Computers hinder children's learning

handout number 6.1

Activity type Starter

This handout can be used right at the start of the year 1 course to get students thinking about the characteristics of 'good research'. The beauty of the exercise is that although they do not have the terminology (yet) they usually can see what is wrong.

Practical use

Paired class activity or individual homework

Additional notes

You can, of course, then give them the terms to link to their intuitive understanding.

Answers

Some suggested issues

Ethical issues, e.g. lack of parental consent, lack of consent from the headteacher, confidentiality of data (exam grades being used for research purposes).

Extraneous variables not accounted for – the teacher didn't ask what the computer is being used for! Nor did she get corroborative evidence, e.g. from the parents.

Sampling – the school is probably not representative and as such the results cannot be generalised to other schools and pupils. Her sampling was not random (choosing a few naughty ones).

Dependent variable – are exam grades the best measure?

Hypotheses: Directional or non-directional?

handout number 6.2

Activity type Consolidation

A straightforward task identifying whether general hypotheses are directional or non-directional. The handout summarises the difference between the two and offers a precautionary warning against jumping to conclusions based on expectation.

The handout covers both experimental and correlational hypotheses.

There is an extension task concerning what determines what type of hypothesis is used.

Practical use

Individual: homework

Additional notes

When discussing the reason for directional/non-directional it may be useful to go back to the topic of memory as a revision exercise and discuss what hypotheses you would use for various theories (capacity of STM, chunking, interference theory of forgetting, etc.).

Answers

ND=non-directional, D=directional

1 = ND, 2 = D, 3 = ND, 4 = D, 5 = D, 6 = D, 7 = D, 8 = ND, 9 = ND, 10 = ND.

Whether a directional or non-directional hypothesis is chosen depends on knowledge from previous research. If the findings of previous research suggest the direction of the findings use directional hypothesis.

When there is little or no research or the findings are ambiguous, it is best to use a non-directional hypothesis.

IV and DV Identification

handout number 6.3

Activity type Consolidation

This is an exercise on identifying the IV and DV. You should emphasise to students the need to be precise.

There is an additional exercise to reinforce the previous topic – deciding if the hypotheses are directional or non-directional.

Practical use

Individual – homework or classwork. If done in class, could be assessment.

Additional notes

This is a good time to ensure that students learn how to spell independEnt and dependEnt!

Answers

ND=non-directional, D=directional

1. IV = auditory or visual stimulus, DV = reaction time. ND
2. IV = presence or absence of drug A, DV = amount remembered. ND
3. IV = red or blue rag (not just colour), DV = number of charges made by the bull. D
4. IV = position in family, first or subsequent, DV = age at which first words spoken. D
5. IV = sex (man or woman), DV = speed of driving. D
6. IV = amount of sleep, DV = amount of learning in ten-year-old boys. ND
7. IV = whether babies are under or over 9 months old, DV = whether or not searching occurs. D
8. IV = social class, DV = I.Q. score. ND
9. IV = whether items are chunked or unconnected, DV = number of items remembered. D

10. IV = time of day, DV = (level of) alertness. ND

11. IV = whether conditions are noisy or quiet, DV = number of words learnt. D

12. IV = whether or not rats are handled., DV = time taken to learn the maze. D

Operationalisation of variables

handout number 6.4

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

1. 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.
2. 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.
3. 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).
4. 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.
5. 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.

Demand characteristics and investigator effects

handout number 6.5

Activity type Consolidation

This is an exercise in which students first suggest cues that may result in demand characteristics and are then given four investigations in which they have to suggest ways in which they may be affected by demand characteristics and investigator effects.

Practical use

Individual: homework or classwork

Additional notes

Demand characteristics are ones that students often find difficult so it well worth spending some time on ensuring that they are able to utilise the term effectively.

Answers

Possible cues resulting in demand characteristics:

- The actual communication during the study: the instructions and any implicit clues from non-verbal communication.
- What the participant may already have heard about the study (for example, from other participants).
- The way the participant is approached initially and asked to volunteer.
- The type of person that the researcher is: whether, for example, he or she is formal or relaxed and so on.
- The setting of the study.

There aren't any 'right' answers to these, the following are suggestions.

6. A group of students is interviewed about their belief in superstitions. The aim of the study is to see if there is a difference between males and females in the degree to which they are superstitious.

Demand characteristics: whether students recognise that the questionnaire is concerned with superstitious behaviour and change their answers to suit the impression they would like to give, that either they are or are not superstitious regardless of the truth!

Investigator effects: the way the interview is conducted, are men and women interviewed differently by tone of voice, etc., and would this influence their response?

7. Teenagers in a youth club are observed to see if girls are more co-operative than boys.

Demand characteristics: if observation is not discreet, the participants may behave in such a way as to give a certain impression. Their behaviour will be affected by being watched.

Investigator effects: the investigator may expect boys and girls to behave differently with respect to co-operation (e.g., that girls will be more co-operative than boys) and this may affect what behaviour is interpreted as co-operative and what is not. How do you measure co-operation, is it standardised?

8. Researchers are investigating whether students work more diligently in a maths lesson than in a general studies lesson. They give very similar worksheets (to do with everyday finance) to the same students in each of these two lessons.

Demand characteristics: the students may work out the purpose of the study because they have a similar exercise given by the same researchers in two different lessons. This may influence their behaviour – they may, for example, work harder in the maths lesson because they feel they should when being observed.

Investigator effects: the investigators may unconsciously communicate that they expect students in one lesson to work harder than in the other and this could, in turn, affect how hard they actually work regardless of the type of lesson.

9. A researcher observes the amount of eye-contact between two people who have been requested to have a staged argument as compared to the amount of eye-contact between two people asked to have an ordinary conversation.

Demand characteristics: the fact that the participants have been requested to have an argument is bound to reveal some aspects of the purpose of the study.

Investigator effects: again, expectation as to results since eye-contact is difficult to measure accurately.

Let's revise

Activity type Idea

The section on confounding and extraneous variables is a good excuse to get the students to revise studies they've already done.

