**University od Djilali Bounama Khemis Miliana**

**Level :3rd Year Councelling & guidance**

**Subject :English Prof :D.Mezaini**

 **Research Methods**

**Lesson one :Experiments** In order for psychology to be regarded as a science it is necessary that rigorously conducted experiments are undertaken, so much psychological research is performed in this manner.

 **The experimental method**

 The **experimental method** is a scientific research method involving the manipulation of variables to determine **causality** (cause and effect relationships). A variable is anything that can occur differently in some way in an experiment and thus has an effect on the findings.
Participants are randomly allocated (without **bias** in selection) to the different conditions (testing groups), which means that the conditions should be fairly equal in terms of the types of people in the testing groups.

**KEY TERMS
Bias** – the degree to which participants in a sample have been selected without prejudice
**Causality** – the establishment of cause and effect relationships through the use of controlled conditions in research settings
**Experimental method** – a research method that uses random allocation of participants and the manipulation of variables to determine cause and effect relationships

**Questions :**

**1** An experiment allows the establishment of causality (cause and effect relationships).
Explain why the experimental method makes causality possible.

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**2** In experiments participants are randomly allocated to the testing conditions.
**a)** State what is meant by random allocation.

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**b)** Suggest how random allocation could be achieved.

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**c)** State the purpose of having random allocation.

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**Lesson two : The experimental method**

**Independent and dependent variables**

 All procedures in an experiment (everything that occurs) should be *standardised*. The intention of this is that all variables in an experiment are *controlled* (kept the same for all participants), so that the effect of the one variable being tested, the **independent variable (IV)**, can be clearly seen and recorded.
So, an experimental study will require an *independent variable (IV)* – the variable (thing) that is being tested. The IV will need to be clearly
**operationalised** (defined) so it can be manipulated (changed) between the experimental conditions (testing groups). It gets its name from the fact that
it is independent of the participants’ control, as it is manipulated instead by the researcher.
The IV is manipulated to see its effect on a **dependent variable (DV)**, which is operationalised as a measurement of some kind. In effect the DV will be a measurement of the effect of the IV upon the different experimental conditions.

**KEY TERMS
Dependent variable (DV)** – the factor measured by researchers in an investigation to determine the effect of an independent variable

**Independent variable (IV)** – the factor manipulated by researchers in an investigation
**Operationalisation of variables** – the process of defining variables into measurable factors

So, for example, if the effect of meditating upon reaction times was being investigated, there would be two experimental conditions: one where participants (who had been randomly allocated to the two conditions) meditated for a set amount of time and one condition where participants did not meditate. The IV would be meditation or no meditation, as this is the one variable that alters between the two conditions and is manipulated by the researcher as they decide (by random selection) who is in each testing group. The DV could be how long it took to press a button when a light came on, in other words a measurement of time.
If reaction times were seen to be faster in participants who had meditated, then the conclusion could be reached that meditation quickens reaction times. The findings have causality (cause and effect relationships), as we know the cause (meditation) and the effect (faster reaction times) and the fact that no other variables, other than meditation, caused the effect, as all other variables were controlled and kept constant.

**Questions :**

**1** State where an independent variable (IV) gets its name from.

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**2** Explain what it means for an IV to be operationalised.

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**3** What is a dependent variable (DV) always a type of?

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**4** If an experiment was being performed to test the effect of gender on memory ability,state what the IV and DV might be.

IV :………………………………………………………………………………

DV :……………………………………………………………………………..

**Lesson three : The experimental method**

**Extraneous and confounding variables**

To see the effect of the IV upon the DV all other variables in an experiment should be controlled so that they don’t vary in any of the experimental conditions or between participants. In other words, they should remain constant for all testing groups. Therefore, **extraneous variables** will be any variables, other than the IV, which could affect the DV. These need to be controlled in order to establish *causality*. If something else other than the IV has affected the DV, it would not be possible to claim that the IV caused the effect upon the DV.
Uncontrolled extraneous variables can become **confounding variables** which confound (confuse) the results by affecting the DV. In effect,extraneous variables are any variables other than the IV, which could affect the DV (and thus the results) and so need to be controlled (kept the same for all participants in all conditions), while confounding variables are extraneous variables that were not controlled and did affect the DV.

**KEY TERMS
Confounding variables** – uncontrolled extraneous variables that negatively affect results.
**Extraneous variables** – variables, other than the IV,that might affect the measurement of the DV.

In the example of testing the effect of meditation upon reaction times, whether
participants had drunk coffee could be an extraneous variable, as having drunk or not drunk coffee might affect participants’ reaction times in pressing a button when a light came on. Therefore, researchers would need to ensure all participants in both conditions had not drunk coffee, so that it did not affect the
DV. If this wasn’t controlled it might become a confounding variable and not allow the effect of meditation upon reaction times to be seen.

