



GENERAL PSYCHOLOGY

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COURSE INTRODUCTION

The Course of Introduction to Psychology is one of the courses of First Semester of BA (Honours) Psychology. The attempt of this course is to explain you the meaning and concept of psychology. It also explains the human behavior and their cognitive processes; biological processes and affective processes that make them behave differently.

The first block of this course is **Introduction to psychology** which discusses the origin of the field of psychology and the emergence of psychology as an independent Discipline in the world including India. The second block of this course is- **Perception** which explains the steps and process of perception. It also explains how our perception is influenced by other factors.

The third block of this course is- **Thinking and language** which deals with the process of thinking and concept of creativity. The fourth block of this course is- **Learning and Memory** which will deal with the definition, process, stages and theories of learning and memory. In the last block of **Motivation and Emotion**, you will be introduced with the concept and theories related to motivation and emotion.



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Block 3
Thinking and Language

BLOCK 3 THINKING AND LANGUAGE

Introduction

This block comprises of *single unit*, which discusses two different processes—thinking and language. Thinking is a higher mental process. We use mental images, concepts, and prepositions in the process of thinking. Creativity is a type of thinking which involves creating original and novel ideas. Studies have suggested that people, who are high on divergent thinking, are more creative. The process of creative thinking involves four stages: preparation, incubation, insight, and verification. The unit also tries to explain the concept of problem-solving behaviour. The steps as well as types of barriers to problem-solving will also be discussed in the present unit of the third block. Another psychological process in which thinking plays an essential role is— decision making. Steps involved in decision making and errors of decision making will be discussed in this unit. After this, the focus of the discussion will be language, its nature and component, and then the development of language will be dealt. At the end, the unit explains the relationship between language and thought which will be discussed with an emphasis on Whorfian theory.



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UNIT 5 THINKING AND LANGUAGE*

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5.0 INTRODUCTION

The Tragedy of Titanic: Sinking of the Unsinkable Ship

“Titanic is unsinkable”, everyone believed this claim by its maker. With 882.5 feet length, 92.5 feet width and 175 feet in height, Titanic was considered as the largest ship of its time. When it left Queenstown, Ireland for its maiden voyage on April 11, 1912, with over 2,200 passengers and crew members, everyone considered it as the biggest, powerful, technologically advanced and indestructible ship of all the time.

In spite of all the claims, on April 14, 1912, Titanic broke into two pieces and sunk in the North Atlantic Ocean after hitting an iceberg. The mystery

surrounded sinking of the claimed ‘unsinkable Titanic’, had always been a topic of interest for many. What exactly had caused Titanic to drown? Of many theories, according to one, the reason was ‘overconfidence’ of the captain of Titanic, Captain Edward Smith in the strength of his ship and his expertise in sailing ships. According to historians, this overconfidence led to the wrong decision making in crucial time by Captain Smith.