You or they could choose a certain number of studies and they could go through them and think about the confounding and extraneous variables that would need to be controlled/considered. In each case students should provide a justification for whether the variables might be extraneous/confounding.

Suitable studies are those presented in a reasonable amount of detail, for example:

Ch 1:
Asch (1952) pg 17, 18
Milgram (1963) Pg 22

Ch 2,
Jacobs (1887) pg 46
Baddeley (1966) pg 46
Burke and Skrull (1988) pg 54
Godden & Baddeley (1975) pg 57
Loftus and Palmer (1974) pg 58
Johnson & Scott (1976) pg 60

Ch 3
Harlow (1958) pg 78
Ainsworth (1969) pg 84
Van IJzendoorn and Kroonenberg (1988) pg 86
Bowlby (1944) pg 88
Rutter *et al* (2011) pg 90

Practical use

This would make a good small group exercise but could be individual homework if preferred.

Additional notes

This could be done later if you wish to incorporate participant design (and the confounding variables that might arise from that).

Answers

Some examples:

Asch – the personality of the participant rather than the situation may affect conformity. The room in which the study is held could affect how easy it is to see the display board.

Milgram – the age of the participant might affect how they are treated or may in itself affect obedience (rather than the situation).

Jacobs (1887) digit span – the textbook specifically mentions inadequate control as a limitation and gives an example (some participants may have been distracted while being tested so they didn't perform as well as they might).

Baddeley – participant reactivity can be a significant extraneous variable and if the participants work out the purpose of the study (hardly difficult in this case!), this can introduce demand characteristics which are difficult to control.

Burke and Skrull (1988) – interference (investigated using advertisements). Some brand names might be easier to recall than others simply because of their name (e.g. they might be 'catchy'). This, rather than interference, may affect how well they are recalled.

Bowlby (1944) – affectionless psychopathy may have been caused by disturbance in the family rather than separation.

Van IJzendoorn and Kroonenberg (1988) – subculture might act as a confounding (alternative) variable, i.e. the fact that people didn't just come from a particular country but may have been urban or rural.

Plan a study (or two)

Activity type Consolidation

We find that the best way of teaching experimental design and related issues (counterbalancing, etc.) is by getting the students to design a variety of studies in small groups and then discuss them as a class. The ones I would suggest are as given below – chosen to give a variety of designs and different counterbalancing needs.

Design an experimental study to test the hypothesis that:

1. People learn more quickly in a quiet environment than in a noisy one.
2. The more times you meet someone, the more positively you will rate them.
3. Alcohol causes an increase in reaction time.
4. People remember items better if they are presented as a picture than if they are presented as words.
5. Children younger than 9 months of age will not try to find a hidden toy but children above this age will.

In your study, include the following:

- What essential apparatus/materials are required.
- How many groups/ conditions will be used.
- What controls are necessary.
- How the findings will be measured.

Put students in groups and put the hypotheses and further instructions on the board.

Then, and this is important, assign each group a specific order in which to do the designs, an order which should vary between groups (group A does 1 2 3 4 5, group B does 2 3 4 5 1 and so on). This ensures that each study is the first one to be designed by at least one group. They make notes on how they would do the study and then there is a discussion.

Starting with group A, ask them what they did on that study. Write it on the board in diagrammatic form. Briefly compare it to other groups then introduce the concepts – repeated measures, etc. The hypotheses have been designed to be discussed in the order above (for example, in the first one, some groups will use a repeated measures design, others will use an independent groups design and the advantages/ disadvantages can be discussed).

Practical use

Group exercise – give them 30 minutes to do the designing then at least the rest of the lesson (assuming an hour) and part of another to discuss it.

Additional notes

Number 1 is quite straightforward and allows designs, order effects and counterbalancing to be introduced. Usually both repeated measures and independent groups are used by different groups and you can discuss the advantages/disadvantages of both. If only one design is used by all groups, then you can introduce the other and ask them why they didn't use it. The emphasis is always on reassurance – that although you are introducing a lot of new terms, the design is common sense (as are the problems).

Number 2 they find a little difficult but it is useful as a way of mentioning when an independent groups design is advisable (as opposed to number 5 in which it's virtually essential).

Obviously the exercise also emphasises operationalisation of variables and various other concepts that have already been taught.

Which experimental design?

handout number 6.6

Activity type Consolidation

This is an exercise in which students have to decide which experimental design to use – repeated measures, independent groups or matched pairs.

Practical use

Individual: class exercise. It's useful to do it in class so answers can be discussed.

Additional notes

This task can easily be expanded. Students can work out how best to carry out the studies. In cases where there is a choice of design and they disagree then a discussion can ensue. The advantages and disadvantages of each design can be considered within the context of the studies together with problems of confounding variables.

There can also be discussion of how groups should be matched if the design is independent groups (e.g. for number 1 the rats should be the same age).

Answers

1. Independent groups.
2. Matched pairs
3. Repeated measures (comparing children before and after watching violent TV. Even better, comparing them when they have watched an exciting non-violent programme with when thay have watched a violent programme).
4. Repeated measures but could be independent groups – a chance to discuss which is better. Participant variables are such that independent groups could be a problem. (Matched pairs is not entirely ruled out but could be impractical as you would need to match participants on the tendency to take risks and this would have several practical problems associated with it, such as how to measure this tendency ahead of the study and the large 'pool' of participants you would require in order to obtain matched pairs from it.)
5. Independent groups or matched pairs.
6. Repeated measures.

Words R Us

handout number 6.7

Activity type Consolidation

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.

Types of experiments

handout number 6.8

Activity type Evaluation

A table for students to complete defining each type of experiment and giving the strengths and weaknesses of each. They have to briefly describe an experiment on memory that meets the criteria of each of the types.

Practical use

Individual: homework.

Additional notes

It is useful for the students to see the patterns of strengths and weaknesses and begin to understand that the process of designing research is a constant battle to optimise the strengths and weaknesses of the methods.

Sampling synopsis

handout number 6.9

Activity type Consolidation

This handout is in three parts. The main task is to complete a table of the main five sampling methods including a definition (presented as three key points – this matches the common exam requirement to provide a 3-mark answer) and a picture to illustrate the method. The handout is plain awaiting their colourful illustrations!