There are three main types of extraneous variables to control:
**1** *Participant variables* – variables concerned with participants themselves that could influence the DV and thus confound the results, for example participants’ ages, gender, level of intelligence etc. If everybody in one condition was over 40 years of age and everyone in the other condition was under 20, then this could have a confounding effect upon the DV (reaction times). To control it there would need to be a balance of types of participants within the testing groups.

**2** *Situational variables* – variables concerned with the experimental setting (the testing environment), for example temperature,noise levels, etc. If one testing group performed the study in a hotter or noisier environment than the other testing group,it might affect reaction times in pressing a button when a light came on, rather than the effect of meditating or not meditating.
Therefore, these factors need to be controlled by making sure the environmental conditions under which an experiment takes place are the same for all participants.
**3** *Experimenter variables* – variables concerned with changes in the personality, appearance and behaviour of researcher(s). For example, a researcher who is laid-back and friendly with some participants and stricter and more
formal with others might have an effect on reaction times. Therefore, the same researcher should test all participants and act in the same way with all participants to ensure it is the IV only that affects the DV.

**Questions :**

**1**What is the difference between extraneous and confounding variables?

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2Name and describe three types of extraneous variables.

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**Lesson four : The experimental method**

**Demand characteristics**Apart from extraneous and confounding variables, there is also the risk of demand characteristics not allowing causality to be established by influencing the effect of the IV on the DV. Demand characteristics involve interactions between participants and researchers that affect participants’ behaviour so that they do not behave naturally.

**KEY TERM**

**Demand characteristics** – features of a research study that influence participants to unconsciously behave in an unnatural manner

There are four ways in which demand characteristics can affect participant behaviour so that results are confounded:
**1** Believing that they have worked out the purpose of the study and so acting in a non-natural way that they believe the researcher wants them to do in order to ‘prove’ their hypothesis.

**2** Believing that they have worked out the purpose of the study and so acting in a nonnatural manner in order to ‘mess up’ the study and produce results that will ‘disprove’ the hypothesis. This is known as the ‘*screw you phenomenon*’.
**3** Knowing that they are taking part in a study and so acting in a non-natural manner out of nervousness or fear of evaluation.
**4** Knowing that they are taking part in a study and so acting in a non-natural manner due to *social desirability bias*, where participants behave in a manner that they believe society would expect of them,
The **single-blind procedure** is one way to reduce the risk of demand characteristics. This involves participants having no idea which
condition of a study they are in. For example,in clinical trials of drugs for use with mental disorders, participants often don’t know if they are in a condition that involves taking a drug or in a condition that involves taking a placebo
(dummy drug).
Using an **independent groups design** can also reduce the chances of demand
characteristics, as each participant only does one condition of a study and so has less chance to form an opinion of what the purpose of the study is and adjust their behaviour to try to ‘prove’ or ‘disprove’ what they believe to be the
hypothesis.However, it may not be practically possible to use either of these techniques to reduce the risk of demand characteristics.

 **KEY TERMS
Independent groups design** – experimental design where each participant performs just one condition of an experiment

**Single-blind procedure** – method of controlling demand characteristics whereby participants are unaware as to which experimental condition they are in

**Questions :**

**1** Explain what is meant by the term ‘demand characteristics’.

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**2** Outline four ways in which demand characteristics can affect participant behaviour so that results are confounded.

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**3** Explain how the following can be used to reduce the risk of demand characteristics:
**a)** a single-blind procedure

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**b)** an independent groups design.

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**Lesson five : The experimental method**

**Investigator effects**

 **Investigator effects** are the ways in which researchers can unconsciously influence research findings. These can occur in three main ways:
**1** *Physical characteristics* – physical aspects of researchers can affect participants’ behaviour .
**2** *Personal characteris*tics – personal aspects of researchers can affect participants’ behaviour, like their accent or tone of voice.
**3** *Researcher bias* – researchers may be unconsciously biased to ‘finding’ or interpreting participants’ behaviour in a way that supports their hypothesis, so that they find what they want to find or expect to find. For example, researchers may unknowingly phrase questions in a way that suggests to participants how they would like them to answer.

A **double-blind procedure** is one way to minimise the risk of investigator effects, where neither participants nor researchers know what conditions
participants are in. This prevents investigators ‘feeding’ clues to the participants as to which condition they are in and thus how they would like them to behave, therefore reducing the chances of demand characteristics. For example, in clinical drug trials neither the researchers nor the participants would know who was taking the drug being tested or a placebo. Again though, this technique is not always practically possible to use.

**KEY TERMS
Double-blind procedure** – a method of controlling investigator effects and demand characteristics where both researchers and participants are unaware of which experimental condition participants are in
**Investigator effects** – where characteristics of a researcher influence participants’ responses in an investigation

**Questions :**

**1**Explain what investigator effects ……………………………………………………………………………………………………………………………………………………………………………………………………………………

**2** Outline the three main ways in which investigator effects can occur.

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**3** Explain how a double-blind procedure could be used to reduce the risk of investigator effects occurring.

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