



School of Psychology
University of Nottingham

HOW TO WRITE A LABORATORY REPORT

Pete Bibby
Dept of Psychology
University of Nottingham



School of Psychology
University of Nottingham

About Laboratory Reports

- The writing of laboratory reports is an essential part of the practical course
- One function of this course is to give you practice and feedback about how to write such reports.



What are Lab Reports For?

- The purpose of a lab report is:
 - to communicate to others what you did
 - To explain why you did it,
 - To describe how you did it
 - To present what you found
 - To say what you think it means.



About the Format of a Lab Report

- It is essential to follow a standard format
 - This allows the reader to locate the information that he or she requires immediately without having to work through the entire report
- The simple rule for report writing is:
 - Could someone replicate your experiment with the information you have provided?



The Format of a Lab Report

- Your task in the report is to tell your reader all about the study you conducted.
- The main sections of the report should be as shown on the right

- Title
- Abstract
- Introduction
- Method
 - Design
 - Subjects
 - Apparatus & Materials
 - Procedure
- Results
- Discussion
- References



Title

- The title should be concise yet clear enough to give the reader an idea of the investigator's central concerns.
- The most common type of title states only the dependent and independent variables
 - Remember that your reader will initially see the title and nothing else, but wishes to know whether or not the report is relevant to his/her research interests.
 - Your title should be a brief, but accurate reflection of the content of the report.



Abstract

- The abstract is a self-contained and brief summary of the main points of the write-up.
- It should contain:
 - a brief statement of the problem being investigated,
 - the design used,
 - the subjects investigated,
 - the stimulus materials involved and any important apparatus
 - the principal results obtained and their analysis
 - the main conclusions drawn.



How Long is an Abstract?

- You should aim for abstracts which are approximately 100 words long
 - A quick rule of thumb is to take a summary sentence from each section of the report.
- The abstract is much easier to write if you make it the last thing that you write even though it appears at the beginning of the write-up



School of Psychology
University of Nottingham

Introduction

- The introduction should present the reasoning behind the particular experiment which you are describing.
- This means that the reader, having read all the introduction, should be able to predict what your experiment will be



What to Include in the Introduction?

- Essentially in the introduction to your report you should provide the following information in the following order:
 - Review the background material (existing findings and theories) relevant to your study
 - Outline the precise problem you chose to investigate and the way in which you investigated it
 - Outline the results predicted by your research hypothesis (hypotheses)



Method

- The method must contain enough information for the reader to be able to repeat the experiment.
- The method section is split into the sub-sections
 - Design
 - Subjects
 - Apparatus & Materials
 - Procedure



Design

- In the design section you must state the following:
 - The type of design you used (e.g. between, within, mixed or matched subjects)
 - The independent variable(s) including the conditions you selected to represent different levels of the IV
 - The dependent variable including details of the units of measurement used (e.g. seconds, milliseconds, or number of correct responses)
 - What the experimental hypothesis was



Subjects

- This should state:
 - the number of subjects used
 - how they were selected
 - any other important characteristics
 - mean age,
 - age range
 - number of male and female participants
 - educational level
 - Occupation
 - etc



Apparatus & Materials

- The apparatus will often consist of simple items such as a stopwatch
 - If complex equipment has been used (e.g., a computer running special software), you should describe it in sufficient detail to allow equivalent apparatus to be used
- The materials used in the experiment are the stimuli
 - Words, puzzles, questionnaires, etc are materials
- You should describe the general criteria used to select the particular materials



Procedure

- This section describes how the design was actually implemented and should describe exactly what the subjects and experimenters did with the apparatus and materials.
- This will include a description of the instructions given to subjects
 - Any particular emphasis (eg., as regards speed and accuracy) should also be mentioned.
- There should be enough information for someone to repeat your experiment exactly.



Results

- This section provides the reader with a clear, concise summary of the data you collected and the results of any statistical tests.
- This section reports the data and their analysis – it does not interpret the results which is left to the discussion section.



Tables & Figures

- Tables and figures should all be titled, and care should be taken to label them clearly.
 - The reader should not have to refer to the text to understand your tables and figures.
 - However, you must include some explanatory text describing what data appears in the table.



A step by step guide to the results section.

- Present a summary table/s of the results including appropriate measures of:
 - central tendency (mean, median or mode)
 - dispersion (standard deviation, variance, range)
- If meaningful use graphs
- Report the statistical analysis conducted on the data.
 - the value of the test statistic
 - degrees of freedom (or number of subjects)
 - one- or two- tailed test
 - the observed p-value
 - whether the test result was significant
- If a significant finding was observed state the direction of the effect



Discussion

- This is the section in which you can interpret the results of the experiment and discuss their meaning.
 - It is important that your discussion relates the results to the issues raised in the Introduction
- The results may not have led to clearcut answers to the questions raised initially
 - Your discussion might have to suggest further experiments which can now be seen to be necessary for answering the initial question.
 - You might also discuss any limitations of the experiment that have come to light, but which were not predicted in advance



Stages to writing a discussion

- State what the results are by providing a précis (in words) of the results.
- Account for the findings.
- Explore the implications of the findings.



Stating the results

- You should open the discussion by summarising the main features of the results:
 - Was there a significant difference between the experimental conditions?
 - If so, in what direction?
 - Were the findings consistent with the experimental hypothesis?



Accounting for the findings

- The next stage is to discuss what the findings mean.
- If you have rejected the null hypothesis then
 - you need to establish whether this was really caused by the manipulation of the independent variable
 - you need to make sure that no other confounding variables or experimental artefacts can be said to be the cause of the outcome of the experiment.
- If you have failed to reject the null hypothesis
 - you need to convince the reader that the only plausible explanation for this is the absence of a cause and effect relationship between the independent and dependent variable.



Failing to Reject the Null Hypothesis

- This is not an opportunity to try and prove the null hypothesis.
- A failure to find a significant difference is just a failure to find a significant difference.
- It does not mean that you can conclude that there was no difference.
- You can only conclude that there was no evidence of a difference.



Were the Findings consistent with the research hypothesis?

- Yes
 - What have we learned about the relationship between the independent and dependent variables?
 - Does this new understanding allow us to improve our theories or our explanations of particular phenomena?
- No
 - If there were any specific limitations to your study then they should be used to:
 - motivate further research
 - decide between alternative explanations
- Essentially your job is to show how the study you have conducted has benefited the research community and improved our understanding of the ideas that you introduced earlier.



References

- When writing references we distinguish between
 - Primary Sources (ones you have actually read)
 - Secondary Sources (ones you have cited but not actually read)
- Further information can be found on the web pages associated with writing lab reports



Marking Scheme

- When assessing the practical reports the markers consider five broad issues:
 - **Content** (does the report suitably motivate, justify, analyse and evaluate the conducted research?)
 - **Global Structure** (does the report adhere to the format specified in the School's document on writing reports?)
 - **Local Structure** (does each section of the report contain the relevant information?)
 - **Reasoning** (is there a convincing line of argument for the research conducted and a suitable conclusion drawn?)
 - **Evaluation of evidence** (is the relevant literature evaluated appropriately?).