Scientific Writing

(Publishing an Article)

By:

Taddese Zerfu; Ph.D.

Research Fellow

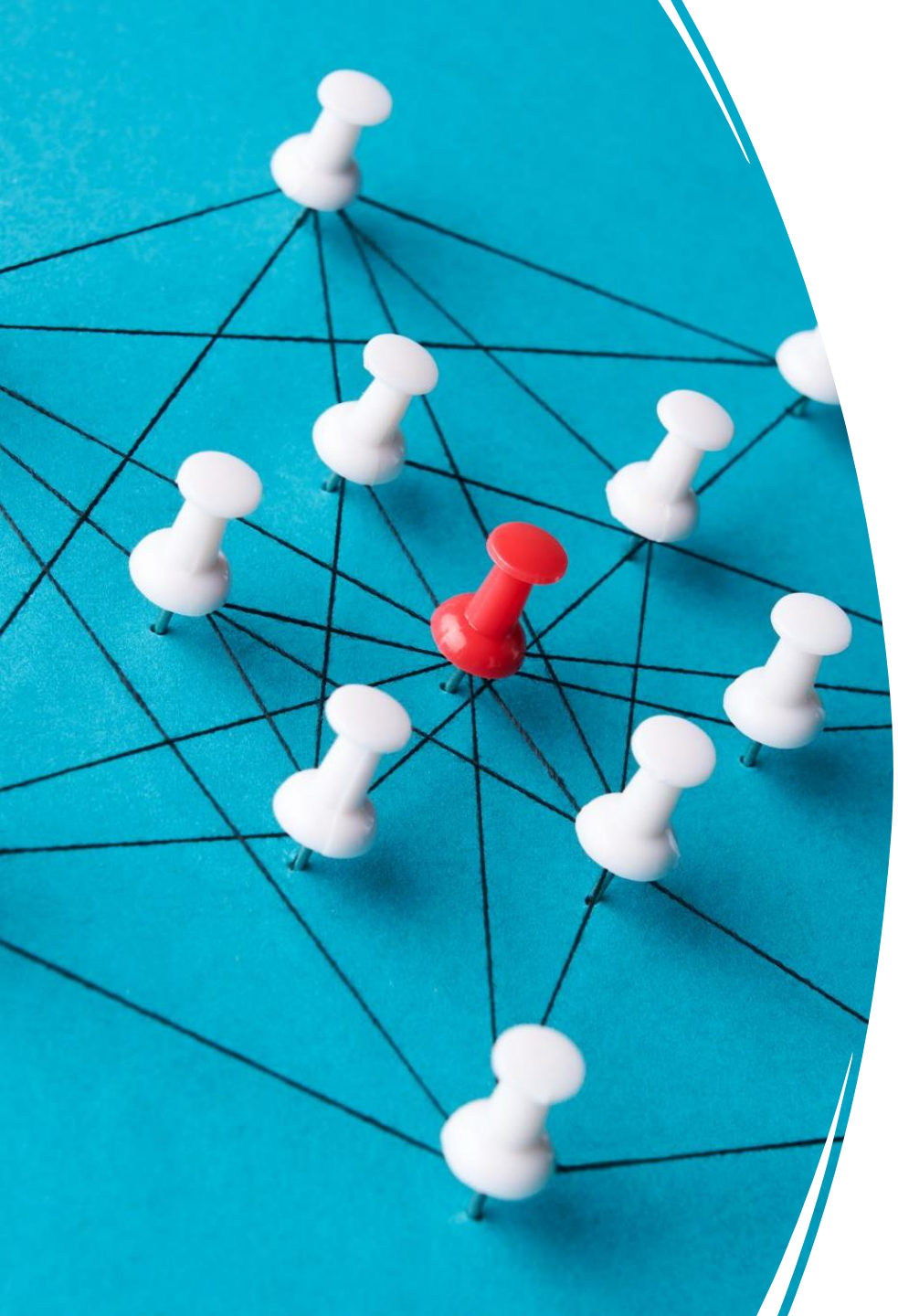
International Food Policy Research Institute (IFPRI)

What is Scientific Writing?

*Communication of research findings in a formal, structured manner.

* Aimed at the scientific community.

* Clear, concise, and precise language.



