PG 3RD SEM : HC7

HYPOTHESIS

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MEANING

- George A. Lundberg :- “A hypothesis is a tentative generalisation, the validity of which remains to be tested. In its most elementary stage the hypothesis may be any hunch, guess, imaginative idea, which becomes the basis for action or investigation”
- Goode and Hatt :- A hypothesis is “a proposition which can be put to test to determine validity”“A hypothesis is therefore a tentative supposition which is put to test to determine validity”.

  A **hypothesis** is a formal tentative statement of the expected relationship between two or more variables under **study**. A **hypothesis** helps to translate the **research** problem and objective into a clear explanation or prediction of the expected results or outcomes of the **study.**

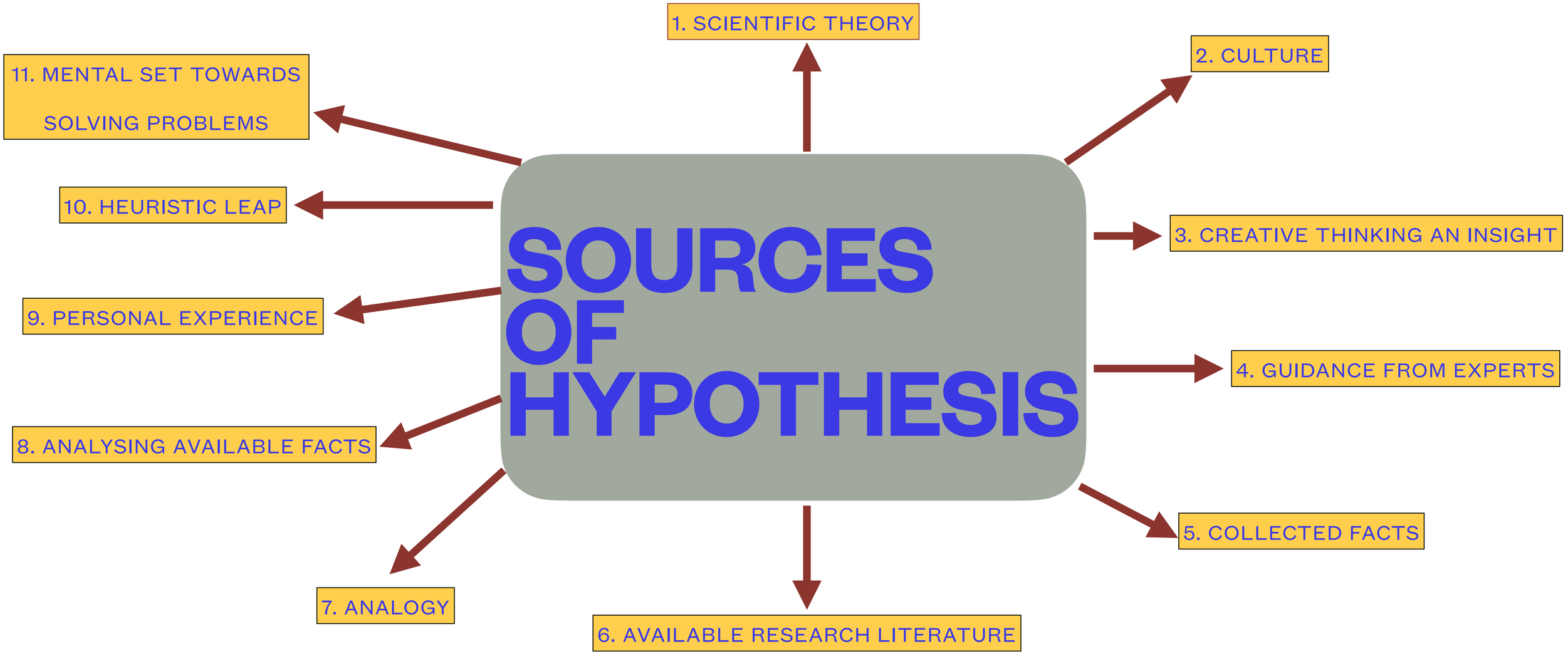
CHARACTERISTICS

CHARACTERISTICS OF A WORKABLE HYPOTHESIS :

- Hypothesis should be clear and precise.
- It should be capable of being tested.
- It should state relationship between variables (Relational Hypothesis) It should be limited in scope and must be specific.
- It should be stated in most simple terms.
- It must be consistent with known facts.
- It should be amenable to testing within a reasonable time.