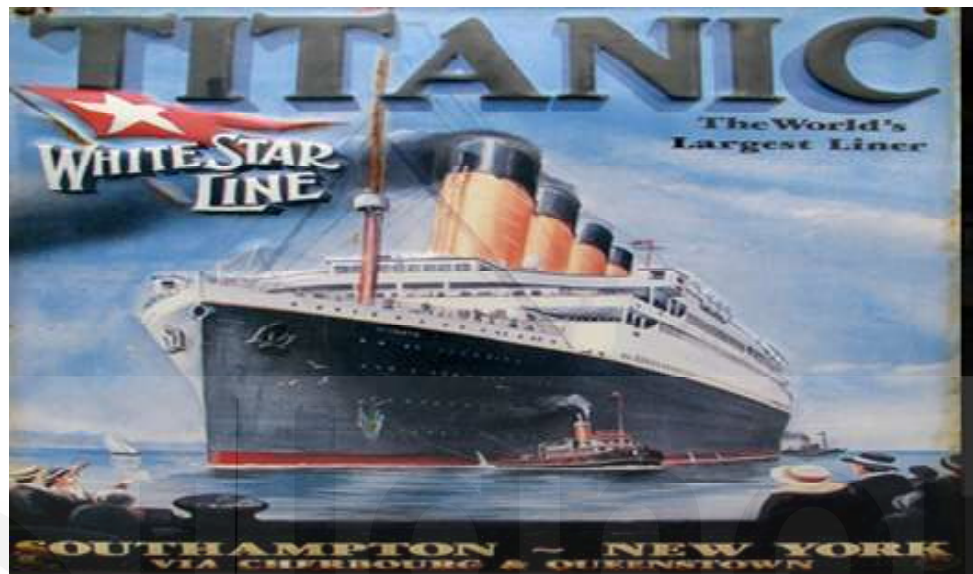


Fig. 5.1: A rare poster advertising Titanic

Source: Retrieved from <https://wonderopolis.org>

What do you think, why this event has been discussed here? Because it highlights the irony of our cognitive abilities. On one hand, our cognitive abilities have extensive capabilities. While, on the other hand, it hinders our effective decision making. The case of Titanic has been discussed to highlight one such incident of incorrect decision due to cognitive error. Decision making is a higher mental process which consists of other cognitive processes like thinking and language. This unit starts with a discussion on thinking followed by creative thinking, problem-solving and decision-making process. Then, we will move to understand the topic of language, and lastly, we will discuss how language and thinking are related to each other.

5.1 OBJECTIVES

After reading this Unit, you will be able to:

- Understand the concept and types of thinking;
- Comprehend the different processes involved in thinking namely, mental imagery, concepts, and propositions;
- Get an exposure to steps involved in generating creative ideas;
- Have an in-depth understanding of the process of problem-solving and various barriers involved in effective problem-solving behaviour;
- Understand the nature of decision making and its process;
- Learn the different types of cognitive errors we make in decision making;

- Discuss the concept and nature of language;
- Understand the process of language development; and
- Learn the debate over the relationship between language and thought.

5.2 THINKING: CONCEPT AND TYPES

Thinking is a higher mental process. In the literature it has been defined primarily in two ways; one category of definition consider thinking as a problem-solving activity. While the other class of definition considers it as a mechanism of an internal representation of the external world. According to Garrett (1968), “Thinking is a behaviour which is often implicit and hidden and in which symbols (images, ideas, and concepts) are ordinarily employed.” Gilmer (1970) has defined thinking as a “problem-solving process in which we use ideas or symbols in lace of overt activity.” Thus, thinking is a goal-directed behaviour. That is, it occurs in some context only and does not occur randomly. From choosing a dress to wear to solving a mathematical problem, all activities involve thinking.

Thinking can be categorized into various forms. Some of the most common types of thinking are as follows:

- 1) *Perceptual or Concrete Thinking*: It is the simplest form of thinking, carried out for the perception of a concrete object. If you are asked to write four sentences on ‘your favourite book,’ then the thinking you will be using is perceptual thinking.
- 2) *Conceptual or Abstract Thinking*: Superior to perceptual thinking. It involves using concepts, symbols or language to solve a problem.
- 3) *Reflective Thinking*: It is an insight based thinking which uses previous experiences to solve a problem.
- 4) *Creative Thinking*: Thinking involved in creating new and novel ideas or objects. It involves rearranging the existing stimuli to create something new.
- 5) *Critical Thinking*: This type of thinking involves in making the reasoned judgment and examining assumptions.

5.3 THE PROCESS OF THINKING: MENTAL IMAGERY, CONCEPTS, AND PROPOSITIONS

We think either in words or mental images. The thought we “hear” in our mind in the form of statements or words is known as **propositional thought**. Sentences such as “one should not waste water” or “black is a beautiful colour” are proposing or claiming something. Therefore, it is called as propositional thought. Another mode of thinking is **visual thought** or **imaginal thought**. It is the type of thought that we “see” in our mind. These (**propositional thought and imaginal thought**) are the two primary modes of thinking.

To understand imaginal thought, first, we need to understand “mental images” and to understand propositional thought, we need to understand “concept.”

5.3.1 Pictures in Your Mind: Mental Imagery

Suppose, you were told by your friend that he saw a beautiful yellow bird with colourless beak in his garden. If you were paying enough attention to his description, you might form a visual image of that bird. The visual image of the bird that you formed is known as ‘mental image’ or ‘mental imagery’, it is a mental representation of stimuli that are not presently perceived by the senses (Moulton & Kosslyn, 2009).

