

Research In Context: Descriptive Statistics

Activities: Collecting Data and Using Descriptive Statistics

The following activities take the form of small scale research projects that you can undertake in class. You will be able to collect different kinds of data, and analyse them in different ways.

1. Sex Differences in Risk Taking at a Pelican Crossing

It is commonly accepted that males and females have different attitudes to risk taking; for example, insurance companies tend to charge men higher rates than women for car insurance, and some research studies have found that men are more likely to take risks with health-related behaviours such as alcohol consumption and sexual behaviour.

- Use the internet to see if you can find any evidence to support the idea that males and females have different attitudes to risk.

This study will test whether males and females behave differently with regard to risk when crossing a road at a pelican crossing. The independent variable in this study is sex, and the dependent variable is the number of people crossing.

- Do you think males or females will take more risks?
- What is your hypothesis for this study?

Stand in a safe place near to a busy pelican crossing, perhaps in a town centre, close enough to observe, but not so close that you are conspicuous. With a clipboard and pen, record whether each person who uses the crossing is male or female, and whether they cross when it is safe (green man) or when it is not (red man or flashing warning). If the crossing is very busy, you may find it helps to agree that one person will observe male pedestrians and another will observe female pedestrians at the same crossing.

- What kind of experiment is this?
- What kind of data is this?
- What measure of central tendency should you use and why?

Back in your classroom, count up the total numbers of male and female pedestrians who fell into each category (red, green, warning).

- Calculate the mode for males and the mode for females
- What does this tell you?

Extension activities:

- a) Calculate χ^2 for this data, and comment on your findings.
- b) Discuss the ethical issues of using this type of experiment.

Research In Context: Descriptive Statistics

2. Animal Phobia and Perceived Harmfulness

Evolutionary psychologists explain phobias as the result of biological preparedness. In other words, we easily learn to be frightened of things that might have been a threat to our survival in our evolutionary history. As evidence, they cite the fact that many of the things we are frightened of can be perceived as dangerous.

- What things are people often phobic about? Can you think how they might have been thought of as dangerous in our evolutionary past?
- Can you find any evidence in text books or on the internet to support the evolutionary explanation of phobias?

This study will investigate whether there is a relationship between people's phobias about different kinds of animals, and how harmful they perceive those animals to be.

- What kind of design is this?
- What is your hypothesis for this experiment?

Collect together a set of photographs (from magazines, or perhaps printed out from the internet) of insects and small animals. You will need to include some of which are likely to be phobic, and some of which most people will not be phobic. You will need about 20 photographs of different animals.

- Devise a rating scale and produce a score sheet for people to use to tell you how frightened they are of the animal in each photograph, and how harmful they think that animal can be.
- Include a short instruction paragraph at the beginning of the score sheet, which tells the participants what they will be doing; make sure that they know that the photographs may include some animals of which some people are phobic, so that they can refuse to take part if they are very anxious. Include a statement of consent that participants can sign.
- What kind of data will you collect?
- Which measures of central tendency and variation should you use for this data?

As a class, agree on the population you intend to study, and decide how you will sample from it. Decide how many people you will each ask to participate. Then collect your data!

- Calculate the mean and standard deviation for your data
- What do these values tell you?
- Plot a scattergram of your data, with perceived harmfulness on the horizontal axis and fear rating on the vertical axis
- What does your scattergram tell you?
- What conclusions can you draw from this data?

Extension activity: Calculate Spearman's rho for your data, and discuss the conclusions you can draw from your findings about phobias with regard to theories of evolutionary psychology.

Research In Context: Descriptive Statistics

3. Evaluating the Use of A Mnemonic Technique For Name Recall

We are often taught to use mnemonics from a very young age whenever we need to learn something by rote in school. The classic example from science is the “Richard of York Gave Battle in Vain” mnemonic to aid recall of the colours of the visible light spectrum. Some memory experts suggest that similar techniques can be used for remembering people’s names (Mindtools, 2007). The idea is simple: when hearing someone’s name, you associate something about their name with your mental image of their face. So, for example, you might look for some unusual or distinctive feature, and imagine a link between that feature and their name. If you meet someone called John, who has a big nose, you might imagine their nose as a letter J, to help you to recall their name when you meet them again. You can also use rhyming or alliteration as a memory aid (for example, Clare’s hair, or Mary’s mouth).

In this experiment, you will investigate whether such techniques really work.

Collect at least 20 photographs of faces of non-famous people, who are unlikely to be known by your participants (you can use magazines or the internet to do this). Sort them into two groups, trying to make sure that they have about an equal number of difficult names, distinctive faces, etc. Call one group A and the other group B. Label each face with a first name (it does not have to be their real name).

Decide from which population you are going to select your sample, and think about how you will choose and recruit your participants. You will need two groups of participants: one group will be taught the mnemonic technique described above and asked to use it during the experiment, and the other group will be the control group, and will not be taught the mnemonic technique. You should randomly allocate your participants to each of the two groups.

- What is the name for an experimental design in which two groups of participants give scores in different experimental conditions?
- What are the advantages and disadvantages of using this sort of design?
- What is the purpose of randomly allocating your participants to the two groups in this experiment?
- What are your IV and DV in this experiment?
- What is your hypothesis?

Produce a set of written instructions and consent forms for your participants, and decide how you are going to teach the experimental group about the mnemonic technique.

For each group of participants, half will use the set A photographs, and half will use the set B photographs.

- Why is it a good idea to split the photographs like this within the two groups?

Run the experiment, and count how many names each participant in each group gets correct.

- What kind of data is this?
- What are the appropriate measures of central tendency and variation to use with this data?

Research In Context: Descriptive Statistics

Present your data as a bar graph showing the mean for each of the two groups. What have you found out about whether or not mnemonic techniques are useful?

Extension Activities:

- a) Analyse your data using a Mann-Whitney U Test. What conclusions can you draw about your findings?
- b) Write up the experiment as a report, using the format required by your teacher.

Further Resources

Carey, G. (1998). Principles of Evolutionary Psychology. Available from:
http://psych.colorado.edu/~carey/hgss/hgsschapters/HGSS_Chapter16.pdf.

Coolican, H. (2004). *Research Methods and Statistics in Psychology*. Fourth Edition. London, Hodder and Stoughton.

Flanagan, C. (2004). *Revise AS Psychology*. London, Letts.

Greene, J. and d'Oliveira, M. (1999). *Learning to Use Statistical Tests in Psychology*. Second Edition. Maidenhead, Open University Press.

Hayes, N. (2000). *Doing Psychological Research*. Maidenhead, Open University Press.

Langdrige, D. (2004). *Introduction to Research Methods and Data Analysis in Psychology*. Essex, Pearson.

Mindtools (2007). How To Remember People's Names. Available from:
http://www.mindtools.com/pages/article/newTIM_12.htm.

Pennington, D. (2002). *Introducing Psychology: Approaches, Topics and Methods*. London, Hodder and Stoughton.

PsyOnline (2007). Research Methods. Available from:
<http://www.psyonline.org.uk/ASStudentLinks.php?module=6>.