

A bright yellow sticky note is partially visible on the left side of the slide, overlapping the white title card.

Scholarly Writing 2

Method and Results
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Methods Section

Methods sections in journal articles are shorter and less important (usually) than in your dissertation.

- Consider carefully what you need in the Methods in a publication.
- Save most space for the results and conclusions.
- Indicate why methods were used.

Possible Topics

- o Sample and sample gathering techniques
- o Materials and Preparation
- o Study design and rationale
- o Measurement instrument or plan of analysis
- o Calculations
- o Research context (any details necessary for understanding the methods – time of year, role the researcher played, how subjects were observed.)

Homework: IN ARTICLES - Organization

Examine the Methods Section of a published article

- o What is the order of the information or subsections?
- o How much detail is there? Which part?
- o What tense(s) are mostly used?
- o Are statements mostly active or passive voice?
- o Do they ever use “we”? When and why?
- o Are there any citations? Where? Why?
- o What previous knowledge do the authors assume and do they explain to the readers?
- o Does the section contain justifications, explanations and even examples?

What else do you notice about this section?

Focus for this session

- o Verbs and verb tenses
- o Detailed descriptions contain precise language
- o Accurate and precise terms

Grammar concerns in Methods Section

Generally **past tense verbs**

Usually **passive voice**

Singular and plurals must be accurate

Clear transitions needed to sequence the steps in your methods section:

- Prior to the deposition of X,
- before adding the X ...
- In the next step, we determined ...
- After X was complete, ...
- We **then** added the....or The XX was **then** added to...

Use of Tenses

Describing populations of people, facts, or on-going truths.

All international students who apply to a US university must take the TOEFL test.

Data are summarized as mean \pm SD.

What tense is used? _____

Can you find a sentence that matches this pattern?

Use of Tenses

Describing samples or sample groups

Students (in this study) had computer-based TOEFL scores of at least 213.

The students (in this study) were primarily Chinese.

What tense is used? _____

Can you find a sentence that matches this pattern?

Use of Tenses

Describing conventional materials or equipment

A typical chemical reactor includes a heat exchanger.

What tense is used? _____

Can you find a sentence that matches this pattern?

Use of Tenses

Describing standard materials used in this study or specially designed or modified materials.

For the testing process, the chemical reactor was placed in the corner of the room.

What tense is used? _____

Can you find a sentence that matches this pattern?

Passive vs. Active Voice

- **Passive voice** is used when the **researcher has performed the action**

The thermocouples were monitored and recorded hourly. (by the researcher)

- **Active voice** is often used when **equipment has performed the action**. (Notice that active voice does not need to be a person in the subject position.)

A 400hp generator provided power to the...

Control gauges monitored air pressure inside the chambers.

- Often use active sentence structure to put emphasis on methodology decisions. “We chose XX because...”
- If you say “by someone” then use active voice instead

Review of passive voice

Simple past passive = *Be verb + past participle* (the third part of the list: know, knew, **known**; do, did, **done**; collect, collected, **collected**)

are collected

were found to be...

was done

Present perfect passive voice = *Have/has + be verb + past participle*

have been found to be...

have been collected...

Words not used in the passive

Some verbs are usually not used
in the passive voice

changes, increase, decrease, expand, contract, forms, opens,
closed

These two sentences have very different meanings:.

- o The temperature was increased by 50°C. **(The researcher did it.)**
- o The temperature increased by 50°C. **(It happened by itself.)**

But be careful: Who/what does the action?

- A. The sample size was increased to a total of 110 patients.
- B. The sample size increased to a total of 110 patients.

In example B, it seems like the patients suddenly duplicated themselves and the sample expanded magically.

Exercise 1: Verbs not used in the passive voice

Change these sentences to active voice

1. Hurricanes can only be formed in areas of high humidity.
2. The temperature inside the chamber was increased to...
3. The density is exponentially decreased with height.
4. The study is focused on ...
5. What areas of research should future research be focused on?

Other verbs

Other verbs not typically used in the passive
have **focused** on (**not have been focused on**)

Concentrated

Happen/occur

Passive vs. Active Voice

You can also **use active voice in many fields to describe the process.**

We measured the

We dehydrated the pellets and then cleared them with...

We drew blood samples every 4 hours and compared them to...

Find one or two passive voice sentences and one or two active voice sentences.

Imperative Verbs

Let p stand for...