5.3.2 Concept

“A concept represents an entire class; it is the set of properties that we associate with a particular class” (Atkinson & Hilgard, 2009, pp. 332). Our concept of a ‘car’, for example, includes the properties of having four wheels, petrol engine, steering, and seats. Concepts help us in reducing the mental complexity of our world by **categorising** it into manageable information. Further, it helps us in developing **prototypes** of the concepts. A prototype is the typical example of the concept or a set of characteristics representing the best example of the concept. For example, for the concept of ‘car,’ our prototype might include properties like having four wheels and a petrol engine. We compare a target object with the prototype and decide by similarity whether the target object belongs to the category or not.

5.3.3 Propositions

Many researchers proposed that thinking can not be limited to images or words only, but it is also abstract. A propositional theory was given by some researchers to support this view. A proposition is a form of mental representation but neither in the form of words or nor in the images. It refers to the underlying meaning of the relationship among concepts. In simpler words, it is the smallest statement which can be judged as true or false. For example, ‘trees are green’. This statement represents the smallest proposition coded with two arguments (are, trees, green).

Thinking is not a passive act; we keep relating one concept to another to understand our world in a better way. According to propositional theory, also called as conceptual-propositional theory, we not only think regarding words or images only but also concerning meanings. Thus we represent our world in the form of meanings by relating concepts together. “We may experience our mental representations as images, but these images are *epiphenomena*—secondary and derivative phenomena that occur as a result of other more basic cognitive processes. According to propositional theory, our mental representations (sometimes called “mentalese”) more closely resemble the abstract form of a proposition” (Sternberg, 2012, pp. 281).

5.4 CONCEPT OF CREATIVITY

The act of creating an original and novel idea or object is known as creativity. One needs not to be a scientist or artist to become creative. It can also be found in all types of day to day activities like cooking, teaching, helping other, acting etc. According to Guilford, two types of thinking are involved in problem-solving behaviour namely, convergent thinking and divergent thinking. Problems which have only one correct solution are known as convergent thinking. Whereas, when

a problem has more than one correct solution then it uses divergent thinking. Now, answer the following questions:

- When did India get independence?
- What are the different uses of a paper clip?

The first question involves convergent thinking while the second involves divergent thinking. According to Guilford, divergent thinking is responsible for creativity. Studies have also suggested that people who are higher on divergent thinking are more creative than others.

5.4.1 Stages of Creative Thinking

Wallas's (1926) proposed a classification of stages involved in creativity. He proposed that creativity involve four stages, as described below:

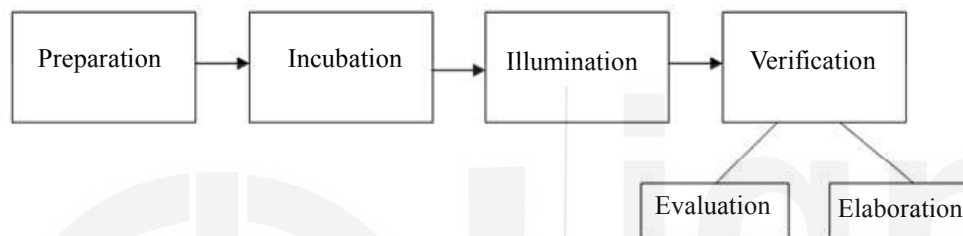


Fig.5.2: Stages of Creativity

Source: <http://www.docente.unicas.it>

Stage I: Preparation

This is the stage of collecting raw material about the problem at hand. One needs to familiarize oneself with the previous work, gaps, and problems of previous solutions in order to understand the task at hand. This process motivates to work more on the problem. In this stage, divergent thinking plays an important role.

Stage II: Incubation

During the process of finding the solution, the person may feel stuck as he is not able to come up with the solution. During this stage, the person is not thinking about the problem consciously, but his mental processes are involved in finding a solution unconsciously. Studies show that many creative ideas come during the incubation stage when the person is in an idle state and not working actively on the problem.

Stage III: Illumination

It is the stage of 'Aha' or 'Eureka' moment. This experience is the result of an immediate solution or insight into the problem at hand. The famous story of 'Archimedes and golden crown' revolves around this illumination stage, where s/he suddenly understands a previously unsolved puzzle.

Stage IV: Verification: Evaluation and Elaboration

During this last stage, the worth or value of the insight is judged by the person. It is a fully conscious stage, in which the person evaluates the worth of the solution he comes across during the illumination stage. The creator banks on his existing

knowledge to verify the arrived solution. Studies on creativity have suggested that it is not necessary that the creative insights will always be appealing in reality, sometimes it may turn out to be bad ideas.

