



INFLUENCE OF PERSONALITY ON PROBLEM-SOLVING ABILITY AMONG SELECTED PARTICIPANTS: A PILOT STUDY

Abayomi S. DARAMOLA

ORCID identifier: 0000-0002-9616-2025
Centre for Petroleum, Energy Economics and Law,
Department of Minerals, Petroleum, Energy Economics and Law
University of Ibadan, Ibadan, Nigeria
updaramola@gmail.com

and

Paul S. WAI

Department of General and Applied Psychology,
Faculty of Social Sciences,
University of Jos, Jos, Plateau State, Nigeria

ABSTRACT

Problem-solving consists of trying to eliminate the differences that may exist between the situations that one is in and the situation one wants to be in by removing anything that serves as a barrier or abnormality in a given situation. In problem-solving, some strategies are used. They are Trial and Error, Algorithms, Hypothesis testing, and Heuristics. Obstacles that an individual comes across while solving problems are, confirmation bias, mental set, functional fixedness, and self-limitation. Etc. Research findings have established that an individual can improve upon his capability by having self-confidence, getting rid of indecision, procrastination, self-limitation, and fear of failure. Personality may be taken to be an individual's most striking or dominant characteristics. The interest of this study was to know whether personality affects problem-solving ability. In an attempt to know if problem-solving ability is affected by an individual's personality eight human subjects were given some practical problems to solve. The problems given are the four—card problem, Duncker's candle problem, Luchin's water—jug problem, Speed and accuracy Test, and fact inspection and assembly tests. This result shows that personality type does not have a significant effect on problem-solving ability.

INTRODUCTION:

Personality and problem-solving ability tend to look into how personality type could influence problem solving ability of a person, (Price, and Barrell, 2012). For better understanding of this paper on the experimenter study looked into a way of trying to define what problem solving is?; what problem-solving ability is? and what personality is? What is problem solving? problem solving consists of trying to eliminate the difference that may exists between the situation that one is in and the situation one wants to be in. that is removing anything that serve as a barrier or abnormality in a given situation. What is ability? Ability refers to the present level of proficiency in a given skill. Abilities are not inherited characteristics of the individual, although they are influenced by genetic factors, but rather reflect constellation of learned behaviours and skills, (Yi, 2019). To look at what is personality? Although personality theories differ greatly, they all attempt to account for two things. Individual differences in the behaviour of different people confronting the same situation, and consistencies in the behaviour of a single person confronting different situations. That is, they all try to explain the relatively stable, persisting organisation of characteristics that makes each person unique, usually by referring to an interaction between biological and social factors. Personality may be taken to be an individual's most striking or dominant characteristics. In that sense a person may be said to be a "shy personality" or a neurotic personality", meaning that



his/her most dominant attribute appears to be shyness or neurosis. More formal definition of or Personality by psychologists also show little consensus. Influential personality theorists tell us that personality is the dynamic organisation on within. The individual of those psychophysical system that determine his characteristic behaviour and through (Allport, 1961). A person unique pattern of traits (Guilford, 1959), the most adequate conceptualisation of a person 's behaviour in all its details (McClelland, 1951).

The question then arises, does personality influence problem solving ability of person? If it does to what degree? Can the ability be improved upon? The aim of this study is to help human being maximised their problem-solving ability to suits their personality. Also, to serve as measure of placing people in jobs that demands the kind of ability that they possessed, more so, this would help subsequence researchers concerning data collection and getting of more facts in relation to personality and problem-solving ability, (Stefaroi, 2015).