Let N equal...

Other imperatives you may find:

- Consider
- Note or Notice
- Compare **but... Compared to X, Y is larger.**
- **Take *the case of...* is different than *in case of***

Who uses these types of words?

Homework: Examine Methods Section

Examine the Methods section of an article in your field. Underline the verbs in 3-4 paragraphs.

- Are the sentences mostly in the past or present tense?
- Can you find an example of a present tense sentence? Why is present tense used?
- Find one active voice and one passive voice sentence. Why are these forms used?
- Does your field use imperatives such as *Let*, *Suppose*, *Note that...*

Use of Formal, Precise Verbs

Why do you need to use precise verbs?

Write a precise verb for each of these less verbs.

put

inserted, placed horizontally

did

measured, conducted...

dried

dehydrated

watered

hydrated

changed

modified, adjusted, altered

obtained

purchased from...

watched

monitored

Precise Verbs for Process Descriptions

Examples of precise verbs:

- Eggs were **collected** from adult frogs and **fertilized** as described previously....
- The viscous glycogen pellet beneath the membrane layer was **discarded**.
- Cytosol was further **clarified** by spinning for 541,000 *g* max.....

Precise words

Administered

Recruited

Adjusted

Conducted

Exploited

Generated

Contacted

Utilized

Addressed

Consisted of

Inflated

Counterbalanced

grouped

adopted

gathered

estimated

scored

manifest

ranged

applied

resembled

converted

deflated

prioritized

applied

performed

generated

aggregated

summed

classified

matched

performed

coded

employed

debrief

encompassed

Exercise 2: Find Verbs

Make a list of 10 precise verbs you know you use in your field. **Look also at the nouns that correspond to these verbs.**

Involve and include

<http://www.english-test.net/forum/ftopic27160.html>

Very generally:

Involve - processes

Include “things” – elements, variables...

Use of detailed language

1. We used a random sample of international graduate students.

We generated a systematic random sample of international graduate students at the University of Minnesota by selecting the first name of all international graduate students across disciplines and subsequently including every fifth name.

Use of detailed language

2. Our measurement instrument consisted of an interview that we administered to each respondent.

Our measurement instrument consisted of a 15-minute oral interview conducted in the native language of each respondent using bilingual interviewers.

Exercise 3: Underline detailed language

Look at several sentences or paragraphs in the Methods section (or other section) and underline the detailed language words.

Special word clarifications

Study: the whole research and paper

Species: both singular and plural

Experiment: countable, the individual procedures or tasks you went through or conducted in the study

Series and species are both singular and plural

one series is or Three series were...

a species is. or Three species

a series and a species

1. A series of computers _____ released early last month.
2. A series of experiments _____ conducted to prove...
3. Three species of mammals _____ examined for...
4. The first series of tests _____ completed.

Use of numbers

- Review the use of numbers in your field
- How are numbers used when referring to measurements, time, or money?

Nineteen cats (14-15 kg) were anesthetized with thiopental sodium (25 mg/kg i.v.). The segment was stretched 6 times to a baseline tension of 100-125 g for 4 min durations.

Numbers and symbols

1. Are numerals used for all numbers (1, 10, 25) or are numbers under 10 spelled out and other numbers written as numerals?
2. Is there a period after abbreviations such as minutes (min) grams (g), and milliliters (ml)?
3. Is there a space between the number and abbreviation?

Make a list of these abbreviations

Use of numbers and symbols

3. Is percent written as a word (per cent, percent) or a symbol (%)?
4. What hyphenated words do you find in this section? **Make a list.**
5. What else do you notice about the use of numbers and abbreviations in this paper?

Use of hyphens

Hyphenate 2 adjectives that need to stay together before a noun.

It is a long-term solution. But The solution was long term.

- o We conducted a 15-minute oral interview.
- o We used open- and closed-ended questions.
- o An end-expiratory CO₂ concentration was used to...
- o We stimulated pulmonary C-fiber endings in each of the 9 dogs.
- o A twenty-five-item, self-reporting rating inventory system was used.
- o A more elegant approach is to use fixed-length columns.
- o During the 3-week measurement period, we...
- o Many medium-access control protocols...
- o We have developed a state-of-the-art solution...

Ending the section

o How does the Methods section end?

Is there any summary or conclusion to this section?

Results or Findings Section

- a. Present all your findings?
- b. Prove you have obtained enough data?
- c. Give them all the raw numbers?

