

Scientific Project: Abstract

Learning Objectives:

- 1) Understand the components of the scientific process.
- 2) Identify the most important details of the individual self-experiment.
- 3) Create a structured summary of a personal scientific experiment.

General Information on writing a successful abstract:

An abstract is usually found at the beginning of a scientific research article. It is a brief summary of the study. You can think of it as the movie trailer – you watch the trailer to the movie to determine whether you want to go see the whole movie. When you read the abstract, you are determining whether or not you are interested in reading the rest of the article. While an abstract is often the very first part of a scientific article, it is the last part to be written. You will submit an abstract for your self-experiment as the final component to the project. This will summarize everything you have discovered throughout the course of the experiment. All journals have slightly different requirements for their abstracts.

The purpose of an abstract is to allow the reader to judge whether it would serve his or her purposes to read the entire report. A good abstract is a concise summary of the purpose of the report, the data presented, and the author's major conclusions.

For this project, the abstracts must be no longer than 250 words, and contain the following **8 subheadings**:

1. **Title:** Develop a title that best suits your experiment.
2. **Background:** Provide 2-3 sentences of brief background information to shed light onto the specific topic that you addressed in your experiment. This is NOT an explanation of personal reasons for why you chose your topic (see examples below).
3. **Objective:** This should be 1 statement, and should finish the sentence: "The purpose of this study was..." This should NOT be phrased as a question.
4. **Methods:** Briefly explain your methodology for your data collection. Unlike your "Methods" section of the project that you completed earlier in the quarter, this section should only include the important details of your procedures. You do not need to list specific brand names.
 - The following 3 important details are required: 1) frequency of testing intervals, 2) manipulation of the independent variable, 3) how you measured the dependent variable.

5. **Results:** State your most important finding(s), but do not explain them. You must include 1) your starting dependent variable value, 2) ending dependent variable value, and 3) total change (mean difference). All of these values should be presented as numbers, as you all have been required to conduct quantitative research.
6. **Conclusions:** Explain your most important findings, and whether or not they agree with the present literature. You must make a comparison to published literature (it can be one statement).
7. **Keywords:** Please list 3-4 keywords that would aid someone to quickly decipher what your the basics of your experiment.
8. **Word Count:** You must present (clearly type out) your word count at the end of the abstract. You must reach a minimum of 200 words, but cannot exceed 250 words. You should NOT include your title or subheadings in your word count total.

General Comments on Style

1. All scientific names (genus and species; *Homo sapiens*, *E. coli*) must be italicized. (Underlining indicates italics in a typed paper; *Homo sapiens*, *E. coli*.)
2. Use the metric system of measurements. Abbreviations of units are used without a following period.
3. Be aware that the word *data* is plural while *datum* is singular, and the word *criteria* is plural while *criterion* is singular. This affects the choice of a correct verb. The word *species* is used both as a singular and as a plural.
4. Numbers should be written as numerals when they are greater than ten or when they are associated with measurements; for example, 6 mm or 2 g but *two* explanations of *six* factors. When one list includes numbers over and under ten, all numbers in the list may be expressed as numerals; for example, 17 sunfish, 13 bass, and 2 trout. Never start a sentence with numerals. Spell all numbers beginning sentences.
5. Be sure to divide paragraphs correctly and to use starting and ending sentences that indicate the purpose of the paragraph. A report or a section of a report should not be one long paragraph.
6. Every sentence must have a subject and a verb.
7. Avoid using the first person, I or we, in writing. Keep your writing impersonal, in the third person. Instead of saying, "We weighed the frogs and put them in a glass jar," write, "The frogs were weighed and put in a glass jar."
8. Avoid the use of slang and the overuse of contractions.
9. Be consistent in the use of tense throughout a paragraph--do not switch between past and present. It is best to use past tense.

10. Be sure that pronouns refer to antecedents. For example, in the statement, "Sometimes cecropia caterpillars are in cherry trees but they are hard to find," does "they" refer to caterpillars or trees?