According to Myers, (1986) problem-solving when faced with novel situations for which no well—learned response suffices, an individual may use any several strategies - trial and error, hypothesis testing, methodical algorithms, and rule-of-thumb heuristics. People do, however, face certain obstacles to successful problem-solving. The confirmation bias predisposes an individual to verify rather than challenge his/her hypotheses. And fixations, such as mental set and functional fixedness, may prevent our taking a needed fresh perspective on the problem. He stated in detail that, Problem-solving is another tribute to our rationality comes from our skills at solving problems — at coping with novel situations for which there is no well—learned response. when arriving home without a key and finding the front door locked, when pondering how to organise a term paper, when pussling over how to test a theory, human ingenuity often triumphs, (Duncker, 1926). It does so through a series of steps; (1) defining the problem (you have no key to the locked front door), (2) developing a specific strategy (try the back door; if it is locked, find an unlocked window), (3) carrying out the strategy, and (4) determining if the strategy is working (Chartrand, Rose, Elliott, Marmarosh, and Caldwell, 1993).

Several different strategies can be used for solving problems. Here are the four most important ones are trial and error, hypothesis testing, algorithms, and heuristics. When the Possible solutions to a problem are few, we may solve it through trial and error. When confronted with a strange television set in a motel room, for instance, we normally try first one button and then another until then another until the set comes on. Unsure of which faucet in the motel bathroom is for hot water, we pick one and turn it on, if we err, we know it is the other. Even when facing more complicated problems, trial and error may be useful. Thomas Edison, for example, had no way of knowing what substance would work as a light bulb filament, so he tried thousands before stumbling on one, carbon, that did (Hunt, 1932).

Closely related to trial and error is another Important strategy for solving problems hypothesis testing. An individual make a tentative assumption about how he/she might deal with the problem and then try it out to see if it works. For instance, if when trying to get the motel's TV to operate, He/she immediately discover that it has no visible controls, he/she may hypothesize that the controls must be concealed in front of the set. So, he/she tests this hypothesis by pulling at various edges to see if he/she can uncover a hidden panel. If the hypothesis was correct, the problem is solved. If the hypothesis was wrong, he/she may try another hypothesis, by fingering the side and bottom of the set where he/she now suspects the control will be found. The most rigorous trial-and-error method has been labelled the algorithms by problem—solving experts Allan Newell and Herbert Simon (1972). Algorithms are logical, methodical, step—by—step procedures for solving problems. They originated in the field of mathematics, but the concept has since been applied to other types of problems. If the proper algorithm is used, the correct solution to a problem is



guaranteed. But the process may take a while because it involves examining every possible solution in an orderly manner until the correct one is found. For instance, given the challenge of forming another word out of the letters in CINERAMA, an individual could elect to use an algorithm. This would involve systematically trying each letter in each position and then checking the resulting combination in a dictionary. If an individual decides to try this approach, set aside a work week, for there are 40,320 possible combinations of the letters. Allowing 10 seconds to look up each possible solution, it will take about 5 days to finish.

Heuristics: Obviously, algorithms are not suitable for most of the problems that people face because time is short enough already. Moreover, there are no algorithms for many problems. Suppose the car an individual is driving gets stuck in the mud. Can he/she think of a rigorous, mathematical-like procedure for getting it out? Because the more formal approaches are often not appropriate, people frequently use simple rule-of-thumb strategies, called heuristics, for solving problems. Everyone has a repertoire of these strategies based on bits of knowledge they have picked up, rules they have learned, or hypotheses that have worked for them in the past. When they use heuristics, then, they are essentially saying: "This problem reminds me of similar problems I have faced before, so what worked then ought to work now" they consider how they might use heuristics to solve the problem of finding another word in CINERAMA. They know for instance, that English words never start with the combinations "Mc" "Nc" "Rc" or "nm" and that two "A"s seldom come together. By using such rules of thumb and then applying trial and error, it shouldn't take too long to come up with the correct answer, AMERICAN.