Published papers **FOCUS** the readers on the most important findings.

It is your job as a research writer to **narrow the focus** of your results and **present them in a manageable way** so it is easy for your readers to understand.

What to focus on

- **Beginning with an overall description** of the experiments/methods, providing the “big picture” without repeating all the details from the Methods.
- **Present representative data** (results relevant to the question) rather than endless repetitive data
- **Order the findings logically** (usually from most important to least important?)
- **Keep data to a minimum in the text** and save these details for the figures or the Appendix

Help your readers focus

- Divide up the findings logically: by type of result or mechanisms or variables
- Present data AFTER stating the result
- Present results in both visual form (figures, tables) and paragraph form (summarize key points in the text)

Homework: Results Section

What is included in the Results section? Carefully examine the Results section of an article in your field. Which organizational style most closely matches the style of your article?

1. Provides results with little or no commentary including no comparisons with other's work, justification of the methods, or interpretation of the results.
2. Provides results with some but limited commentary.
3. Provides the results and a commentary, justification, or comparison to other's work.
4. Provides results and a great amount of commentary so that it appears the Results and Discussion sections are combined.

Reference: Organizing the Results

Avoid describing your results

chronologically (First, I found this, then I found...).

In general, organize your highlighting statements (summary of the results) from **most important to least important.**

Another way to organize is **by hypotheses themes** (especially Social Science)

Reference: What to include

- **primarily quantitative?** -- include numerous tables and figures summarizing the large amount of data.
- **different statistical measures?** (correlations, multiple regression analysis) -- discuss the results of the relationship between the variables separately for each statistical measure.
- **primarily qualitative?** -- organize your results **around observations or stages** in a process that emerge from your observations.

Report Results not just Data

Data are facts, numbers or details gathered as a result of your experiments or observations. Data can be raw data, summarized data (means and standard deviations) or transformed data (percents).

Results, on the other hand, are general statements that interpret the data.

Data rarely stand alone without the general statements of interpretation. ...Your job is to tell the reader what the data say.

Tell results, not just data

Data: In the 30 control subjects, the mean resting heart rate was 99. The mean heart rate of the 25 soccer players was 84.

Are the data similar or significantly different? What is the point?

Results: The mean resting heart rate was significantly higher for the control subjects (99) than for the soccer players (84).

Results: The mean resting heart rate was XX% higher for the control subjects than for the soccer players (99 and 84, respectively).

Results not just Data

Data: In poor essays, there were an average of 19.3 uses of transitions compared to 26.5 uses in good essays.

Results: Using the average number of T-tests for good and poor essays (27.5 and 18.3, respectively), we found that good essays contained proportionally more transitions than poor essays (1.346 and .984, respectively), and substantially more correct uses of transitions (1.346 and .685, respectively).

Exercise 4: Find Results

Find **3 statements in the literature from your field** that focus on the results instead of the data and write them.

Do these statements tell you the point (results)? How?

Tense Guidelines in Results

1. **Results of hypothesis-testing studies** and **tests of new methods** are reported in **past tense** because they are discrete events that occurred in the past.
 - o Pulmonary artery constriction *was reduced*
 - o XXX *inhibited* the increase in pulmonary heart disease by ...

Tense Guidelines

2. Results of descriptive studies, are usually reported in **present tense** because the description continues to be true.

- In most tissues, the leptin receptor mRNA *appears* as a single band slightly larger than 5 kb
- Type III and IV receptor genes *have* extra introns in the extra-cellular domain.

Summarize Methods

Statements that summarize the methods

The average content of the protein in the microsomes *was* about 2 mg/ml; thus, microsome solutions were diluted to 1 mg/ml for the incubation. The incubation time (1 hour) *was determined* by data from a previous experiment.

What tense is used?

Past tense

Locate Figures

Statements that locate the figures where the results can be found are in **present tense**

(**Passive voice**) Results of t-tests *are presented* in Table 1.

(**Active voice**) Table 4 *summarizes* the test results of...

o Figure 2 *illustrates* the network throughput in a Star network when three different protocols are used separately.

o Figure 1 *describes* the trend of the change of means for the BDI according to the 4 groups during the 3-week measurement period.

Present Findings

Statements that present the most important findings

- As a group, stay-at-home mothers *spent* over twice as much time with their children as full-time working mothers (Figure 2).
- The coefficient of the correlation *was found* to be significant at the .001 level.
- As can be seen in Figure 1, with each increment of liquefaction time, the liquefaction rate *increased* significantly.