5.5 PROBLEM SOLVING: A CONCEPT

Let's start this section with famous "The two string problem" by Maier (1931).



Fig.5.3: The two String Problem

Source: Sternberg (2012)

"Imagine that you are the person standing in the middle of this room, in which two strings are hanging down from the ceiling. Your goal is to tie together the two strings, but neither string is long enough so that you can reach out and grab the other string while holding either of the two strings. You have available a few clean paintbrushes, a can of paint, and a heavy canvas tarpaulin. How will you tie the two strings together?" (Sternberg, 2012, pp.444).

How can you solve this problem? What steps do you follow to solve it? In general, how do we solve any problem faced by us? In the first place, what is a problem? In this section, we will answer these questions and discuss other related psychological factors.

A problem is a barrier or hindrance towards your goal. Therefore, problem-solving can be defined as behaviour of overcoming these hindrances to achieve your goal. A typical problem-solving process follows seven steps:

- 1) *Problem identification:* It is a pre-condition for the problem-solving process. A problem can be solved only when it is identified as a problem.
- 2) *Problem definition:* In this stage, a problem's nature, meaning, and scope are identified.
- 3) *Strategy formulation:* Stage involved in exploring the ways to tackle/overcome the problem i.e., generating possible solutions.

- 4) *Organization of information*: Collecting and organizing all the information about the problem and its proposed solution. According to Sternberg (2012), this stage involves “How do the various pieces of information in the problem fit together?”(pp.445)
- 5) *Allocation of resources*: After deciding which strategy is appropriate and how to follow the selected strategy, in this stage, a decision is taken regarding allocating resources (time, money, effort, etc.) appropriately in solving the problem. That is deciding, how to go about solving the problem?
- 6) *Monitoring*: To solve a problem successfully, this stage requires a person to continuously cross-check or scrutiny the path he/she had chosen.
- 7) *Evaluation*: In this last stage of the problem-solving process, judgment about the success or failure of the attempt to solve the problem is made.

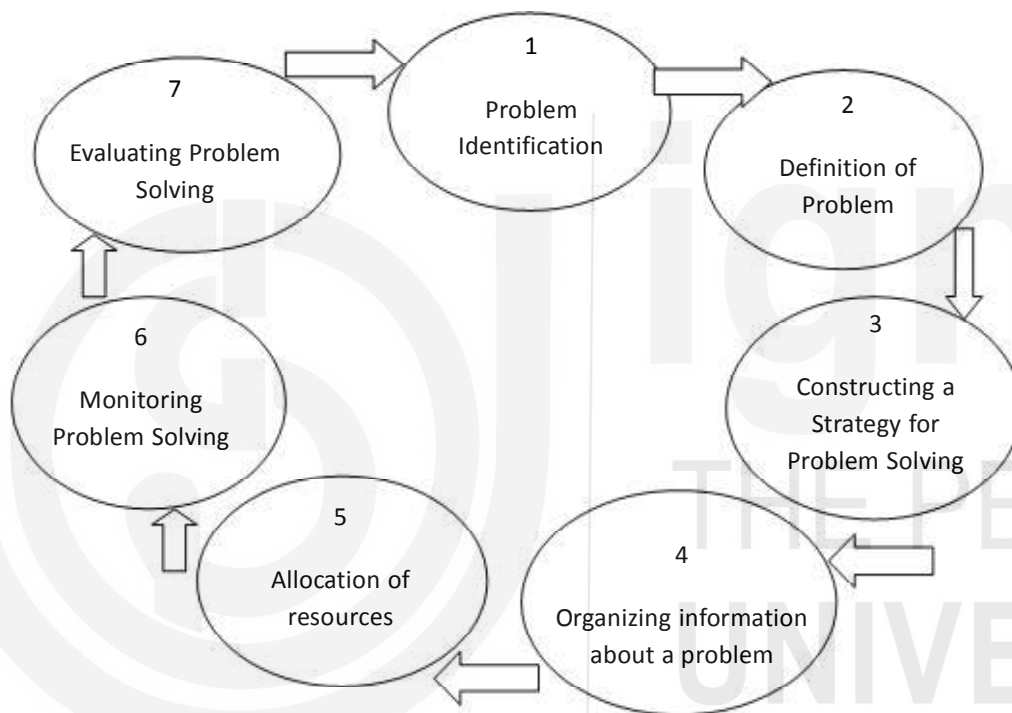


Fig.5.4: Problem Solving Cycle

5.5.1 Barriers to Problem Solving

The process of problem-solving requires overcoming obstacles effectively to achieve a goal. However, sometimes this goal attaining behaviour is hampered by some obstacles. In this section, we will talk about those factors that hinder our problem-solving ability.