As inventive as humans can be in solving problems, there are certain human tendencies that interfere with an individual's problem-solving abilities. This paper briefly looked at two of these obstacles to problem-solving here - the confirmation bias and fixation. The confirmation bias, one of the major obstacles to problem-solving is the natural human tendency to search for information that confirms a person's hypothesis; consider for instance, the "four-card problem" created some years ago by British researchers Peter Wason and Philip Johnson Laird (1968). In this experiment, subjects were shown four cards. Each card has a letter on one side and a number on the other. The participants were asked of which cards they would turn over to test the following rule. If there is a "D" on one side of any card, there must be a "3" on the other side. Which card will you turn over to test the rule? The problem sounds simple, but few people get it right. Most of course, want to turn over the card with the "D" to see if there is indeed a "3" on the other side. But which card should be turned over next? Most people choose the "3" but in fact, turning over the "3" proves nothing, for if the card has some letter other than "D" on the other side, the rule still holds. (Remember, the rule pertains only to cards with a "D" on one side). The correct second choice is the "7", for if it has a "D" on the other side, the rule would be disproved. Why do people have trouble with this problem? Because they are hoping to locate confirming instances of the rule they are testing. Experiments such as this one indicate that we are more eager to verify our beliefs and hunches than to try to disconfirm them. Wason (1981), reported that even when people are given the correct answer to the four-card problem, indeed, even when the error in their logic is demonstrated by using actual cards-they often will not budge from their illogic. "This incorrigible conviction that they are right when they are, in fact, wrong has analogies to real life crises of belief... ordinary people evade facts, become inconsistent, or systematically defend themselves against the threat of new information relevant to the issue". In fixation, if an individual is to try his or her hand at some brainteasers-much like these, "arrange the six matches so that they form four equilateral triangles". "Suppose that you have a 21-cup jug, a 127-cup jug, and a 3-cup jug. Drawing and discarding as much water as you like, you need to measure out exactly 100 cups of water. How can this be done?" (Lunenburg, 1946)

“Given the box of matches, the thumbtacks, and the candle, how can you use these materials to mount the candle on a bulletin board?” (Duncker, 1945). One set of major obstacles to problem-solving includes various forms of fixation the inability to take a new perspective on a problem. For instance, if individual attempts to solve the match problem were fixed on two-dimensional solutions, as is typically the case, then the three—dimensional solutions to the problem will have eluded you. People tend to become fixated on certain types of solutions for a very good reason, namely, the fact that solutions that were successful in the past can frequently be applied to new problems, (Ginevra, Nota, Heppner, Heppner, and Soresi, 2014).

As helpful for solving present problems as past successes can be, they may interfere with our taking a fresh approach when faced with problems that demand an entirely new type of solution. This tendency to repeat solutions that have worked in the past is a type of fixation normally called “Mental set”. Another type of fixation, referred to by the appropriate but awkward label “Functional fixedness” is our tendency to perceive the functions of objects as fixed and unchanging. A person may see a dime as a coin, and not as a needed screwdriver. People may have experienced functional fixedness when they tried to solve the candle problem. If they thought of the matchbox as having only the function of holding matches, they may have overlooked its potential for serving as a platform for the candle; indeed perceiving and relating familiar things in new ways is an important aspect of creative thinking, (Wason & Johnson-Laird, 1968)