Why Publish?

- Share knowledge and contribute to scientific progress.
- Build academic reputation and career.
- Receive peer feedback and recognition.

Understanding the Publishing Process

Key Steps in Publishing an Article:

- Research & Data Collection
- Writing the Manuscript
- Selecting a Journal
- Submission & Review
- Revision & Acceptance
- Publication & Dissemination

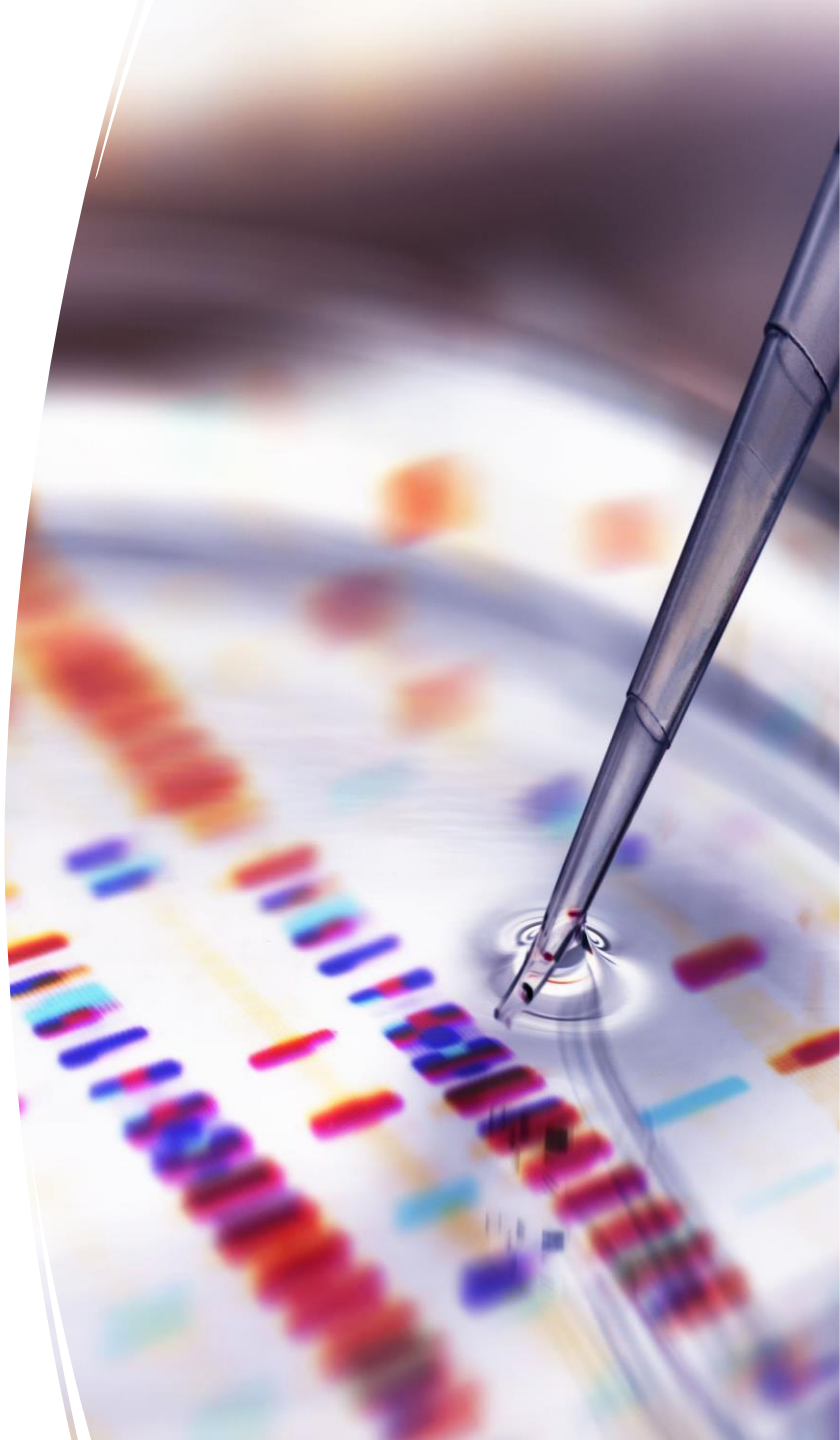
Preparing the Manuscript

- **Structure of a Scientific Article:**
  - **Title**: Clear and concise.
  - **Abstract**: Summary of the research.
  - **Introduction**: Background and problem statement.
  - **Methods**: Detailed explanation of the experiment or study design.
  - **Results**: Data presentation and analysis.
  - **Discussion**: Interpretation of results, implications, and limitations.
  - **Conclusion**: Final thoughts and recommendations.
  - **References**: Citations of previous work.