- *Mental Set/Perceptual Set*: Our tendency to overuse an already tried mental strategy in solving a problem is called a mental set. Our previous successful experience with that particular strategy makes us biased to prefer it every time. Thus, when we face up with a new problem, we stick to already tried and tested technique. The mental set is also known as ‘set effect’.

Now, try to solve the following famous ‘the nine-dot problem’. Without lifting your pen you have to join these nine dots using only three or four straight lines.

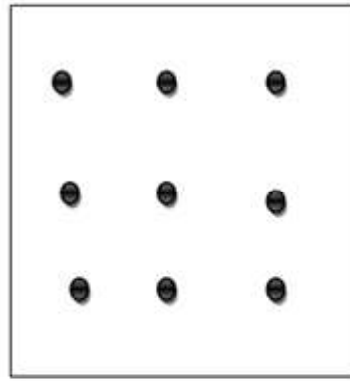


Fig.5.5: Nine dot problem

Functional Fixedness: Our tendency to see objects in the light of its usual or typical function only. Thus, posing difficulty in solving those problems which require the novel use of the objects. If you were not able to solve the Maier's two string problem, discussed in the previous section, then you can attribute your inability to functional fixedness.

Using Incomplete Representation: How do you process initial information regarding problem also influences your chances to solve a problem successfully. An incorrect interpretation would lead to incorrect representation, which in turn lead to the false solution.

Lack of Expertise or Intellect: It means whether you pose the intellectual ability to solve the given problem or not? If you have sufficient expertise only, then you will be able to solve it. What do you think, if you give a problem of algebra to a student of the first standard, will he be able to solve it? No, because he does not pose sufficient intellect or expertise to solve it.

Lack of Motivation: Even though you possess all the ability to solve a problem, but lack of motivation can hinder your chances to solve it effectively. Therefore, it is necessary to maintain your motivational level even after facing failure in the initial trials.

Emotional Block: Your ability to solve a problem effectively can severely get hampered by your emotional state. Suppose, if you have stage phobia then there is a high probability that you will not be able to solve a mathematical problem on your classroom blackboard effectively. Because stage phobia leads to stress and anxiety and these emotions will hamper your performance.

Self Assessment Questions (SAQ-I)

State whether the following are 'True' or 'False':

- 1) Thinking is not a higher mental process.....
- 2) Functional Fixedness refers to our tendency to see objects in the light of its usual or typical function only.....
- 3) A problem is a barrier or hindrance towards your goal.....
- 4) A concept is the set of properties that we associate with a particular class.
.....
- 5) Critical thinking is an insight based thinking which uses previous experiences to solve a problem.

5.6 DECISION MAKING: CHOOSING AMONG ALTERNATIVES

In our day to day life, from choosing what to wear for the party to what novel to read, we have to make priorities and choose among alternatives. The cognitive process that you use to evaluate alternatives and make a choice is known as **decision making**. Thus, we can say that decision making is a type of problem-solving behaviour where you are already aware of all the possible solutions and have to choose between them.

5.6.1 Decision Making Process

What steps typically we follow, when we make a decision? According to psychologists our decision-making process involves the following six steps:

- **Identifying the Problem:** In order to make a decision, first you need to have a problem. So, at this stage, a problem is first identified for which decision have to be made. (For example: What shall I wear at my friend's marriage ceremony?)
- **Generating Alternatives:** After identifying the problem, all possible alternatives are generated. (Either *Saari*, *salwar-suit*, or *lehanga*?)
- **Evaluating Alternatives:** We evaluate all the generated alternatives with reference to its costs and benefits. (Today's weather is little chilly than other days. Even I am also not feeling well. If I wear *salwar-suit* that would be best for me as it could protect me more from cold waves better than *lehanga* or *Saari*.)
- **Choosing an Alternative:** In this stage, the best possible alternative is selected. (*Salwaar-suit*)
- **Implementing the Decision:** This is an action taking the stage, where you implement your selected alternative. (Iron clothes and get dressed.)
- **Evaluating Decision Effectiveness:** In this last stage, you evaluate your decision and modify it according to requirement. (Look in the mirror, decide it looks good but might need to change sandals.)