PROBLEM - SOLVING ABILITY

M.S. Michel, Sweet Murder, (1943) "Intelligence is the particular facility a person has to cope with any given situation. Adaptive behaviour varies with the people and the situation involved. For a manager or salesperson in our society, it might be competence in interpersonal relations. For Islanders in the South Pacific, it might be the ability to fish and to “read” the ocean. Others view intelligence as those cognitive abilities, whatever they may be, that help people to solve problems effectively and to achieve their rationally chosen goals, regardless of their cultural environment (Baron,1985). The abstract and novel questions asked on intelligence tests provide miniature challenges that are intended to evaluate people's abilities to solve a variety of problems effectively, no matter what their cultural background may be, (Duncker, 1945). The assumption is that people who on the Wechsler Adult Intelligence Scale (WAIS) can remember a long string of digits and then report them backward, or can find the missing element in a picture, will likely have an edge at solving a variety of other problems, be it taking tests in school or growing corn. According to Davidoff (1987), Human beings are continually confronting problems that run the gamut from trivial to momentous, (Simon, 1969; Simon, 1979). What should I wear? people solve easy problems quickly, without even realising they are problems they may take years to cope with more complicated questions. During problem solving humans have an objective, encounter difficulties, and work to overcome the obstacles and achieve the objective (Vinacke, 1974). Problem Identification. Problem solvers identify a challenge and prepare for it. They work at resolving it and eventually evaluate the solution, (De Groot, 1965). Problems may appear “on their own”, or humans may actively search for them. Finding a worthwhile problem to solve seems to be one of the most difficult aspects of creative problem-solving, (Kahn,1962). The preparation period usually follows the identification of a problem. Preparation or representation of problems can be thought of as overall ideas about how to attack the problem. An adequate representation is a key to understanding a problem. Solvers take four aspects of the problem situation into account (Glass et al., 1979) what is the initial situation? (where am I now?) what is my goal (what am I seeking to do?) What are the constraints, or restrictions, on what I can do? what moves or operations will take me from the start to the goal? The success of your problem-solving efforts



depends on your representing the problem adequately. Difficulties in Representing problems are— Hazy data and constraints — irrelevant factors and incomplete information. In the course of trying to solve, or resolve, a problem, people often plan a solution, carry it out, and check the results. These tasks, which blur together, are usually called strategies (Glass et al; 1979) Rarely do individuals go directly from strategy to solution. Typically, they take one tactic as far as possible before switching to a new one. In addition to reasoning. problem solvers often rely on the generate—test strategy, means-ends analysis, and mental imagery. Evaluations usually occur during the course of solving the problem or at the end, (Polya, 1945; Wertheimer, 1945; Wertheimer, 1959).

Lazerous (1975) the first formal theory in the field of personality was Sigmund Freud's psychoanalytic theory, Freud introduced psychoanalysis in 1888 in the interpretation of dreams and kept revising and supplementing his ideas until his death in 1939. The theory has had a tremendous influence even on those who reject it. Freud's sources of data were chiefly the free association of hysteric patients, although he also treated people with other disorders and performed an impressive amount of self—analysis. From these data, Freud theorised the existence of unconscious processes, probably his most important contribution. He proposed infertile wishes and goals reside in the unconscious and can come to consciousness through free association. Freud found that a patient's free associations, and also, his Psychosomatic symptoms, dreams, jokes, and accidents (such as forgetting an appointment), revealed unconscious conflicts, usually between an impulse to engage in a forbidden act and social or moral constraints that prohibit the act. Freud saw personality structure as consisting of the three sseparate but interacting agencies; the "id" the "ego" and the Superego. The "id" is an inborn reservoir of instinctual psyche energy, or Libido, completely unconscious, which demands immediate satisfaction and operates according to the pleasure principle. The "ego", which is not inborn, develops to handle transactions between the "Id" and the outside world; later, it also mediates the demands of the "Superego". The "ego" is the executive agency of the personality. It controls action postpones gratification of impulses in the interest of long-term goals and operates according to the reality principle. The superego, which develops at around age six, represents social values and ideals. It includes both the conscience, which inhibits the impulses of the "id", and the "ego" ideal, which offers a standard of behaviour toward which the person aspires. According to Freud, the energy for human behaviour is provided by two in born "id" instincts, sex and aggression, which he redefined in his later writing as life instincts (Eros) and death instict8 (Thanatos) He believed that personality is determined by the way a person resolves the conflict between the "id's" demands that these instincts be satisfied and society's restrictions on the ways they may be satisfied. Freud postulated a homeostatic, or tension reduction, model of behaviour: An aroused instinct activated behaviour, If the behaviour is successful, it reduces tension and returns the person to the state that existed before the instinct was aroused. In discussing conflict and tension reduction, Freud emphasised four terms.