Students then devise their own mnemonic for recalling these methods and answer questions on target populations.

Practical use

Individual: homework

Additional notes

Encourages students to consolidate this material and also reflect on how they will learn it.

Answers

a) Tory voters
b) people with a spider phobia
c) separated infant monkeys
d) South African Whites
e) blind people.

Choosing a sample

handout number 6.10

Activity type Consolidation

This worksheet covers various aspects of sampling by requiring students to choose samples for some studies. It looks at disadvantages of certain methods and includes some maths.

Practical use

Individual task for class or homework

Additional notes

Maths content:

Percentages and proportions

Answers

1. a) How would she select a random sample from the workforce? (2)

Place all the names of the workers into a computer database and use a computer program to select 50 at random (or place all names in a hat and pick out 50).

b) How would she select a stratified sample? Be precise! (4)

30 shop-floor workers, 5 supervisors, 10 office staff, 3 buyers, 2 management staff. Students should then say how these numbers are to be selected, e.g. randomly within each subset.

c) For this investigation, which method of sampling would be better and why? (2)

A stratified sample is probably better than a random sample in this instance because you are dealing with small numbers and are therefore at risk of some groups not being represented at all with random sampling. For example, you may well not get any management representation from a random sample.

d) Why are volunteer samples unlikely to be representative? (2)

Because volunteers are not representative of the general population. They are likely to be helpful, keen and curious therefore results obtained from such a group cannot necessarily be generalised to the population as a whole.

2. Think of at least **three** ways in which the sample so obtained is likely to be biased. (3).

There is likely to be bias in terms of:

- Gender: magazines are aimed at one sex.
- Age: readers are usually in their twenties, maybe thirties.
- Socio-economic class: certain magazines appeal to certain demographic groups and you have to be able to afford them but not feel they are intellectually beneath you!

3. **a)** What percentage of the target population is the sample? Show your working. (3)

125/2500 = 0.05 = 5%,

b) How would he draw a systematic sample of the target population? (2)

Get all the school registers and take every 20th student from the first to the last register (20 x 125 = 2500 therefore you take every 20th student).

c) How would he obtain a random sample of the students? (2)

Give every student a number and use a random number generator to select 125. Using a hat is rather impractical but credit-worthy as long as described properly (pull 125 names out).

GIVE US A CLUE

handout number 6.11

Activity type Quiz

This is a quiz covering the topics so far studied in this chapter: aim, hypothesis, IV and DV, operationalisation of variables, sampling, experimental design.

Practical use

Individual assessment in class

Additional notes

Give students the answers and get them to mark each other's. Most of it is straightforward but they will benefit by thinking about whether a fellow student's hypothesis is worthy of full marks. They might also consider whether it should be non-directional or directional.

Answers

1. How many participants took part in the study? (1)

40

2. **a)** What type of sampling was used? (1)

Opportunity sampling

b) Suggest **one** disadvantage of this sampling method. (2)

It is unlikely to be representative of the target population because it is drawn from one group of students who are all similar in terms of age, socio-economic class and educational attainment so the findings cannot necessarily be generalised to the wider population.

c) Suggest **one** advantage of this sampling method. (2)

This method is convenient. It saves the researcher a good deal of time and effort finding participants and thus is less costly than most other sampling methods. (In addition, with certain investigations, such as the one in this question, the bias in the sample is unlikely to cause major problems.)

d) Suggest another sampling method the students could use and explain how it would be done. (3)

E.g. volunteer sampling: the students ask for volunteers to take part in the study by displaying a notice on the school noticeboard. E.g.random sampling in which the students choose a target population, such as the whole school, and select a number of participants by drawing names from a hat.

3. What is the aim of the study? (1)

To investigate whether cues help people remember.

4. Write a suitable hypothesis for the study. (2)

Participants given a cue (in the form of the first and last letters) will remember more words than participants not given a cue.

5. What is the IV and DV in this study? How were each operationalised? (6)

IV is whether or not cues were provided.

The DV is amount of recall.

The IV was operationalised by providing participants with the first and last letter of the word, or not.

The DV was operationalised by counting the number of words correctly recalled.

6. a) What was the experimental design of the study?

Repeated measures

b) Give one advantage and one disadvantage of this type of experimental (participant) design.

An advantage is that this method controls for individual differences in the participants so you do not get a situation in which one group has a better memory than the other and that this, rather than the IV, causes differences in the two conditions.

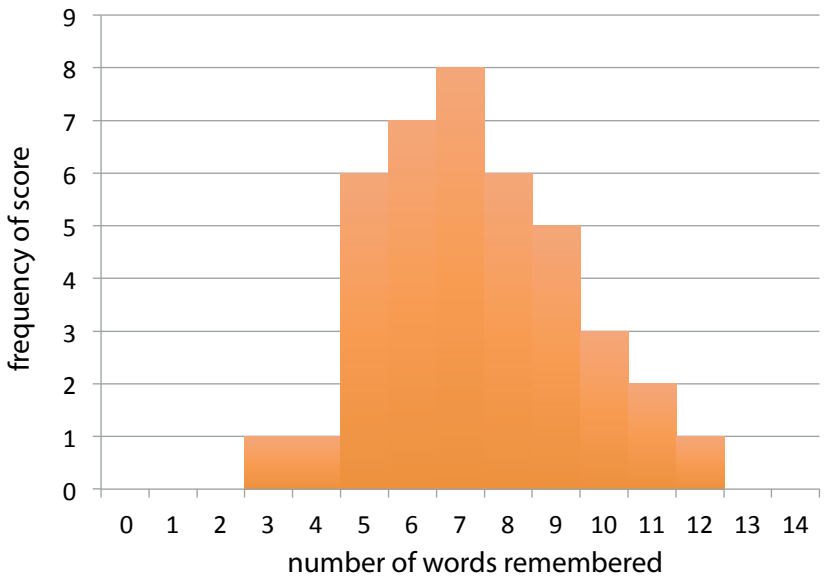
A disadvantage is that there may be order effects: participants may experience boredom and/or fatigue, which could make the second condition artificially poor or there could be a practice effect which may make the second condition better.

c) Describe how the student experimenters could have used a different experimental design for this study.

