SOS POLITICAL SCIENCE & PUBLIC ADMINISTRATION
M.A POLITICAL SCIENCE IV SEM
RESARCH METHODOLOGY (403)
UNIT-III

TOPIC NAME-CONCEPT OF HYPOTHESIS

WHAT IS A HYPOTHESIS IN RESEARCH?

- A hypothesis is a tentative statement about the <u>relationship between two or more</u> <u>variables</u>. It is a specific, testable prediction about what you expect to happen in a study. For example, a study designed to look at the relationship between sleep deprivation and test performance might have a hypothesis that states, "This study is designed to assess the hypothesis that sleep-deprived people will perform worse on a test than individuals who are not sleep-deprived."

HOW IS A HYPOTHESIS USED IN THE SCIENTIFIC METHOD?

- In the scientific method, whether it involves research in psychology, biology, or some other area, a hypothesis represents what the researchers think will happen in an experiment.

- The scientific method involves the following steps:

- Forming a question

- Performing background research

- Creating a hypothesis

- Designing an experiment

- Collecting data

- Analyzing the results

- Drawing conclusions

- Communicating the results

- The hypothesis is what the researchers predict the relationship between two or more variables, but it involves more than a guess. Most of the time, the hypothesis begins with a question which is then explored through background research. It is only at this point that researchers begin to develop a testable hypothesis.

- In a study exploring the effects of a particular drug, the hypothesis might be that researchers expect the drug to have some type of effect on the symptoms of a specific illness. In psychology, the hypothesis might focus on how a certain aspect of the environment might influence a particular behavior.

- Unless you are creating a study that is exploratory in nature, your hypothesis should always explain what you *expect* to happen during the course of your experiment or research.

- Remember, a hypothesis does not have to be correct.[1] While the hypothesis predicts what the researchers expect to see, the goal of the research is to determine whether this guess is right or wrong. When conducting an experiment, researchers might explore a number of factors to determine which ones might contribute to the ultimate outcome

ELEMENTS OF A GOOD HYPOTHESIS

- When trying to come up with a good hypothesis for your own research or experiments, ask yourself the following questions:

- Is your hypothesis based on your research on a topic?

- Can your hypothesis be tested?

- Does your hypothesis include independent and dependent variables?

- Before you come up with a specific hypothesis, spend some time doing background research on your topic. Once you have completed a literature review, start thinking about potential question.

HOW TO FORM A HYPOTHESIS

- The researcher would propose a hypothesis about how these two variables are related, such as "Test anxiety decreases as a result of effective study habits."

- In order to form a hypothesis, you should take these steps:

- Start by collecting as many observations about something as you can.

- Evaluate these observations and look for possible causes of the problem.

- Create a list of possible explanations that you might want to explore.

- After you have developed some possible hypotheses, it is important to think of ways that you could confirm or disprove each hypothesis through experimentation. This is known as falsifiability.

TYPES OF HYPOTHESIS

- Simple Hypothesis.

- Complex Hypothesis.

- Working or Research Hypothesis.

- Null Hypothesis.

- Alternative Hypothesis.

- Logical Hypothesis.

- Statistical Hypothesis

IMPORTANCE OF A HYPOTHESIS IN RESEARCH

- In various <u>qualitative</u> as well as <u>quantitative studies</u>, hypothesis is developed to talk about the research problem or to address any phenomenon. It aims to encourage critical approach. It enables the researcher to develop a specific direction as well as better understanding about the subject matter of the study. It further assists in the careful and focused analysis of data collected. There are different types of hypotheses. The two that are more basic involve those used in scientific researches and the other one in sociological studies. In scientific researches, hypotheses are developed keeping in view the experimentation and observation drawn from the past. Such hypotheses are tested according to the current theories. Science fair projects involve these forms of hypotheses. For example, if water temperature rises then sugar/ salt will be dissolved at higher rate.

