

# Technical Writing and Speaking in English

## Class 7,8: writing research results and discussion/conclusion

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# RESULTS

## OVERVIEW

In this chapter we examine the third major section of the experimental research report, called **results**, in which you present the findings of your study and briefly comment on them. Some writers call this section “results and discussion”, thus indicating more extensive comments on the findings of the study.

However, in this chapter we follow the convention of including only brief comments focused on the statistical analysis, reserving the more general comments for a later section. Before you write this part of your report, check with your professor or editor to find out which organizational format you should follow.

Rq terminology: sometimes named discussion

## Ordering Your Information

The example just shown is typical of results sections in research reports in many fields. As you can see, this section consists of three basic elements of information.

### RESULTS: Three Information Elements

ELEMENT 1: A statement that *locates the figure(s)* where the results can be found

ELEMENT 2: Statements that *present the most important findings*

ELEMENT 3: Statements that *comment* on the results

## Choosing Verb Tenses for Results

In using the three-step format to write your results section, you should observe the following verb tense conventions.

In Element 1, use the *present tense* to locate your data in a figure.

### ELEMENT 1: LOCATING THE FIGURE

#### Present Tense

EXAMPLE: Results of the t-tests *are presented* in Table 1.

EXAMPLE: Table 4 *summarizes* the test results on precontaminated insulators.

Notice in the examples in the box above that locational statements can be written in either the *active* or *passive voice*, but in both cases the *present tense* is used.

When you report your findings (Element 2), use the *past tense*.

## **ELEMENT 2: PRESENTING THE FINDINGS**

### **Past Tense**

EXAMPLE: As a group, divorced mothers *spent* over twice as much time in employment as married mothers (Figure 2).

EXAMPLE: The coefficient of correlation *was found* to be significant at the .001 level.

NOTE: In some fields such as engineering and economics, authors may present their findings in the present tense.

When *commenting* on the findings (Element 3), it is conventional to use the *present tense* or *modal auxiliaries*.

### **ELEMENT 3: COMMENTING ON THE RESULTS**

#### **Present Tense or Modal Auxiliaries**

When the comment *compares* your results with the results of other studies, use the *present tense*.

EXAMPLE: This *is* consistent with earlier findings suggesting that personal characteristics *are* not related to attrition and teaching.

When the comment gives a *possible explanation* for the results, use a *modal auxiliary*.

EXAMPLE: These results *can* be explained by considering the voltage *may* distribution on 230 kW insulators during freezing conditions.

When the comment *generalizes* from the results, use *may*.

EXAMPLE: Hyperactive children *may* be generally responsive to amphetamines.

In your Element 3 comments you may also use *tentative verbs* in the present tense instead of modal auxiliaries to generalize from results.

### ELEMENT 3: COMMENTING ON THE RESULTS

#### Tentative Verbs

EXAMPLE: It  $\left\{ \begin{array}{l} \textit{appears} \\ \textit{seems} \\ \textit{is likely} \end{array} \right\}$  that hyperactive children are generally responsive to amphetamines.

EXAMPLE: These results **suggest** that children who display learning problems are depending on only one cerebral hemisphere.

# CHECKLIST FOR CHAPTER 7

## Describing Results

### INFORMATION

- Include three elements of information in presenting results, in either long or short format
- Write comments after each important finding, or put a general comment after the results
- Write comments for various functions, depending on your findings

### LANGUAGE

- Use present tense to locate findings in a figure
- Use past tense to indicate the most important findings
- Use present tense or modal auxiliaries to comment on the findings
- Use comparative and superlative expressions to report findings involving a comparison among groups



# DISCUSSION

## OVERVIEW

In this chapter we look at the fourth section of the experimental research report.

Usually titled **discussion**, it is the last major section of the report, followed by the list of references.

In the discussion section you step back and take a broad look at your findings and your study as a whole.

As in the introduction, researchers use the discussion section to examine their work in the larger context of their field.

Sometimes this section is called “conclusions” instead of “discussion” or discussion and conclusion.

The conclusion can be named as follows: concluding remarks, conclusion and further work.

