

Craft of Research

Week 5: Results and Discussion Sections

Outline

- Milestone updates
- Results
- Discussion
- Broader impacts
- Upcoming
- Reminders

How are milestones going? Have you
been communicating with your mentors
and faculty?

Results Section

What does this contain?

BEFORE Writing the Results Section

- Consider the following questions:
 - ✓ What is the most logical way to present your results?
 - ✓ Do you understand what the results mean beyond statistical significance?
 - ✓ Do your results have a collective broader implication?

Results Section Key Objectives

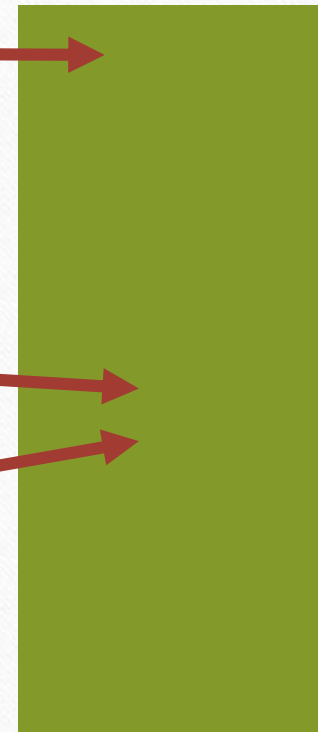
- 1) To show progression to specific findings
- 2) To communicate the findings (and non-findings)
- 3) To interpret the findings

Basic Organization of Results Sections

A. Approaching the Niche
(Progression to Findings)

B. Occupying the Niche
(Reporting Findings)

C. Construing the Niche
(Interpreting the Findings)



Basic Organization: **Approaching the Niche**

(Progression to Findings)

- **Providing General Orientation**
- **Restating Study Specifics**
- **Justify Study Specifics**

EXAMPLE: The membrane potential and membrane microviscosity of the cells were investigated here to determine the effect of micelles on cell membrane microenvironment.

- Restating Study Specifics; Providing General Orientation

Basic Organization: **Occupying the Niche** (Reporting Findings)

- **Reporting Specific Results**
- **Indicating Alternative Presentation of Results**

EXAMPLE: Crop residue coverage on the soil surface from the previous year's crop was nearly the same for irrigation treatments one through five (53% and 49%), but treatment six had significantly less residue cover than the other treatments (table 6).

- Reporting Specific Results; Indicating Alternative Presentation

Basic Organization: **Construing the Niche**

(Interpreting the Findings)

- **Comparing Results with Literature Review**
- **Accounting for Results**
- **Explicating Results**
- **Relating to Expectations**
- **Acknowledging Limitations**

EXAMPLE: The harvest index, test weight, and dry matter per plant parameters, taken together, indicate that plant populations across irrigation treatments were appropriate.

- Explicating Results

Tips for Writing Results Sections

- Organize results reporting logically
 - Follow your methodology/analytic plan/content areas
 - Should be very stepwise
- Include the statistical/numeric results, as well as the interpretation
- **Tense:** Present
- **Length:** Depends on your methods
- **Number of Sources:** Depends on when you're interpreting the findings

Activity 1: Outlining Potential Results Section

- Research teams
- Discuss potential organization of your results section
- Consider the following:
 - Do you understand the methods you're going to use? Do you feel confident explaining potential related outcomes?
 - What is the most logical organization? (e.g., methodological stepwise, major anticipated findings, etc.)
 - Similar to last week's methods activity, outline the potential results section of your paper as best you can. This will serve as a helpful guide for your writing

Discussion and Conclusion Sections

What are these?

BEFORE Writing the Discussion Section

- Consider the following questions:
 - ✓ What were the main findings?
 - ✓ What were the interpretations of the main findings?
 - ✓ What surprised you?
 - ✓ What were the limitations in your study? Be realistic.
 - ✓ What are the broader impacts of your findings? How could the findings be used in the real world?

Discussion Section Key Objectives

- 1) Provide extended interpretations
- 2) Expand the meaning of the results outside of the study
- 3) Indicate how the results add/relate to knowledge in the field
- 4) Acknowledge study limitations
- 5) Propose future research

Basic Organization of Discussion Sections

A. Re-establishing the Territory

(Grounding the Discussion)