What tense is used?

Past tense

Comments on results

Statements that comment on the results

- o These results *are consistent* with earlier findings suggesting that...
- o These results *can be* explained by...
- o It *seems that* hyperactive children are...
- o These results *suggest* that...
- o *It is surprising* that MACA *performs* poorly in this network.
- o *Interestingly*, connective transitions was the category in which there was the least difference in frequency (.557 and .337 for good and poor essays, respectively). This finding *may be attributed to* the fact that connectives are considered an important feature taught in most ESL classrooms.

What tense is used?

Present (often with modal – may- or tentative verb)

Tentative verbs

Writers sometimes soften the strength of the claim by using

- modals (can, may),
- tentative verbs (seems, suggest)
- phrases of surprise or interest (it is surprising).

Strength of Modals

Had better **very angry and strong**

Ought to **very (overly) polite**

Must **strong**

Have to **(too demanding/informal)**

Should

Need to

Might/could **weak**

Would (used in so many different places with different meanings)



Homework: Find statements

Find each of the following types of statements

Statement summarizing the methods used (if applies):

Statement that locates a figure:

Statement that summarizes the finding(s):

Statement that comments on the finding(s):

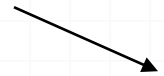
1. What tense is used in each sentence?
2. Is the active or passive voice used?
3. Are there any words or phrases that reduce the strength of the claim (may, can, suggest)?

Homework: Find statements that..

- o Introduce a figure in the text (See Figure 1; As can be seen in Figure 1...)
- o Highlight the important findings in the text
- o Interpret the results or explain the results (use of tentative verbs?)

Exercise 5: Language used in graphs

Decline, slump, slide, drop, low point, low dip



Plunge, steep fall, plummet



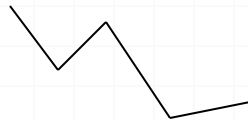
Sharp rise, spike, peak, Level off



Bounce back



Fluctuate



Describing trends in figures

Adjectives or adverbs

Often writers want to give more information about the trend, usually the degree of change or the speed of change. Use of adjectives and adverbs can give the reader a very different impression of the changes.

Consider the following sentences. What is the difference?

The year started with a decline in sales

The year started with a steady decline in sales.

The year started with a slow decline in sales.

The year started with a dramatic decline in sales.

Sales fell rapidly at the beginning of the year.

Adjectives and adverbs

Sales recovered sharply in the third month.

Sales recovered dramatically in the third month.

Sales increased substantially in the third month.

A substantial increase in sales can be found in the third month.

Sales slumped in early August and then reached a peak in September.

Sales dropped drastically in early August and then

Draw a graph

With a partner, describe a part of the graph using language from the previous 2 slides

Prepositions of Time

Graphs frequently contain times that need to be described in the text using prepositional phrases of time. Here are some common prepositional phrases of time used in graphs:

1. From 1999 to 2003, the US stock market dipped over 200 points.
2. In or During this two-year period, consumers lost millions of dollars in their retirement funds.
3. The daily New York Stock Exchange fluctuated throughout this period.
4. This trend continued 2004.
5. In 2004, there was a sharp upturn in the economy.

Reference: Prepositions *in* or *at*?

In the following example, the writer has used what appears to be a preposition of time, but in fact, it is referring to a certain point on a graph.

The rate of decrease is slower in this group than in the HRT-active group at week 2.

If this phrase were used in the text (describing the methods instead of the graph) a different preposition would be used.

The HRT-active group was given injections in week 2.

Prepositions

_on a specific day – Jan 1, Monday

In a month

In _ a year

_at noon, night

on a page, webpage, website

In _ a book, an article

In a chapter, unit, Appendix, Figure 1

at a phone number, a web address (I can be reached..)

Correct the prepositions

1. Thank you in advance for considering my application.
2. I am interested in working on a project in the MIS field
3. I will be graduating in June 20XX
4. I am interested in this award because it will help me complete my research
5. I am interested in applying for the position of Systems Analyst
6. It is my understanding that you have a position open in the Finance Department

What have you learned?

- o About writing?
- o About style?
- o About grammatical structures?
- o About specific types of research papers?



For additional help
with your writing,
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<http://www.awc.metu.edu.tr>