**In either case, the writing conventions reflect some common features**

## Ordering Your Information

The information that you include in this section depends greatly on the findings of your study ; **the specific-to-general movement** is a convention that most writers follow. The kinds of information that you can include in your discussion section are not fixed. However, the first elements are typically those that refer **most directly** to the study and its findings.

They include:

### FIRST INFORMATION ELEMENTS IN DISCUSSION: Specific Reference to the Study

- A reference to the *main purpose* or *hypothesis* of the study ;
- A review of the most important *findings*, whether or not they support the original hypothesis, and whether or not they agree with the findings of other researchers ;
- Possible *explanations* for or *speculations* about the findings ;
- *Limitations* of the study that restrict the extent to which the findings can be generalized

As the discussion section continues, the writer moves the reader's attention away from the specific results of the study and begins to focus ***more generally*** on the importance that the study may have for other workers in the field.

**LATER INFORMATION ELEMENTS IN DISCUSSION:**  
**General Statements about the Study**

- *Implications* of the study (generalization from the results) ;
- *Recommendations* for future research and *practical applications*.

## Answers Ex. 8.2

- Sentences 1, 2, 3 and 4 – review of findings
  - Comparison with other studies
  - Reference to hypothesis
- Sentence 5 – limitation of the study
- Sentence 6 & 7 – suggestions for further research
- Sentence 8– implications
- Sentence 9 – practical application

## Researcher's Position towards the Findings

In the discussion section more than any other place in the report, researchers make explicit their own views on the study and its findings. The researcher may take a position with respect to the *explanations*, *implications*, *limitations*, or *applications* of the findings (Elements 3, 4, 5 and 6).

RESEARCHER'S POSITION ON INFORMATION IN THE DISCUSSION	
Position	Information element
One possible explanation is	that speed jobs do not tax older workers to their limits. ( <i>explanation</i> )
We can no longer assume	that it is satisfactory to seek explanations only in economic factors. ( <i>implication</i> )
We acknowledge	that other industries may produce different results. ( <i>restriction</i> ).
Clearly,	this technique has promise as a tool in evaluation of forages. ( <i>application</i> )

## Exercise 8.3

- |      |  |                                      |
|------|--|--------------------------------------|
| 1: E | ➤ two theories                         | ➤ main purpose                       |
| 2: C | ➤ two perspectives                     | ➤ explaining purpose and findings    |
| 3: B | ➤ both theories                        | ➤ interpretation of findings         |
| 4: D | ➤ In the first case                    |                                      |
| 5: G | ➤ On the other hand (contrasting idea) |                                      |
| 6: A |  | ➤ practical implications             |
| 7: F | ➤ Finally                              | ➤ Restriction/practical implications |

## Verb Tenses Used in Discussion Statements

The verb tenses used in the discussion section depend on the type of information you want to present. Remember that the first information elements of the discussion refer specially to the study and its findings.

The verbs tense most commonly used in referring to the purpose, the hypothesis, and the findings is the *simple past*.

### VERB TENSES IN FIRST DISCUSSION ELEMENTS:

#### Simple Past Tense

Referring to the purpose

EXAMPLE: This research *attempted* to assess two theories of behavior.

Referring to the hypothesis

EXAMPLE: We originally *assumed* that physical decrements would be more apparent in speed jobs than in skill jobs.

Restating the findings

EXAMPLE: The principle of readability *was not followed* in the income tax booklet of any of the states studied except Virginia.

NOTE: In some fields the *present perfect tense* may be used in referring to the *purpose*.

In discussion statements that explain possible reasons for, or limitations to, the findings, the *past*, *present* or *modal auxiliaries* may be used. The choice depends on whether the explanation for the specific findings is *restricted* to your study (past) or whether it refers to a *general condition* (present). Modal auxiliaries may also be used to emphasize the speculative nature of these statements.

#### VERB TENSES IN FIRST DISCUSSION ELEMENTS:

##### Past, Present and Modal Auxiliaries

###### Explaining the findings

EXAMPLE: It is possible that microbial activity **caused** some immobilization of labial soil phosphorous. (*restricted to study*)

EXAMPLE: It is possible that microbial activity **causes** some immobilization of labial soil phosphorous. (*general condition*)

###### Limiting the findings

EXAMPLE: Our sample **was** very small.