B. Framing Principal Findings

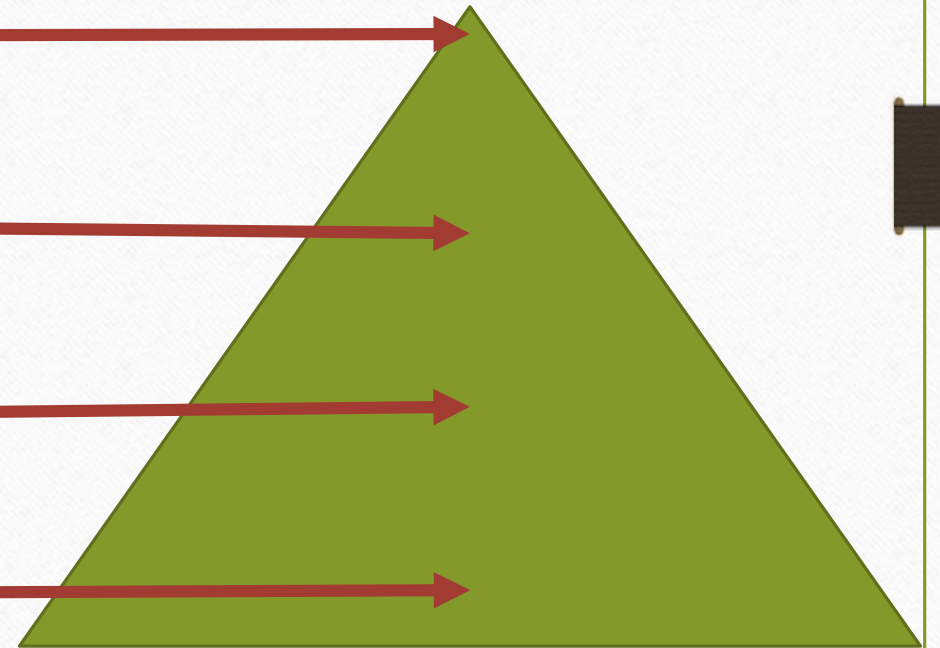
(Commenting on the Results)

C. Reshaping the Territory

(Referencing Literature for Support)

D. Establishing Additional Territory

(Expanding Beyond the Study)



Basic Organization: **Re-Establishing Territory**

(Grounding the Discussion)

- **Drawing on general background**
- **Drawing on study-specific background**
- **Announcing principal findings**
- **Previewing content**

EXAMPLE: The time was chose to depict the highest number of cows lying, resulting in the best cow comfort index.

- *Drawing on Study-Specific Background; Announcing Principal Findings*

Basic Organization: **Framing Principal Findings**

(Commenting on the Results)

- **Accounting for Results**
- **Explicating Results**
- **Relating to Expectations**
- **Addressing Limitations**

EXAMPLE: This little amount of sand could possibly explain why there was no difference between the waterbeds alone and the ones with sand.

- Accounting for Results

Basic Organization: **Reshaping the Territory**

(Referencing Literature for Support)

- Supporting with Evidence
- Countering with Evidence

EXAMPLE: Changes in bacterial communities were consistent with the previously reported composting factors, such as temperature, pH, and moisture content.

- Supporting with Evidence

Basic Organization: **Establishing Additional Territory**

(Expanding Beyond the Study)

- **Generalizing Results**
- **Stating the Value**
- **Noting Implications**
- **Proposing Directions**

EXAMPLE: This mixing system and control program has the potential to be used in several different combinations and configurations in the future, primarily in soils with clay textures.

- **Noting Implications**

Logic Flow of Discussion Section

1. Recap of key findings
2. Paragraphs/sections based on main and related findings or by analysis... what do the findings mean? Answer the 'why'
3. Limitations
4. Future directions
5. Broader impact

Tips for Writing Discussion Sections

- Use logic flow
- Do not introduce any new literature
- **Tense:** It depends
- **Length:** It depends
- **Number of Sources:** Nothing new! But refer back to literature in the intro

Broader Impacts

“[T]he potential to benefit society and contribute to the achievement of specific, desired societal outcomes.”

Broader Impacts

Criterion:

- ✓ Why should people outside of research care about what you did?
- ✓ How does it benefit society?
- ✓ What positive societal/community outcome did you achieve?

Examples:

- Improved well-being of individuals in society
- Increased economic competitiveness
- Improved national security
- Public scientific literacy

Tips for Writing about Broader Impacts

- Built up for justifying your broader impact
- Demonstrate creativity or originality
- Have a well-organized strategy for accomplishing the goals
- Establish qualifications for those responsible for activities to accomplish goals

Basic Guiding Questions

1. How has your research findings and discussion built up to this point?
 - What is your primary argument you've created?
2. Why and how will your research benefit society?
3. What future steps must be taken for society to benefit?

Activity 2: Practicing Broader Impacts

- Research teams
- Open the two documents under *Broader Impact Resources* on CoR website
- Complete the following using the documents as informational guides:
 1. What types(s) of broader impacts will you address with your project? Explain
 2. Draft up a couple sentences identifying your anticipated broader impact. Utilize concepts and terms within the documents as content guides

Upcoming

Week 6

- Creating research posters

Week 7

- Formatting
 - Abstracts
 - Tables
 - Figures

Reminders

- Videoconference
- July 3rd and 4th
- Kayaking trip