LESSON 02

METHODOLOGIES OF DATA COLLECTION

Psychologists use some of the following methods for research and data collection:

Experimental Method

The experimental research design is when a cause-and-effect relationship between an independent and a dependent variable of interest is to be clearly established, then all other variables that might contaminate or confound the relationship have been tightly controlled. In other words, the possible effects of other variables on the dependent variable have been accounted for in some way.

(a) Independent Variable

An independent variable is one that influences the dependent variable in either a positive or negative way. That is, when the independent variable is present, the dependent variable, there is an increase or decrease in the dependent variable also. In other words, the variance in the dependent variable is accounted for by the independent variable. To establish causal relationships, the independent variable is manipulated.

(b) Dependent Variable

The dependent variable is the variable of primary interest to the researcher. The researcher’s goal is to understand and describe the dependent variable, or to explain its variability, or predict it. In other words, it is the main variable that lends itself for investigation as a viable factor. Through the analysis of the dependent variable (i.e., finding what variables influence it), it is possible to find answers or solutions to the problem. For this purpose, the researcher will be interested in quantifying and measuring the dependent variable, as well as the other variables that influence this variable.

(c) Intervening Variable

An intervening variable is one that surfaces between the time the independent variables start operating to influence the dependent variable and the time their impact is felt on it. The intervening variable surfaces as a function of the independent variable(s) operating in any situation, and helps to conceptualize and explain the influence of the independent variable(s) on the dependent variable.

Control

When we postulate cause-and-effect relationships between two variables X and Y, it is possible that some other factors, say A, might also influence the dependent variable Y. In such a case, it will not be possible to determine the extent to which Y occurred only because of X, since we do not know how much of the total variation of Y was caused by the presence of the other factor A. For instance a Human Resource Development manager might arrange for special training to a set of newly recruited secretaries in creating web pages, to prove to his boss that such training would cause them to function more effectively. However, some of the new secretaries might function more effectively than others, mainly or partly because they have had previous intermittent experience with the web. In this case the manager cannot prove that the special training alone caused greater effectiveness, since the previous intermittent experience of some secretaries with the web is a contamination factor. If the true effect of the training on learning is to be assessed, then the learner’s previous experience has to be controlled. This is what be mean when we say we have to control the contamination factors.
Observational method

It is possible to gather data without asking questions of respondents. People can be observed in their natural work environment or in the lab setting, and their activities and behaviours or other items of interest can be noted and recorded.

Apart from the activities performed by the individuals under study, their movements, work habits, the statements made and meetings conducted by them, their facial expressions of joy, anger, and other emotions, and body language can be observed. Other environmental factors such as layout, work-flow patterns, the closeness of the seating arrangement, and the like, can also be noted. This is called observational method of collecting data.

Case design: study of a particular case

Case studies involve in-depth contextual analyses of similar situations in other organizations, where the nature and definition of the problem happen to be the same as experienced in the current situation. Hypothesis can be developed in case studies as well.

Longitudinal methods

The researcher might want to study people or phenomenon at more than one point in time in order to answer the research question. For instance, the researcher might want to study employees’ behaviour before and after a change in the top management, so as to know what effects change accomplished. Here, because data are gathered at two different points in time, the study is carried longitudinally across a period of time. Such studies are called longitudinal studies and the method as longitudinal methods.

Survey design; Study of aggregates

Survey design may be called the study of aggregates which means that the data are collected through various instruments such as questionnaires, interviews etc. to gather the information about the variables.

Cross sectional methods

A study can be done in which data are gathered just once, perhaps over a period of days or weeks or months, in order to answer a research question. Such studies are called one-shot or cross-sectional studies.

CONCEPTS OF RELIABILITY AND VALIDITY

RELIABILITY

The reliability of a measure indicates the extent to which it is without bias (error free) and hence ensures consistent measurement across time and across the various items in the instrument. In other words, the reliability of a measure is an indication of the stability and consistency with which the instrument measure the concept and helps to assess the “goodness” of a measure.

Stability of Measures

The ability of a measure to remain the same over time—despite uncontrollable testing conditions or the state of the respondents themselves—is indicative of its stability and low vulnerability to changes in the situation. This attests to its “goodness” because the concept is stably measured, no matter when it is done. Two tests of stability are test-retest reliability and parallel-form reliability.
Test-retest Reliability

The reliability coefficient obtained with a repetition of the same measure on a second occasion is called test-retest reliability. That is, when a questionnaire containing some items that are supposed to measure a concept is administered to a set of respondents now, and again to the same respondents, say several weeks to 6 months later then the correlation between the scores obtained at the two different times from one and the same sets of respondents is called test-retest coefficient. The higher it is, the better the test—retest reliability, and consequently, the stability of the measure across time.

Parallel-Form Reliability

When responses on two comparable sets of measures tapping the same construct are highly correlated, we have parallel-form reliability Both forms have similar items and the same response format, the only changes being the wording and the order or sequence of the questions. What we try to establish here is the error variability resulting from wording and ordering of the questions. If two such comparable forms are highly correlated (say 8 and above), we may be fairly certain that the measures are reasonably reliable, with minimal error variance caused by wording, order, or other factors. Examples (test-retest, split half).

Split-Half Reliability

It is another measure or reliability which measure the internal consistency of measures. The internal consistency of measures is indicative of the homogeneity of the items in the measure that tap the construct. In other words, the items should “hang together as a set, “ and be capable of independently measuring the same concept so that the respondents attach the same overall meaning to each of the items.

Split-half reliability reflects the correlations between two halves of an instrument. The estimates would vary depending on how the items in the measure are split into two halves. For example, if we split a question are into two parts and administer them independently, we may be able to check if the answers to the first half are consistent with those to the second.

VALIDITY

It refers to the fact that when we ask a set of questions (i.e., develop a measuring instrument) with the hope that we are tapping the concept, how can be we reasonably certain that we are indeed measuring the concept we set out to do and not something else? This can be determined by applying certain validity tests.

Several types of validity tests are used to test the goodness of measures and writers use different terms to denote them. However, validity tests may the grouped under the following headings:

Content validity

Content validity ensures that the measure includes an adequate and representative set of items that tap the concept. The more the scale items represent the domain or universe of the concept being measured, the greater the content validity. To put it differently, content validity is a function of how well the dimensions and elements of a concept have been delineated.

A panel of judges can attest to the content validity of the instrument. Kidder and Judd (1986) cite the example where a test designed to measure degrees of speech impairment can be considered as having validity if it is so evaluated by a group of expert judges (i.e., professional speech therapists).

Predictive/Criterion validity
It is established when the measure differentiates individuals on a criterion it is expected to predict. This can be done by establishing concurrent validity or predictive validity. Concurrent validity is established when the scale discriminates individuals who are known to be different; that is, they should score differently on the instrument.

Predictive validity indicates the ability of the measuring instrument to differentiate among individuals with reference to a future criterion. For example, if an aptitude or ability test administered to employees at the time of recruitment is to differentiate individuals on the basis of their future job performance, then those who score low on the test should be poor performers and those with high scores good performers.

**Construct validity**

It testifies to how well the results obtained from the use of the measure fit the theories around which the test is designed. In other words, it shows relationship of characteristic with other observable constructs.