- On the other hand, working hypotheses are based on the widely accepted suppositions in order to carry out further research. For example, if I start the consumption of more vegetables and fruits then I will prone to faster weight loss or if I start adding pesticides to the growth of my plants then these will grow safer

CHARACTERISTICS OF A GOOD HYPOTHESIS

- Formulating a hypothesis is a tricky deal. Remember there are various points that turn a proposition or supposition into a well written and researchable hypothesis. For example, a good hypothesis is always logical and affirmative. It is based on proper verification with clear, yet precise, statement offering balanced relationship between independent and dependent variables. It should be a guess for an observation, phenomenon or a problem that can be tested via research or experimentation following previous findings as well. The clarity of a good hypothesis could be judged according to previous studies, if required. Cause and effect factor is also considered while writing a good hypothesis. It simply means that the hypothesis needs to propose that something will happen if something else is done. Sample hypothesis in this regard,

- Children who are emotionally abused by their elders are more inclined to develop frustrated behaviors and feeling of rejection than children who are not

- Kindergarten children who are praised and rewarded while collaborating with the instructor tend to be more prone to learning than their non-rewarded peers

- In a nutshell, it is observed that one variable is supposed to affect the other variable in a well written hypothesis

WHAT IS THE CONCEPT OF HYPOTHESIS?

- A **hypothesis** (plural: **hypotheses**), in a scientific context, is a testable statement about the relationship between two or more variables or a proposed explanation for some observed phenomenon. A simple **hypothesis** might predict a causal relationship between two variables,**meaning** that one has an effect on the other.

STEPS OF HYPOTHESIS TESTTING

- Four Steps of Hypothesis Testing

- All hypotheses are tested using a four-step process:

- The first step is for the analyst to state the two hypotheses so that only one can be right.

- The next step is to formulate an analysis plan, which outlines how the data will be evaluated.

- The third step is to carry out the plan and physically analyze the sample data.

- The fourth and final step is to analyze the results and either reject the null hypothesis, or state that the null hypothesis is plausible, given the data

REAL-WORLD EXAMPLE OF HYPOTHESIS TESTING

- If, for example, a person wants to test that a penny has exactly a 50% chance of landing on heads, the null hypothesis would be yes, and the alternative hypothesis would be no (it does not land on heads). Mathematically, the null hypothesis would be represented as Ho: P = 0.5. The alternative hypothesis would be denoted as "Ha" and be identical to the null hypothesis, except with the equal sign struck-through, meaning that it does not equal 50%.

EXAMPLE

- A random sample of 100 coin flips is taken, and the null hypothesis is then tested. If it is found that the 100 coin flips were distributed as 40 heads and 60 tails, the analyst would assume that a penny does not have a 50% chance of landing on heads and would reject the null hypothesis and accept the alternative hypothesis.

- If, on the other hand, there were 48 heads and 52 tails, then it is plausible that the coin could be fair and still produce such a result. In cases such as this where the null hypothesis is "accepted," the analyst states that the difference between the expected results (50 heads and 50 tails) and the observed results (48 heads and 52 tails) is "explainable by chance alone."

THE PROCESS OF BECOMING A SCIENTIFIC THEORY

- Every scientific theory starts as a hypothesis. A scientific hypothesis is a suggested solution for an unexplained occurrence that doesn't fit into a currently accepted scientific theory. In other words, according to the Merriam-Webster Dictionary, a hypothesis is an idea that hasn't been proven yet. If enough evidence accumulates to support a hypothesis, it moves to the next step — known as a theory — in the scientific method and becomes accepted as a valid explanation of a phenomenon.

THE PROCESS OF BECOMING A SCIENTIFIC THEORY

- Tanner further explained that a scientific theory is the framework for observations and facts. Theories may change, or the way that they are interpreted may change, but the facts themselves don't change. Tanner likens theories to a basket in which scientists keep facts and observations that they find. The shape of that basket may change as the scientists learn more and include more facts. "For example, we have ample evidence of traits in populations becoming more or less common over time (evolution), so evolution is a fact but the overarching theories about evolution, the way that we think all of the facts go together might change as new observations of evolution are made," Tanner told Live Science.

THANK YOU