

Writing an APA Lab Report

A lab report is a writeup of an experiment. It has the same components as a published research study. Below is a general guide on how to write a lab report for a psychology course. You may find individual graduate schools to have variations of these rules so ask before making a mistake and then making a second mistake by say, “Back at Williams we could do that.”

Using APA Style

Manuscripts submitted for publication in American Psychological Association (APA) journals must use APA style, as described in the Publication Manual of the American Psychological Association (5th ed.)

Lab reports have eight sections (see also the APA manual, Chapter 1). In the list below the number in () indicate on what page of this report you will find more detailed instructions that section of the lab report. The number in [] indicates where you will find information in the APA manual.

- Title Page (4) [10 & 296]
- Abstract (5) [298]
- Introduction (6) [16]
- Method (7)[17]
- Results (8)[20]
- Discussion (9)[26]
- References (10)[299]
- Tables and Figures (11)[155 & 21]

General Requirements for all APA papers

Spacing. Double space all text.

Margins. APA specifies 1-inch margins all around (top, bottom, left, right). The only exception are block quotes that are indented 5 spaces on the left.

Pagination. Use your word processor's header function to put page numbers in the upper-right-hand corner one inch from the right-hand edge of the page. Start with the title page and go all the way through.

Manuscript Page Header. It consists of the first couple of main words of the title. Place the header in the upper-right-hand corner of the document, on the same line as the page number. Like the page number, the manuscript page header appears on every page of the manuscript.

Running Header. This is a short descriptive title that will go at the top of title page in the published journal. In your manuscript the only place it appears is on the title page, flush left, in uppercase letters, just below the manuscript page header and page number. It does not have to use the same words as the page header. Since scientific manuscript titles are often quite wordy this is a short working title.

Headings. Headings are the titles of each of the sections of the research report. Center all headings of major sections using upper and lower case (Abstract, Method . . .) The introduction heading is the title of your paper, rather than the word "Introduction". Headings for subsections of the paper are underlined and flush with the left margin, with text beginning on the next line. They are used mainly in the methods section. See the

Specific suggestions

1. Arrange the title page information on its own page. Center the title page information from the side margins. Place the title in the center of the page.
2. Choose a title carefully. The primacy effect works with titles.
 - a. Make the title specific

Not: The effects of gambling

But: The effects of gambling relapse on levels of depression and anxiety

- b. The title may ask a question

EXAMPLE: Does Linguistic Analysis of Freshmen essays predict withdrawal from college?

- c. Consider including the independent variable and dependent variable, and perhaps even the outcome (if it is straightforward)

Independent as a Predictor of Dependent

EXAMPLE: Anxiety Scores as a Predictor of rumor development

The Relationship between Dependent and Independent is ...

EXAMPLE: A curvilinear relationship between peer pressure and alcohol use among adolescents

- d. Do not use different fonts and font sizes, bolding, italics, or underlining in titles.

Abstract

Think of the abstract as the "Reader's Digest" version of the report. Its purpose is to show the reader the research at a glance. The abstract is not an introduction but gives the reader an overview and often tells them if they want to continue reading.

Requirements

Condensed format. Abstracts must be condensed (100-120 words) yet stand alone. This

means that the abstract should be understandable to someone who has not read the lab report. The abstract is not an introduction.

Order. Each section of the paper requires at least one sentence in the abstract. Methods and Results usually require more than one sentence each. Information is arranged in the same order as the sections in the lab report: Introduction, Method, Results, and Discussion.

Single paragraph. Abstracts should be one paragraph.

Should not contain. Abstracts should not have quotes nor citations.

Do not indent abstract.

Specific suggestions

1. Write the report before writing the abstract. If you write the abstract first often it will become an outline of what you are going to write or will contain statements that are not in your report.
2. Focus initially on content, not length. It is easier to condense later if needed.
3. Look at each section in the report and find one main sentence or sentences that summarizes that section. Underline key sentences and include it in your abstract.
4. Cut out redundant or unimportant information.

Introduction

The goal of the introduction is to justify your study. Introduce the research question, summarize the research done to date, and demonstrate that there is work yet to be done (your study). At the end of the introduction, state the specific hypotheses you tested.

Requirements

Give background. This section gives the history behind your research question. Identify the work done in the area so far and the value of your study.