Displacement, by which instinctual energy is transferred from one object to another; Identification, by which a person iincorporates personality features and values of another person, particularly his same—sex parent anxiety, in which a person senses impending danger (whether real or not); and defence mechanisms, which are unconscious attempts to reduce anxiety by denying or distorting reality. Some common defence mechanisms are repression; regression; reaction formation; projection; and sublimation, (Schacter, Gutchess, and Kensinger, 2009; Friedman, and Schustack, 2015).

Freud describes personality development in terms of five psychosexual stages; Oral, anal, Phallic (or childhood genital), latency, and genital. Except for the latency period, each stage is

named for the zone of the body that is most important to personality development during a particular time of life. Fixation occurs when development from one psychosexual stage to the next is partially (and in some rare cases, completely) halted. The adult then manifests certain character traits associated with the stage of fixation. For example, fixation at the oral stage may result in gullibility or argumentative during adulthood. During the phallic stage, the Oedipus complex (or Electra complex in girls) appears: The child falls in love with the parent of the opposite sex. The Oedipus complex is resolved when the child identifies with the same—sex parent, partly to defend himself against castration anxiety and partly to achieve vicarious possession of the opposite—sex parent. Identification is responsible for the development of the superego and the establishment of the child's basic sexual identity, (*Friedman, and Schustack, 2016*).

NEO-FREUDIAN PSYCHOANALYTIC DEVELOPMENTS

Analytic psychology was founded in 1913' by Carl Jung and Alfred Adler, goon broke from Freud over certain issues. Jung differed with Freud on two points. First, he took a more positive view of human nature, that people try to develop their potential as well as to handle their instinctual urges. Second, he distinguished between the personal unconscious (similar to Freud's idea of the unconscious) and the collective unconscious, which is a storehouse of memories and behaviour patterns from mankind's ancestral past. The school of individual psychology was formed in 1911. Adler believed that people are motivated to achieve superiority; he is the originator of the term inferiority complex. He stressed the uniqueness of the individual personality, the primacy of aggressive over sexual instincts, and the importance of social rather than instinctual forces in development. Other neo—Freudians have given the ego more importance than Freud did. For example, Robert White says that a young child's behaviour, rather than being oriented toward the sexual and aggressive instincts of the id, is largely motivated by a desire for competence. White points out that walking, talking, and playing with more complex toys which increase the child's feeling of competence are probably more central events in a two-year-old's life than toilet training, (*Roberts, and Yoon, 2022; Kahn, 2002*).

A third group of neo-Freudians emphasises the social factors in development. Erik Erikson says that personality results from an encounter between the needs of a person, and the demands of a society during a particular epoch. He outlines eight psychosocial stages of development, each characterised by a particular crisis, such as the identity crisis of adolescence. Building on Erikson's biographies of Luther and Gandhi, several psychoanalysts and historians have begun a new approach to personality called psychohistory, which stresses the importance of historical context to personality development. Erich Fromm emphasises the sociohistorical roots of personality even more than Erikson. He says that the ways human needs express themselves are determined by a person's society. In a capitalist society, for example, a person may try to satisfy his need for personal identity by becoming rich. Froom is particularly interested in the relation between alienation and freedom. Harry Stack Sullivan stressed the interpersonal nature of personality, pointing out that an individual's personality inevitably involves his or her relations with other people mental disorders, according to Sullivan, exist not “inside” people but in a network of distorted and manipulative social relations. Sullivan gave particular emphasis to the acquisition of language as a contributor to personality development. A final Neo-Freudian theme concerns the physical expression of psychological conflict, a concept developed especially by Wilhelm Reich. He suggested the idea of “Muscle Armor” or “Character Armor” to describe the way in which prolonged conflict can alter a person's posture, breathing pattern, facial expressions, and movements, (*Roberts, and Yoon, 2022*).



