 'who is superior or interior?" is stated. So, it is an "alternative hypothesis (Ha2). Mean Scores of Boys> Means Scores of girls in creativity.
- Mean Scores of Boys> Means Scores of Girls in creativity.
- We can formulate any one type of hypothesis. From the above given examples, you have learned null hypothesis, alternative non-directional hypothesis and alternative directional hypothesis. For research purpose, we may use any one type of hypothesis. Now you are going to learn testing of hypothesis and their limitations.

Testing Of Hypothesis and Their Limitations

Under this heading, we have to learn three aspects, namely, decision rule, level of significance, and type of errors. Here we understand one by one.

a. Decision rule: Testing of hypothesis is also called as decision rule. When a null hypothesis Ho and alternative hypothesis Ha are given, we can make a rule which is knows as decision rule or hypothesis testing which is itself a research. In the testing of hypothesis, we accept Ho (ie reject Ha) or reject Ho(i.e accept Ha). In the hypothesis testing, the researcher much decide the number of items to he tested and the criterion for accepting or rejecting the hypothesis. This is known as decision rule of testing of hypothesis.

b. Level of significance: Under the limitations of the testing of hypothesis, first we have to learn the level of significance. This is not only very important but also essential concept in the contest of hypothesis testing. For rejecting null hypothesis (Ho) at 5 percent (0.05) level of significance, the sampling result or the calculated value (ie observed evidence) should be lesser than the table value which is calculated under specific table at the end or appendix of any statistic book. The table values are already statistically calculated for different number of items of sample.

For example the null hypothesis (Ho) at 5 percent (0.05) level of significance, the sampling result or the calculated value (ie observed evidence) should be greater than the table value. Thus sampling result will give us the level of significance.

c. Types of errors: In the contexts of testing hypothesis, there are two types of errors. They are Type

I error and Type II error Dema vejet Dowhen Ho is true, and it is known as Type I error. We may accept Ho, when in fact Ho is not true and it is known as Type II error. Type I error is also known as (alpha) error, where as Type II error is known as (beta) error.

With a fixed sample size, (n), when we try to reduce Type I error, the probability of committing Type II error increases. Therefore, in the testing of hypothesis, one must make all possible effort to maintain or make an adequate balance between Type I error and Type II error.

Important Uses of Hypothesis

According to M.T. McClure, "Hypotheses are islands in stream of thoughts." Hypothesis serves as a necessary link between theory and the practice or investigation.

It serves the important function or linking together related facts and information and organising item into wholes. It provides direction to research and prevents the review of irrelevant literature and the collection of useless data or excess data. It sensitizes the research certain aspects or situations. It evaluates the researcher to understand with greater clarity, accuracy, and precision of the problem. Hypothesis are particularly necessary in studies where "cause and effect relationships" are to be discovered. Hypothesis directs for the application of statistical analysis, selection of sample and tools, fixing the procedure and interpreting data effectively. It prevents the wastage in the collection of data. Hypothesis makes observation possible and experiment feasible. It limits the field of research in determining what observation to be made and which is to be ignored. It prevents irrelevant thinking in the context to research work. It differentiates the differences between precision and haphazards & between fruitful and fruitless investigation. It serves as a framework for the stating conclusion in a meaningful way. Hypotheses help us to determine or fix statistical tools and to use them for that particular research. Population parameter(s) can be calculated from the hypothesis testing in a selected and an appropriate sample. Hypothesis testing itself is research activity or investigation itself.

RESEARCH DESIGN AND SAMPLING DESIGN

Meaning of research design: Research design is a plan or strategy for conducting the research. Research designs are specific to the types of research. Research is a serious enquiry into a problem. When research is conducted according to a well designed structure it is most likely to be accurate and purposeful. Research is the process of attempting to answer researchable questions. A research design is a more general plan and that a single design may contain and require the use of several methods. Kerlinger (1973) has identified two basic purposes of research design: (1) to provide answers to research questions and (2) to control variance. Research design sets up the framework for adequate tests of relations among variables. Research problem suggests how many observations are to be made, which variables are active and which are attributes.

A design tells us what type of statistical analysis to use. Finally an adequate design outlines possible conclusions to be drawn from statistical analysis. The research design ensures that a researcher obtains usable results.

