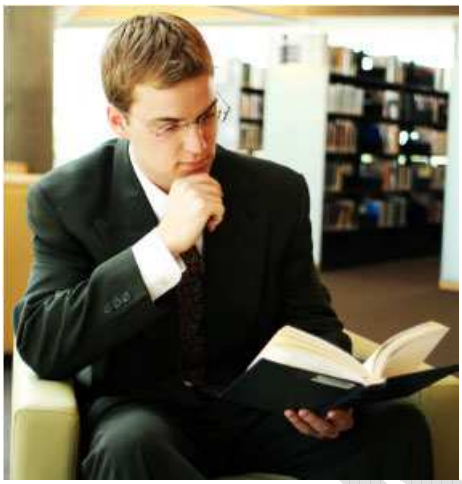
Module 1 Introducing Research Methods

Objectives

- **To understand the importance of research design**
- **To have an understanding of the differences between exploratory, descriptive and explanatory research projects**
- **To understand why it is necessary to standardise the experiment**
- **To have an awareness of different research methods and instruments**

Introduction



One of the tasks performed by the forensic psychologist is the conduct of research in order to inform a case. This can involve the psychologist in carrying out experimental tests in order to illustrate a point or provide further information to the courts, e.g. how likely is it that someone can identify an object in the hand as a 9mm automatic pistol at a distance of 100 metres on a wet winters evening. Alternatively it can involve the psychologist providing the court with a summary of current research findings which may be relevant to the case in question.

For the purpose of this course research involves the methodical investigation of a subject in order to discover facts, its aim is to discover, interpret, and revise existing knowledge on the topic under investigation. The research project can use scientific methods, but need not do so. The project, however, will need a design.

A research design (or research proposal) is a tool which assists in defining the topic under investigation. It describes the method by which the topic will be explored and analyses the sources which will be utilised. As the research progresses, however, and more is learned about the topic under investigation it will often be necessary to revise and enhance the research design. Because knowledge of the topic is limited in the beginning, the initial research design is usually a brief general statement of the topic under investigation, the method that will be used to conduct the investigation and the sources.

The following considerations might help in writing an initial research design:

Definition

- What is the topic under investigation? What is the hypothesis? Define as exactly as possible what it is that is being investigated
- State why this particular investigation is being conducted
- Comment on the existing state of knowledge on this topic. (Brief review of the

literature on this topic)

- If there are specific publications that already deal with this topic, will the new research be different and original?
- What are the merits and shortcomings of the existing state of knowledge?
- What is the importance or significance or relevance of your topic? (Why bother researching this topic?)

Methodology

- What information is there about the topic and how will this information be found and analysed? (What is the plan of action?)
- What is the initial hypothesis or leading argument?
- What preliminary questions can guide the research?
- How do you plan to collect and analyse data which will prove your thesis?

Sources

- What type of data (information/sources) is likely to provide answers to questions posed?
- Are the intended sources available and accessible? Where are they? (E.g. libraries, internet, anecdotal)
- What sources (primary and secondary) are most/least valuable? Why?
- Attachment of a bibliography to the research design is always useful

Designing the research

The research should be designed to test the hypothesis (hypotheses) and if possible to answer questions raised by the review of the current literature. The design should fulfil certain basic criteria in respect of the rigour of the research, subject/respondent concerns and pragmatic concerns.

Concerns relevant to the conduct of the research might include:

- Reliability of tests and data obtained (Have all sources of bias been eliminated or at least accounted for?)
- Validity of results and conclusions drawn (Has the research achieved its objectives?)
- Transparency of methods (Could the investigation be reproduced?)
- Objectivity (Is equal consideration given to proving and disproving the hypothesis?)
- Complexity (Are the purpose and methods understood by all concerned?)
- Special materials (Are such specialised resources needed that they might have an effect on results obtained?)

- Fakeability (How easy is it for the subjects/respondents to fake responses? How likely is it that results might be faked?)

Respondent concerns that the researcher might need to consider could include:

- Noxiousness (Are the tasks required of subjects/respondents morally, ethically, culturally and socially acceptable?)
- Familiarity (Do all subjects have the same level of familiarity with the tasks/questions involved in the research?)
- Language (Do all subjects/respondents have the same level of understanding of the language in which research instructions/questions are presented?)

