



10. IV = time of day, DV = (level of) alertness. ND  
 11. IV = whether conditions are noisy or quiet, DV = number of words learnt. D

## OPERATIONALISATION OF VARIABLES

handout number

64

Activity type Consolidation

This is an exercise on operationalising variables as well as writing both directional and non-directional hypotheses.

### Practical use

Individual, classwork or homework

### Additional notes

It may be useful and time saving on marking for students to swap papers and mark each other's answers. They

could discuss the appropriateness of various ways of operationalising the different variables.

### Answers

Obviously there are many ways of operationalising variables and as long as they are a means of precisely measuring the variables that is acceptable.

Examples

- To see if the amount of work students do is affected by when they do it:
  - Amount of work – score on a test or a set of questions.
  - Time – any two time slots such as 9–10 a.m. 8–9 p.m.
- To see if the amount of stress people are under affects their health.
  - Scores on a stress questionnaire such as the life events scale.
  - Health – number of days off sick (if working); scores on a health questionnaire.
- To see if the age of the child affects how much rough and tumble play they engage in.
  - Age – 3–5 years and 10–11 years (any suitable time span).
  - Rough and tumble play – quantity of play involving physical contact accompanied by smiling or laughing (observations made using behavioural categories and counted).
- To see whether spending time on social media affects people's sociability.
  - Time on social media – average daily or weekly time spent on it.
  - Sociability – the average amount of time per day (or weekly) spent with friends.
- To see whether an audience affects how hard a bee will work.
  - Audience – put the bee in a see-through hive with or without other bees on the outside.
  - Work – the amount of honeycomb they build; the amount of time spent cleaning the hive; the amount of honey they take to the queen.

### Extension activity

Internal validity is defined as the extent to which what is measured reflects what a study aims to measure. For example, a measure of intelligence which measures the head circumference is obviously not a valid measure (a ridiculous example serves to make the point). Students

may think of various measures of memory in which lists of words are recalled – how valid is this as a measure of everyday memory? They could use examples from memory experiments they have studied.

N.B. validity is on A level but not AS specification.



## WORDS &amp; US

Activity/type Consolidation

handout number

67

This is a handout concerning a natural experiment. It requires students to think about the limitations of such a method as far as any cause/effect conclusions which can be drawn. It also asks students to redesign this study

as a field experiment thus emphasising the practical differences between these two types of experiments.

## Practical use

Individual; homework.

## Additional notes

Students may confuse natural experiments with natural settings so it is worth revisiting this wherever viable during the course.

## Answers

## 1. Write out a suitable hypothesis for this study. (2)

There will be a difference in the improvement of reading age between those using *Readwell* and those using *Let's Read!*.

## 2. The study described above is a natural experiment. What is a natural experiment and why would this study be described in this way? (2)

A natural experiment is one in which the independent variable is not arranged by the psychologist (researcher) but would have varied anyway. In this case, the new reading scheme is being introduced to the school and the psychologist takes advantage of this in order to study its effect.

3. The study found that the *Readwell* group did better. Despite this, suggest three reasons why you could not necessarily conclude that *Readwell* was more effective than *Let's Read!*. (6)

In general, there are many influences on the children's reading ability other than the reading schemes. For example, there may be differences in the children's ability which would counteract any effects from the reading schemes. The teachers might be responsible for the children's ability rather than the reading scheme. Children in one group might be more encouraged by parents than those in the other one and again counteract any effects of the reading schemes.

## 4. If a psychologist had the full co-operation of the teaching staff, how could she or he design a true experiment (rather than making use of a naturally varying independent variable) to test the effectiveness of the new reading scheme? (3)

The children would need to be carefully matched on current reading ability (and possibly IQ) and one member of each pair assigned to each group so that the groups were more or less equivalent.

The alternative is to use random assignment to the two groups.

The same teacher should teach both groups and should have no predetermined ideas about which scheme is better (preferably he/she should not have used either scheme before).

Several other controls could be mentioned: for example, both groups should get exactly the same amount of teaching, parents from both groups should be given the same encouragement to help.

## 5. Why would this make any conclusions from the results more valid? (2)

Any conclusions would be more valid because, by deliberate manipulation of the IV (the two reading schemes) and matching of the groups, you have controlled extraneous and confounding variables better than in the natural experiment. You can therefore be more confident about cause and effect (that differences in the improvement of children's reading abilities are genuinely due to the different reading schemes rather than to other uncontrolled variables such as the teacher or the ability of the children).