The type and trait theories are one of the most enduring approaches to personality that seeks to label and classify people according to their psychological characteristics. For the types, some categorisations sort individuals into discrete categories or types. In the ancient theory of temperaments, for example, the Greek Physician Hippocrates assigned persons to one of four types of temperament. Choleric (irritable), melancholic (depressed), sanguine (optimistic), and Phlegmatic. (calm, listless). In accord with the biology of his time (about 400 B.C), Hippocrates attributed each temperament to a predominance of one of the bodily humors, yellow bile, black bile, blood; and phlegm. A choleric temperament was caused by an excess of yellow bile, a depressive temperament reflected the predominance of black bile, the Sanguine person had too much blood; and phlegmatic people suffered from an excess of Phlegm. Other typologies have searched for constitutional types, seeking associations between physique and indices of temperament. Such groupings in term of body build have considerable popular appeal, as seen in the prevalence of stereotypes linking the body to the psyche. Fat people are "jolly" and "lazy" thin people are "morose and "sensitive, and so on. Formal classifications of the possible links between personality and somatic type were developed by the German psychiatrist Kretschmer, and more recently by an American Physician, William H. Sheldon. Sheldon's classification has received the most attention. In 1942 he suggested three dimensions of physique and their corresponding temperaments. The endomorphic individual is obese, the mesomorph has an athletic build, and the ectomorph is tall, thin, and stoop-shouldered. Rather than dividing people into three distinct types, Sheldon considered every individual's status on each dimension. He developed a seven-point rating system for measuring somatotypes, (Spielman, Jenkins, and Lovett, 2020).

Other typologies have grouped people into purely psychological categories. The Swiss psychiatrist, Carl Jung, for example, considered all people either "introverts" or "extroverts". The introvert tends to withdraw into himself, especially when faced with emotional conflict and stress. He prefers to be alone, is shy, and avoids people. In contrast, the extrovert responds to stress by trying to lose himself among others. He tends to be in an occupation that lets him deal directly with many people, such as sales or promotional and he is likely to be conventional, outgoing, and sociable. Jung's introversion—extraversion typology has continued to intrigue psychologists and has been extensively researched for many years. The results suggest that people differ in the degree to which they are introverted and extroverted rather than fitting into one or the other category exclusively. Most other hypothesised psychological typologies also turn out to involve a continuum of individual differences rather than discrete types. There are limitations of typologies because typologies are appealing because of their simplicity, but it is their simplicity that limits their value. An individual personality cannot be fitted neatly into one category or another, (Furnham, and Tsvirikos, 2016).

Traits are continuum dimensions on which Individual differences may be arranged quantitatively in accord with the amount of an attribute that the individual has (like degrees of intelligence) Trait theorists conceptualise traits as underlying properties, qualities, or processes that exist in persons. Traits also are constructs to account for observed behavioural consistencies within persons and for the enduring and stable behavioural differences among them in their responses to similar stimuli. For, Allport, traits are the ultimate realities of psychological organisation. They are the mental structures that account for consistency in behaviour. In his view, traits are predispositions to respond, and they serve to integrate what would otherwise be dissimilar stimuli and responses. Traits are relatively general and enduring, although they may range in generality from highly generalised cardinal through central to secondary traits or more specific "attitudes". An individual's "personality structure" is his pattern of dispositions or traits. Allport emphasised



this structure, rather than the environment or stimulus conditions, in his analysis of human behaviour. He stressed individual differences and the uniqueness of each person. Although he recognised some roughly common traits on which individuals can be compared, he urged the intensive study of the individual. He disapproved of many of the statistical methods and quantitative research strategies by other trait theorists, (Kelly, 1980; Epstein, 2003).