EXAMPLE: Other industries **may produce** different results.



When comparing your findings to those of other researchers, use the *present tense*.

**VERB TENSES IN FIRST DISCUSSION ELEMENTS:**

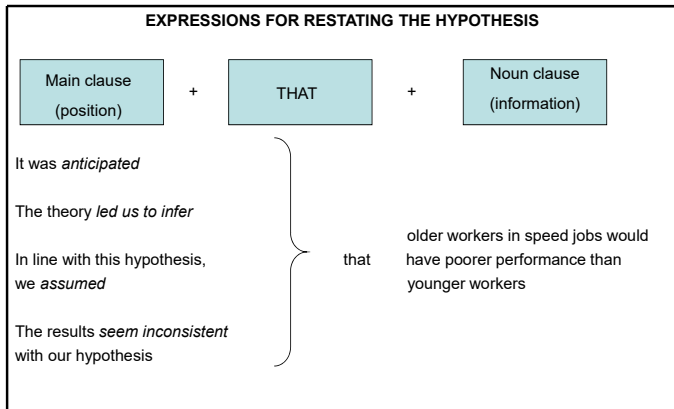
**Present Tense**

Comparing findings

EXAMPLE: These results *are* in substantial agreement with those of Bates (2).

c.f. Ex 8.2 sentence 3

As you move from the specific considerations of your study to broader, more general statements about the importance of the study as a whole, use *simple past tense* and *modal auxiliaries/tentative verbs*.

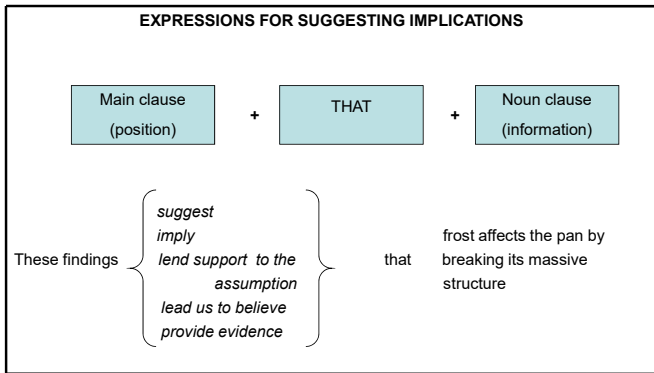


Other expressions are typically used when you need to *explain* your findings.

**EXPRESSIONS FOR EXPLAINING FINDINGS**

Main clause (position)	+	THAT	+	Noun clause (information)
These results can be explained by <i>assuming</i>		that		skill increases with experience.
One reason <i>could be</i>		that		jobs in light manufacturing do not tax older workers to their limits.
It is <i>unlikely</i>		that		age of the subjects had much of an effect on attitude.

Still other expressions are used when you wish to suggest the *implications* of your findings.



## Exercise 8.4

Sentence 1 :      ➤ used/reviewed/gathered/exploited/collected/  
                              was realised with  
                              ➤ would

Sentence 2 :      ➤ that

Sentence 4 :      ➤ confirms

Sentence 5 :      ➤ seems/appears/suggests      implications

Sentence 6 :      ➤ should      recommendation

## **Some questions to be asked....**

1. What assumptions or hypotheses did you have about your topic before you started your research ?
2. Were your hypotheses confirmed ?
3. What were your most important results ?
4. Why do you think you obtained those particular results ?
5. Were there any problems with the methodology of your study that may limit the generalizability of the results ?
6. What important implications do your results have ?
7. What is the next logical question for further research to pursue in investigating your topic ?

# CHECKLIST FOR CHAPTER 8

## Discussion

### INFORMATION

- Include various elements of information, depending on the problems encountered, results obtained, possible applications, and further research needed
- Move from specific results to general implications

### LANGUAGE

- Use complex structures including noun clauses to express your position towards the findings
- Use past tense to refer to the original hypothesis and to review your results
- Use the simple present, simple past or modal auxiliaries when explaining and limiting your results
- Use the simple present tense to compare your findings with those of others
- Use the simple present and modal auxiliaries or tentative verbs to make implications or recommendations or to suggest applications
- Use special expressions to indicate your position towards any of the information elements included