## 6. Explain why this new experiment might be classed as a field experiment. (2)

It would be classed as a field experiment because the dependent variable is being measured in the children's own natural environment but the independent variable is manipulated by the researcher. In a lab experiment the DV would be assessed in the researcher's own lab and generally conditions would have been much more controlled.



Answers

The balance is between the rights of the participants (in research studies) and the goals of research to produce authentic, valid and worthwhile data.

The BPS (British Psychological Society) is the body responsible for ethical guidelines.

1. How do you gain consent? Participants should be issued with a consent letter or form detailing all relevant information that might affect their decision to participate. Assuming the participant agrees, this is then signed. For investigations involving children under 16, a signature of parental consent is required.

2. Three alternative ways of getting consent are:
  - Presumptive consent
  - Prior general consent
  - Retrospective consent

3. Dealing with deception and protection from harm:
  - Full debrief
  - Right to withdraw
  - Reassurance/counselling

4. Dealing with confidentiality:
  - Maintain anonymity
  - Protection of data (reassurance of this).

Extension activity

**CONSENT:** With respect to presumptive consent rather than getting consent from the participants themselves, a similar group of people are asked if the study is acceptable. If this group agree, then consent of the original participants is 'presumed'. Prior general consent involves asking participants to give their permission to take part in a number of different studies, including one that will involve deception. By consenting, participants are effectively consenting to be deceived. Retrospective consent requires that participants are asked for their consent during debriefing, having already taken part in the study. They may not have been aware of their participation or they may have been subject to deception.

**DEALING WITH DECEPTION and PROTECTION FROM HARM**

At the end of a study, participants should be given a full debrief. If deception was involved, participants should be made aware of the true aims of the investigation. Participants should also be made aware of any details they were not supplied with during the study, such as the existence of other groups or experimental conditions. Participants should also be told what their data will be used for and must be given the right to withhold data if they wish. This is particularly important if retrospective consent is a feature of the study. Participants may

have natural concerns related to their performance within the investigation, and so should be reassured that their behaviour was typical or normal. In extreme cases, if participants have been subject to stress or embarrassment, they may require counselling which the researcher should provide.

**DEALING WITH CONFIDENTIALITY**

If personal details are held these must be protected. However, it is more usual to simply record no personal details, i.e. maintain anonymity. Instead, researchers usually refer to participants using numbers when writing up the investigation. It is standard practice that during briefing and debriefing, participants are reminded that their data will be protected throughout the process.

ETHICS IN CONTEXT

Activity type Consolidation

This is a ready to go homework sheet where students are required to state a relevant issue, explain why it is an

Practical use

Individual homework task

Additional notes

When students see an exam question that asks for a relevant ethical issue to be named they will often take the first one they think of – this may not necessarily be

handout number 6.14

issue in the context of the given study and suggest a way of dealing with it.

the best one, particularly if they then have to say how it should be dealt with. Encourage them to select wisely by going through all the possibilities before deciding.

Answers

Suggested answers – there are a number of possibilities in each case. One example for each is worked through here.

1. An experiment to investigate whether the memories of 3 to 4-year-olds are more susceptible to influence than adults' memories.
  - a. Protection from harm.
  - b. Children are vulnerable and need to be protected from distressing memories.
  - c. Ensure that the memory that is planted is one that they could have been expected to have had anyway and one that is not distressing.
2. A field experiment to investigate how people react to orders from someone dressed in a uniform or not.
  - a. No informed consent, no right to withdraw.
  - b. The participants have been unwittingly deceived and it may be difficult to debrief them.
  - c. The experiment should be assessed by an ethical committee to decide whether the intervention causes no risk or potential harm to participants.
3. A study to see whether parenting style affects later school attainment.
  - a. Protection from harm.
  - b. The children's parenting should not be manipulated as there could be long-term consequences.
  - c. Would need to take naturally occurring variations in parenting style and investigate any differences in outcome.
4. A study to see if recall is affected by anxiety.
  - a. Protection from harm.
  - b. If the study causes a distressing level of anxiety then the participant should be allowed to withdraw.
  - c. The participant needs to be reminded of their right to withdraw at the start and end at least. Any signs of distress should lead to further offers and if necessary the researcher should stop anyway. All data should be destroyed.
5. A study to see if workplace stress increases the likelihood of heart attacks.
  - a. Confidentiality
  - b. Data on stress and medical conditions needs to be kept securely between the researcher and the participant.
  - c. Data should be stored securely (both physically and on computer) and anonymously. It should not be disclosed to a third party.
6. A study to see if the boys in an A level Psychology class do better than the girls in the same class.
  - a. Informed consent.
  - b. As the students are likely to be over 16 they can give their consent but for it to be informed they will need to know the aims of the study and be aware of how their data could be used (anonymously).
  - c. They should be given the opportunity not to participate and it must be carefully checked that they understand what is being done and why.