The concept of controlling variance: All research is conducted for the purpose of explaining variancethe fact that all individuals are not the same or have the same score. Also when the variance of any one variable is considered, it may be influenced by any number of factors. Variance in achievement, for example may be due to aptitude and motivation etc. The manifestation of variance can be explained by an example. A high school teacher is studying the effects of three different methods of motivation on achievement in physics. The research problem is stated as follows: "A study of the effects of motivation on the performance of high school students". The problem implies that an experiment should be conducted since motivational training an independent should be conducted since motivational training an independent variable of primary interest will be manipulated by the experimenter.

Motivational training has three levels say M1, M2, and M3. The dependent variable is performance in the school subjects, physics which can be measured through achievement tests administered after training. Ninety students enrolled in the same school and taught by the same teacher are tested on achievement. There will be 90 scores. There scores will not be the same and hence the distribution will have variance and it may be due to different effects and since motivation is the independent variable, the researcher has to determine whether or not they have different effects. Some students may be more able to do then others and other physical and mental conditions may cause validity. Therefore it is important to study the effects of variables on the dependent variable. Controlling variance means being able to explain what is causing it.

Procedure for controlling variance:

There are four ways by which controlling variance can be done.

- a) Randomization.
- b) Building conditions on factors into the design as independent variables.
- c) Holding conditions or factors constant.
- d) Statistical adjustments.

(a) **Randomization:** In the above example the same person gives training to 90 students, having three groups of 30 students each, each group trained by different motivational method. Assume that the 90 students form a representative sample of some larger population, but they are a heterogeneous group with respect to ability level is randomly distributed to three groups and we expect its effect to be the same in each group of 30 students.

It can also be noted that in this example other variables associated with the students for examples anxiety is distributed randomly among the three groups. Mathematical knowledge related to performance in physics is also randomly distributed.

(b) **Building in factors as independent variables**: Of the 90 students, if the top 45 students are classified as 'Higher' and the remaining 45 as 'lower' ability level, then we will have ability level as independent variable with two levels. Fifteen students of each of the two ability groupings will be randomly assigned to each method. Research Design with ability level built in as an independent variable

(c) **Holding factors constant:** Holding a factor constant consists of reducing a variable to a constant. For example, the trainer could reduce ability level to a constant if only students with one defined ability say those scoring between 98 and 108 on an I.Q. test are included in the study. If ability level does not affect performance on the dependent variable, its effect would now be diminished. Only students within a particular I.Q. range would be randomly selected. This number will be less than 30 per group. Here the results arrived generalize only to the restricted group.

Method Ability	Students R	andomly	Dependent Variables
	assigned		
M_1	High	15	
	0	0	
	Low	15	
		-0	
Ma	High	15	Performance
1112	mgn	10	
			S
9	Low	15	52
	ATTI,	DO OTICCE	
M_3	High	15	
	Ũ		
	Low	15	
	2011	-0	

(d) **Statistical control:** Statistical control is attained through computational procedures. When the data are analysed, the variable of ability level in physics assumes that an ability measure consisting of performance on I.Q. test is available for each of the 90 students. There may exist a relationship between I.Q. test scores and performance on the physics test such as high scores on one go with the high scores on the other. If physics test scores are adjusted ability on the physics test scores.

This can be done using a sophisticated statistics and the specific statistics procedure commonly used is the analysis of covariance using procedures for control in combination. The four procedures for enhancing control can be used singly or in combination with each other. The four variables (in addition to the independent variable, i.e., motivation) and their methods of control are as follows.

C Λ Λ	στιιις
Variable SAA	Let of Control
Science background of the student.	Randomization
Trainer	Build in as an independent variable. The same trainer trains everyone in the sample. The same teacher teaches physics
School	Reduced to a constant. Students of only one school areincluded.
Ability level	Statistical control. The I.Q. test scores are based.

The purpose of controlling variance is to enhance the interpretation of results so that the researcher can tell what effects, if any, the variables are having. When the research design is developed, the researcher has to think about controlling variables. Careful designing is essential to enhance the validity of the results.