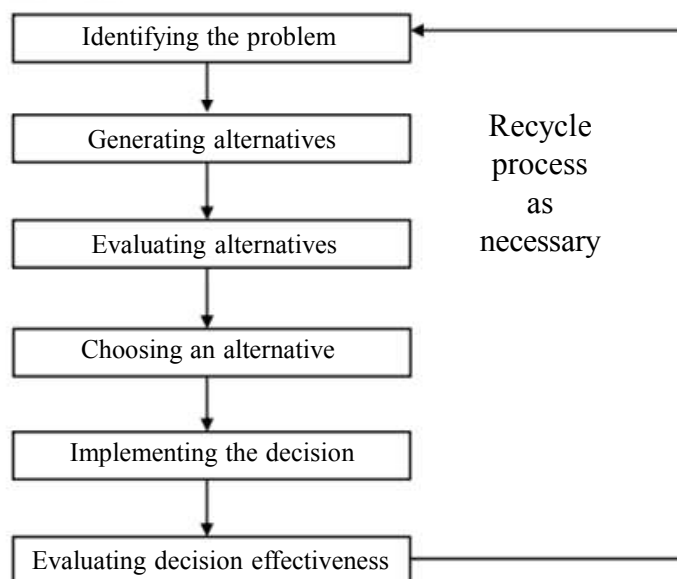


Fig.5.6: Decision-making process

Source: Lunenburg (2010)

5.6.2 Cognitive Errors in Decision Making

As discussed in the previous unit on “Perception,” our brain receives countless information from the environment every single second, leading to tremendous cognitive load on mental processes. Studies have suggested that in order to manage this cognitive load we unconsciously use some mental formulas. On the one hand, these mental formulas help us making the decision quick whereas, on the other hand, it also leads to the incorrect conclusion, i.e., cognitive error. The following read will help you understand the factors responsible for the incorrect decision. Broadly, there are two sources of cognitive errors: heuristics and biases.

5.6.2.1 Heuristics

It is a mental shortcut that helps us in taking a decision quickly by decreasing cognitive load. Even though these heuristics are very helpful in making an everyday decision but, it is always not a flawless process. Sometimes, it leads to an incorrect decision. Following are some major types of heuristics/ mental shortcuts:

- 1) *Representative Heuristic*: We use this mental shortcut when we have to make a judgment about probability. It helps us in deciding whether a stimulus belongs to a particular category or not based on the degree of similarity in their characteristics.
- 2) *Availability Heuristic*: The availability heuristic suggests that the ease with which an instance can be recalled or available to our mind is considered as more prevalent. Thus, this heuristic judges the importance of an event based on its frequency of availability to our mind.
- 3) *Framing Effects*: Our tendency to interpret the same message differently depending upon how it has been presented or framed.
- 4) *Anchoring and Adjusting Heuristic*: According to this heuristic, to take a decision we start with a reference point which acts like an anchor-and then we evaluate and adjust our decision with new information.

5.6.2.2 Biases

In this section, we will discuss some common biases that frequently occur while making decisions:

- 1) *Illusory correlation*: In statistics, correlation implies that two variables have a statistically significant relationship. Thus, illusory correlation refers to the situation in which we unrealistically consider a significant relationship between two variables. For instance, judging someone from prevalent stereotypes.
- 2) *Overconfidence*: Decision makers have a tendency to overestimate their skills and ability, thus leading to poor judgment. Why, we tend to be overconfident in our decision? Because we tend to ignore our previous actual performance and do not want to be judged as wrong.
- 3) *Hindsight Bias*: Also known as “knew-it-all-along” effect, hindsight bias occurs when retrospectively thinking about a problem situation people claim

that they knew beforehand about the outcome of the problem situation in the past.

- 4) *Confirmation Bias*: “This is the tendency to search only for information that will confirm one’s initial hunch or hypothesis, and to overlook or ignore other information” (Galotti, 2015).

5.7 CONCEPT, NATURE, AND SCOPE OF LANGUAGE

Man is an animal but different from other species of animal. So, what sets man apart from others? It is an ability to communicate information using **language** – which refers to a complicated set of symbols, sounds, gestures and rules of combining them to communicate one’s views to others. Language is expressed through gestures, speech, and writing.