**A CONTROLLED OBSERVATION**

Activity type Application

*Handout number***6.17**

This activity and the next one both involve observational studies of children but there the similarity ends. They are designed to assess very different aspects of observational techniques. This one, as the title implies, looks at the

practical and ethical issues in designing an observation in a structured environment and compares it to a naturalistic observation study.

**Practical use**

Individual: homework, classwork or assessment

**Additional notes**

Given a markscheme, students can mark each other's: this gives them deeper understanding of any pitfalls they might encounter and the way in which answers must be structured in order to gain full marks. It also makes them

think about their work from the perspective of the examiner. (How many times do exam markers think 'Yes, I know what you're trying to say but you haven't actually said it!')

**Answers**

1. Suggest **two** more pieces of observational data that could be collected by the psychologist, one qualitative and one quantitative. (4)

Qualitative data could include the facial expression of the father, the way in which he plays with the child. Quantitative data could include the number of smiles, the time spent in eye-contact.

2. One of the problems of observational research is that of observer bias. How might this have affected this study? How could it have been reduced? (4)

The observer might tend to notice aspects of behaviour that support his/her own hypotheses. It could be reduced by using more than one observer or by videoing the interaction and then independently checking the scoring.

3. Describe **two** ways in which this study differs from a naturalistic observation study. (4)

The location – it takes place in a controlled environment rather than in the 'field'. The type of behaviour sampled – in a controlled setting, there is control over the environment and therefore this elicits certain responses.

4. Suggest **one** advantage that a controlled observation has over a naturalistic observation study. (2)

In the controlled setting, certain responses are likely to be elicited which may never or only rarely occur in a natural setting. It is easier to make the observations. Comparisons can be made between participants because they are responding to the same situation. It is easier to replicate.

5. Name the sampling method used in this study and describe **one** disadvantage of using such a method. (2)

Volunteer sampling. This is liable to provide a biased sample because volunteers have been shown not to be typical – Ora (1965) showed that volunteers are atypical: they tend to be more easily influenced, moody, anxious, aggressive and neurotic than non-volunteers.

6. Outline **two** ethical considerations the psychologist would need to consider when conducting such research. (4)

Participant distress: whether the child would be upset by the procedure, for example if the father had to take away a toy they were enjoying in order to offer another. Psychological harm: fathers should be given the right to withdraw at any time.

7. This study takes place in an artificial environment and is highly structured. Why is this study a controlled observation study and not an experiment? (1)

There is no IV.

8. The psychologist decided to extend this research by repeating the study but using mothers as well as fathers and comparing the two sets. What type of experiment is this? What is the independent variable? What is the dependent variable? (4)

It is a quasi-experiment (because the IV is a condition that exists (sex of parent) and not a deliberately manipulated variable). The IV is the sex of the parent. The DV is the parents' behaviour (not the child's).



**VERY DODGY EATING QUESTIONNAIRE**

Activity type Application

Our students absolutely love pulling a questionnaire apart (see further idea below) and this one gives them plenty to go at!  
It demonstrates pretty much how not to write a questionnaire – students should find the mistakes and problems.

There is then the option to get them to rewrite the questionnaire after the faults have been considered. Hopefully they will be suitably outraged!

handout number

6.20

**Practical use**

Class activity – paired or individual for discussion. The extension task could be for homework depending on time available.

**Additional notes**

Ask students to keep a lookout for questionnaires 'with issues' and bring them to class – should make for entertaining reading!

**Answers**

**Issues in the introduction**

No clear informed consent and no chance to ask questions.  
Have to do every question – right to withdraw?

Need to make sure that they are old enough to give consent themselves.  
What if they don't want to fill it in? (There is an argument for some coercion going on here!)