Characteristics of a Good Research Design

A good research design must not only be appropriate but must yield results from the research that can be interpreted with confidence. Four characteristics of a good research design are identified. However they cannot be considered naturally independent of each other. They are, free from bias, free from confounding, control of extraneous variables and statistical precision for testing hypotheses.

a. Free from bias:

This means that the data and the statistics computed from them do not vary in any systematic way except as expected on the basis of random fluctuations. The differences that appear can be attributed to the independent variables under study. Bias can enter into the data in a number of ways, including biased assignment of the individuals to the experimental method.

b. Freedom from confounding:

A good research design should eliminate confounding of variables or keeps it to a minimum so that we can separate effects and we can interpret results without confusion. Two or more variables are confounded if their effects cannot be separated. In the physics example, if there are three trainers instead of one, trainer and type have been confounded. If the students trained in one type of motivation score higher on the physics exam than those of the other two types, we will not know whether the higher performance is due to one type or to the trainer. The effects of trainer and type of motivation cannot be separated because each trainer uses only a single type.

C. Control of extraneous variables:

The control of extraneous variables means that the influences independent variables outside to the purposes of the study are minimized, nullified or isolated. In other- words, the variance of such variables is in effect reduced to zero or near zero. There are three ways to control extraneous variables. For example if we select only one sex for an experiment, then we can be sure that sex cannot be contributing independent variables. Here we lose the power of generalization.

For instance, if we use only boys in the experiment, we cannot say anything about the relation understudy with girls.

The second method to control extraneous variance is through randomization. Theoretically randomization is the only method of controlling all possible extraneous variables. This does not mean that the group should be equal in all the possible variables. By chance, the groups can be unequal but the probability of their being equal is greater.

The third means of controlling an extraneous variable is to build it into the design as an independent variable. For example, if sex is to be controlled, then it can be added as another independent variable. The fourth way to control extraneous variance is to match subjects. The basic principle is to split a variable into two or more parts. (Example high & low intelligence) and then randomize within each level, but care should be taken on the subjects which are matched. They should be related to the dependent variable.

Statistical Precision for testing hypothesis:

Another characteristic of a good research design is that it will provide appropriate data with enough precision to test those hypotheses that require statistical tests. In statistical sense, precision is increased as random (or error) variance is decreased.

-SAMPLING

Meaning: sampling may be defined as "the selection of part of an aggregate or totality on the basis of which a judgment or inference about the aggregate or totality is made". A sample is a smaller representation of a large whole. It is section of the population selected from the latter in such a way that they are representative of the universe. A single member of a population is called elements are selected with the intention of finding out something about the population from which they are drawn, that group of elements is referred as a sample and the process of selection of the elements for a sample is called sampling.

Importance of sampling:

When the population is very large, the research study can satisfactory cover the entire population through sampling. If the number is limited, intensive and exhaustive data collection is possible. It saves time, cost and energy. When the units of area are homogeneous, sampling technique is highly useful.

Characteristics of a good sample:

It should be representative of the population. It should be free from error due to bias, deliberate selection. It should have adequate size. A randomly selected sample of fairly adequate size, reflecting all the characteristics of the population is considered to be a good sample.

Methods of Sampling

Sampling techniques may be classified into two broad categories and they are probability sampling and non-probability sampling.

Probability Sampling:

This is a strategy in which sample elements are automatically selected by some method under which every elements has the probability of being selected equally.

[i.] Simple Random Sample:

Theoretically, the best way of achieving probability sampling is by random method. One example of random sampling is the lottery which is commonly used for selecting prize winners. Here the selection is random or unpredictable and therefore fair because every item has an equal chance to be selected. The selection of one item does not depend upon the other item.

Merits: there is no possibility of personal bias of the researcher in the selection of items. Probability theory can be used for generalization.

Demerits: It is time consuming and expensive. If the items are not homogeneous either in size or in nature, this method cannot be applied.

[ii] Systematic Sampling:

To simplify the simple random sampling process, systematic sampling is adopted. In this case, the population is finite or accurate. It is estimated by drawing every nth element from an existing list beginning at a randomly determined point. (k = N/n rounded of to the nearest number N = number of elements proposed to constitute the sample, k = 100/5=20. The first element will be selected from the 1st 20 elements, then every 20th element from that will be automatically included in the sample (example: 6,26,46,66,86,.....etc.) In systematic sampling, only the 1st element is selected randomly and the others are at fixed intervals.

