Research methods II: Autumn Term 2002

There were some common mistakes in the write-ups of the first module from previous years. Bear these points in mind when you write up your report.

Abstract

In the abstract, do not report specific numbers (of subjects, words, values of statistics, etc). Just state the purpose, the basic method, which conditions were different from which others, and the main conclusions.

Introduction

In the introduction start general and become specific, finally focussing on your study. Successive paragraphs should be explicitly connected and form the thread of a coherent argument. For example, do not discuss criticisms of level of processing (LOP) and then suddenly announce your prediction that the deep group should remember more than the shallow group in your study. What was the function of the criticisms of LOP in the argument leading to why your experiment was done? Make sure everything you say is there for a reason that directly leads to the motivation for your study. Other issues can be taken up in the discussion.
Provide a rationale for your study. Why did you do it? Your experiment could be what is called a "conceptual replication" of e.g. Hyde and Jenkins. This means that you are replicating in spirit what they did, but in a slightly different way. Perhaps this is simply to check the generality of the results with a slightly different procedure and with different materials. If so, state what interesting differences there are between your study and Hyde and Jenkins to show how your results extend their findings. Or you may be extending the results in a more radical way - for example, you may be applying levels of processing to a domain in which (as far as you know) it hasn't been applied before. Whatever the rationale of your study, state it. Relatedly, state why you chose the conditions that you did.

Your aim is not to show that some difference is significant. Your aim is to find out whether some difference is real, as in exists in the population. Significance is a property of a sample, not the population. In the population, a difference exists or not, it is meaningless to talk about whether a population difference is statistically significant or not. You are only interested in the significance of a sample in so far as it legitimates conclusions about the population. (Remember there is no guaranteed correspondence between the significance of a sample and whether a population difference exists or not. For example, a real population difference can still lead to a sample with an insignificant result. You wish to draw conclusions about the population, but you do that with known risks of being wrong in the long run.)

Method

In the method section use separately labelled subsections for: participants, design, materials, and procedure. There is no need to describe how subjects were randomly allocated to groups, just state that they were; similarly there is no need to describe how experimenters were assigned to subjects. There is no need for an apparatus section, unless you have complex apparatus, which you won't in this course. In materials, there is no need to list objects that you self evidently used, such as "piece of paper, pens, stop watch" etc. Instead, in materials you should describe the stimuli and their relevant properties and the criteria by which you selected or constructed them. For example, if subjects had to count vowels, what was the distribution of vowels across the stimuli? In procedure, make sure you describe what the cover tasks were; the reader should not have to refer to the appendix, materials section, etc, to know what the procedure was (conversely, don't put procedural information in the materials or other sections). Note if subjects responded to the cover task questions verbally or in writing; if verbally, did you record the subjects' responses? Were subjects run individually or in groups? Here, and in the results and discussion, label the groups with meaningful names, not with numbers or letters.

Results

When reporting means and standard deviations be aware of a meaningful degree of accuracy. Many of you will be reporting number of words recalled as your dependent variable. A tenth of a word would be an extremely small difference in recall, but perhaps still meaningful as a mean; a one hundredth of a word can hold no possible interest to us. Thus, for this type of data, report your means and SDs to no more than one decimal place.

Discussion

When bringing up criticisms of your study in the discussion, relate what you say to the conclusions you drew. How could the particular point you bring up undermine the conclusions you draw? If it cannot, then it is not a criticism of your study. Just because a variable you did not control e.g. a subject variable (or a materials variable) could influence the dependent variable, it does not mean there is a problem with your study. Remember the magic of random assignment of subjects to groups. If you bring up a problem explain why it is really a problem.

Appendix

1) Put histograms, SPSS output, exact instructions, and a list of materials in the appendix.

2) Boxplots do not need to be included in the write-up, but they are very useful summaries of data, and certainly can be included (in the appendix), and indeed have often been included in previous years, and this is fine. However, they are often misunderstood. Below is a description of what they mean; a lot of this description I have simply copied from SPSS "help" .

Boxplots
Summary plots based on the median, quartiles, and extreme values. Boxplots are formed from "boxes", which contain the 50% of values falling between the 25th and 75th percentiles (i.e. the first and third quartiles, so the width of the box is the interquartile range), and the "whiskers", lines that extend from the box to the highest and lowest values, excluding outliers (i.e. the whiskers define the range of the data, excluding outliers). A line across the box indicates the median. Boxplots also convey information about spread and skewness (the box will be symmetric if there is no skew). The boxplot identifies outliers and extreme values. Outliers are cases with values between 1.5 and 3 box-lengths from the upper or lower edge of the box. Extreme values are cases with values more than 3 box-lengths from the upper or lower edge of the box.

The importance of outliers and extreme values is that they should occur only rarely in data sampled from a normal distribution. About one percent of observations from a normal distribution would be classified as outliers by the boxplot. So if you had a sample of 20 observations you would expect 0.2 observations to be outliers. Put another way, about one in five boxplots of such data will show an outlier by chance alone. Although this probability is reasonably high, finding an outlier might indicate that there was a mis-recording of data, a breakdown of procedure, or a particularly unusual individual. Thus, the point should be investigated before it is put in the analysis to check that there was no recording error etc. If the point is an extreme value, perform the analysis with the point removed, because that one point will be unduly influential on the value of the mean and standard deviation calculated for your sample (always report that you have removed a point and what its value is). An extreme value may make the mean fall on a value completely outside the body of the data, so the mean is no longer representative of most of the data.

Note that boxplots do not display means, standard deviations, or standard errors.

General

1) Write sentences that are grammatically complete. If your sentence contains a verb as a participle (i.e. in stem+ING form: illustrating, meaning, implying, etc) not preceded by "be" in one of its forms (is, am are, etc), the sentence is not complete for the purposes of formal writing. "Meaning the theory was rejected" is not a

complete sentence. (“These results led to the rejection of the theory” or “These results mean the theory should be rejected” are complete sentences.)

2) Be concise in your writing. You don’t need to state the same thing several times in a row. Having stated means in a table, don’t state them again in the text; having presented them in a graph, do not present them in a table. Having stated p values and other statistical details in the results section, do not restate such details in the discussion. Having presented Newman-Keuls in a pictorial fashion, do not restate the results in prose.
Do not try to complicate the results section. Just follow the example in the handout closely without adding explanations and further descriptions.
Relatedly, do not try to complicate the design section. In the design section, just state the name of the independent variables, whether they are between subjects or within subjects, the names of their levels, and the name of the dependent variable. No other explanation is needed.
In general, in any part of the report, do not write one sentence, then repeat it in a slightly different way. Concise writing is clear writing.

3) Do not write in lists for introduction, materials, etc; use normal prose.

4) Before writing up, read the handout given last year on how to write a practical report, and also the handouts from this course for the relevant module.