



# Chapter#5: Identifying Variables

GROUP PRESENTATION

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# Definition of a Variable

AN IMAGE ,PERCEPTION OR  
CONCEPT THAT IS CAPABLE OF  
MEASUREMENT-HENCE CAPABLE  
OF TAKING DIFFERENT VALUES ,IS  
CALLED A VARIABLE

IN OTHER WORDS, A CONCEPT  
THAT CAN BE MEASURED IS  
CALLED A VARIABLE

# Other Definitions

## Kerlinger

- ▶ A variable is a property that takes on different values.
- ▶ Putting it redundantly, a variable is something that varies.
- ▶ A variable is a symbol to which numerals or values are attached.

## Black and Champion

- ▶ Define a variable as;
- ▶ Rational units of analysis that can assume any one of a number of designated sets of values”.
- ▶ A concept that can be measured on any one of the four types of measurement, is called a variable.

# Example of Variables

- ▶ As Variables are measurable, so our judgements become variables which could be measured.
- ▶ E.g; This program is “effective”
- ▶ This program is “not effective”
- ▶ We are providing a “quality service” to our clients
- ▶ This product is not doing “well”
- ▶ If you want to find out, if the program is effective, if a service quality or if a product is doing well, you need to be careful that such judgements have a rational and sound basis.
- ▶ Here measuring mechanism should be used.

# The Difference between a concept and a variable

Main difference between Concept and Variable is Measurability.

## Concept

- ▶ Mental image or perception that vary from individual to individual
- ▶ Measurement of impressions
- ▶ Example;
- ▶ Satisfaction
- ▶ Excellence
- ▶ Self esteem

## Variable

- ▶ Variables are crude or refined units of measurements
- ▶ Example;
- ▶ Gender
- ▶ Age
- ▶ Weight
- ▶ Income
- ▶ Attitude

# Concept, Indicator and Variables

- ▶ When using a concept in the study , researcher need to develop indicators from the concept
- ▶ That is, developing from these indicators, measurable variable
- ▶ This is what is called operationalization
- ▶ Operationalization is thus a process of quantifying variables for the purpose of measuring their occurrence, strength and frequency.
- ▶ For example, to determine this concept?
- ▶ The level of knowledge, concerning a specific issue
- ▶ The variable , poor knowledge, will assist in determining factors influencing the problem under study

## Contd.

- ▶ Sometimes the research team in a particular case decide that one indicator is not enough, more are needed to fully measure or quantify the concept.
- ▶ E.g psychologists have built entire questionnaires to measure complex concepts such as depression, where a range of questions on mood and emotions are then scored
- ▶ Then a persons depression level or score is established.



# Types of Variable

The classification done here results from looking in three different ways

## Three ways of classification

1. The causal relationship
2. The design of the study
3. The unit of measurement

# From the Viewpoint of Causation

**In studies** that attempt to investigate a causal relationship four set of variables may operate;

- **Change variables:**

These variable is bringing about change in phenomenon.

- **Outcome Variables:**

These variable are the effects of a change variable.

- **Affect variables:**

These unmeasured variable affect the link between cause and effect variables.

- **Connecting or linking Variables:**

These variables in certain situations are necessary to complete the relationship between cause and effect variables.

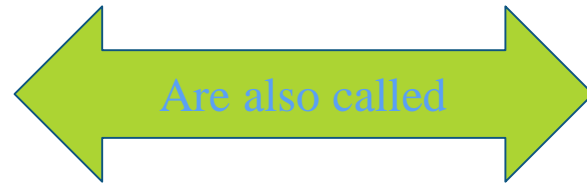
# In research terminology;

Change  
variable

Outcome  
variables

Connecting  
variables

Connecting  
variables



Independent  
variables

Dependent  
variable

Extraneous  
variables

Intervening  
variables

# Contd.

## **1. Independent variable:**

The cause supposed to be responsible for bringing changes in a phenomenon or situation.

## **2. Dependent variable:**

The outcome of the changes brought about by introduction of an independent variable.