Merits: It is easier and less expensive. The sample is fairly representative of the population. Demerits: If there is a hidden periodicity in the population, systematic sampling will not be effective. For example if every 20th item is defective, then we would get all defective and the generalization of the result will be questionable.

[iii] Stratified Rando Samuling RTHI IAS

In some cases, the population to be sampled is not homogenous but in essence, consists of several sub populations. For example, the population of working women can be divided into higher income group, middle income group, and lawer income group based on their income. A sample is drawn from each stratum of random. These samples are then combined to from a single sample of the universe. The sample so drown will be typical of the whole population as it will represent all the different segment. This approach to sampling is called stratified random sampling because the population is stratified into its sub-population. All the strata are represented in sample.

Merits: All the significant groups are represented. Units are concentrated and localized within each stratum.

Demerits: Bias may be caused in the sample through improper stratification. There are three forms of stratifies random sampling namely, equal, proportional and optimum.

Туре	Characteristics
Equal	An equal number of case are taken from each stratum regardless of
	the size of the strata in proportion to the universe.
Proportional	The number of elements to be draw from each stratum is the same
	proportion as they constitute in the universe.
Optimum	In cases where starta differ not only is size but also in variability, the
	largerand more variable the stratum, the greater will be the
	contribution to the sample. The sampling fraction varies among starta.

[iv] Cluster sampling:

When the selection of individual members from the population for the sample is impractical or too expensive, groups or clusters of members may be selected for the sample. Cluster sampling is a procedure of selection in which the unit of selection, called the cluster, contains two or more population members. Each member of the population must be uniquely contained in one and only one cluster. In stratified random sampling, selection occurs with individual members but in cluster sampling selection occurs not with individual members but with the clusters. The cluster are randomly selected from the large population of clusters and once a clusters, is selected for the sample of the population members in that cluster are included in the sample. It is not necessary that all cluster have the same number of population members. In cluster sampling, the exact sample size may not be known until the sample is selected. This is because clusters are not of the same size. For example fourth grade children's achievement motivation is to be estimated using a standardized test. It there are, say 135 elementary schools it will be too expensive to administer the test to all students and a selection by simple random will be extensive. Stratified random sampling may be possible but it has one disadvantage. They are in the class and it will be inconvenient to test some members leaving others. Suppose there are 597 fourth grade classes throughout the system with an average enrolment of 34.8 students per class. A sample size of 520 students is desired so it may be decided to select 15 classes or clusters.

Merits: It is economical, easier to observe cluster of units and because it combines the advantages of both random as well as stratified sampling.

Defects: It may produce larger sampling error. Sample bias may be there due to unequal size of the sub groups selected.

Sample stages:

Single stage samples are those drawn in one step from a sampling frame. Multistage samples are drawn in a sequence of two or more samples stages and the last will be elements to consider. Fist we may sample the inclusive groups from the population. Secondly the subgroup will be sampled form the sampled inclusive groups. At the third stage we may select the individual cases from the selected subgroups. In the example cited for cluster sampling, the population is the 4th grade students of the different elementary schools.

First we make a random sampling of the required number of schools from the total number of schools (which is the sampling frame of the population). Then from, the selected schools (inclusive groups of

the population), we make a random as ping of casses. The classe are the subgroups. Form the subgroups, we then randomly select the individuals, the school's student thus selected form the final sample, and first sampling is done at school level, then at the class level and finally at the student level. At every level sampling is done at random. It can be done either simple or stratified at every stage.

A. Non-Probability sampling:

The alternative to probability sampling is non-probability sampling, which includes any method in which the elements have unequal chances of being selected. There are four kinds of non-probability sampling.

- 1. Purposive Sampling
- 2. Convenience Sampling
- 3. Quota Sampling
- 4. Incidental Sampling.

Purpose Sampling: In this, respondents are chosen because of certain characteristics. For example, career women are suspected to have a risk factor of certain stress disorders but it is rare in the population. In this case, the researcher may resort of purposive sampling by interviewing the particular career women.

Convenience Sampling: It depends on the convenient availability of the respondents. No pre planning is necessary for this. A convenience sample may be used for pilot study. Further convenience sampling may be used in one or more of the following situations. When the universe is not clearly defined. Sampling unit is not clear a complete source list is not available.