Pragmatic concerns

- Expenses (What funds are available for conduct of the research? Can the research be realistically conducted within the constraints of the available budget?)
- Adaptability (Can the research design be honestly and transparently adapted to accommodate any circumstances unforeseen in the preliminary design?)
- Accessibility (How accessible are sources, resources and subjects/respondents included in the research design?)
- Time (Can the research be conducted and results analysed, evaluated and reported within the time constraints?)

Research methods and instruments

Research methods include:

Experimentation, which is commonly used in sciences such as sociology and psychology, physics, chemistry, biology and medicine. It is a collection of research designs which use manipulation and controlled testing to understand causal processes. Generally, one or more independent variables are manipulated to determine their effect on a dependent variable. The investigation of the effects of one variable on another allows for the testing of hypotheses and the proving of a theory. A theory can be defined as a "general principle proposed to explain how a number of separate facts are related." In other words, a theory is an "idea about a relationship." In order to test whether a theory is correct or not, it is necessary to conduct research. Because theories are stated in general terms, it is necessary to define more accurately what an experiment is designed to do. In order to do this, the variables in the theory have to be defined so that they are testable. Every experiment has two types of variables:

- Independent variable, which is manipulated by the experimenter

and

- Dependent variable which is free to change over a range of different experimental treatments.

By defining the variables that are to be used to test a theory, a hypothesis is derived. This is basically a testable form of a theory. If a hypothesis states that the dependent variable will change in some systematic way as the experimental treatments change, examination of the data, generated by the experiment, will reveal whether or not the hypothesis was right.

An example of this is the theory that people who have received a university education will have a more successful career in the police service. The independent variable would be the type of education received (secondary education, college, university, distance learning, in house training, etc.). The dependent variables, the outcome of our research, would be a successful career. It would be necessary to further define successful career, as this could include individual arrest and conviction rates, personal effects on the community policed or elevation through the ranks. In this example success is defined as something that can be tested, i.e. rising to or above the superintending grades. This would give the basics of a very simple experiment and a hypothesis such as: *People who have had a university education are more likely to rise to or above the superintending grades than people who have not had a university education.*

Research biases

The formulation of the hypothesis is the first step in conducting an experiment. It is necessary, however, to have an awareness of some aspects of research that can contaminate the results. These aspects are called research biases, and there are basically three main biases which can contaminate the results of the research. These are:

- Selection bias, which occurs when differences between groups are present at the beginning of the experiment. This bias can be controlled by random selection of subjects
- Placebo effect, which involves the influencing of performance due to the subject's belief about the results. People may attend alternative medicine sessions after which they feel that their health has improved. Although there may be no scientific evidence to support this belief, there is scientific evidence which supports the notion that the power of the mind can change a person's perceptions of reality. This bias can be controlled by adopting a blind study, that is where the subjects are not aware of the expected results
- Experimenter bias, occurs when the experimenter's behaviour is consciously or unconsciously influenced by their own belief that the hypothesis is true (false) to such an extent that it influences the responses of the subject. A double blind study where both subjects and experimenter are unaware of the expected result would eliminate experimenter bias. Within the constraints of this course it would be extremely difficult, if not impossible, to conduct a double blind study. Nevertheless the experimenter needs to be constantly aware of this bias.

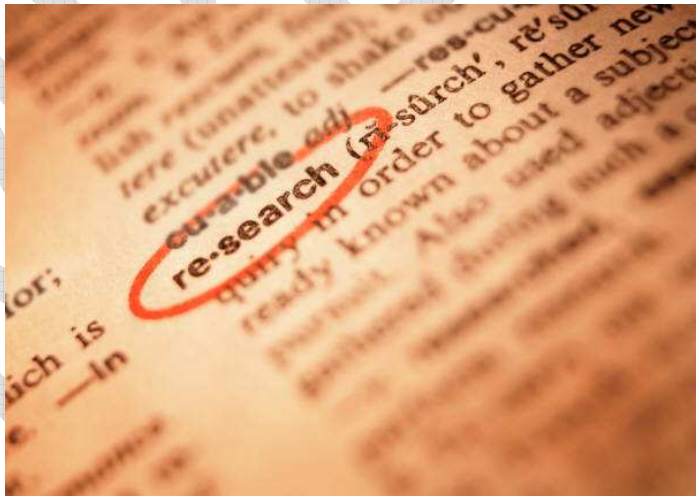
Standardisation of the experiment

Having determined the hypothesis, and identified the subject pool, it is then necessary to standardise the experiment. It is necessary to produce a specific set of instructions. There are two main reasons for this:

- It is essential that all the subjects are given the same instructions, presented with the experiment in the same manner, and that all of the data is collected in exactly the same way for all of the subjects
- Single experiments cannot typically stand on their own. To show, beyond doubt, that are results are valid, experiments need to be replicated by other experimenters with different subjects. To do this the experimenters need to know exactly what was done in the original experiment so that they can replicate it.

The researcher needs to consider whether the research is exploratory, descriptive or explanatory or a combination of models.

Exploratory research



Research is exploratory when it uses no earlier model as a basis for the study. The most common reason for using this approach is that the researcher has no other choice. Normally researchers take an earlier theory as a support, but if there is no supporting earlier theory, or all available models are unsuitable in the context of the proposed research, then an exploratory model has to be used.

Even when there are relevant theories or models, the researcher may prefer not to use them. Reasons for this could be:

- The goal of the current research is to document an object as completely as possible, not restricting the description to those topics that have been documented in earlier studies
- The object of study differs from all earlier studied objects. The goal of the study is to describe its exceptional character which existing theories are unable to portray
- To develop a phenomenological understanding of the object due to a distrust of earlier descriptions and explanations.

Normally in exploratory research hardly anything is known about the matter at the outset of the investigation. The researcher begins with a rather vague impression of what should be studied, making it impossible to make a detailed work plan in advance.

The gradual process of accumulating intelligence about the object of study means also that it will be impossible to start with a definition of the concepts of the study. It is during the exploratory research project that the provisional concepts gradually gain precision.

Descriptive research

Descriptive research classifies phenomena. Descriptive research generally precedes explanatory research. For example, over time chemists have described the elements through the periodic table. The periodic table's description of the elements allows people to think about the elements in helpful ways. It allows for explanation and prediction when elements are combined. The use of observation and description as a research tool has a lengthy history not only in the social sciences but in the physical and life sciences too. (Hannon 2000)

Most of biology until about 1900 was concerned primarily with description and Charles Darwin proposed his theory of evolution based on his own observations and the previous observations of other biologists. Emil Kraepelin in the latter half of the 19th century, classified mental illness into two major categories based upon a study of case histories. His system, with relatively few changes, has been in use by psychiatrists up to the present day. Similarly Jean Piaget used observation and description in formulating a number of hypotheses and interpretations concerning the language and thought of the child. His work has had considerable influence on subsequent research using alternative methodologies.

Explanatory research

Explanatory research is used to explain why something occurs. It builds on exploratory and descriptive research and goes on to identify the reasons for something that occurs. Explanatory research looks for causes and reasons. For example, a descriptive research may discover that 2% of police officers abuse their constabulary powers, whereas the explanatory researcher is more interested in learning why officers abuse their constabulary powers. The goals of explanatory research include:

- Explaining things, not just reporting them. Why? It enriches and elaborates a theory's explanation.
- It determines which of several explanations is the best
- It determines the accuracy of the theory
- It tests a theory's predictions or principle
- It advances knowledge about the underlying process
- It builds and elaborates a theory

- It elaborates and enriches a theory's predictions or principle
- It extends a theory or principle to new areas, new issues, and new topics
- It provides evidence to support or refute an explanation or prediction

The distinction between descriptive and explanatory research is often very blurred, any explanation requires description, and it is difficult or perhaps impossible to describe something without at the same time explaining it (McNeil 1990). The inclusion of contradictory features in a design is supported to some extent by Hayman (1967), when he suggests that:

> *"the better the initial approximation to the laboratory experiment in a research design, the less effective is the inquiry as a descriptive one, and this choice is irreversible and irremediable. Using a descriptive design permits the later test of a hypothesis by 'an approximation of the fact' to an explanatory design, but the initial choice of an explanatory design precludes any later approximation to the design needed for a descriptive survey".*

Constructing the research instruments

The number and type of instruments to be used in conducting the research will depend to a large extent on the hypothesis, the subject pool and of course the research design. Among the possible instruments that could be included in the battery are:

- **Questionnaires -** can be a cost-effective research tool for use in data collection. A number of sequential steps should be followed in planning and designing questionnaires, not least of which is piloting a sample to check reliability and validity before using with the research sample
- **Structured interviews -** in its simplest form, a structured interview involves one person asking another person a list of predetermined questions about a carefully-selected topic. The person asking the questions ("the interviewer") should be prepared to explain things the interviewee (or "respondent" - the person responding to the questions) does not understand or finds confusing.