Cattell distinguished between surface traits and source traits. Surface traits are identified by statistical correlations; source traits, by factor analysis. Through factor analysis, Cattell tried to estimate the basic dimensions or factors underlying surface variations in behaviour. Extensions of trait theory have been provided by Guilford and Eysenck. Despite their many differences, most trait theorists share the following theoretical assumptions and strategies. Traits are assumed to be general underlying dispositions that account for consistencies in behaviour. Some traits are considered to be relatively superficial and specific others that are more basic and widely generalised are assumed to produce consistencies across many situations. A person's tested or sampled behaviours (including what he says about himself) are viewed as signs of his underlying traits. To search for basic traits a psychometric strategy is used, which samples and compares large groups of subjects quantitatively under uniform conditions. As of now, there is no comprehensive personality theory that holds the allegiance of psychologists, (Pierce, and Cheney, 2008).

METHOD

Design

An experimental design of between-groups design was used for the four groups in this study.

Participants

Eight (8) undergraduate participants of University of Jos were randomly selected and assigned to problem-solving tasks under the same conditions based on their personality types.

Population

Undergraduate students of the University of Jos were selected based on their personality types using the four personality types of Sanguine, choleric, melancholy, and Phlegmatic.

Measure

Personality types were determined by the Tim LaHaye Test as adopted by the researchers by combining two of the Tim LaHaye Tests. The first was 6 items while the second with 8 items was used for further check to confirm the participants' personality type.

Apparatus

The following problem tasks were given to participants to solve and scores were given. The four—card problem, Duncker's candle problem, Luchin's water—jug problem, speed and accuracy test, and fact inspection and assembly tests (see appendix for details of the problem tasks and Scoring).

Ethical Consideration

The researchers observed ethical consideration of informed consent, anonymity, confidentiality, and debriefing.

Procedure



Participants were informed of the purpose of this study and they were assured of confidentiality, and the right to withdraw from the experiment at any point in time. Personality types was established based on the Tim LaHaye Temperament Test. It took about 65 minutes for each of the participants to participate in this study in turn to solve each of the five problems presented to them and they were scored based on the scoring and the time allowed per tasks.

Data Analysis

Analysis and interpretation were done with a one-way Analysis of Variance (ANOVA).

Results

The results were not significant in the influence of personality on problem-solving skills among the participants, since $F = 0.09$ was less than the F table at 0,05 which was 2.77 for the given degree of freedom.

Discussion

As indicated in this pilot study there was no significant influence of personality on the problem-solving ability of individuals that participated in this study, it was not in accordance with the study which shows the significant difference among clinical patients' personality and their ability to solve complex problems (Kipman, Bartholdy, Weiss, Aichhorn, and Schiepek, 2022), this might be due to several factors such as different settings of the study and the population of the study, the personality theory used and nature of problems that were administered. Also, the study on personality and coping strategy (Yadav, Bhattacharyya, Srivastava, and Salhotra, 2017), shows differences.

Conclusion

In solving problems, it is necessary to look at the situation freely and open-mindedly, viewing the whole, and trying to discover, to realise how the problem and situation are related. Then will thinking lead to the desired solution in harmony with things as they are. Wertheimer's advice for would be productive thinker was to let the whole dominate the parts and never to lose sight of the problem as a whole while devoting attention to details. An individual is to concentrate on the structure of a situation and to get that clearly in view and locate the gap in it which constitutes the problem. In scrutinising details, an individual should ask what role each detail plays in the pattern of the total situation.

In problem-solving, a person puts together various ideas, concepts, and skills in unique and special combinations until he/she finds the answer to a question or problem. There are, then, two aspects to problem solving: (1) The way in which an individual combines idea, and (2) The recognition of the answer when he/she finds it. Psychologists have been most interested in the way in which the various combinations of ideas occur to an individual in problem-solving. Such information made known why some problems are solved rapidly while others are not, it turns out that there are some general principles about the order of an individual person's thoughts and the way in which they combine ideas.

Self-confidence is an important tool in solving problems tactically. A person facing problem(s) is expected to be bold enough to accept the challenge instead of ignoring or rationalising it. Such a person should search for alternative solutions and quickly evaluate the consequences and make a commitment by choosing an alternative that gives maximum benefits at minimum costs, and the person should take action following the decision taken. There is also a need to anticipate



likely difficulties, and likely unintended consequences of the decision and prepare to deal with them.