They could use an independent groups design in which participants were divided into two groups and only took part in one conditions of the IV, in other words, one group memorised a list with clues and the other memorised the same list with no clues.

7. Draw a histogram of the data from Condition B with an appropriate heading and labels. (4)

Histogram to show the frequency of scores in a memory test: condition with no clues



Ethical issues in psychology

handout number 6.12

Activity type Consolidation

This gapped handout covers the basic principles of the guidelines with a couple of examples of studies used to emphasise the points made and put them in context.

Practical use

Individual: class exercise or homework

Additional notes

This provide a starting point for learning the guidelines before going on to the more complex issues covered in the other two worksheets on ethics.

Answers

Ethical issues arise in Psychology when there is a conflict between the rights of **participants** and the needs of **researchers** to conduct research that makes a meaningful contribution to **society.**

One major issue is that of informed consent. This involves making participants aware of the **aims** and the **procedures** of the research and informing them of their **right** to withdraw. However, from the viewpoint of the researcher, telling the participant the purpose of the research may render it **meaningless** as participants will no longer act as they would in the usual course of their lives. This was a particular issue in the study by **Milgram** as no participants would have potentially harmed 'Mr Wallace' if they knew the purpose of the study. Informed consent can be a particular problem in **covert** observation studies since participants may have no opportunity to consent.

Deception is another major issue. This may involve simply withholding information from participants or may involve being deliberately **dishonest**. Deception can be justified if it does not cause undue **distress.** It is important to do a full **debrief** at the end of the study so that participants are aware of the aims and can **withhold** their data if they so wish.

A third issue is that of the safety of participants who have the right to be protected from **physical** and psychological harm. The latter includes not causing them to feel **embarrassed** or feel inadequate as they may have done in the research on conformity by **Asch.**

Privacy and **confidentiality** are two other linked issues. If **personal** details are held they must be protected. If possible it is better to have no such details, that is to maintain **anonymity**.

Under all circumstances it is important that participants are treated with **respect** and their **dignity** maintained.

Dealing with ethical issues

handout number 6.13

Activity type Application

This exercise starts with a general ethical point (what are ethical issues trying to balance?) and provides a useful mnemonic, inviting students to make up their own. It then requires students to suggest ways of dealing with ethical issues, such as what to do if it is impractical to gain informed consent. The handout requires only a brief summary of dealing with all the important issues (so that students have a summary from which to revise) and the extension activity requires students to expand on these issues.

Practical use

Individual: homework (see additional notes)

Additional notes

The basic exercise followed by the extension activity provide two separate pieces of work. We would suggest that a way of organising this is to get students to do the basic exercise in class, go over it to check that it is correct (rather than taking in for marking), then give the extension activity as a homework.

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

handout number 6.14

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

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 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.

AIMING TO PILOT

handout number 6.15

Activity type Revision

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.

1. 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.

2. 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

3. 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.

4. 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.

5. 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.

Designer observation

Activity type Idea

On page 180 of the textbook there is a list of observation studies in which students have to say if they are naturalistic or controlled / covert or overt / participant or non-participant.

To reinforce these definitions, let's work the other way! Ask students to make three pairs of cards:

- Naturalistic observation / number 1 on reverse side
- Controlled observation / number 1 on reverse side
- Covert observation / number 2 on reverse side
- Overt observation / number 2 on reverse side
- Participant observation / number 3 on reverse side
- Non-participant observation / number 3 on reverse side
- Students work in pairs:
  - Place the cards with number face up.
  - One person chooses three cards, one number 1, one number 2 and one number 3, and turns each over.
  - The partner has to design (briefly) an observation study that fits these descriptions – writing down the description. He/she must NOT base it on one that has already been written – it must be quite different.
  - Partners swap roles and continue for 15 minutes – see how many each couple can do.

Practical use

Class exercise in pairs

Additional notes

You require postcards – six cards per student pair.

Types of observation

handout number 6.16

Activity type Evaluation

Using the textbook for support, students are asked to make a summary table containing definitions, advantages and disadvantages of the types of observation.

They need to be encouraged to use their own words here and not just copy! One way to do this is to ask students to identify key words rather than write answers in full sentences.

Practical use

Class exercise in pairs or individually

Additional notes

Using a table for this should help them see the relationship between the pairs very clearly, i.e covert/overt, participant/non-participant and controlled/naturalistic. The motivation for understanding this is of course that they get to know that the advantage of one is a disadvantage of the other – less to learn!

Answers

Overt	Allows informed consent to be collected.	May not be natural behaviour as they know they are being observed.
Covert	Should mean that the behaviour observed is natural	Informed consent is not sought.
Participant observation	Allows increased insight into the situation being observed.	Less objectivity.
Non-participant observation	Allows the researcher to be more objective	Will not have the same level of insight into the situation as a participant observer would have.
Controlled observation	Can observe participant's responses in relation to specific situations, e.g. Strange Situation.	Findings are less generalisable as the situation is not capturing natural behaviour in its usual context.
Naturalistic observation	High external validity (and hence generalisability).	Lack of control makes replication difficult.

A CONTROLLED OBSERVATION

handout number 6.17

Activity type Application

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 exam marker. (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).

A NATURALISTIC OBSERVATION

handout number 6.18

Activity type Application

This question is concerned with the use of a naturalistic observation study in a school playground and requires students to consider how observers are trained, categories chosen and the concept of inter-observer reliability.

Practical use

Individual: homework, classwork or assessment

Additional notes

If students do both of the observational study questions (this one and the previous one) you can have a discussion about the different ethical considerations of each as well as how different these two studies are, despite both of them being concerned with the observation of children.

Answers

1. Suggest **two** practical factors that must be taken into account when organising the study. (2)

   Any reasonable suggestion such as the place from which observation should be made, the number of children to be observed at once, the exact nature of the categories, whether to use videotapes, how the observations can be made without disruption of normal play activities.

