4. Constructs

4.1 Relationships between constructs

As mentioned in Lecture 3, ‘introversion-extroversion’ is a construct that is as abstract as ‘anxiety’. Here, introversion and extroversion will be treated as poles (extremities) of the same dimension (variable). We identify a number of behavioural instances of the construct ‘introversion-extroversion’ and postulate that the more extrovert a person is, the more that person will tend to engage in these behaviours. An example of such behavioural instances might be

1. Attending parties
2. Working in a group
3. Talking readily to people
4. Speaking spontaneously

This kind of information allows a researcher to develop a test to measure the construct. We may develop a scale which scores from ‘low’ to ‘high’, low for more introverted (or less extroverted) persons.

If ‘anxiety’ can be similarly measured by the behavioural instances

1. Nervous reaction to challenges
2. Avoidance of novel situations
3. Feelings of inadequacy
4. Feelings of helplessness
5. Sweating
6. Heart palpitations
7. Lack of appetite

we may also develop a scale to rate a person’s level of anxiety.

We now postulate that there is a relationship between ‘introversion-extroversion’ and ‘anxiety’. The schematic presentation of this relationship is given in Fig. 4.1 below.

Note It is useful to distinguish between the structural part of the hypothesis and the measurement part.
If we can allocate numbers to behavioural instances so that they reflect the intensity to which it is present, we have a way of measuring the construct. Testing for a relationship between the two constructs will be immediately halted if measurements are not reliable and valid.

4.2 Definitions of constructs

A good understanding of measurement theory is essential if one has to conduct research concerning the operational definition and measurement of a construct. In this module, it will be assumed that all measures have an acceptable level of reliability and validity. The process of specifying the observable instances of a construct is often referred to as providing an operational definition for a construct.

4.2.1 Theoretical definition

The theoretical definition of a construct corresponds to that found in a dictionary, that is, where a construct is defined in terms of other constructs.

4.2.2 Operational definition

The operational definition of a psychological construct defines the construct in terms of observable phenomena in an attempt to measure it. Operational definitions bridge the gap between theoretical constructs and observations by spelling out what a researcher must do to measure the construct.
5. Conducting good research

To solve problems and answer questions about a variety of issues in companies, industrial psychologists must study and interpret information objectively. This is only possible through methodical work, analytical thinking and critical evaluation based on statistical techniques and research procedures.

The steps for conducting good research are shown in Fig. 5.1 below.

Fig. 5.1 Conducting good research

5.1 Identifying the research problem

It must be ensured that the problem meets the requirements of the scientific method. The problem must not only be clearly and unambiguously defined but the purpose of the study or research must be stated as well.

5.2 Determining the scope of the research

The study must be manageable – its practical and financial limitations must be considered. The scope may also be determined by the urgency of the problem: bigger projects take more time and feedback may take even longer.
5.3 **Identifying practical limitations**

The following limitations should be considered:

1. Time
2. Cost
3. Sample size
4. Data collection techniques
5. Processing techniques
6. Access to information
7. Nature of available information
8. Form in which data is available
9. Validity and reliability of measuring instruments
10. Validity and reliability of information

5.4 **Evaluating the available research tools**

For conducting a good research the following tools are relevant:

1. Knowledge
2. Skills
3. Statistical techniques
4. Computer equipment
5. Interpretation skills
6. Report-writing skills

5.5 **Survey of the literature**

This is otherwise known as *literature review*: a researcher has to be familiar with other researches that have been carried out in the same field. This will help in better planning and execution of the current study. If others have approached the same or similar problems, we can perhaps replicate their studies or use the same research methodologies. Literature review, through bibliographies, enables us to find sources that would not have been known otherwise. We may even learn how to approach our problem from a different perspective or discover new techniques to answer our question. Eventually, we may evaluate our own work by comparing it with other people’s studies.

5.6 **Research planning and design**

Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. The plan is an overall scheme or program of the research. It includes an outline of what the investigator will do from writing hypotheses and their operational implications to the final analysis of the data. Briefly, research design constitutes the blueprint for the collection, measurement,
and analysis of data. This crucial part of a research determines the method by which data is to be retrieved – experiments, interviews, observation, and analyses of records or simulation – decisions have to be made (see Fig 5.2). Improper designing may create havoc in a research project and render it unmanageable as well as causing the collected data to be worthless. Once the design is complete, its procedure may be simply followed step by step.

![Fig. 5.2 Research planning and design](image)

5.7 Writing a research proposal

A research proposal has to be submitted and approved before one can go ahead with a research project. The organisation or institution which funds or supervises the research has to satisfy itself beforehand that

1. the project is feasible
2. the researcher is competent enough to handle the project
3. the information obtained from the results of the study will be useful

The writing of a proposal is obviously a vital part of the planning since it determines the approval or rejection of the project. The following points should be borne in mind when drawing up a proposal:

1. The problem and its context
   
   1.1 Statement of the problem
   1.2 Sub-problems
   1.3 Hypotheses
   1.4 Limitations
   1.5 Definition of terms
   1.6 Assumptions
   1.7 Importance of the study
2. Literature review

3. The data, processing and interpretation
   3.1 Primary or secondary data
   3.2 Criteria to determine what data are to be sued
   3.3 Research methodology
   3.4 Identification and handling of sub-problems

4. Qualifications of the researcher to conduct the project

5. Description of the proposed study

6. A selected bibliography

**Fig. 5.3** below summarises these main points.

![Fig. 5.3 Writing a research proposal](image)

**Note** An electronic copy of ‘How to write a research proposal’ (courtesy University of Western Cape, South Africa) will be made available to the students doing this module. In the lecture, I will personally talk about how I wrote my Master’s proposal and expose the difficulties I went through in the process.
5.8 Data collection

During data collection, the following points must be clarified:

1. what data is to be collected
2. why these specific data will be used in the research
3. nature of the data
4. how the data will be collected
5. on how many people data will be collected
6. who will collect the data
7. what will be done to ensure that the information collected is reliable and valid

5.9 Data processing

Data can only be processed if they are recorded in a specific format (e.g. on a computer). Thus, we bear in mind the following points and questions:

1. How will the data be recorded and made available for processing?
2. What additional information has to be obtained? This could include bibliographical information.
3. What processing techniques will be used? Will we use software like SPSS or Microsoft Excel to process them? These techniques are closely linked with the research design and the types of data that are used.

5.10 Writing a research report (feedback and recommendations)

After processing and interpretation, the results have to be recorded in the form of a research report. This need not be a very long document – the problem, research steps followed, processing performed and the results obtained must be set out in a simple and clear language so that readers of the report will be in no doubt about any aspect of the research. In fact, the information should be so clear that anybody else should be able to replicate the research.

Note Depending on the nature of the research and the results, the researcher may think about sharing (by circulating) these results with the worldwide research community. This is done through ordinary media or via articles in specialised journals.