

Writing a Research Report:

Elements and Errors

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## Writing a Research Report: Elements and Errors

When writing a manuscript that reports the results of an empirical study, authors should generally structure the manuscript following the standard format used by most journals. Authors preparing empirical manuscripts may be unfamiliar with this structure and thus have their manuscripts rejected because reviewers quickly judge the manuscript to be unacceptable even if the study itself is excellent.

Considering the balance of manuscript form and study content enables the author to achieve the critical goal of readability. Form deals with clarity-related structure, elements, and techniques. Content is what the article is about. Good form does not assure the required content nor does the required content compensate for poor form. The ideal article conveys the required content in clear form, thereby providing a good experience for the reader.

In the following pages, I outline the standard structure of a research article by explaining the purpose, formal elements, and common errors for each section of a manuscript. Inserting your content into this form is a good way to craft an article.

### Overview

- Write for a non-specialist
- Write clearly and concisely
- Select appropriate journal
- Write for a specific journal, using published papers as models
- Follow APA style
- Plan to write at least five drafts
- Have a friend review the next-to-last draft

### Common errors

- Study does not reflect current state of the field
- Contribution is of little importance
- Paper is premature, more work needed
- Paper replicates prior research
- Paper is a piecemeal report
- Paper should be submitted to a less demanding journal

## I. Introduction

### Purpose

- Demonstrate a need for the paper; show that it is important and relevant for the field
- Provide brief description of former work
- Clearly state the objectives(s) of the study
- Explain origins of the hypotheses

State the hypotheses or research questions to be answered

### Elements

- A. Background of the problem (or thesis)
- B. Statement of the problem (or antithesis)
- C. Resolution of the problem (or synthesis)
  - 1. purpose of the study
  - 2. hypotheses or research questions

### Common Errors

Hypotheses stated in future tense  
“Positively relate” when should be “relate positively”  
Too long; inclusion of material better reserved for discussion  
Inclusion of extraneous or tangential material  
Excessive details in description of previous studies  
Reinventing the wheel, especially in first sentence/paragraph  
Omission of directly relevant studies  
Summary of results of study included  
Terminology is confusing  
First sentence = The purpose of this study is.... (too pedestrian)  
Citations incorrect

## **II. Methods**

### Purpose

Allow the reader to evaluate research design  
Materials or subjects (especially selection)  
Sample size, and how determined  
Operational definition of the variables in the hypothesis  
Procedures - provide adequate test of hypotheses  
Statistical analysis (consider error rates for multiple analyses)  
Ethics review; consent  
Adequate to permit duplication of work by others

### Elements

- A. Measurement of Variables
  - 1. Explicit rationale for the selection of measures
  - 2. Do the measure derive from the hypotheses
    - description of instruments or apparatus
    - empirical data on instruments or apparatus -valid, reliable
    - suitability for participants
    - adequacy of translation

-if unique to the study, report supporting evidence

#### B. Participants

1. Suitable, representative for purpose of study
2. Selection: how were Ss selected—at random, block assignment, intact groups, etc.? What are the Ns?
3. Characteristics: demographic variables (age, grade, race, sex, urban-rural residence, etc.); psychometric data (intelligence, etc.)
4. Comparison with reference groups: norms, base rates, etc.
5. Explain any probable biases in participants (volunteers, non-responders)

#### C. Data Collection

1. Explain how consent was obtained and participants debriefed
2. Describe in detail how the data were gathered (explain administration of tests)
3. Indicate how data were collated for analysis (if relevant)
4. Explain how participants were debriefed

#### E. Design and Analysis

1. Outline or graphically portray the data design
2. Present rationale for the statistical analyses conducted

#### Common Errors

Interpretation of results; do not accept or reject hypotheses  
Inadequate information for evaluation or replication  
Detailed descriptions of standard published methods  
Failure to explain unusual statistical analysis  
Participants too heterogeneous  
Failure to explain scoring of instruments  
Measures not validated; reliability poor or unknown

### **III. Results**

#### Purpose

Provide clear, organized statements regarding all findings, significant and non-significant, positive and negative

Answer all research questions asked

Illustrate complex data with tables and figures

Tables: when specific numerical values are important

Figures: when comparisons of multiple values are important

#### Elements

- A. Statistical Assumptions
- B. Gender differences, racial and ethnic differences
- C. Descriptive Statistics (Report means, sd, and correlations)
- D. Inferential Statistics
  - Is sample size adequate
  - Report tests of significance
  - Report practical significance and effect size
  - Consider restriction of range in correlations studies
- E. Additional Analyses (usually post hoc)

#### Common Errors

Complex, incomprehensible figures and tables  
Repetition of data in text, tables, figures  
Failure to follow the same format as in introduction and methods  
Failure to provide data promised in methods  
Inadequate or inappropriate statistical analysis  
Inclusion of material more suitable for legends to figures and tables  
Reliance on figures or tables to provide conclusions

### **IV. Discussion**

#### Purpose

Present and interpret conclusions  
Highlight important findings  
Compare and contrast with previous related work

#### Elements

- A. Conclusions: relation of results to hypotheses
- B. Interpretations: expected vs. alternative
- C. Implications
  - 1. Theoretical
  - 2. Research
  - 3. Practice
- D. Limitations of Study: approximation to ideal study
  - Estimate confidence in conclusions
  - Explain possible qualifications to the conclusions.
  - Identify methodological matters pertinent to the findings
- E. Recommendations for future research

#### Common errors

Repetition of introduction  
Repetition of results  
Discussion not based on purposes of study  
Discussion not based on results  
Hypotheses not explicitly discussed  
Non-significant trends promoted to findings  
Presentation of new data  
Repeats review of literature  
Unwarranted speculation  
Recommendations not based on results  
Providing summary when abstract already present  
Statements are unacceptable, unconvincing, or unwarranted

## **Abstract**

### Purpose

To provide a brief summary of:  
Purpose, hypothesis or problem  
Research design  
Principal observations  
Conclusion(s)

### Common Errors

Introduction that belongs in introduction  
Too long and detailed; excessive data/analysis  
Indicative style/ stated as fact (descriptive summary)

## **References**

### Purpose

To provide support for statements requiring it  
To allow evaluation of methods, statistical analysis  
To provide reader with most pertinent references on same topic

### Common errors

Too many, especially multiple references to support single, simple statements  
Use of secondary references  
References out of date  
References to standard procedures

Misspelled authors' names

Unpublished observations, personal communications, talks

Submitted for publication

Fugitive sources

Different language

### **Title**

#### Purpose

Permit reader to judge contents and general nature of paper

Include key words for indexing purposes

#### Common Errors

Too long ("brief abstract")

Clever, humorous, cute

Rhetorical question

Complete sentence