2. Some examples of behavioural categories are given above (rough and tumble play, ball games, skipping). Suggest **two** other categories that could be included. (2)

   Anything appropriate such as climbing on apparatus; games with small toys such as marbles or conkers; chasing games.

3. Explain **two** ethical problems associated with naturalistic observational studies that the psychologist would need to consider when arranging the study. (4)

   You would need informed consent from the head teacher and parental consent. You should also ask the children themselves. You need to consider whether or not you would interfere if the play became violent (protection from harm). (You could include other general ethical considerations, such as not breaching confidentiality when results are published.)

4. Why would it be necessary to have at least two observers watching the same group of children? (1)

   To see if they are reliable in their measurements, control for observer bias.

5. Explain what is meant by *inter-observer reliability*. (2)

   A measure of the extent to which observers are in agreement with their measurements.

6. Explain how the observers might have been trained in the use of the behavioural categorisation system. (2)

   Use an appropriate piece of material (for example, a video of children's play). Get each observer to rate it using the categories, then discuss any discrepancies until agreement is reached.

7. Suggest **two** reasons why it would not be suitable to use an experimental technique in a laboratory to study play in school children. (4)

   The children would not behave as they normally would. They may be uncomfortable and nervous. The opportunity for usual play is very limited because of the nature of the environment.

8. One problem with naturalistic observation studies is that observers need to be careful not to influence the behaviour of the participants. How could this be arranged in this case? (2)

   Observation from inside the school (from a classroom window) or from anywhere in which the observers would not be obvious.

9. Naturalistic observation studies have high external validity. What does this mean and why it this true of such observation studies? (3)

   High external validity means that findings can be generalised to everyday life as the behaviour is studied within the environment in which it would normally occur.

10. Outline **one** disadvantage of naturalistic observation studies. (2)

    The lack of control over the research situation makes replication difficult, or there may be many uncontrolled extraneous variables that make it difficult to judge any pattern of behaviour.

Interviews and questionnaires

handout number 6.19

Activity type Consolidation

This handout checks students' understanding of issues associated with interviews and questionnaires, including the type of questions that they utilise.

The second part of the handout asks them to apply their knowledge of different types of interview and make some real design decisions, i.e. which would be the best choice in a number of scenarios.

Practical use

Individual activity: class or homework

Additional notes

They could check each other's answers with the express intention of 'stealing' any answers that are better than theirs.

Answers

1. What is the difference between a questionnaire and an interview?

   A questionnaire is a written set of questions whereas an interview takes place live – for example, either face-to-face or over the phone.

2. What advantage might a questionnaire have over an interview?

   It might be more cost effective when collecting from large samples because many can be given out in minutes and filled in simultaneously.

3. What advantage might an interview have over a questionnaire?

   Interviews can be more flexible – for example, in unstructured or even semi-structured ones the interviewer has the option to follow up on interesting aspects of responses and gain a deeper understanding.

4. Why might researchers prefer to use mainly closed questions in some studies?

   Because it tends to yield quantitative data that is easy to analyse and test statistically.

5. Why might researchers prefer to use mainly open questions in some studies?

   Open questions tend to yield more in-depth qualitative data which may be preferable in cases such as attitudinal research where there may be an almost infinite range and combination of responses that could be given, etc.

Interviews (although suggestions are provided arguably any method could be used in each case)

1. Finding out the difference in moral attitudes between males and females
   a) Unstructured.
   b) To allow flexibility to follow up interesting responses and understand them fully.
   c) Is it ever right to steal?
2. Comparing the weekly average calorie intake for teenagers and over 60s
   a) Structured.
   b) Could produce quantitative data that is easy to analyse statistically.
   c) Can you tell me what you ate yesterday? (this would then be converted into calories).
3. Gaining eyewitness testimony following an accident in school
   a) Semi-structured.
   b) Would allow all the students to be asked the same questions for comparison whilst those who saw more could be allowed to elaborate on their testimony.
   c) Can you tell me what happened in the Biology lab this morning?

Very dodgy eating questionnaire

handout number 6.20

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!

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 ...

handout number 6.21

Activity type Consolidation

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

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

Practical use

Class individual or paired activity

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? Yes No	May be unanswerable	Either…to your knowledge are any of your friends allergic to animals or offer the option of 'I don't know'.
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? a) Pretty well b) Great c) Fantastic d) Incredibly well	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
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 +

Sticker time

Activity type Idea

It can be a useful exercise for students to look at a range of real Psychological Questionnaires but many are not easily accessible.

http://www.yorku.ca/rokada/psyctest/

There are some here that can be printed and used by students.

A copy of each could be produced (perhaps enlarged to A3 size) and a placed around the room.

Students could be given a set of Post-it notes to stick on where they recognise aspects they have learned about self-report designs, for example, open and closed questions, different scales, etc.

Practical use

A class activity

Additional notes

Encourages students to actively consider types of self-report and get to know terms.

Big Foot or Shortie?

Activity type Idea

When introducing correlations and scattergrams, get students to do a correlation of shoe size and height of everyone in the class. It's quick, easy, gives a positive correlation, gives the students an opportunity to draw a scattergram and to decide on the scales to use of the axes (as well as using personal data – but not too personal – which they enjoy).

Practical use

Class exercise to gather data then individual class exercise to draw a scattergram.

A correlational crossword study

handout number 6.22

Activity type Consolidation

No, not a crossword, just a correlational study about crosswords. It covers the basics of using a correlational design and other issues already covered such as operationalisation of variables.

It also makes students think about the essential differences between correlations and experiments by requiring them to design an experiment to see if there is a cause/effect relationship between verbal ability and ability to solve crossword clues.

Practical use

Individual: homework or assessment

Additional notes

If you have covered measures of central tendency, you can ask for the median scores on both tests.

Answers

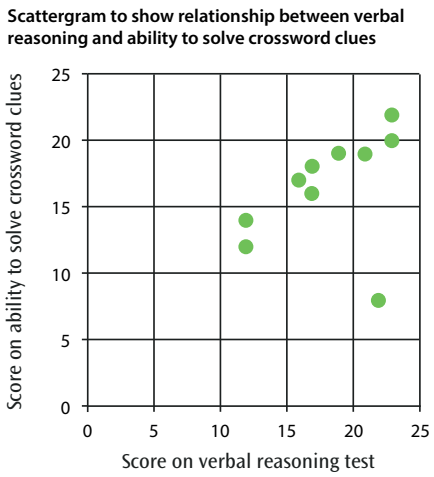
1. Write an aim for this study. (1)

   To investigate whether there is a positive relationship between ability to solve crossword puzzles and scores on verbal reasoning tests.