Cite all relevant research, not just the studies whose results you agree with. For studies that support an opposite finding, explain what might cause the differences. You are responsible for reporting all previous studies.

State hypotheses. At the end of the introduction, state the hypothesis that you propose to test and the specific predictions that follow from them.

Need rationale. The hypothesis should be based on specific rationale. In other words, why do you believe this hypothesis will hold true. “I have a gut feeling.” is not a sufficient answer.

Specific suggestions

1. Use PsycInfo which can be found on the Ebsco host on the Williams home page to see what research has been done in this area previously. Try a number of search words and phrases.
2. If there is controversy over your topic you must try to explain the source of the disagreement.
3. At the end of the introduction, point out what research is needed and state your specific hypotheses. If there are more than one or two, then list them ('This study will test the following hypotheses: (1) . . . (2) . . . (3) . . .')
4. Avoid plagiarism by giving credit where credit is due. Whenever you cite someone else's ideas or use their language, you must give the name of the author and the year of publication.

5. In scientific writing, it is much more common to paraphrase an author's ideas than to use direct quotes. If you use direct quotes, however, also cite the page number: "Anatomy is destiny," (Freud, 1929, p.75).
6. Use specific language and support your arguments with concrete examples. Avoid vague references and subjective phrases like "I feel" or "I think".
7. Don't overuse the passive voice, its easy to slip into and is often unclear. I.e. instead of "Subjects were administered the NEO Personality Inventory" use "Subjects took the NEO Personality Inventory." In reading the first sentence quickly you might mistake it to say the subjects administered the NEO. The second sentence is much clearer
8. Avoid self references such as "I tested five students." Or "My hypothesis was..." Instead "Five students took the test." and "The hypothesis was ..." If working with someone do not use "we"
9. Do not address your reader directly as "you". For example do not say "If you experience a traumatic situation you may develop PTSD." use instead "Traumatic experiences often produce PTSD."
10. Refer to you paper as "the current study" or "the present study". Do not use these terms for studies you are reviewing as part of your literature search.

Method

The Method section is a detailed breakdown of your experiment, including your subjects, research design, equipment used, and what the subjects actually did during the experiment (the procedure). Provide the reader with enough information so that they can reasonably replicate the experiment. Usually this section will be subdivided into sections.

Requirements

The Method section is often divided into subsections such as Subjects, Design, Stimuli, Equipment, and Procedure. Each subsection should provide only the essential information needed to understand and reasonably replicate the experiment. Very short subsections can be combined (e.g., Stimuli and Equipment). There is no APA rule on the order of subsections. The order shown below is common.

Order

1. **Subjects/Participants.** State the number of subjects, who they were, and how they were selected. If you are writing up an animal study, do not call this subsection "Participants."

I.E. Participants

300 Gen students from a small liberal arts college in rural Arkansas volunteered to participate in the experiment

2. **Materials.** This subsection briefly describes the equipment/materials used in the experiment.

I.E. Anxiety was measured using the Anxiety scale on the Revised version of the NEO Personality Inventory.

3. **Design.** Identify and explain variables and their levels, and state whether the variables are between groups or within subjects.

I.e. This study was an archival design utilizing marriage and divorce records obtained from the bureau of county records

or

The design was an untreated control group design with pretest and post-test samples with switched replications.

Group one was given an anxiety pretest and taught relaxation techniques while group two was given a pretest and then watched a new broadcast concerning an improvement in fuel efficiency in new cars. Then both groups were given a post test and then the second group was taught relaxation techniques while group one was shown the news

broadcast and then finally both group were again tested for anxiety levels.

4. **Procedure.** Describe in sequence the procedures used.

I.e. Subjects' names were taken upon arrival at 8:00. Subjects who arrived after 8:00 were not allowed to participate in the experiment. Subjects were told that the experiment had run into a problem and would not begin until 8:30. Subjects were provided with magazines and refreshments. At 8:15 one of the experimenters, pretending to be a subject, began to insist that she could not wait and had to leave. At which point another experimenter entered the room and talked her into staying. At 8:20 the experimenter in the room again began to insist that she could not wait. This time two experimenters came in to talk her into staying. This procedure was repeated at 8:25 and again at 8:30 with the experimenter becoming more and more frantic about having to leave. Finally at 8:35 the experimenter left saying she could wait no longer. Shortly after the experimenter left the subjects were taken to another where they were given a brief anxiety questionnaire. The results were then shared individually with the subjects. During this sharing the subjects were asked to evaluate the emotional state of the experimenter who had left. Each subject was asked identical questions about the experimenter but was not informed they were prearranged questions but were led to believe that they were engaging in small talk while the examiner finished some paperwork. This entire procedure was repeated with a second group of subjects but this time the experimenter in the room who insisted upon leaving was a male.