Confidentiality – asked to put name on it (and name of people who over- or under-eat) and then just hand it in to anyone.

1. Name – is this necessary? Confidentiality.

2. Age – What if you are 17? They should be told that they cannot participate if they are under 16.

3. What is too much? How will we know if they are right in their thinking. Very vague and unhelpful question. Answers likely to be affected by social desirability bias.

Also could be considered to be leading as it states most people do!

4/5. What if you think you never do? No option for that. Or for the other times, e.g. late evening.

6/7. It depends on level of activity, height, etc., so there is no right or wrong answer here. Not an accurate measure of what people understand about how much they need to eat.

8. This one has nothing to do with the aim of the study!

9/10. Very difficult to answer accurately as we are not usually around people for every meal, etc. Also are 'double-barreled' in that the answer could be yes they over-eat but they may not be overweight or vice versa therefore cannot be answered accurately. You should not ask anyone to name someone full stop but then say just hand it into the office. Potential for harm!

**IMPROVE ON THIS**

Activity type Consolidation

This exercise is designed to get students thinking carefully about the wording of questionnaire, etc.

**Practical use**

Class individual or paired activity

handout number

6.21

First they have to work out what is wrong with the question, then they should offer a solution.

**Additional notes**

This is slightly more challenging than the Very dodgy eating questionnaire which was an earlier starter. This one could be used at revision time to sharpen skills.

As an extension you might ask students then to write a questionnaire from scratch on a given topic and get another pair to critique it. Hopefully they will realise that there is real skill involved in writing good questions!

**ANSWERS**

Some example answers are provided but of course there will be a range of alternative right solutions.

Poor question	What's wrong	Rewritten version
How would you rate the reign of the illustrious Henry VIII?	Leading question	How would you rate the reign of Henry VIII?
Are any of your friends allergic to animals?	May be unanswerable	Either... to your knowledge are any of your friends allergic to animals or offer the option of 'I don't know'.
Yes No		
Do you know anyone that is protanopic?	Over use of jargon	Do you know anyone that is colour blind (protanopic)?
How well do you think that the government runs the country?	Leading question/ biased	a) Very effectively b) Quite effectively c) Neither effectively nor ineffectively d) Quite ineffectively e) Very ineffectively f) I don't know
a) Pretty well b) Great c) Fantastic d) Incredibly well		
Do you approve of the oppressive uniform policy of this school?	Emotive language (oppressive)	Do you agree with the uniform policy of this school? Or What do you think about the uniform policy of the school?
What is the fastest and cheapest way to get to London from here?	Double barreled question (the fastest may not be the cheapest, for example)	What is the fastest way to get to London from here? What is the cheapest way to get to London from here?
If you were in a foreign country and could not speak the language would you: a) Use a lot of hand gestures? b) Try to learn the language?	Unanswerable/unclear There are many other alternatives	Please state any methods you might use if you were in a foreign country and could not speak the language (e.g. hand gestures, etc.).
Now that you know how bad smoking is for you, will you give up? Yes No	Leading question	What is your intention regarding smoking now?
Do you look forward to going to work? a) Never b) Always	May be unanswerable	a) Never b) Occasionally c) Not usually d) Yes usually e) Always
What is your age? a) 10-20 b) 20-30 c) 30-40 d) 40+	Unclear (which do you tick if you are 20 or 30?)	a) 10-19 b) 20-29 c) 30-39 d) 40 +



## QUANTITATIVE AND QUALITATIVE DATA

handout number

6.25

Activity type Consolidation

Students are given a brief account of a study which collects either quantitative or qualitative data.

Students are required to think of an alternative type: quantitative if the data is qualitative and vice versa.

### Practical use

Individual: homework or classwork, could work in pairs

### Additional notes

This exercise encourages students to think about how data can be collected rather than simply deciding which

type it is. This can be useful in exam questions in which they may have to plan a study.

### Answers

Obviously there are no 'right' answers. Some suggestions are:

Steve: the number of people who want to be a doctor, etc. Or: the categories might be broader – number of people who want to join the caring professions.

Harsa: the percentage of people who specify that a person must be over a certain height (or have a certain hair colour, etc.)

Lucy: interview to find out how people attempt to remember the items.

Ellie: what kind of buildings they construct.

Jon: the number of people who disapprove of players' behaviour. The number of people who think the papers exaggerate bad behaviour. Note – it should be data concerned with what people think of football not of the behaviour of players.