2. Write a suitable hypothesis for the study. (2)

   There is a positive correlation between scores on a verbal reasoning test and ability to solve crossword puzzles. (The hypothesis should be directional.)

3. Draw a scattergram of the results, using a heading and clearly labeling the axes. (4)



4. What conclusions can be drawn from examining the scattergram? (2)

   There is a fairly strong positive correlation (relationship) between scores on the verbal reasoning test and scores on the ability to solve crossword clues. People who are good at crosswords are also good at verbal reasoning (and/or people who are poor at verbal reasoning are also poor at solving crossword clues). One can therefore be used to predict another.

5. Suggest a way in which the researcher may have operationalised the variable of ability to solve crossword clues. (1)

   Give the participants a crossword puzzle to solve and add up the number of clues successfully solved (ideally more than one puzzle of different types).

6. Briefly outline how a researcher could plan an experiment to see whether improved verbal reasoning increases people's ability to solve cross-word puzzles. What would be the IV and DV? (5)

   Two groups of people of equal ability on verbal reasoning and crossword solving. Split in two randomly. Train one on verbal reasoning over a period of time and then test both on crossword solving ability. The IV is whether or not they have additional training in verbal reasoning. The DV is ability to solve crossword puzzles (operationalised in a suitable way).

7. What is the advantage of using the experimental method rather than doing a correlational study? Apply your answer to this study. (2)

   The advantage of using an experimental design is that the results can show cause and effect. In this case they can show whether or not training to improve verbal reasoning can improve the ability to solve crossword clues.

8. What is the median of the scores on verbal reasoning? What is the mode and the mean of scores on ability to solve crossword clues? (3)

   Median on VR = 18

   Mode of scores on ability to solve crossword clues = 19

   Mean of scores on ability to solve crossword clues = 16.5

Can you be too laid back?

handout number 6.23

Activity type Evaluation

This exercise covers several issues. The main purpose is to consider the advantages of using a scattergram to show a U- (or inverted U) shaped relationship. It also revises directional/non-directional hypotheses and operationalising variables and requires the drawing of a scattergram.

Practical use

Individual: homework (or classwork)

Answers

1. Should the hypothesis for this study be directional or non-directional? Justify your choice. (2)

   Non-directional because the researchers do not agree on the direction.

2. Write a suitable hypothesis for this study. (2)

   There is a relationship between arousal (increase in heart rate) and performance on a motor task.

3. How were the variables operationalised in the study? (2)

   Arousal was operationalised by increase in heart rate (as measured by a heart monitor). Performance was operationalised by asking participants to carry out a motor task as quickly as possible.

4. Describe the results shown in the scattergram. (4)

   At low levels of arousal the performance increases, demonstrating a positive correlation to start with (2 marks) but at a certain level (in this case indicated by heart rate increase of just below 20 bpm) the performance goes down and there is a negative relationship between arousal and performance (2 marks).

5. One way of measuring correlation is to use a number known as a correlation coefficient. In this study the correlational coefficient is +0.13, which is almost a zero correlation. Why may expressing this result in this way be misleading? (2)

   Simply knowing that the correlation coefficient is weak implies that there is no relationship between the variables. This is misleading because the scattergram indicates that the relationship is positive at low levels of arousal and negative at high levels which gives much more accurate information. It is not a linear relationship.

6. Suggest one limitation of correlational studies. (2)

   Correlational studies do not show cause and effect. They do not demonstrate whether one variable causes the other to vary.

7. Suggest one use of correlational data. (2)

   Correlational data can enable researchers to make predictions since knowing of one variable can allow the other to be predicted.

Correlation or experiment?

handout number 6.24

Activity type Application

How many times do you find students stating clearly that a study is a correlation then discussing the IV and DV or writing a hypothesis (or a conclusion) that implies cause and effect?

It's vital that students recognise the difference between a correlation and an experiment when asked questions in an exam. Obviously it affects the way in which the alternative (and null) hypothesis is written, the way in which the data is presented and analysed and the conclusions you can draw from the findings. This exercise attempts to clarify this distinction.

Practical use

Individual: homework or assessment

Additional notes

You may wish to give advice to students on ways in which to make the distinction between correlations and experiments. For example:

- Is any cause or effect mentioned or implied in the description of the study or the results?
- Is association/relationship or (even) correlation mentioned?
- Do any of the questions on the handout refer to a DV and IV?
- Is a difference being measured?

Answers

1. Correlation
2. An experiment
3. An experiment
4. Correlation
5. An experiment
6. An experiment
7. An experiment

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.

c) If you had to select one of these clowns for a national competition for the funniest clown, which would it be and why? (2)

Krusty because some people obviously rated him very highly indeed (you can tell this from the range) whereas few people rated Bozo very highly (or very low). So Krusty is more likely to get a very high score.

(You might select the more reliable clown but he is never going to be best with a maximum possible score of 7.)

2. a) What is the advantage of using the range rather than the standard deviation? (1)

The range is much easier to calculate than the standard deviation.

b) What is the advantage of using standard deviation rather than range? (1)

The standard deviation takes account of all scores and is not as distorted by anomalous scores. It is therefore more representative of the general spread than is the range.

3. Matthew carries out a study of conformity using a questionnaire that gives scores between 0 and 20. He finds that the mean score is 7, the mode is 10 and the median is 8. If he draws a distribution curve will the data have a normal distribution, a positive skew or a negative skew? Give a reason for your answer. (2)

It gives a negative skew because the mode is higher than the mean or median.