Results

This section presents the statistical analysis of the data collected. It is often less than a page long.

Requirements

No data interpretation. Statistical results are presented but not discussed in this section.

Discuss results in the Discussion section.

Statistics. There are specific ways to report statistical data. These are discussed and illustrated in the APA manual and in statistics class. For example to report a t-test it should be in this form $t(75) = 8.4, p < .05$.

Specific suggestions

1. Describe all results that are directly related to your research questions or hypotheses. Then you can describe any additional or unexpected results that are relevant to your questions.
2. Report main effects before reporting contrasts or interactions. Briefly mention problems such as reasons for missing data, but save discussion of shortcoming for the discussion section.

I.e. In an experiment where you are testing to see if number of years in college affects self-esteem. At the same time you are also testing to see if there are gender differences. You have two main effects in this experiment; gender and number of years in college. You would report these main effects first and then tell whether there was an interaction. For example, if males had higher self-esteem as freshmen and females had higher self-esteem as seniors that would be an interaction.
3. For each test used, provide degrees of freedom, obtained value of the test, and the probability of the result occurring by chance (p-value). Here is an example of a t-test and an F-test, respectively: $t(23) = 101.2, p < .001$; $F(1,3489) = 7.943, p < .001$. Again if this does not make sense it is probably because you have not taken statistics.
4. Keep your hypotheses in mind while you write. Each result must relate to a hypothesis.
5. If you are presenting many complicated results (i.e., many variables or variables with many levels), write a brief overview and then discuss each variable in separate subsections.
6. Use tables and figures to summarize data. Include significance levels, and means and standard deviations. The goal is to communicate what happened without being excessive or redundant.

Discussion

In this section, interpret your results by relating the results to your hypotheses. You gave your results in the previous section, here you discuss them.

Requirements

Discuss the results in relation to each of your hypotheses.

Discuss possible explanations for your results. How do your results agree or disagree with the ideas that you introduced in the Introduction? How do your results relate to previous literature or current theory? Identify and discuss limitations in the experimental design that may reduce the strength of your results. Introduce new ideas that your results suggest.

Generalize your results. Discuss the strengths and weaknesses of applying your results to other groups, species, ages, or sexes.

Identify additional experimentation to be done in this research area.

Specific suggestions

1. Explain whether your results support the hypotheses tested. This is what the whole paper is about.
2. Discuss how the results relate to the research question in general.
I.e. The results are consistent with the Yerkes-Dodson law.
I.e. These results show the advantages of using a secondary reaction time paradigm for assessing cognitive load during reading.
3. If a result didn't turn out as expected, discuss possible explanations as to why, including unanticipated shortcomings in the design, problems such as equipment failure, or even

that the theory tested needs modification. Make sure to show how your explanation accounts for the specific results.

I.e. NOT: One reason for this puzzling result could be that some subjects received different instructions. Another possible reason might be that the room was hot. A third possibility is that we should have . . .

This example is not well written for two reasons. First, the reasons are not supported. The author does not demonstrate how these reasons explain the unexpected pattern of results. Second, probably because of the lack of justification, the author's use of "could" and "should" does not sound confident.

BETTER: One possible explanation for this result is that experimental subjects received slightly different instructions than control subjects. Subjects in the control condition were told to press [1] for "yes"; subjects in the experimental condition were told to press [y] for "yes". Because [1] and [y] are positioned apart on the computer keyboard, the extra time required to locate [y] may account for the increase in reaction time. Another possible reason is that the room was hot, which could explain...

4. Discuss limitations of the experiment that could be remedied in future experiments. State the specific reason for performing the next experiment. Do not assume that it is obvious.
5. Avoid overstating the importance of your findings. Be modest.
6. Stay focused on the research question. Resist the urge to state glittering generalities.
7. End the paper with conclusions, implications and/or ideas for future research, not with problems or weaknesses of your design.

