CHAPTER 9

Writing-Up Research Discoveries

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I. Research Paper Template

Information to be useful to others and to be consensually validated must be communicated. Any findings which are not independently evaluated are of questionable validity. Discoveries are therefore usually presented in the form of formal papers and published in journals. You must be comfortable with this communication format if you are to either conduct or consume research.

If you are going to write a paper, ask yourself what would have been the perfect paper for you to have read in order for you to understand everything you need to know. Then write it. Assume that your reader is a bright, enthusiastic student with a background in Introductory Psychology.

Papers must be understandable and meaningful. Papers are for replication and understanding. Ask yourself "will the reader know everything that happened?" Provide everything that is needed. Contrariwise, everything is designed to tell somebody something. Include nothing that is inessential. Each sentence must be as informative as possible. Include all relevant information. but never use anything you do not know is absolutely and totally real or empirical . Outline the paper until it is perfectly clear, then write it.

You cannot rediscover all the knowledge in the field of psychology for yourself. You will need to utilize the thousands of man years of hard work and thinking already provided by people in the field if you are going to contribute meaningfully or if you wish to be an ethical purveyor of psychology. Additionally, you are expected to do enough outside reading to develop an understanding of the implicit rules underlying how to write a paper. As a result, you must read journals to survey what is known and to gain a sense of what is appropriate.

The following list of questions step you through the major issues which must be addressed in a research paper. After each question is answered the construction of the research paper is simply developing transitions between the items. I recommend writing as much as you can possibly think of in a stream of consciousness mode for each item (i.e., false alarms don't hurt much - misses hurt a lot).

Then develop an outline of your paper with each line representing a paragraph. Cut and paste the paragraphs you write, in answer to the template into the correct position on your outline (saving any irrelevant stuff at the end), and whatever text is necessary to fill out your outline, and finally, edit the paragraphs to get them to flow together. Outline within each paragraph to make

sure each paragraph develops only one point. Cut and paste the sentences into other paragraphs so similar issues are together. Re-edit the whole paper into a continuously flowing idea development. Look back through the removed material at the end of your paper for good ideas and edit those ideas back into the main paper.

The following template can be used either to write papers or as a study guide and evaluation form when you read research papers.

A. Title

Article title:
Author(s):
(Concise portrayal of research)

B. Abstract

Context of research question?
Explicit statement of question?
What and how many subjects used?
How question was answered? Research design?
Results of research?
Implication of results?

C. Introduction

Background necessary to understand the research?
The specific problem? the specific hypothesis?
Case for why the question is important or interesting and why the reader should want an answer?
Case for why the procedure is appropriate and the best procedure, given the situation?

D. Subjects

Information necessary to exactly replicate the study with respect to subjects?
Information necessary to realize any confounds or inability to generalize because of some special property of the subjects?

E. Apparatus

Information necessary to exactly replicate the study with respect to apparatus or setting?
Information necessary to realize any confounds or inability to generalize because of some special property of the apparatus or the setting?

F. Procedure

Specific procedure used to answer the problem?

Information necessary to exactly replicate the study with respect to the procedure?

Designed to avoid potential confounds?

Procedures used to deal with unavoidable confounds?

Information necessary to realize any confounds or inability to generalize because of some special property of the procedure?

Was a baseline obtained or were the groups equal at the start?

How were the independent variables measured?

How were the dependent variables measured?

G. Results

In general, what was found? What happened?

Data provided to justify statements or major trends?

Reliability of the results?

How was reliability demonstrated?

Was the design capable of detecting very small changes in the dependent variable? How small of a change in the dependent variable would be recognized as significant?

What proportion of the variance in the dependent variable did the independent variable account for?

H. Discussion

Was the original question answered? A simple statement of the support or lack of support of the original question in the introduction?

Nonstatistical arguments for the reliability of the finding?

Nonstatistical arguments for the generality of the findings? Arguments for accepting that the exact independent and dependent variables are appropriate "models" for the inferred independent and dependent variables?

Nonstatistical arguments for the meaningfulness of the findings?

Answer the question "so the procedure produced these results - so what?" What additional relevance was there?

II. APA Research Paper Guidelines

Research papers have a syntax just as do any other form of communication. If you put words or ideas out of order when you are talking, then people don't

understand you. If you dial a phone number out of order, the wrong person answers. A similar case holds with research papers. People have become accustomed to a particular order of presentation, therefore, all professional papers are written according to the latest Publication Manual of the American Psychological Association (5th Ed.)