4. Using the graph, answer the following questions:

In the total population of the U.K. the arithmetic mean of I.Q. scores is 100 and the standard deviation is 15.

a) What approximate percentage of the U.K. population have I.Q. scores between 100 and 115? (2)

b) Between which two scores do approximately 95% of the population of the U.K. fall? (2)

c) What approximate percentage of the U.K. have scores above 115? (2)

a). 34% b) 70 and 130 c) 16%

5. An arithmetic test is given to 200 children. The test has been standardised and scores are normally distributed. The mean of the test is 50 and the standard deviation is 6.

a) Approximately how many children will score between 44 and 56 on this test? (1)

b) Approximately how many children will score above 56? (1)

c) What is likely to be the median score for the 200 children? (1)

a) 136 (68% of 200 = 68/100 × 200)

b) 32 (16% of 200 = 16/100 × 200)

c) 50 (the same as the mean).

Know your graphs!

handout number 6.28 a,b

Activity type Consolidation

The handout depicts five graphs and asks for them to be named and then conclusions drawn from them. There is an additional task that tests recognition of variations of the normal distribution, too.

Practical use

Individual activity to check basic understanding

Additional notes

There are many possible conclusions – make sure the students do not miss the most obvious though.

Answers

1. Scattergram

There is a positive correlation between the scores on a general knowledge test and age.

2. Bar chart

The most effective therapy is CBT combined with antidepressants. All of the therapies are better than none. Any other reasonable conclusions from the graph.

3. Bar chart

On average girls outperform boys on the Maths exam. Boys and girls score equally well on the Science exam.

Both boys and girls do better on Maths than Science.

4. Scattergram

There is a negative correlation between self-reported stress scores and the number of hours sleep per week people report, suggesting that people who are more stressed sleep less.

5. **a)** Normal distribution

Where data is normally distributed, most people's scores will be located centrally around the mean, mode and median.

b) Negative skew

Where most scores fall on the low side of the curve.

c) Positive skew

Where most scores fall on the high side of the curve.

TRUE OR FALSE?

presentation 6.29

Activity type Consolidation

Most of the mathematical content has already been covered in previous spreads and students can be reassured that they already know most of it! This exercise is a quick, fun run through of different mathematical content designed not to make it seem like a tedious maths lesson. It provides a series of slides in which students have to decide whether it is true or false. A good excuse for a competition!!

Practical use

Class whole group exercise (quiz), work in pairs or individually

Additional notes

You could time how long students get for each slide.

20 questions – depending on how seriously you want to take this, you could score it as a minus for every incorrect answer to discourage lazy guesswork!

You could give extra points for the right answers.

Answers

See slides. The answer to each question is in the notes under every slide so you can go back at the end of the quiz and go over each one.

A MATHEMATICAL QUIZ

handout number 6.30

Activity type Quiz

Call an 'exercise' a 'test' and it's altogether more scary than a quiz, so we'll opt for a quiz – but it's the same!!

Use these questions on mathematical concepts as an assessment, a quiz or simply a way for students to check their own understanding. It covers all basic concepts.

Practical use

Individual

Answers

1. 25%
2. 65/100 = 13/20
3. 20 (they should use 13/20 not 65/100 in answer to Q2)
4. 1:2
5. 26/39 = 2/3
6. 6.9
7. 3:1
8. $p = 0.05$
9. $p \leq 0.05$
10. 95%
11. 6.46
12. 10.01
13. 3.88
14. higher
15. α
16. $6 < 12$
17. 43
18. small
19. mode (it's the only one you have from this data!)
20. histogram

Introducing probability: Jackanory time

Activity type Idea

Students find the whole concept of why psychologists use a 5% level of probability very confusing. I find the following scenario helps to explain it: I just relate the following little tale. Jackanory time.

'I'm a very clever person. Obviously you know that already but I'm going to tell you about a special talent I have. I can tell the sex of a baby before it's born just by looking at the mum's bump. Last year, when my friend Sue was only just pregnant, I guessed that she was going to have a boy and she did. Are you impressed?'

The students say no, it was a 50/50 chance, so you write on the board, the likelihood that my guess was due to chance is 50%.

'Yes but soon after that my friend Lulu had a girl and I'd predicted that too. Aren't I clever?'

The students are still not impressed and say that there was a 25% chance you would get both correct. It could easily be just luck. (The brighter mathematician students may argue that each chance is 50% but you can say that ahead of time, the chance of two correct guesses is 25%.)

'Ah, but I said my neighbour Linda was going to have a girl and her scan a couple of months ago has shown it is a girl. Now you have to admit that I'm very talented.'

The students say well….not really, it's still a 12.5% likelihood it is luck (chance).

'Oh come on, give me a break, I also guessed that my cousin was going to have a girl and …. yes… you've guessed it, she did..so there! Conclusive proof.'

By this time the students (usually) get the hang of it and concede that by the time the probability of the correct answers being due to chance has dropped to 6.25%, that it's reasonable that doubts are creeping in that you're not just boasting about nothing. Certainly by the time it's 3.125% (i.e. after 5 correct guesses) then they concede that it's unlikely to be due to chance.

So you explain that that's why psychologists think that a 5% probability level is reasonable. If the probability of results being due to chance is 5% or lower, then it's fair to assume that it's not chance (although there's a 5% chance you are wrong!).

It may also be worth saying that, when it comes to real results we are not dealing with 50:50 probabilities and therefore the calculations become complicated. That's why you need statistical tests – let's leave the complicated stuff to the mathematicians!

Practical use

Class discussion, teacher led

Additional notes

There are variations on this. You can pretend to go to the pub with one student (just say 'you and I are going to the pub'). When we get there, I suggest that rather than taking it in turns to buy a drink, we toss a coin and the loser buys the drink. I'm the teacher so I toss the coin and guess the outcome correctly. The first round is on you. And the next. And the next…. In fact you buy every drink. How many drinks will you buy before you begin to believe that I'm on the fiddle? (Funnily enough, it is fewer than the number of correct guesses of a baby's sex than it takes for students to be impressed!!)

You can also play the game of Heads and Tails to show how probability works. [Everyone stands up. Each person places their hands on their bottom (guessing tails) or head (guessing head); a coin is tossed, all those who are wrong sit down and so it goes on until there's only one person standing.] You can get them to predict how many rounds this will take to get to one person. A prize at the ready makes it more fun!