Writing the Abstract

What Makes a Good Abstract?

- Summarize the research succinctly.
- Include the problem, methods, key results, and conclusions.
- Typically limited to 250-300 words.



Tips for Writing the Abstract

1. Be Clear and Concise

- The abstract should be a succinct summary of your entire study.
- Avoid unnecessary details or jargon that may confuse the reader.
- Stick to the word limit (typically 250-300 words).

2. Start with the Research Question

- Clearly state the main research problem or objective.
- Provide context for the study by highlighting its importance.

3. Briefly Describe the Methods

- Include a short description of the methodology used (experiment, survey, etc.).
- Focus on the approach and key techniques rather than details.

Tips … Abstract … cont’d

4. **Present Key Results**
   - Summarize the most important findings without overwhelming the reader with data.
   - Include any significant trends or outcomes, but avoid detailed statistics or raw data.

5. Provide a Clear Conclusion
   - State the implications of your findings and their significance in the field.
   - Avoid introducing new information in the conclusion.

6. Keep it Self-Contained
   - The abstract should be understandable on its own without referring to the full article.
   - Do not cite references or include figures/tables in the abstract.

7. Use Active Voice
   - Make the abstract direct and engaging by using active voice where possible.
   - Example: "We investigated" instead of "An investigation was conducted.“

Tips … Abstract … cont’d

8. Avoid Overuse of Technical Terms

- Use simple and straightforward language that can be understood by a broad audience.
- If technical terms are necessary, briefly define them.

9. Write the Abstract Last

- Although it appears first in the manuscript, write the abstract after completing the full paper.
- This ensures you accurately capture the essence of your study.

10. Tailor for the Journal’s Audience

- Consider the scope and readership of the journal when writing the abstract.
- Tailor the level of detail to the audience’s expertise, whether general or specialized.

Crafting the Introduction

Purpose of the Introduction:

- Provide context for the research.
- Define the research question and its importance.
- Review relevant literature.
- State the study’s objectives.

Tips for Crafting the Introduction

1. Start with a Hook

- Begin with a compelling opening to engage the reader (e.g., a relevant question, a surprising fact, or a significant problem in the field).
- This draws the reader in and sets the stage for the rest of the paper.

2. Provide Background Information

- Offer essential context about the research topic.
- Review relevant literature to highlight key studies and gaps in the field.
- Demonstrate why the research is important and worth pursuing.

3. Clearly Define the Research Problem

- State the specific problem or knowledge gap your research addresses.
- Be clear about what you aim to solve or investigate.

Tips for Crafting the Introduction

4. **Justify the Study's Relevance**
    - Explain why your research matters in the broader context of the field.
    - Emphasize the potential impact or significance of the findings.

5. End with a Clear Research Objective or Hypothesis
    - Conclude the introduction by outlining your research question or hypothesis.
    - Provide a roadmap for the study by briefly mentioning the methods and goals.

Methods Section

What to Include?

- Clear description of experimental design, materials, and procedures.
- Ensure reproducibility.
- Be transparent about potential biases.

Tips

1. Be Detailed and Specific
   - Provide enough detail so that other researchers can replicate the study.
   - Include information about materials, equipment, and procedures used.
   - Mention specific measurements, techniques, and technologies employed.

2. Organize Clearly
   - Use subheadings or bullet points to make the section easy to follow.
   - Start with the study design, then describe the participants (if applicable), followed by data collection and analysis methods.

Tips

3. Ensure Reproducibility

- Describe each step in sufficient detail to allow for reproducibility.
- Include any statistical tests, software, or tools used in data analysis.