Quota Sampling: In this, the researcher tries to create a sample which matches the demographic profile in the population. For example, if it is know that 54 percent of the adult of a community are females and the researcher wants 100 respondents, the first 54 female, and the first 46 males, will be selected by quota to match the population profile. Quota sampling is a simple case of convenience sampling. For example, selecting the 100 respondents from those persons doing business at a shopping center.

Incidental Sampling: Without applying any method described above, whatever comes on our way we take it as a sample? Traveler's pickup opinion of the people whom they meet on their way, to write a book. An inspector of school puts a question to a student in a class to understand whether the teaching- learning is up to the mark in a class of students. In the T.V. Channels you may observe interview (in a cinema theatre) of people after seeing a movie whether it is good. Incidental sampling is a casual choice of a sample for observation.

NON-EXPERIMENTAL, DESCRIPTIVE OR CORRELATIONAL RESEARCH

A descriptive research describer interprets facts as they are the conditions that exist, the relationship between two events, options that are held, the processes that are going on, effects that are evident, and the trends that are developing.

Descriptive research involves events that have already taken place and may be related to present condition and also primarily what is happening now. Hence, they are called ex- post fact i.e., fact after it has happened. For example, there was an evaluation of voting behaviour of people in India by different research groups.

In descriptive research, the investigator or researcher does manipulate events. This method is widely used in behavioural science, because there are many human behaviours which cannot be manipulated, and it is also unethical. For example, to study the effect of deprivation of food, a researcher should not deprive children from eating when they are hungry, to understand its effect on lungs. Thus, in studying such relationship, the researcher has to use descriptive methods where human behaviour can be systematically analyzed and examined in natural settings.

However, descriptive studies also have the criteria of science, namely

(a) Disciplined enquiry,

(b) Expertise in the field,

- (c) Objectivity and
- d) Careful execution.

Experimental Methods and Quasi Experimental Research

Experimental method of research involves a logical and systematic way of answering questions. Experimenters, researchers or investigator manipulate certain facts or variables. They control certain conditions in the field and study and observe how the behaviour changes or is affected.

Hence, in experimental research there is a deliberate and systematic manipulation. The researcher must be aware of all the relevant factors that could influence the outcome. Experimentation is the classic method of science. It is more sophisticated, exacting and powerful method of disconcerting and developing an organized body of knowledge. Great achievement in the field of medicine, science and technology is attributed to this experimentation process.

Experimental method in also used in other fields such as education, agriculture, and also social sciences.

Experimental and control group

An experiment involves the comparison of the effects of a particular treatment with that of different treatment or no treatment. In a simple conventional experiment, reference usually made to an experimental group. For example, let us take an example of an experimental study wherein a researcher is interested in knowing the effects of monetary reward on performance of a specific task in a group of school boys. The experiment divide the boys into two groups. These two group are equated as nearly as possible for factors such as age, education, social status, parent's status etc. The experimental group is exposed to the influence of the factor under consideration, i.e., the boys in the experimental group are given monetary reward for performing certain tasks, where as the boys in the control group are not given any monetary reward.

Observations on performances and other aspects are systematically recorded by the researcher to determine what difference appear in performance of experimental group as contracted with the control group. Sometimes, the effect of investigator participating in the experiment itself may influence the results. When an experimenter in dealing with physical and chemical objects, the chances of his/her presence influencing the outcome is minimal. However, in dealing with animals and human subjects, the experimenter's variable (presence) may affect the results. This effect in clinical research is called 'placebo effect'.

Medical researchers have long recognized that patients who receive any medication, regardless of its real efficacy, tend to feel better refer form more effectively. In medical experiments, a harmless or inert substitute is administered to the control group to offset the psychological effect of medication.

These substitutes, or placebos, are indistinguishable from the real medication under investigation, and neither experimental nor control subjects know whether they are receiving placebo or medication. The effectiveness of true medication is the difference between the effect of the medication and that of the placebo.

Similarly in psychological researchers, the participation in a study influences the behaviour of people over and above the actual treatment given. This effect in called "Hawthorne effect." This was recognized by "Hawthorne" in a series of experiments at the western electric company in 1950s. Just the way medical researchers uses a placebo control group, the psychological researchers use a comparison control group with minimum exposure to experimental set up. Varying types, amounts or degrees of experimental factor may be applied to members of control group.