Do the sign test

handout number 6.31

Activity type Application

A study on dance preference to use as an exercise in doing the Sign Test.
It is worked through step by step as in the book, students fill in the values as they go.

Additional notes

Students will need the table of critical values in the book (page 198)

Answers

Participant	Zumba rating	Ceroc Rating	Sign of difference
1	7	5	+
2	8	5	+
3	4	4	=
4	6	7	-
5	9	8	+
6	9	5	+
7	10	2	+
8	4	7	-
9	7	7	=
10	7	6	+
11	4	3	+
12	8	6	+
13	5	5	=
14	6	9	-
15	9	6	+

Step 2: number of pluses = 9, number of minuses = 3

Step 3: S is the value of the smallest number of signs, in this case it is 3

Step 4: N is 12, the critical value is 2

Step 5: As the calculated value is greater than the critical value, the results are not significant.

We reject the hypothesis.

Peer review mind map

handout number 6.32

Activity type Consolidation

A basic mindmap for students to complete with the aims and evaluation of the peer review process. The amount of detail is up to you – see additional notes.

Practical use

Individual homework

Additional notes

You can require students to do a very basic exercise by simply putting a brief heading for the aims and evaluation or require them to write them in more detail.

Answers

The aims:

- To validate the quality and relevance of research
- To suggest amendments or improvements
- To allocate research funding.

Evaluation:

- Anonymity (the smiley face!)
- Publication bias (sad face)
- Burying ground breaking research (sad face).

The additional questions:

What are peers?
Peers are experts in the field.

What is the most common way in which psychological research is published?
Most research is published in academic journals.

What implications does psychological research have for the economy?

Activity type Idea

On page 201 of the student book there are two suggestions as to areas in which psychological research has implications for the economy.

Students could be given a homework to write about two other areas in which psychological research has implications for the economy.

Firstly, remind students that by 'implications' we mean: how does what we learn from the findings of psychological research influence, affect, benefit or devalue our economic prosperity?

Their starting place is the textbook for suitable topic areas but they should use the Internet to expand on this. Some suggestions of suitable areas are shown below.

Practical use

Individual homework, paired activity

Additional notes

Suggestions:

Ch 1: Normative influence can be used to make people act in socially responsible ways with respect to the environment (with obvious economic implications in conserving energy, etc.).

Ch 2: Work on improving witness testimony; specifically training of police in techniques that improve witness testimony by use, for example, of the cognitive interview. This in turn makes better use of public money.

Ch 3: There are many social implications of attachment research: it can be argued that anything that reduces the need for psychological therapy in later life and helps people become effective working members of society makes an economic contribution to society. Therefore the changes from orphanage care to family-type care, improvements in foster care (not moving children from home to home), improvements in nursery education, better facilities for parents of very sick children to visit them in hospital mean that children are less likely to be an economic burden due to psychological problems later in life (of course, the benefits go far beyond economics but that is the brief).

Ch 5: Improved treatment for mental illnesses, especially some of the cognitive therapies. Comparison of which treatments are most effective long term with respect to what they cost. Attempts to integrate sufferers into the community instead of isolating them in large-scale hospitals can, in some cases, be an economic use of resources.

Make sure you understand the question!

handout number 6.33

Activity type Consolidation

Ever had a student answer 'range' when asked for an appropriate measure of central tendency? This sheet tries to reduce the chances of that happening. It asks students to write in all possible answers to certain questions.

Practical use

Individual class exercise

Additional notes

A lot of these terms are confusing so this can help clear up the confusion but students may need guidance as to what is required – once they know, it's easy. It really does help in exams.

Answers

1. Repeated measures, independent groups, matched pairs
2. Lab, field, natural, quasi-
3. Mean, median, mode
4. Random, stratified, systematic, volunteer, opportunity
5. Range, standard deviation
6. Structured, semi-structured, unstructured

Alphabeat-Ya

handout number 6.34

Activity type Quiz

A fun quiz to end on. Students have a sheet of definitions and have to fill in the answers – they must find an answer for every letter of the alphabet. Who can finish first?

(NB. Please note that there is NOT a direct correspondance between the left and right-hand columns. the answer to the first definition begins with 'c'. You may need to make this clear to students.)

Practical use

Individual exercise in class

Additional notes

The answers are a single word, except for one hyphenated one which students are told about (*x*-axis – well you try and think of an alternative!!) The only 'cheat' was Yuille as I couldn't find another y expression but I've related it to research methods and they should know the study from the chapter on memory.

Answers

aim	A general statement of what the researcher intends to investigate.
bias	Systematic distortion. In the context of sampling, certain groups are not fairly represented.
control	The group who do not experience the IV and are used as a baseline.
deception	An ethical issue which involves not telling the participant the true aims of the study.
extraneous	Any variable other than the IV that may affect the DV.
field experiment	An experiment that takes place in a natural setting with the IV manipulated by the researcher.
generalisation	The extent to which findings from an investigation can be broadly applied to the population.
hypothesis	A clear precise testable statement about the relationship between the variables being investigated.
independent	The variable that is hypothesised to affect the dependent variable.
jargon	Technical terms that are only familiar to those within a specialised field. To be avoided in questionnaires.
key	The word used to describe important terms in the student textbook.
leading	Description of a question that is phrased in such a way that it makes one response more likely than another.
mode	Measure of central tendency that is the most frequent score.
normal	Distribution in which the mode, median and mean are all the same.
overt	Type of observation in which participants know they are being watched.
primary	Describes original data that has been collected by the researcher first hand.
qualitative	Type of data that is descriptive and is expressed in words.
random	A sample in which all of the target population have an equal chance of being selected.
sample	A group of people who take part in a research investigation.
target	The population of people in whom the researcher is interested.
unstructured	An interview in which there are no set questions and which works like a conversation.
volunteer	Sample composed of people who offered to take part.
weak	Description of a correlation that is near to zero.
x-axis	The horizontal bar at the base of a graph (hyphenated).
Yuille	With Cutshall, did a field study on witness testimony.
zero	A correlation that expresses no relationship.