This instrument has the following advantages:

- It enables the researcher to examine the level of understanding a respondent has about a particular topic - usually in slightly more depth than with a postal questionnaire
- It can be used as a powerful form of formative assessment. That is, it can be used to explore how a respondent feels about a particular topic before using a second method (such as observation or in depth interviewing) to gather a greater depth of information
- Structured interviews can also be used to identify respondents whose views may require a more detailed exploration (through the use of focused interviews, for example)
- All respondents are asked the same questions in the same way. This makes

it easy to repeat (“replicate”) the interview. This research instrument is easy to standardise

- It provides a reliable source of quantitative data
- The researcher is able to contact large numbers of people quickly, easily and efficiently.

It has the following disadvantages:

- Can be time consuming if sample group is very large, because the researcher needs to be present during the delivery of the structured interview
- The quality and usefulness of the information is highly dependent upon the quality of the questions asked. The interviewer cannot add or subtract questions
- A substantial amount of pre-planning is required
- The format of questionnaire design makes it difficult for the researcher to examine complex issues and opinions. Even where open-ended questions are used, the depth of answers the respondent can provide tend to be more limited than with almost any other method
- There is limited scope for the respondent to answer questions in any detail or depth.

Unstructured interviews

Unstructured interviews are usually conducted when the researcher has developed enough of an understanding of a setting and his/her topic of interest to have a clear agenda for the discussion with the respondent, but still remains open to having his/her understanding of the area of inquiry open to revision by respondents. Because these interviews are not highly structured and because the researcher's understanding is still evolving, it is helpful to anticipate the need to speak with informants on multiple occasions. The advantages of this type of instrument are:

- The interviewer and respondents engage in a formal interview in that they have a scheduled time to sit and speak with each other, and both parties recognise this to be an interview
- The interviewer has a clear plan in mind regarding the focus and goal of the interview. This guides the discussion
- There is no structured interview guide. Instead, the interviewer builds rapport with respondents, getting respondents to open-up and express themselves in their own way
- Unstructured interviews are an extremely useful method for developing an understanding of a not fully understood or appreciated culture, experience, or setting
- Unstructured interviews allow researchers to focus the respondents' talk on a particular topic of interest, and may allow the researcher the opportunity to test out his/her preliminary understanding, while still allowing for ample

opportunity for new ways of seeing and understanding to develop

- Unstructured interviews can be an important preliminary step towards the development of more structured interview guides or surveys.

The disadvantage of this type of interview is:

- Questions tend to be open-ended and express little control over informants' responses
- Unstructured interviews can also be very time consuming as the conversation can go on and on
- The data collected is prone to digression and much of the data collected could be worthless
- The data is not reliable as it cannot be replicated with the same results due to a number of factors
- Unstructured interviews are usually small scale so it is hard to generalise with the results as only a small number of the population can be interviewed
- Data collection can be hard to categorise as there is likely to be a variety of different answers.

Scales

Rating scales are much-abbreviated measurement tools, when compared to standardised tests.

Still, they can be very useful for measuring changes in factors such as attitude. They can be constructed so that the subject rates himself/herself, or they can be constructed so that the researcher can rate the subject.

