

## What are Variables

### Variables of the Study

Variable is observation that can take different values. It is a measurable characteristic that varies. It may change from group to group, person to person, or even within one person over time. A variable is an object, event, idea, feeling, time period, or any other type of category you are trying to measure. There are two types of variables-independent and dependent.

A variable is any entity that can take on different values.

- An image, perception or concept that is capable of measurement – hence capable of taking on different values – is called a variable. In other words, a concept that can be measured is called a variable.

Anything that can vary can be considered a variable. For instance, age can be considered a variable because age can take different values for different people or for the same person at different times. Similarly, country can be considered a variable because a person's country can be assigned a value.

Variable is central idea in research. Simply defined, variable is a concept that varies. There are two types of concepts: those that refer to a fixed phenomenon and those that vary in quantity, intensity, or amount (e.g. amount of education). The second type of concept and measures of the concept are variables.

A variable is defined as anything that varies or changes in value. Variables take on two or more values. Because variable represents a quality that can exhibit differences in value, usually magnitude or strength, it may be said that a variable generally is anything that may assume different numerical or categorical values. Once you begin to look for them, you will see variables everywhere. For example, gender is a variable; it can take two values: male or female. Marital status is a variable; it can take on values of never married, single, married, divorced, or widowed.

Family income is a variable; it can take on values from zero to billions of Rupees. A person's attitude toward women empowerment is variable; it can range from highly favourable to highly unfavourable. In this way, the variation can be in quantity, intensity, amount, or type; the examples can be production units, absenteeism, gender, religion, motivation, grade, and age. A variable may be situation specific; for example, gender is a variable but if in a particular situation like a class of Research Methods if there are only

female students, then in this situation gender will not be considered as a variable.

Whether we accept it or not, we all make value judgements constantly in our daily lives: 'This food is excellent'; 'I could not sleep well last night'; 'I do not like this'; and 'I think this is wonderful'. These are all judgements based upon our own preferences, indicators or assessment. Because these explain feelings or preferences, the basis on which they are made may vary markedly from person to person. There is no uniform yardstick with which to measure them. A particular food may be judged 'excellent' by one person but 'awful' by another, and something else could be wonderful to one person but ugly to another. When people express these feelings or preferences, they do so on the basis of certain criteria in their minds, or in relation to their expectations. If you were to question them you will discover that their judgement is based upon indicators and/or expectations that lead them to conclude and express a particular opinion.

## **Types of Variables**

### **1, Continuous and Discontinuous variables**

Variables have different properties and to these properties we assign numerical values. If the values of a variable can be divided into fractions, then we call it a continuous variable. Such a variable can take infinite number of values. Income, temperature, age, or a test score are examples of continuous variables. These variables may take on values within a given range or, in some cases, an infinite set.

Any variable that has a limited number of distinct values and which cannot be divided into fractions, is a discontinuous variable. Such a variable is also called as categorical variable or classificatory variable, or discrete variable. Some variables have only two values, reflecting the presence or absence of a property: employed-unemployed or male-female have two values. These variables are referred to as dichotomous. There are others that can take added categories such as the demographic variables of race, religion. All such variables that produce data that fit into categories are said to be discrete /categorical/classificatory, since only certain values are possible. An automotive variable, for example, where "Chevrolet" is assigned a 5 and "Honda" is assigned a 6, provides no option for a 5.5(i.e. the values cannot be divided into fractions).

**1. Independent Variable:** An independent variable is exactly what it sounds like. It is a variable that stands alone and isn't changed by the other variables you are trying to measure. For example, someone's age might be an

independent variable.

**2. Dependent Variable:** Just like an independent variable, a dependent variable is exactly what it sounds like. It is something that depends on other factors. (Independent variable) causes a change in (Dependent Variable) and it isn't possible that (Dependent Variable) could cause a change in (Independent Variable).

### **Definitions of hypothesis ③**

“Hypotheses are single tentative guesses, good hunches – assumed for use in devising theory or planning experiments intended to be given a direct experimental test when possible”. (Eric Rogers, 1966) ③ “A hypothesis is a conjectural statement of the relation between two or more variables”.

(Kerlinger, 1956) ③ “Hypothesis is a formal statement that presents the expected relationship between an independent and dependent variable.”(Creswell, 1994) ③ “A research question is essentially a hypothesis asked in the form of a question.”

“An hypothesis is a statement or explanation that is suggested by knowledge or observation but has not, yet, been proved or disproved.” (Macleod Clark J and Hockey L 1981)

### **Hypothesis of the Study**

Hypothesis is a tentative conjecture explaining an observation, phenomenon, or scientific problem that can be tested by further observation, investigation, or experimentation. Hypotheses are testable explanations of a problem, phenomenon, or observation. Both quantitative and qualitative research involve formulating a hypothesis to address the research problem. Hypotheses that suggest a causal relationship involve at least one independent variable and at least one dependent variable; in other words, one variable which is presumed to affect the other.

### **Type of Hypothesis**

1. **Null Hypothesis:** The null hypothesis states that there is no association

between the predictor and outcome variables in the population. The null hypothesis is the formal basis for testing statistical significance.

2. **Alternative Hypothesis:** The null hypothesis states that there is association between the predictor and outcome variables in the population. The alternative hypothesis cannot be tested directly; it is accepted by exclusion if the test of statistical significance rejects the null hypothesis.

## **One and Two-tailed Hypotheses**

A one-tailed (or one-sided) hypothesis specifies the direction of the association between the predictor and outcome variables. A two-tailed hypothesis states only that an association exists; it does not specify the direction.

## **Characteristics of Hypothesis**

A hypothesis should state the expected pattern, relationship or difference between two or more variables;

A hypothesis should be testable;

A hypothesis should offer a tentative explanation based on theories or previous research;

A hypothesis should be concise and simple.