After writing a report, read it over, watching especially for lack of precision and for ambiguity. Each sentence should present a clear message.

The following examples illustrate lack of precision:

1. "The sample was incubated in mixture A minus B plus C." Does the mixture lack both B and C or lack B and contain C?
2. The title "Protection against Carcinogenesis by Antioxidants" leaves the reader wondering whether antioxidants protect from or cause cancer.

The only way to prevent such errors is to read and think about what you write. Learn to reread and edit your work.

Example of an Abstract:

Title: Replacement Of Electronic Media Exposure With Reading From A Printed Book Before Sleep Can Improve Sleep Quality and Next Day Wakefulness In A College Male.

Background: Blue light exposure late in the evening has been closely linked to disruptions in circadian rhythms and decreased sleep quality in previous studies. Common sources of blue light, such as tablets, phones, and computers, are commonplace in college environments, and have been linked to decreased sleep quality and next day wakefulness. Research has also shown that bright light exposure during the day, like that in a college environment, may be protective with regards to late evening blue light exposure.

Objective: The purpose of this study was to explore the relationship between electronic media exposure or physical book reading and reported sleep quality in a college male.

Methods: Data was collected and analyzed with daily recordings in a Sleep Log provided by the National Sleep Foundation, and modified PSQI questionnaire completed weekly. For one week, just prior to bed I was exposed to electronic media for 30 minutes, and during the experimental week this was replaced with reading from a printed book.

Results: Results from the sleep log show higher reported sleep quality and next day wakefulness in the experimental versus control group. The PSQI score improved by two points from 5 in the control week to 3 in the experimental.

Conclusions: The findings from this experiment agree with literature about electronic media exposure before bed, and contradict that which stated daytime bright light exposure can be protective, and indicate that nightly reading may be beneficial for students in improving next day wakefulness.

Keywords: Sleep Quality, Electronic Media, Sleep, Wakefulness, Book, Reading

Word Count: 246 words

Rubric for the Abstract

| Descriptor | Superior | Good | Poor | Unacceptable | |
|---|---|--|---|--|--------------|
| Points | 5 | 3 | 1 | 0 | Total |
| Criterion 1: Title | Title directly represents the experiment. | Title vaguely represents the experiment. | Title does not represent the experiment. | Title is not included. | |
| Criterion 2: Background | Background info clearly identifies important topics regarding the experiment. | Background info vaguely identifies important topics regarding the experiment. | Background info is unrelated to the topic of the experiment. | Background info is not included. | |
| Criterion 3: Objective | Purpose is stated clearly and succinctly. | Purpose is stated, but is vague. | Purpose is unclear, or is phrased as a question. | No purpose is stated. | |
| Criterion 4: Methods | All 3 specific criteria outlined in the instructions are included. | 2 of 3 specific criteria outlined in the instructions are included. | Only 1 of the 3 specific criteria is included. | Methods do not include any important details. | |
| Criterion 5: Results | All 3 specific criteria outlined in the instructions are included. | 2 of 3 specific criteria outlined in the instructions are included. | Only 1 of the 3 specific criteria is included. | Results do not include any important details. | |
| Criterion 6: Conclusion | Explanations of findings are clear and relevant to the results presented; comparison to previous literature is evident. | Explanations of findings are vague, but still relevant to the results; comparison to previous literature is vague. | Explanations are unrelated to the findings presented in results; no comparison to previous literature was made. | There is no explanation of findings included. | |
| Criterion 7: Word Count And Keywords | Abstract is at least 200 words, but does not exceed 250 words. Plus contains 3-4 keywords that describe the body of the experiment. | Abstract is greater than 250 words and 3-4 keywords are present. | Abstract is less than 200 words and one or less keyword. | Word count and keywords are not included. | |
| Criterion 8: Formatting | Complete sentences, appropriate subheadings are used throughout the document, and references if needed. | Complete sentences are used, some subheadings are included in the document, references if needed. | Complete sentences are used, but there are no subheadings included and no needed references. | Methods are not written in complete sentences and no references. | |
| | | | | Total Possible Points | 40 |