It becomes mandatory for an individual to get rid of indecision, procrastination, fear of failure, self—limitation, fear of being misunderstood, mental set, and functional fixedness to improve problem-solving ability. A problem solver should always remember this saying while solving a problem. “Reality is not the way you wish things to be, nor the way they appear to be, but the way they actually are” (that is an individual either acknowledges reality and uses it to his/her benefit or it will automatically work against such a person).

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**Appendix I**

Details of the Problem tasks that were solved.

1) The Four—card problem

The Four—card problem contains four cards with D, 3, B, and 7 on each card; each card has a letter on one side and a number on the other and given the rule, “if there is a “D” on one side of any card, there must be a “3” on the other side”, which cards should you turn over to test this rule? Which card should be turned over next? If they choose the “3” as the second card then they are wrong, because turning over the “3” proves nothing, for if the card has some letter other than “D” on the other side, the rule still holds (The rule pertains only to the card with a “D” on one side), thus the correct second choice is the “7” for if it has a “D” on the other side, the rule would be disproved.

Scoring: The four-card problem attracts 1 point if the participants answer the second question correctly.

2) The Duncker’s Candle Problem

Using these materials (Box of matches; Candle; Thumbtacks; Bulletin board) how would you mount the candle on a bulletin board?

Scoring: 4 points for first tryer; 2 points for second tryer; 1 point for third tryer.

Maximum time of 60 seconds (one minute).

3) The Luchin’s water jug problem

Using water jugs “A”; “B”; and “C” with the capacities indicated in the table, how would you measure out the volumes indicated in the right-hand column?

Scoring: 1 point for each of the problems 1 to 5; 2 points for each of the problem 6 to 7.

A time limit of 60 seconds (one minute).

4) The speed and accuracy test

Was adopted from the differential aptitude test (1961).

Scoring: 1 point for each correct answer.

5) The Fact inspection and assembly test

This test was adopted from the inspections and Assembly section of Fact (1953, John C. Flanagan).

Scoring: the first part which was the inspection attracts 1 point for each correct answer. The second part which was the assembly test also attracts 1 point for each correct position.

A time limit of 60 seconds (one minute).

Appendix II

Tim LaHaye Temperament Test

1. Are you an extrovert? If so, you are predominantly sanguine or choleric.

2. If “yes” to 1, ask yourself, “Do I lean toward being a superextrovert?”
That is, are you generally the first to speak? If so, you are a sanguine.

3. If “yes” to 1, ask yourself if you are a good salesman type. If so, you are predominantly sanguine.

4. If “yes” to 1, but “no” to 2 and 3, ask, “Am I a strong natural leader?” If so, you are probably a choleric.

5. If you answered “no” to 1—that is, you are not an extrovert—then ask yourself, “Am I a perfectionist, analytical, and somewhat critical?” If so, you are probably predominantly melancholy.

6. If you answered “no” to 1, ask yourself if you are known by others as “very quiet.” Do you rarely get angry but experience many fears and worries? If so, you are probably phlegmatic.



Further check Temperament Test

To further satisfied with the accuracy of the above test, here are some questions to ask yourself to at least identify your primary temperament.

1. Are you an extrovert or an introvert?
2. Are you a spontaneous quick-talker?
3. Do you have to apologize frequently?
4. Do you have high emotional responses?
5. Are you quiet and slow of speech?
6. Are you a good speller?
7. Do you do well at math and detail?
8. Do you get depressed easily?

If your answer to question 1 is extrovert and you answered yes to 2-4, your primary temperament is probably sanguine. If only one of 2-4, you are probably a choleric temperament.

If you answered 1 that you're an introvert and yes to 6-8, your primary temperament is probably melancholy. But if you said yes to 5 and you do not get depressed very often, your predominant temperament is probably phlegmatic.