SOURCES OF HYPOTHESIS

- GOODE AND HATT have given the following sources of hypothesis :
- (1) General Culture - Culture helps to formulate hypothesis and also guide its trend. Culture has a great influence on thinking process and hypothesis may be formed to test one or more of these ideas.
- (2)Scientific Theory - Theories help us to form further generalisations or corollaries from it, which form a part of hypothesis.
- (3)Analogies - Sometimes a similarity between two phenomena is observed and a hypothesis is formed.
- (4)Personal Experience - Sometimes personal experience helps us in formulating a hypothesis. Experiences through critical observation may serve as the basis of ahypothesis. For example Issac Newton could strike the idea of force of gravitation as he keenly observed the falling of an apple.


SOURCES OF HYPOTHESIS
1. SCIENTIFIC THEORY
2. CULTURE
3. CREATIVE THINKING AN INSIGHT
4. GUIDANCE FROM EXPERTS
5. COLLECTED FACTS
6. AVAILABLE RESEARCH LITERATURE
7. ANALOGY
8. ANALYSING AVAILABLE FACTS
9. PERSONAL EXPERIENCE
10. HEURISTIC LEAP
11. MENTAL SET TOWARDS SOLVING PROBLEMS

TYPES OF HYPOTHESIS

Simple Hypothesis

It shows a relationship between one dependent variable and a single independent variable. For example – If you eat more vegetables, you will lose weight faster. Here, eating more vegetables is an independent variable, while losing weight is the dependent variable. Some other examples are - Smoking leads to cancer. The higher ratio of unemployment leads to cancer.

Complex Hypothesis

It shows the relationship between two or more dependent variables and two or more independent variables. Here dependent and independent variables are more than two. Some ex are - Eating more vegetables and fruits leads to weight loss, glowing skin, reduces the risk of many diseases such as heart disease, high blood pressure, and some cancers. Smoking and other drugs leads to cancer, tension and chest infections etc. The higher the ratio of unemployment, poverty, and illiteracy, the higher is the occurrence of crimes like dacoity and robbery.

Directional Hypothesis

It shows how a researcher is intellectual and committed to a particular outcome. The relationship between the variables can also predict its nature. For example- children aged four years eating proper food over a five year period are having higher IQ level than children not having a proper meal. This shows the effect and the direction of effect.Ex- There is positive relationship between years of teaching experience and job satisfaction among teachers.

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Non-directional Hypothesis

It is used when there is no theory involved. It is a statement that a relationship exists between two variables, without predicting the exact nature (direction) of the relationship. Ex- There is relationship between years of teaching experience and job satisfaction among teachers.

Null Hypothesis

It provides the statement which is contrary to hypothesis. It's a negative statement, and there is no relationship between independent and dependent variable. The symbol is denoted by "HO". For example, 'There is no difference in the academic **performance of high school students who participate in extracurricular activities and those who do not participate in such activities' is a null hypothesis**

Associative and Causal Hypothesis

Associative hypothesis occurs, When there is a change in one variable resulting a change in the other variable. Whereas, Causal hypothesis propose a cause and effect interaction between two or more variables.

FUNCTIONS/ROLES

First, it is an operating tool of theory. It can be deduced from other hypotheses and theories. If it is correctly drawn and scientifically formulated, it enables the researcher to proceed on correct line of study. Due to this progress, the investigator becomes capable of drawing proper conclusions.

