



Variables & Its Types

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Variables

1. Variables are properties or characteristics of people or things that vary in quality or magnitude from person to person or object to object (Miller & Nicholson, 1976)
 - ▶ in order to be a variable, **a variable must vary** (e.g., not be a constant), that is, it must take on different values, levels, intensities, or states
2. "any entity that can take on a variety of different values" (Wrench et al, 2008, p. 104)
 - gender
 - self-esteem
 - managerial style
 - stuttering severity

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1. A variable is “a **concept** that varies” (Neuman, 1994).

Two types of **concepts** – could refer to

First, Fixed phenomenon (e.g. the ideal typical bureaucracy) &

Secondly, Those phenomena that vary in *quantity, quality, intensity or amount* etc. (amount of sugar, amount of glucose, sweetness of biscuits).

- ▶ These second types of concepts & their measures are variables.
- ▶ A variable can take on two or more values.

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Examples of variables



- **body-temperature** (a concept) can be (1)98.4, (2) 98.6, (3)98.7, (4) 98.8, (5) 98.00, (6) 106 etc.
- **Crime** is a variable: it can be a robbery, shop-lifting, abduction etc.
- **Personal income** is a variable: (1) Rs.100,000/month, (2) 100/month, (3) 1000/month, (4) 13000/month etc.

Every variable has **attributes**.

Attributes are “the values or categories of a variable” (Neuman, 1994, p. 107).

In the above examples personal income the various values or categories of a variable are its *attributes*.

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Remember! Variables and attributes are related.
However, each has different purpose to serve.



- ▶ A *change in definition* can give an attribute the status of a variable itself.
- ▶ **Male & female** are *categories/attributes* of a variable **sex**. But ...
 - ***degree of masculinity*** is a variable, because it describes the intensity or strength of attachment to attitudes, beliefs, and behaviours associated with the concept of ***masculine /Feminine*** within a culture (Neuman, 1994, p. 107).
- ▶ **Attributes, values, and levels** are the variations in a variable
 - Attribute: political party
 - Value: Democrat, Republican, Independent, etc.
 - Attribute: Self-esteem
 - Level: High, Medium, Low

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- ▶ In a quantitative research we are required to redefine concepts of interest/research into the language of variables (Neuman, 1994).

Remember



slight change in the definition can convert the non-variable (attributes) into a variable concept (Neuman, 1994).

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Types of variables



- ▶ **Quantitative research** can take on the form of a causal-analysis.
- ▶ In causal analysis, we start with the **effect**, and then proceed to analyse/understand the **cause(s)** of a phenomenon.
- ▶ Variables are classified based on their *location* in the causal relationship (Neuman, 1994).
- ▶ Quantitative designs have at least **two types** of variables: **independent** and **dependent** (Creswell, 2004).
- ▶ independent variable (x-value) can be manipulated, measured, or selected prior to measuring the outcome or dependent variable (y-value).
- ▶ A third type of variable is **Intervening variable** (a 4th type "extraneous variable, is also discussed)

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1. Independent variable



1. The **cause variable** or the variable that is believed to be the cause or the force/condition acting on something (Neuman, 1994).
 2. The variable that is **manipulated** either by the researcher or by nature or circumstance
- ▶ Independent variable are also called "stimulus" "input" or "predictor" variables
 - ▶ Analogous to the "cause" in a cause-effect relationship
 - ▶ The 'independent variable' is *independent* of prior causes or influences while the 'dependent variable' is *dependent* on the cause.

How to identify the independent variable?

Two questions can help in this regard.

- ▶ First, "does it come before other variables in time?" (Neuman, 1994, p. 107) By definition 'independent variable' comes before any other variable.
- ▶ "Second, if the variables occur at the same time, does it mean that one variable has an impact on another variable?" (Neuman, 1994, p. 107)

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2. Dependent variable



- ▶ “A variable that is the result/outcome/effect of another variable” (Neuman, 1994).
- ▶ “A variable that is ***observed or measured***, and that is influenced or changed by the independent variable”
- ▶ a.k.a “response” or “output” or “criterion” variables
- ▶ analogous to the “effect” in a cause–effect relationship

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Example – 1. If I want to study “the ***causes*** of ***absenteeism*** (frequent or habitual absence from work, school, etc.) among students of M.A Gender studies/Sociology”:

Causes (that are intended to be identified during research) are independent variables; ***absenteeism*** is a dependent variable.

Example – 2. in “***Causes*** of non–existence of ***Alumni Associations*** in University of Peshawar”:

Causes (that are intended to be identified during research) are independent variables.

Alumni Associations is a dependent variable.

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- ▶ In the above examples, *Causes* are 'Independent variables', because they determine/affect/impact the non-existence of a phenomenon (i.e. Alumni association or absenteeism etc.).

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3. Intervening variable.



- ▶ a.k.a. ***moderating, intervening, intermediary, or mediating*** variables
- ▶ a 2nd or 3rd variable that can increase or decrease the relationship between an independent and a dependent variable.
- ▶ for example, whether listeners are persuaded more by the quality or quantity of arguments is moderated by their degree of involvement in an issue.
- ▶ In literal sense, it is from ***Intervene*** (to come between disputing people, groups, etc.; to occur or come between two things; to occur or happen between other events or periods).

Intervening variable occurs in complex causal relations.
Intervening variable is a variable that comes/occurs between the independent variable and dependent variable.

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- ▶ It is not always the case that two phenomena are related directly in causal-relationships. In research we may choose to identify the *mechanism* in which causal-relationship between variables exist.

Example: Durkheim (French Sociologist), presented a theory of suicide, after researching its causes.

Durkheim found evidence that **Married People** are less likely to commit **suicide**, because they have greater **social integration**. he said that people who are socially integrated are less likely to commit suicide.

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- ▶ Durkheim's theory can be restated in the form of three variables as ...

Marital Status (independent variable) causes the degree of social integration (intervening variable), which affects suicide (dependent variable).

Specifying the chain of causality makes the linkages of variables in a theory clearer and thus helps us (researchers) test complex explanations.

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interchangeability of independent and dependent variables



- ▶ The same concept or construct could serve as the independent variable in one investigation, and the dependent in another.
- ▶ example: "Depression"
 - as an independent variable; RQ: Does Depression (low versus high) have a significant effect on attitude change?
 - As a dependent variable; RQ: Does *social integration* affect the levels of depression?

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