According to psycholinguists, a language consists of the following components:

- 1) **Phoneme**: It is the smallest or basic unit of spoken language. The word “pen” has three phonemes viz. ‘p,’ ‘e’ and, ‘n’.
- 2) **Morpheme**: Morpheme is the smallest unit of meaning. Phonemes are combined to make morpheme, such as the word “remake”, consists of two words “re-” and “make”.
- 3) **Semantics**: It refers to the set of rules by which we understand the meaning of words and sentence. For example, adding “-ed” at the end of the word refers to past tense.
- 4) **Syntax**: These are the grammatical rules which explain how different words can be combined to make a meaningful sentence.
- 5) **Pragmatics**: The societal rules related to language. How one should talk to older adults, what one can say in public or private, are some of the examples of pragmatics.

5.7.1 Development of Language

Language development is an essential aspect of cognitive development. Studies have suggested that individual differences among children can be found in language development. Some children acquire language more rapidly than others. Nevertheless, by the age of 5, the language of most children starts resembling to an adult’s speech. In the following section, we will learn how we acquire a language. First, we will discuss language development in infants then language development in the context of children will be discussed.

5.7.1.1 Language in Infants

- *Speech perception in Infancy*

Language acquisition stage begins with the ability to distinguish between the smallest sound units, i.e., phonemes, of their language. Studies have suggested that infants are very efficient not only in recognising phonemes but also in recognising differences among different phonemes.

- ***Language Comprehension in Infancy***

Can infants understand the language? To answer this many studies have been done suggesting, infants between the age of four to five months can turn their heads to the location from where their name is spoken, suggesting they can recognize their name. Further, they can understand “the correspondence between a speaker’s facial expression and emotional tone of the speaker’s voice” (Matlin, 2009, pp. 479). Children start to understand their name, usually by about six months, followed by commonly used words like “bottle,” “mama,” and “doggie” by 10 to 12 months (Mandel, Jusczyk, & Pisoni, 1995).

- ***Language Production in Infancy***

Language production in infants follows a series of a stage. The intentional vocalization begins by the age of two months with **cooing** noises, it is a one vowel sound (e.g., oo). By the time infant reaches the age of six to eight months, infants start doing babbling, “a vocalization that uses both consonants and vowels, often repeating sounds in a series such as dadada” (Matlin, 2009, pp. 480). Further, infants use different type of gestures to communicate with adults. Infants shake their head “no” around 6–9 months, and they respond to verbal requests to do things like “wave bye-bye” or “blow a kiss” around 9–12 months.

5.7.1.2 Language in Children

According to the various studies, most of the infants start speaking their first word when they become one year old. In this section, will discuss the characteristics of the initial words spoken by infants and children, followed by grammatical rules children use and lastly, we will learn how children learn pragmatics, i.e., social rules of language.

- ***Words***

One of the first words that children speak is related to objects, people or sometimes to their activities. By the age of one-year in the children can speak between 12 to 52 words, depending on his/her developmental speed. A child of 12 or 13 months will frequently use partial words to express their thoughts such as “ter” for “water” or “flo” in place of “flower”. These partial words are expressing an idea, which is known as Holophrase speech.

Once a child learns a word, s/he overuses it in expressing all other objects along with the original reference. This is known as **Overextension**. Opposite to this phenomenon, children show under extension, where a learned word is underused. For instance, if a child has learned that the German shepherd of his house is a doggie, then all other breeds of dogs cannot be called as doggie.

- ***Morphology***

After learning words, children soon start learning about using morphemes such as –ed, -ing, -s etc. An English speaking child acquires knowledge of using morphemes appropriately between the age of one-and-half and three-and-half years. Studies have suggested that they first learn using –ing followed by –s and then learn to use –ed.

- **Syntax**

Between the ages of 18 to 24 months, often children begin to combine words. A topic of interest for psychologists has always been the development of **syntax**, i.e., rules of grammar, among children. By the end of the second birthday, children start combining two words to convey their message. For instance, “Mummy apple” may refer to “Mummy I want to eat an apple”. These kinds of speech are known as “**Telegraphic speech**”, in this kind of speech words serving grammatical functions are omitted, and the message is expressed only using two or three words. Further, during the age between one and two years, children talk to themselves loudly when they are alone. This kind of speech is known as “**Crib speech**”, it is produced by children to refine their linguistic skills.