In the words of **Goode and Hatt,** “without hypothesis the research is unfocussed, a random empirical wandering. The results cannot be studied as facts with clear meaning. Hypothesis is a necessary link between theory and investigation which leads to discovery and addition to knowledge.

Secondly, the hypothesis acts as a pointer to enquiry. Scientific research has to proceed in certain definite lines and through hypothesis the researcher becomes capable of knowing specifically what he has to find out by determining the direction provided by the hypothesis. Hypotheses acts like a pole star or a compass to a sailor with the help of which he is able to head in the proper direction.

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Thirdly, the hypothesis enables us to select relevant and pertinent facts and makes our task easier. Once, the direction and points are identified, the researcher is in a position to eliminate the irrelevant facts and concentrate only on the relevant facts. Highlighting the role of hypothesis in providing pertinent facts, P.V. Young has stated, “The use of hypothesis prevents a blind research and indiscriminate gathering of masses of data which may later prove irrelevant to the problem under study”.
For example, if the researcher is interested in examining the relationship between broken home and juvenile delinquency, he can easily proceed in the proper direction and collect pertinent information succeeded only when he has succeed in formulating a useful hypothesis.

Fourthly, the hypothesis provides guidance by way of providing the direction, pointing to enquiry, enabling to select pertinent facts and helping to draw specific conclusions. It saves the researcher from the botheration of ‘trial and error’ which causes loss of money, energy and time.

Finally, the hypothesis plays a significant role in facilitating advancement of knowledge beyond one’s value and opinions. In real terms, the science is incomplete without hypotheses.

FORMULATION OF HYPOTHESIS

How to Develop a Good Research Hypothesis

A hypothesis is a statement that introduces a research question and proposes an expected result. It is an integral part of the scientific method that forms the basis of scientific experiments. Therefore, you need to be careful and thorough when building your hypothesis. A minor flaw in the construction of your hypothesis could have an adverse effect on your experiment.

More importantly, you need to build a robust testable hypothesis for your scientific experiments. A testable hypothesis is a hypothesis that can be proved or disproved as a result of experimentation.

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Importance of a Testable Hypothesis

To devise and perform an experiment using the scientific method, you need to make sure that your hypothesis is testable. To be considered testable, some essential criteria must be met:

1. There must be a possibility to prove that the hypothesis is true.
2. There must be a possibility to prove that the hypothesis is false.
3. The results of the hypothesis must be reproducible.

Without these criteria, the hypothesis and the results will be vague. As a result, the experiment will not prove or disprove anything significant.

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How to Formulate an Effective Hypothesis :

A testable hypothesis is not a simple statement. It is an intricate statement that needs to offer a clear introduction to a scientific experiment, its intentions, and the possible outcomes. However, there are some important things to consider when building a compelling hypothesis.

- State the problem that you are trying to solve. (Make sure that the hypothesis clearly defines the topic and the focus of the experiment)
- Try to write the hypothesis as an if-then statement. (Follow this template: If a specific action is taken, then a certain outcome is expected)
- Define the variables. (In scientific experiments, a hypothesis proposes and examines the relationship between an independent variable and a dependent variable. The effect on the dependent variable (the idea being tested) depends on or is determined by what happens when you change the independent variable (the factor being changed). For example, let us take a look at this hypothesis:

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- The greater number of coal plants in a region (independent variable) increases water pollution (dependent variable). If you change the independent variable (building more coal factories), it will change the dependent variable (amount of water pollution).

- Developing a strong testable hypothesis has few advantages, it compels us to think intensely and specifically about the outcomes of a study. It enables us to understand the implication of the question and the different variables involved in the study. It helps us to make precise predictions based on prior research. Hence, forming a hypothesis would be of great value to the research.

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Using a checklist can help you make sure your experiment is on solid footing.

Here are some important questions to ask:

1. Is the language clear and focused?
2. Does the hypothesis introduce the research topic?
3. Does the hypothesis include both an independent and dependent variable? Are they easy to identify?
4. Can the hypothesis be tested through experimentation?
5. Does the hypothesis explain what you expect to happen during your experiment?