In the above experiment, the researcher may use a single experimental group with monetary reward and 2 or 3 control groups.

One control group may have the presence of experimenter while performing the task and another control may receive a verbal reward or appreciation. Control may be performing the task without any one's presence (no experimentor's presence). There are few concepts we have to understand in relation to the experimental method of research. They are variables, validity and designs. In this unit we will discuss the concepts of variables and experimental validity. Variables are the conditions or characteristics that the experimenter manipulates, controls and observes for example, age, gender, economic status, attention span, performance, intelligence, achievement etc.

Independent Variables ar the constitution of the chirateristic the operimenter manipulates, controls or varies to ascertain its relationship to observed phenomenon. Dependent variables are the conditions or characteristics that appear, disappear, or changes as the experimenter introduces, removes or changes independent variables. Independent variable can be treatment and organisic (attribute) variables.

Treatment variable are those factors that experimenters manipulate and to which subjects are assigned. Attribute variables are those which cannot be altered and are already determined, but the experimenter can include or remove them from experiment by manipulating (controls).

Let us see an experimental design to understand the different variables in "a study on efficacy of relaxation on headache activity among women." Here the experimenter is using a treatment variable i.e., relaxation (technique). This he can manipulate by exposing one group to its influence and another group without it. The dependent variable in headache activity or headache experiences on which the effect in seen. As the intensity of number of relaxation increases, the headache activity also should vary.

Thus, the study aims to show the cause effect relation between two set of variables. There are other attribute variable such as gender which may also influence headache experience. Hence sex in controlled by the experimenter by including only women group in the study.

Confounding variables are those aspects of study or sample that might influence the dependent variables and whose effects may be confused with the effects of independent variable.

Confounding variables can be intervening or extraneous. In the above example there are many aspects of a person's life which may have an effect on the headache experience, for example, stress, general health etc. They must be observed and controlled so that they do not influences the outcome (dependent) variable.

Extraneous variables are those which are present during experimental situation and may affect the independent variable or dependent variable experimenter's bias, enthusiasm, testing procedure, etc. A Good experimental study would control the influence of intervening and extraneous variables on the outcome measures. These aspects you would have studied in the previous lessons.

Cross sectional method of research

To make significant contribution to the development of knowledge and its application, the researcher must conduct studies which are scientifically valid. The factor that have been manipulated in the study must have definite effect on the observed consequences.

For Example, a teacher who is varying the teaching method (independent variable) must be able observe the true differences on the learning or performance in children (dependent variables) who have received different teaching methods. But in experimental situations there may be many variables which are present in the situation or generated during experimental situations which may influence the dependent variables.

- Let us examine some of them now School children change biologically and psychologically in many ways over a period of time. This is called "Maturation Effect" which may influence the learning and performance rather than the teaching method (independent variable).
- Specific events in the child's life (called history) may also affect the performance and learning (For example, anxiety of exam, family problems etc.)
- Testing procedures and instruments vary sometimes and they may influence the results.
- In order to control such influences, researcher can resort to cross sectional studies or longitudinal study.

A cross sectional method involves studying a large sample of subjects across different age groups. For example, the teacher who is studying the effect of teaching method may take sample of school children from different class levels 7th standard, 8th standard and 9th standard. He or she may take a representative sample of the subjects in each group or class. Thus, "maturation" effect can be controlled by studying how younger and older children vary in their learning and performance when exposed to different teaching method. A cross sectional study use multiple sample in different sections or over different period of time. The advantage of this method are that a large sample of subjects can be studied at a given time. Whatever factors which are influencing the independent variable can be controlled by the investigator using cross section method. For example, age, sex, time, geographical location. It is economic Sagarera are on the study high AS

Longitudinal Method

Studies of development, growth and charge always involve groups using time as a variable. Longitudinal studies involve obscurations by the experimenter at different pints in the time. It is possible to control for the reaction to measurement effects in the longitudinal study.

For example, while testing the children an investigator may notice that performance may be poor because of high reactivity to testing procedure. However, in the longitudinal study, the children will overcome such reactivity and their performance can also vary.