- **Pragmatics**

Pragmatics refers to the social rules of language. As language is a social tool of interaction, it has some underlying rules, such as, how to behave as a listener, what one should say in a particular situation, and how to coordinate in a conversation are some examples of pragmatics. Studies have suggested that in comparison to adults, children take more time in turn-taking because of their inability to recognize the completion of a remark. With maturity, children learn to use the phrase “and then” to signal their listeners that they wish to continue their speech. Children also learn to adapt their language according to the listener, i.e., if the listener of a six-year-old child is his peer, then the language used by him would be different from the language used for a two-year-old listener.

5.7.2 Relation between Language and Thought



Fig.5.7: Girls of Hopi Tribe

Source: <https://in.pinterest.com>

Whether our language control thought or thought to control our language? This has always been a question of debates among psychologists and linguistics since many decades. According to **linguistic relativity hypothesis** or **Whorfian theory**, our language shapes our thought. Whorf (1956), proposed that the available words of the language influences our thinking; therefore people with different languages

may think differently. For example, the Hopi tribe of America do not have any past tense in their language. So according to Whorf, they rarely think of the past.

The opposing view on this debate is that our thoughts determine our language. This debate still has not been resolved successfully. However, recently a modified version of Whorfian theory has been proposed. According to some researchers, our language does not determine all aspects of our thinking. It only influences the way people think about the relationship between objects (Hunt & Agnoli, 1991; Lucy, 1992).

Self Assessment Questions (SAQ II)

Fill in the following Blanks:

- 1) The cognitive process that is used to evaluate alternatives and make a choice is known as
- 2) In order to make a decision, first you need to have a
- 3) According to theory, our language shapes our thought.
- 4) After learning words, children soon start learning about using
- 5) Language development is an essential aspect ofdevelopment.

5.8 LET US SUM UP

It can be summed up from the following discussions that, thinking is a higher mental process. We use mental images, concepts, and prepositions in the process of thinking. Creativity is a type of thinking which involves creating original and novel ideas. Studies have suggested that people, who are high on divergent thinking, are more creative. The process of creative thinking involves four stages: preparation, incubation, insight, and verification. We also understood the concept of problem-solving behaviour is a process by which we overcome barriers towards our goal. The steps as well as types of barriers to problem-solving were also discussed. Another psychological process in which thinking plays an essential role is- decision making. Steps involved in decision making and errors of decision making was also discussed in this unit. After this, the focus of our discussion was language. First, we discussed the nature and component of the language and then the development of language was discussed. Lastly, the relationship between language and thought was discussed with an emphasis on Whorfian theory.

5.9 UNIT END QUESTIONS

- 1) Define thinking and describe any three forms of thinking.
- 2) Discuss the role of mental imagery, concept, and proposition in the process of thinking briefly.
- 3) What do you understand by creativity? Discuss how divergent and convergent thinking plays important roles in creativity.
- 4) What do you mean by 'mental set'? Critically discuss its role in the process of problem-solving.
- 5) What role do heuristics play in problem-solving?

- 6) Heuristics and biases are the two sources of cognitive error. Explain how?
- 7) Write a note on language development.
- 8) What is the linguistic relativity hypothesis?

5.10 GLOSSARY

Thinking	: A higher mental process done with the help of symbols of one's language.
Problem Solving	: A behavioral attempt to overcome the hurdle towards achieving a goal.
Decision Making	: A type of problem-solving behaviour, in which we have to choose among available options.
Mental Set	: Our tendency to use a previous successfully used solution in other situations also.
Language	: It is a set of symbols, which are combined using some grammatical rules, to communicate information.
Functional Fixedness	: Our tendency to see objects in the light of its usual or typical function only. Thus, posing difficulty in solving those problems which require the novel use of the objects.
Framing Effects	: Our tendency to interpret the same message differently depending upon how it has been presented or framed.
Concept	: A concept represents an entire class; it is the set of properties that we associate with a particular class.

5.11 ANSWERS TO SELF ASSESSMENT QUESTIONS

SAQ-I

- 1) False
- 2) True
- 3) True
- 4) True
- 5) False

SAQ-II

- 1) decision making
- 2) problem
- 3) linguistic relativity hypothesis or Whorfian
- 4) morphemes
- 5) cognitive

5.12 REFERENCES AND SUGGESTED READINGS

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Solution to Nine-dot problem (asked in section 1.5.1)

As you can see, this problem can be solved by following two ways.