Alistair: what qualities people are looking for in a film. Which factors influence their decision to go to a film.



THE CENTRAL LINE ..... *handout number* 6.26

Activity type Consolidation

This is an exercise on various aspects of measures of central tendency. Firstly, students have to write advantages and disadvantages into a table, and then

have to apply other knowledge about these measures to answer questions.

**Practical use** .....

Individual: useful as assessment but could be homework.

**Answers** .....

1. a. mean = 12, median = 12, mode = 12  
b. mean = 5.7, median = 5.5, mode = 5
2. The median score. The mean would be distorted by a single high score (49) and there is no modal score.
3. The pocket money would be calculated by using the most frequent amount given to class members. It has the advantage over the mean of not being distorted by extreme scores, e.g. by a child (or few children) being given very large amounts of pocket money or none at all.
4. The mode. With category data (nominal data) this is the only measure of central tendency available.
5. • If you have individual data and no extreme scores, use the mean because it is the only measure of central tendency which takes account of all the results.  
• If you have a few extreme scores (especially if they are in one direction) use the median because the mean may be distorted.  
• The mode is never the best option on its own unless the data is in categories. However, it is sometimes useful to express the modal score (e.g. which was the most common score on how many words people could recall) in addition to other measures of central tendency. (this advice comes mainly from the exam tip on page 192)

SPREAD THE WORD ..... *handout number* 6.27

Activity type Application

An exercise to help students become aware of what measures of dispersion (range and standard deviation) imply.

**Practical Use** .....

Individual: homework or classwork

**Answers** .....

1. a) The mean score for each clown is very similar but the range and standard deviation differ widely. What does this tell us about the ratings for Krusty as compared to the ratings for Bozo? Give as much information as you can. (3)  
As indicated by both the range and standard deviation, the ratings for Krusty are far more variable than the ratings for Bozo. Using the range alone, this could be due to one anomalous result but the difference in sd indicates that this is not the case and the variation is consistently more extreme for Krusty than for Bozo. Since the means are very similar, this indicated that Krusty had both higher and lower scores than Bozo. Bozo's ratings are likely to have been very consistent, not extreme, clustering around the mean.  
b) If you wanted to be confident that the clown would not hugely disappoint, which one would you choose and why? (2)  
Bozo because very few people rated him very low so he is less likely to *hugely* disappoint.  
There is a maximum score of 10 and Krusty's range is 9, therefore his scores are 1 to 9 or 2 to 10. Bozo's top score must be above the mean so the range is going to be 4 to 6 or 5 to 8.



## AIMING TO PILOT

Activity type Revision

handout number

6.15

Students need to know not only what pilot studies are but why they are valuable and how they are done. This handout asks them to review the definition and aims

of a pilot study before working through some application examples which require them to suggest what might actually be checked in each case.

### Practical use

Individual activity for class or homework

### Additional notes

The handout could be used to support initial work on pilot studies or as a useful revision activity without notes.

### Answers

The aim of piloting is to check that procedures, materials, measuring scales, etc., work and to allow the researcher to make changes or modifications as necessary.

Suggested answers are given below but they may not be exhaustive depending on how the students imagine the study being carried out. In each case there are elements of the study which might be looked at more closely and potentially changed for the final study:

- The study aimed to investigate whether or not playing calming music in a dental waiting room could reduce the level of anxiety observed in patients.
  - Try out actual music; decide how long they listen to it; test observation criteria for judging anxiety level.
- The study aimed to investigate smoking habits in teenagers by issuing a questionnaire.
  - Whether all the possible alternative responses are provided; whether all the questions are understood; how long participants need to complete the questions
- The study aimed to investigate whether or not the presence of loud noise in the background impacted on the recall of photo-based images of people.
  - If the music was loud enough; whether the images were presented for long enough; whether or not standardised instructions were understood.
  - The study aimed to investigate the difference between the level of aggression in boys and girls in the school playground.
    - Whether the aggression categories were suitable; whether a camera or observers were suitably placed; whether the recording method worked.
  - The last question suggests that students should reflect on what they need to remember. Key points are:
    - Pilot studies are carried out before the main study.
    - Often changes to the design are made as a result of the pilot.
    - Pilot study data will not be included in the final data set (it will usually have been collected under different circumstances due to changes).
    - Piloting potentially saves time and money because it helps avoid flawed designs.