Generally longitudinal studies are used in single group studies. However, controls groups are also used in longitudinal researcher's method to control extraneous factor influencing the dependent variables. Longitudinal method are useful in studying process oriented changes. The internal validity and external validity of the experiments can be very well demonstrated here. Adding more control groups, adding more observation helps in replication of the experimental results and demonstrating the efficiency of experimental interventions.

Generally survey research or expost facto type descriptive studies are cross- sectional in nature. Field experiment and explorative interventional studies are longitudinal in nature. Longitudinal research uses times-series and other multivariate statistical procedures to analyze the information.

Longitudinal research method suffers from experimental mortability of subjects (dropouts from investigation) over exposure. They are time consuming. In spite of their limitations many advances in behavioural science is attributed to the knowledge gathered from decades of studies conducted by behavioural scientists.

Exploratory case study or single-subject experimental research

The exploratory case study is also referred to as single case or number of one research. This is also a particular type of experimental research. The important feature of this method is the rigorous study of the effect of intervention on an individual. Even though the focus of this type of study is on individual subjects, some of the studies include more one subject. When the number of subject is more, each individual is taken as a separate case and the data is analyzed separately rather than as a group. Single case study is also a method to test the research hypotheses. One of the major drawback of the case studies is the limitation of generalisability. The evidence based on a single case cannot be generalized to other subjects. Single case studies are widely sued in the area of behaviour modification. Case study requires careful assessment, repeated observations and measurements and careful control and applications of the experimental treatment.

- Observations are critical in studying the cases. The procedure for observation and the behaviours to be observed must be carefully planned. Major psychological process in the field of clinical psychology and developmental psychology is attributed to the single case explorative study.
- For example, Piaget studied the cognitive development process observing the behaviour of his own children. Many major theories in psychology is based on single case observation. Ebbinghayse's experiments on self were basis for his expositions on memory process. Freud's psychoanalytic theory was based on single case clinical studies. The single case studies provide preliminary hypotheses for developing major theory. And they are also called explorative studies. There do not have formalized hypotheses for testing, which can be later structured.
- Many children and Diagnostic research follow the case study methods. These methods use in depth approaches to understand basic causal relation and also study the processes of change or growth. Observed are carefully defined and are observable. The measurement procedures including tests, surveys, attitude scales are also used. Still the observation is the primary measurement tool in case studies.
- In group research designs, what we call pretest data is considered baseline in case studies. Thus, observations are made under different conditions such as pre-intervention phase, intervention phase etc. There are different designs used in case studies which you would have studied in previous lessons on research designs.

Tools of data collection

Once the research problem in pan in Exikel of the searcher has b collect the evidence for testing the hypothesis. The researcher would have to decide which sort of information he/she would be using for the study. According to the decisions they have to use different methods of data collection. Data collection is an important process in research, which is essential in arriving at conclusions. The data should be appropriate and also adequate for the study.

The data can be primary or secondary. The former is collected by the researcher directly either by survey or experimentation. For example, if a researcher conducts an experiment,he can record his observation on a daily record. This forms his primary data. Secondary data are those which are already collected by someone else and which have already been passed through the statistical process.

The method used by the researcher to collect information or evidence for testing hypotheses is called tools. The data can be collected by more than one way be using tools like observation. Interviews, questionnaires, checklists, inventories, rating scale etc.

The tools used by the researcher to collect the data depends on the following factors:

- (a) Nature of investigation
- (b) Objective and scope of inquiry
- (c) Financial resources
- (d) Available time
- (e) Desired degree of accuracy.

Ability to select the appropriate tools for research depends on the experience and knowledge of the researcher. Let us examine each of the above mentioned tools of data collection to ascertain what ways they are adequate or appropriate for the research.

a. Observation Method

Observation is a common scientific tool for collecting information. Here the information is sought by way investigators, own direct observation without asking the respondent. This method in widely used in behavioural science.

For example instead asking the respondent what brand of pen he/she uses, the investigator may look at the pen he uses. Many preference of people can be inferred from observation.

Observation:- Observation of natural phenomena along with systematic classification and measurement lead to the development of various theories and laws. Observation is a part of any king of research, be it an experimental one or a descriptive type. Observation method is mostly used in single subject experimental research as it is a costly affair to observe behaviours pertaining to a larger group. Observation can be direct data gathering method in descriptive research. This data is know as anecdotal reports and very useful fo research studies.