References

Below are the most common citation styles used for writing lab reports (see also pp. 215-281 of the APA Manual).

References

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<http://www.eur.nl/fsw/research/happiness/philosophy.htm>

Requirements

Use APA format. It is important to use correct APA style because it will make your paper easier to read and help you to present information accurately.

Specific suggestions

1. List all of the authors cited in the text in alphabetical order.
2. Use the correct citation format for each source.
3. Double-space each citation, using a hanging-indent (Word Perfect will do this for you).

Tables and Figures

It often helps to explain your material if it is represented by a table or figure. APA requires they be placed in a separate section but at Williams you are allowed to place them inside the text.

However, many journals and schools would not allow this so wherever you go check first.

Requirements:

Captions. All tables and figures require captions. Ordinarily table captions are placed above the table and figure captions go on a separate page from the figure called a Figure Captions page. At Williams you are allowed to put captions on the same page as the table and figure.

Labels. Number the tables and figures separately.

Footnotes. Use footnotes in tables to explain missing data and any other key information that

doesn't fit in the table itself.

References to text. If you include a table or figure, you must refer to it in your paper. Refer to tables and figures by their numbers either in the text or in parentheses.

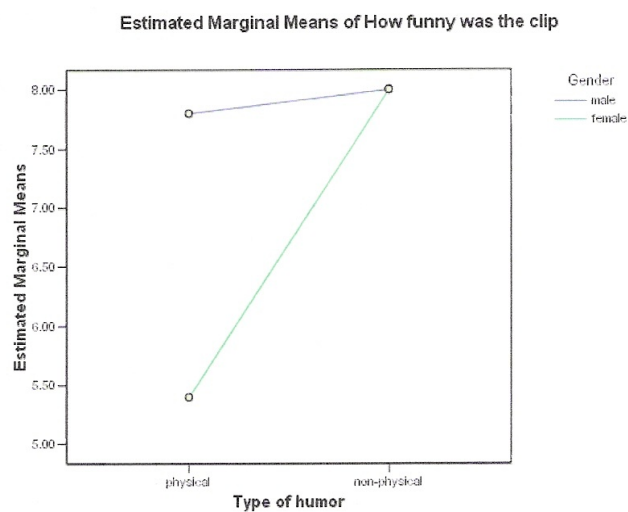
Specific suggestions

1. What is the difference between tables and figures? Tables save more space, but figures have a greater visual impact.
 - a. Use tables to summarize data.

GPA rater Totals

GPA	Raters			Totals
	1	2	3	
<1.00	2	3	2	7
1.00 to 1.999	3	3	3	9
2.00 to 2.999	3	4	3	10
> 3.00	4	3	3	10
totals	13	15	14	

- b. Use figures to help the reader visualize objects, results, or ideas.



2. Design the table or figure to stand alone. It should be an independent source of information. Captions, variable labels, and value labels should be precisely worded.

Instructions for writing Statistical results up in correct APA format

Generally begin describe, the variables, the statistical testes that were conducted and the purpose of the statistical tests

For example

“A one-way analysis of variance was conducted to determine if there was a relationship between levels of depression and recidivism. Clinical ratings were made by supervising psychologists placing the subject in one of five depressive categories; mild, moderate, substantial, severe and psychotic. The dependent variable, recidivism was rated in terms of how many times the subject was readmitted to the hospital over a 2 year period.”

Give the results of those tests both in full complete sentences and follow that in abbreviated style commonly used in APA writings.

Correlations

For example

“A Pearson correlation was conducted to determine if there was a relationship between alcohol use and tobacco use by 6 grades and a moderately strong correction of .49 was th obtained which was significant at the .01 level.
 $r = .45, p = .01$ ”

If a multiple correlation is conducted then Again a full and complete sentence is used to described the results followed by a table to summarized those results.

For example

Correlation coefficients were computed between the four variables of risk behavior and as can be seen in Table 1 four correlations were statistically significant, three at the .01 level. However, one of the correlations was very weak ($r = .24$) indicating little relationship between drugs an alcohol. The results suggest a very strong

relationship between curfew violations and drug use and curfew violations and alcohol use. ($r = .53$ and $r = .35$) This suggests that curfew violations may be a good indicator of both of these behaviors. Finally the use of alcohol correlates strongly $r = .49$ with having unprotected sex. This result is not unusual since it has long been known that the use of alcohol was a major factor in adolescents having unprotected sex.