A Likert-type scale is usually a 5-point to 9-point scale that has anchors at each end and definitions of some or all of the scale points that indicate increasing or decreasing qualities or properties of the scaled item. For example, a rating scale that focuses on the satisfaction of members of the public who have requested police assistance in the past year and employing a 5-point rating strategy might look like this:

	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree
I believe that police response times are very good	[ ]	[ ]	[ ]	[ ]	[]

Use of a 7-point or 9-point scale instead of a 5-point scale, would increase the sensitivity of the scale. Sensitivity in this context refers to the likelihood that the scale will detect a true change in the dimension being measured, (satisfaction with response times) if one occurs. In other words, it takes a bigger change to move from a satisfaction level of 3 to a satisfaction level of 2 on a 5-point scale than it does to

go from a 3 to a 2 on a 9-point scale because the intervals are smaller on the 9-point scale, assuming that the overall scale includes the same upper and lower limits of satisfaction regardless of how many points are on the scale. The more points on the scale, the more sensitive the scale is in detecting change. However, there is a trade-off with regard to increasing scale sensitivity. Practically speaking, as the number of points on the scale increases, it is necessary to devise increasing numbers of scale point descriptions indicating the intended level or value of each rating possibility. Eventually labelling a scale with a large number of points becomes problematic.

Self-completion diaries

Diaries have a number of advantages over other data collections methods:

- Diaries can provide a reliable alternative to the traditional interview method for events that are difficult to recall accurately or that are easily forgotten
- Like other self-completion methods, diaries can help to overcome the problems associated with collecting sensitive information by personal interview
- They can be used to supplement interview data to provide a rich source of information on respondents' behaviour and experiences on a daily basis
- The diary interview method' where the diary keeping period is followed by an interview asking detailed questions about the diary entries is considered to be one of the most reliable methods of obtaining information.

Disadvantages of this method include:

- Participant may not remember information accurately or may distort responses in a socially desirable way
- Participants may not be meticulous in recording events
- The data collected is not within the control of the researcher and much of the data collected could be worthless
- The data is not reliable as it cannot be replicated with the same results due to a number of factors. If the diary keeping is small scale it will be hard to generalise with the results as only a small number of the population have been involved
- Data collection can be hard to categorise as there is likely to be a variety of different answers.

Field studies

A field study is a term used by naturalists for the scientific study of free-living wild animals in which the subjects are observed in their natural habitats without changing, harming, or materially altering the setting or behaviour of the animals under study. Zweig (1948,1952) adapted this time of study for his work with the poor and labouring classes of London.

Structured observations

Structured observation involves observing behaviour, or an event, rather than asking questions about it. One advantage of observation is that it is not necessary to ask questions. The researcher just watches and records. The observation is structured to allow the researcher to observe that which has been decided in advance. When using this method observers try not to influence the environment they observe. They can either participate in the event (as participant observers) or simply observe the event or situation without participating in it (non-participant observers). The researcher may wish to be a participant observer in order to gain greater understanding of the process, intervention, or event in which he/she is participating. He/she may wish to be a non-participant observer if involvement as a participant might bias the findings. As a non-participant observer, it is necessary to ensure that lack of participation does not draw attention to the observer role as this may affect the situation or behaviours of the subjects.

Depending upon the kinds of information to be collected more or less structure can be employed in the observation. If more than one person is conducting observations, it is necessary to clearly define the questions the observations are designed to answer so that everyone has the same understanding about what it is that is being learned and how the observations will be recorded. This will help ensure that each observer answers the evaluation questions in the same way.

Unstructured observations

Unstructured observation is closer to the original field study of the naturalists; it is the unplanned, informal, watching and recording of behaviours as they occur in a natural environment.

Wertheimer (1945) seems to suggest that although design, methodology, data collection, analysis and evaluation are all important the greatest advances in knowledge depend upon the right questions being asked.

"*The function of thinking is not just solving actual problems but discovering, envisaging, going into deeper questions. Often in great discoveries the most important thing is that a certain question is found. Envisaging, putting the productive question is often a more important, often a greater achievement than the solution of a set question.*

Suggested reading

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Hannon, T. (2000) *The Changing Division of Policing Labour* Chichester: Barry Rose Law Publishers

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Module 1 Introducing Research Methods

Activity 1

(To be submitted for assessment)

Answer the following questions:

1. Why is it necessary to design a research project?

2. What concerns should the researcher try to address? How might these be addressed?

3. What is meant by explanatory research?

Activity 2

(To be submitted for assessment)

Design a 5-point Likert Scale to test the hypothesis “People in this area are satisfied with the levels of police foot patrol in this community”. Distribute your scale to what you consider to be an adequate sample of subjects (the more the better, aim for at least 30).

Evaluate your findings and report:

1. Whether the hypothesis appears true or false

2. The size of the sample