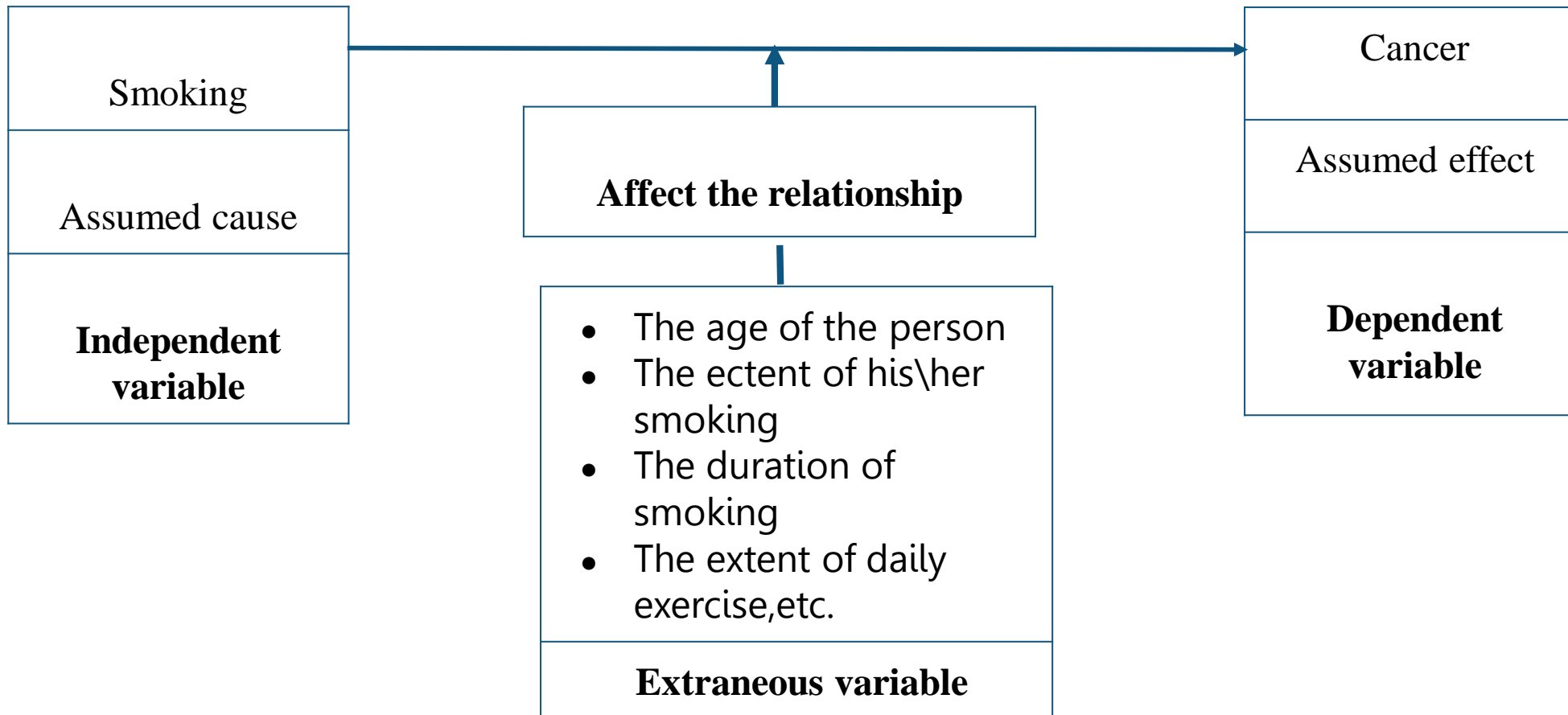
## **3. Extraneous variable:**

Unmeasured factors which may affect changes in dependent variable. These may increase or decrease the magnitude or strength of the relationship between independent and dependent variables.

## **4. Intervening variables:**

Sometimes called the confounding variable. Links or connect the independent and dependent variables. Sometimes the relationship between both variables cannot be established without the intervention of another variable.

# Example



# From the Viewpoint of the Study Design

- ▶ A study that examines association or causation. In controlled experiment the independent variable may be introduced or manipulated by researcher. In these situations there are two set of variables :
- ▶ **Active Variables**
- ▶ **Attribute Variables**

# Contd.

## Active Variables

- ▶ A researcher can manipulate or control.
- ▶ Study intervention;
- ▶ Different teaching models (model A, model B, model C )
- ▶ Program service
- ▶ Experimental intervention

## Attribute Variables

- ▶ Researcher can not manipulate or change, and reflect the characteristics of study population
- ▶ Study population ;
- ▶ Age
- ▶ Gender
- ▶ Religion
- ▶ Attitudes

# Summary

- ▶ Knowledge of the different types of variable and the way they are measured plays a crucial role in research
- ▶ Variables bring clarity and specify conceptualization of a research problem, to the formulation of hypotheses and to the development of a research instrument.
- ▶ The way you ask a question determines its categorisation on a measurement scale, which in turn affects how a data can be analysed, what statistical tests can be applied to the data.