A. Miscellaneous

The word "datum" is singular and the word "data" is plural. Never use anyone's first name or affiliation. Never use first person. Never refer to yourself. Refer to the behavior of the subject. Do not refer to the subject, organism, animal, or person. A very powerful and productive rule of thumb is to never refer to the subject by any term outside of the "subject section." If you refer to the subject itself rather than to the behavior of the subject, you are probably wrong. A paper is trying to understand the causes of behavior not anything about the subject itself. Focus on real changes in the environment, not presumed changes in the mental processes of the subject. Use passive voice; no one wants to know what you did. Readers want to know what variables were manipulated and what happened. Avoid lists and quotes. Question every "it," to be sure "it" is defined. Never use redundant terms like "an experiment to prove" or "an experiment" in the title. Be simple. Do not be rhetorical. Do not use flowery sentences.

Text margins must be 1 inch on all sides (70-75 characters per line, 20-25 lines per page). Count characters on a line and the number of lines on a page to confirm that you have your size and leading set correctly. Papers must be typed with double spacing between all lines (at least 3/16 to 1/4 inch). Adjust line spacing or leading to give sufficient space between lines for editorial commentary. Never single space under any circumstances. Do not justify the right margin and do not hyphenate words. Use a serif typeface such as Times Roman, Century Schoolbook, or New Century Schoolbook. Print on only one side. Do not "bind" in any covers and do not include blank sheets preceding or following the paper. Never format and typeset to appear like it would in the journal.

B. Computer Assisted Writing

Avail yourself of the spell checker and grammar checker on your word processor. Better yet is to have your world processor "auto summarize" your paper. Read the summary. If it is a good and accurate summary, then good. If not, fix your paper so that it summarizes well.

C. The Use of Abbreviations

Abbreviations can simplify technical terms but in order to avoid confusion only standardized abbreviations should be used. Do not force your reader to learn the meaning of many abbreviations. It makes it difficult to remember which is

which. Remember you have been using these abbreviations for a long time while the reader must pick them up in one reading. Before using an abbreviation introduce the term first, and then consistently use that abbreviation when you use the term. Use abbreviations sparingly. Do not use abbreviations at all in the title or abstract.

Example of introducing a term:
A variable-interval (VI) schedule of reinforcement ...

Metric abbreviations are not introduced first.
The chamber measured 30 cm high and 25 cm wide.

D. The Use of Numbers

Numbers are spelled out if they are less then ten, but not if over ten.
An average of five responses occurred.
An average of 46 responses occurred.
Numbers are also used when indicating:

series of four or more	The sequence was 2, 4, 6, and 8.
decimals and fractions	The chamber was 30.5 cm high.
ages	The subject was 2 years old.
units of measurement or time	10 and 15 g over a 5-day period

E. Measurements

The Standard International system of units (the modern version the metric system) should be used when specifying measurements. Abbreviations and conversions of measurements are shown below.

Quantity	**Name**	**Symbol**	**Conversion**
length	meter millimeter centimeter	m mm cm	39.4 in = 1 m 1 in = 25.4 mm 1 in = 2.54 cm
mass	gram	g	1 oz = 31.1 g
time	second	s	
force	Newton	N	1 gram force = .01N

F. Proofreader's Marks

In order to simplify the correction of your papers, the following proofreader's marks are used by editors.

Proofreader's Mark and Meaning	Mark in Margin	Mark in Text
insert	two	Use only samples.
delete		Use only two samples.
let stand as originally typed	stet	Use only two samples.
transpose	tr	Use only two smaples.
close up		Use o nly two samples.
spelling	sp	Use only too samples.
type in upper case	cap	use only two samples.
type in lower case	lc	Use ONLY two samples.
insert a space	#	Use onlytwo samples
begin a new paragraph	¶	¶Use only two samples
move left		Use only two samples.
move right		Use only two samples.

G. Page Arrangement

Arrange your papers in the following order and begin a new page for the sections preceded by an asterisk (*).

* Cover Page (not labeled as such)
* Abstract
* Introduction (not labeled as such)
  Method
  Results
  Discussion
* References
* Table 1
* .
* .
* Table n
* Figure Captions
* Figure 1
* .
* .
* Figure n

Number all pages in consecutive order beginning with the Title page. Type the first two or three words of your title in the upper right hand corner, 2 cm down. Place the page number on the same line but typed to the far right.

H. Web Sources of Information

http://owl.english.purdue.edu

III. Sample Paper With Annotations

The following pages represent a sample paper. It is intended to demonstrate appearance. It is not intended to make sense. The commentary within the boxes discusses the section on the page following it; that way you can get commentary as well as a feel for how the paper should appear.

Title Page

The Title Page can be seen as a very very short abstract and an introduction to your paper. It should convey what the paper is about as well a who did the work. It should be simple and elegant.