Risky Behaviors	Alcohol	unprotected	drugs	curfew violations
alcohol		.495**	.248*	.351**
Unprotected			.178	.180
drugs				.534**

** $p < .01$ level
 * $p < .05$ level

Table 1 Correlations among factors of risky behaviors

The form the table takes should be noted and copied. More details on how tables should look can be found on pp. 149-175 of your APA manual. Note no vertical lines are used and only limited horizontal lines are used.

t-tests

These are written in a similar fashion to correlations except that tables are usually not needed.

For example

“A significant difference ($p < .02$) was found between male and female scores on the Masterson Word Association Test with males making more negative associations than females. $t(98) = 2.4, p = .018$.”

For p-values of .000, report them as “ $p < .001$ ”.

Tell the reader whether the test was significant or not in a complete sentence in the form above.

Do not just give the t and p values.

Give the effect. For example, “For this paired-sample t test, $d = .65$.”

Effect size can be abbreviated a d , D , or η^2 depending upon which test for effect was used. Most

of time that will be d for significance tests and η^2 for ANOVAS. If you are not sure of the abbreviation for the results of a particular statistical test consult your APA manual pp. 141-144

Also include the relevant descriptive statistics, such as the means and standard deviations. If you are telling the reader that there is a significant difference between male and female scores of a word association exam the results do not tell where the difference is $t(98) = 2.4, p = .018$.”

Whereas including the means will tell the reader.

Group Statistics

Gender	Mean	Std. Deviation	Sample size
Males	.5333	.05196	55
females	.5071	.05687	45

If there are only two means they probably can be mentioned in a sentence rather than as a chart.

For example

“The results found that the males mean interest in violence ($M = .53, SD = .00701$) was significantly greater than the female mean concern for violence ($M = .50, SD = .00848$), $t(98) = 2.4, p = .018$. The magnitude of the difference in means was moderate. ($D = .50$)”

Italicize all non-Greek statistical symbols

After you have given your results describe and summarize the general conclusions that arise from those results

For example:

“The results support the hypothesis that males have a greater interest in violence than females.”

This order could be reversed and the general statement made first followed by statistical

summary sentence but the wording will have to be changed slightly

General descriptions for reporting ANOVAS

Again describe the variables, (independent and dependent) the tests conducted and the purpose of the tests.

For example

“A one-way analysis of variance was conducted to determine the relationship between therapist personality type and levels of improvement levels of borderline personality disorders. The dependent variable was an improvement as measured by an average rating of the subject by the subjects family. The independent variable were three different therapeutic personality type as based on the Handerson Therapeutic Personality Measurement. This measurement divides therapist into three personality types: directive, non-directive and relational.”

Report the over results of these test just as you did the t-tests, both as full sentences and in an abbreviated fashion.

For Example

“The results indicated a significance difference at the .004 level in patient improvement under three different therapeutic personality type as established by the Handerson Therapeutic Personality Measurement. $F(2,97) = 5.819, p = .004.$ ”

Again for P values of .000 simple report $p < .001$.

Also report effect statistics that allow the reader to know what impact these results would have.

In the case of an ANOVA that is reported a eta squared. “ $\eta^2 = .35$ ”

In addition report the results of the pos hoc test. Tell what post hoc test was used, (there are several) and the results and significance of those results. This tells the reader where the difference is

For example

“A Tukey HSD post hoc was conducted finding a significance difference in improvement in borderline patients between those seeing a directive therapist and a relational therapist, $p = .003$. The greatest improvement was found among patients in the directive group ($M = .53, SD = .0072$) which was significantly greater than the improvement found in the relational group ($M = .48, SD = .014$). The non-directive sample fell in between these two with a mean of .51 ($M = .51, SD = .009$) and was not statistical significant from either the relational or the directive group means.”

Reporting a χ^2

For example

“A Chi square was conducted to determine whether adolescent drivers versus drivers who had their licence over 10 years of truck verses cars were more or less likely to have insurance on their vehicle. The results of the text were significant $\chi^2 (1, N = 94) = 5.284, p = .022$.”

In the above example $\chi^2 (1, N = 94) = 5.284, p = .022$. The “1” is the df.