Observation must always be systematic, for a specific purpose, carefully focused and thoroughly recorded. Like any other research procedures, it must be subjected to the usual formalities of accuracy, validity and reliability. It is very necessary that the observer knows that what is significant or insignificant to the study. Objectivity, being careful and accurate in measuring and recording important aspect of observation.

Since human behaviour is complex and certain tracts are difficult to observe directly, they must be carefully used in precise operational form. It is also important that behaviours that mean different things to different observers, be dealt carefully. In defining which behaviour needs to be acted out, the researches needs to first determine the class roles avoid labeling permissible behavior as acting out. Instruments like stopwatch, mechanical counter, camera, audiometer, audio, video recordings and other devices help in making observations more sincere when behaviour are recorded. It is at the proposal of the researcher to start and stop the action for mere accurate recording of the data, to collect inter- observer reliability data without more than one researcher at the site and to re-examine ideas and decide on a new format for coding behaviours. Systematic observation of human behaviour in natural settings is to an extent an intrusion into the dynamics of the situation. This intrusion may be reactive i.e., might cause an effect on the behaviour of the person who is being observed.

Recording Observations: - Recording while the behaviors is in action is advisable if it would not distract on create a barrier between the observer and the person. This minimizes the errors that might occur from faulty memory. Recording must be done as soon as possible when the action is still fresh in memory. But many agree that objectivity is more likely when the interpretation of the meaning of behaviour described is learnt until a later time as simultaneous recording and interpretation often

interfere with objectivit, SAARTHI IAS

Systematizing Data Collection procedures: - To record information obtained through observation, devices like checklists, rating scales, scorecards and scaled specimens help in systematic means of summarizing.

Characteristics of Good observation:

Observation is planned carefully, systematic and perspectives. Observers are aware of significant and insignificant details in their research. They aren't distracted by the action or seeing itself. Observers are aware of the wholeness of what they observe. They are objective. Bias which may influence what they observe and report is eliminated to the maximum. They separate the facts from the interpretation of facts. Interpretation is done later. Observations are checked and verified by repetition or comparison with those of other observers. Observation is carefully and expertly recorded. Observations are collected in such a way to check for reliability and validity.

Advantages of observation

Subjective bias on the part of respondent is eliminated. In other words, what is obvious behaviour cannot be hidden from investigator, if observation is accurate? Information on what is currently happening can be obtained. Respondent's willingness to respond does not count. This method in very useful in studying behaviours of the, children and clinical cases where respondents are not ready to verbalize or not capable of giving verbal responses.

Disadvantage of the Method

It is expensive and time consuming. Information provided is very minimal. Unforeseen factors may interfere with observation.

1. Checklist

Checklist is a simple device of data collection comprising of prepared lists of behaviours or items. The presence or absence of a behaviour is indicated by checking 'Yes' or 'No' or the type of number of items may be indicated by inserting the right number. Checklists can also be used to count the number of behaviours occurring in a given time period.

2. Rating Scales

This involves qualitative description of a limited number of aspects. The classifications may vary from 5 to 7 point scale of description like.

- (i) Superior/above average/average/fair/inferior
- (ii) Always/frequently/occasionally/rarely/never
- (iii) Strongly agree/agree/disagree/strongly disagree

Rating scale may be either graphic scale or an itemized rating scale. The above example are all graphic scales where the rater indicates his rating by a simple tick mark at the appropriate point on a line that runs from one extreme to the other.

This type rating may sometime increase the tendency of rater to choose always a particular point (tendency to mark on neutral point). The frame of reference for the researcher and the respondent may vary. This is another limitation.

Itemized rating scale is also known as numerical scale. Here a series of statements is presented and the respondents select the statements that are as best reflecting his view or perception or he may order them according to his preference. The order is progressively in terms of more or less on some property.

Here is an example.

What do you prefer most in your job?

- Leisure time
- Conductive work atmosphere
- Good company policy, More perks
- Responsibility
- Opportunity to use potentials Independence Good wages, Good relationship

This type of scale provides more information to the rater and increases its reliability. Rating scales are