4. Address Ethical Considerations

- Mention any ethical approvals or consent obtained (e.g., institutional review boards for human subjects).
- Provide information on how participants' privacy was protected (e.g., confidentiality measures).

5. Avoid Ambiguity

- Be clear and precise to avoid confusion. For example, if you are using a specific procedure or method, clearly state the process.
- Don’t assume readers will understand abbreviations or techniques without explanation.

6. Describe Data Analysis Procedures

- Provide details on how you analyzed the data, including statistical tests and software.
- Mention how you handled outliers or any data cleaning procedures.

7. Use Passive Voice Appropriately

- The methods section is often written in the passive voice (e.g., "The samples were analyzed using...").
- This focuses on the methodology rather than the researcher, providing an objective tone.

Presenting the Results

- **Effective Presentation:**
  - Use tables, graphs, and figures to summarize data.
  - Focus on key findings.
  - Avoid interpretation; save that for the discussion.

Tips

1. Be Clear and Objective

- Present your findings without interpretation - just the facts.
- Focus on key results and avoid overwhelming the reader with unnecessary details.

2. Use Visual Aids

- Include tables, figures, and graphs to help convey data clearly.
- Ensure that visual aids are labeled properly (titles, axis labels, legends) for easy understanding.
- Choose appropriate chart types (bar graphs, line charts, etc.) based on your data.

3. Highlight Key Findings

- Emphasize the most important and relevant results, especially those that support your hypothesis.
- Present data in a logical order that aligns with your research objectives.

4. Provide Quantitative Data

- Include key statistical measures such as means, standard deviations, p-values, and confidence intervals.
- Report results in numerical format where appropriate, but avoid overwhelming the reader with too many numbers.

5. Maintain Consistency

- Use consistent units, terminology, and presentation styles throughout the results section.
- Ensure that data presented in text matches exactly with data in tables and figures.

Writing the Discussion

- **Purpose of the Discussion:**
  - Interpret results and compare with previous studies.
  - Address limitations of the study.
  - Propose future research directions.

Tips

1. **Interpret Your Results**
   - Go beyond simply restating your findings; explain their meaning.
   - Relate your results to the research question and provide insight into their significance.

2. **Compare with Previous Studies**
   - Discuss how your results align with or differ from previous research.
   - Identify agreements or discrepancies with existing literature and offer possible explanations.

3. **Address Study Limitations**
   - Acknowledge any weaknesses or limitations in your study, such as small sample size or methodological constraints.
   - Discuss how these limitations may affect the interpretation of your results.

4. **Suggest Future Research**
   - Propose areas for further investigation based on your findings and limitations.
   - Offer ideas for improving methodology or exploring unanswered questions.

5. **Keep the Tone Balanced and Objective**
   - Be cautious when interpreting results—avoid overstating conclusions.
   - Keep the discussion grounded in your findings and maintain a balanced perspective.

Conclusion and Future Directions

- **Conclusion:**
  - Briefly summarize the major findings.
  - Reiterate the research’s significance.

- **Future Directions:**
  - Suggest areas for further investigation.

Tips

1. **Summarize Key Findings**
   - Briefly restate the most important results of your study.
   - Focus on the conclusions that directly address your research question or hypothesis.

2. **Emphasize the Study's Impact**
   - Highlight the significance of your findings in advancing the field.
   - Discuss how your research contributes to broader knowledge or practical applications.

3. **Avoid Introducing New Information**
   - The conclusion should not present new data or concepts.
   - It's meant to wrap up the paper, not introduce additional findings.

4. **Suggest Practical Implications**
   - If applicable, suggest how your findings can be used in real-world applications, policy-making, or industry.
   - Consider how your research can inform future practices or strategies.

5. **Outline Future Research Directions**
   - Identify areas where further investigation is needed, either to build on your findings or address unanswered questions.
   - Be specific—suggest concrete studies or experiments that could extend your work.

Selecting a Journal

- **Scope & Focus**: Ensure the journal's content aligns with your research field.
- **Impact Factor**: Higher impact factor generally indicates broader readership and higher visibility.
- **Audience**: Consider who reads the journal - experts, practitioners, or a broader audience.
- **Journal Guidelines**: Check for specific submission requirements (e.g., word limit, citation style).
- **Review Process**: Choose journals with a rigorous peer-review system.
- **Open Access vs. Subscription**: Decide if you want your article freely accessible or behind a paywall.

Common Mistakes in Writing a Manuscript

- **Lack of Clear Focus**: Failing to clearly state the research question and objectives.
- **Poor Organization**: Disorganized sections or improper flow of ideas.
- **Excessive Jargon**: Overuse of technical terms without explanation.
- **Incomplete Literature Review**: Neglecting to review key research or citing outdated sources.
- **Weak Data Presentation**: Presenting results without adequate context or clarity.
- **Overlooking the Conclusion**: Failing to provide a clear, impactful conclusion.
- **Ignoring Journal Guidelines**: Not adhering to the specific formatting and submission requirements.
- **Plagiarism**: Failing to properly cite sources or presenting others' work as your own.

The Submission Process

Steps to Follow:

- Prepare the manuscript according to journal guidelines.
- Submit via online system or email.
- Include necessary supplementary materials (e.g., cover letter, conflicts of interest).
- Track submission status.

Peer Review and Revision

- **Peer Review Process:**
  - Reviewers evaluate the quality, validity, and significance of the research.
  - Types: Single-blind, double-blind, open review.

- **Revisions:**
  - Address reviewer comments thoroughly.

  - Revise manuscript based on feedback.

Tips

1. **Take Reviewers' Feedback Seriously**
   - Read reviewers' comments carefully and consider them objectively.
   - Even if the feedback feels harsh, view it as an opportunity to improve your work.
   - Respond to all comments and ensure that revisions address each point.

2. **Be Clear in Your Revisions**
   - When revising, clearly highlight changes made to the manuscript.
   - Use track changes or provide a detailed response letter explaining how you addressed each reviewer's comment.

3. **Don't Rush the Revision Process**
   - Take the time needed to revise thoroughly. Quick fixes often overlook important issues.
   - Ensure that your revisions improve the overall clarity, coherence, and quality of the paper.

4. **Address Major Comments First**
   - Prioritize significant changes that affect the validity or quality of the research (e.g., study design issues, missing data).
   - Once major revisions are addressed, focus on smaller issues such as wording or formatting.

5. **Communicate Clearly with Editors and Reviewers**
   - If you disagree with any feedback, politely explain your reasoning in your response letter.
   - If a reviewer suggests changes you feel are not appropriate, make a compelling case for why the original approach is valid.

Common Reasons for Rejection

1. Lack of Originality

- Submitting research that does not contribute new insights or findings.
- Results that replicate existing studies without adding significant value.

2. Poor Quality or Incomplete Data

- Insufficient data or flawed experimental design that limits the study's reliability.
- Lack of proper controls or statistical analysis.

3. Failure to Meet Journal Scope

- Submitting to a journal that does not cover the specific topic of your research.
- Misalignment between the journal's audience and the focus of the article.

4. Inadequate Literature Review

- Not providing a thorough review of existing literature, or ignoring significant studies.
- Failing to position your research within the broader scientific context.

5. Weak or Unclear Hypothesis

- An unclear or poorly articulated research question or hypothesis.
- The study's objectives are not well-defined or are too vague.

Common … cont’d

6. Poor Manuscript Structure

- Disorganized or unclear manuscript sections.
- Missing important sections, such as methods, or weak presentation of results.

7. Unclear or Weak Statistical Analysis

- Incorrect or insufficient statistical methods.
- Failure to report confidence intervals, p-values, or assumptions made during the analysis.

8. Writing and Language Issues

- Poor grammar, spelling mistakes, or overly complex language.
- Lack of clarity and coherence in presenting ideas.

9. Not Following Submission Guidelines

- Not adhering to the journal’s formatting or word count limits.
- Failure to provide required supplementary materials (cover letter, conflicts of interest, etc.).

10. Ethical Concerns

- Issues like plagiarism, inadequate citation practices, or lack of informed consent in human studies.
- Not reporting conflicts of interest or financial disclosures.

Final Steps and Publication

- **Acceptance & Final Revisions:**
  - Once accepted, follow through with any final edits or formatting requests.

- **Post-Publication:**
  - Promote your research (social media, academic networks).
  - Monitor citations and respond to post-publication comments.


Thank
you