# Begin Writing an Academic Paper

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- Review of Two Paper Types
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Please click here to see the Lecture Video

- **Why Do Scientists Publish?**

# Why do scientists publish?

From personal point of view

You personal reasons of publishing:

- Get administrated  Get PhD degree
- Get funding  Get promoted

…….

However, for the whole scientific community

Scientists publish to share with the Community something that **advances**, not **repeats**, knowledge and understanding in a certain field.

There are three necessary steps in **useful** research: **the first to begin it**, **the second to end it** and **the third to publish it**. If your research does not generate papers, it might just as well ***not*** have been done.

"Surely you were aware when you accepted the position, Professor, that it was publish or perish."

"Interesting and unpublished" is equivalent to "non-existent".

# When you submit a paper, many people invest in you.

- Editors and reviewers invest time in considering, revising, and editing your paper;
- Researchers invest time in exploring your ideas and findings;
- Publishers invest time and resources organizing the review process, and building the review systems.

# Is your paper worth people's time?

**QUALITY** and **VALUE** are at the heart of the scholarly communication system. **Journals do not want:**

- Reports of no scientific interest
- Work that is out of date
- Duplications of previously published work
- Incorrect/unacceptable conclusions
- "Salami" papers: datasets too small to be meaningful

- Draft -> outline -> paper->manuscript

# What is a good manuscript?

A good manuscript leads readers to scientific significance immediately.

- Content is essential
  - ✓ Contains a scientific message that is clear, useful, and exciting
- Presentation is critical
  - ✓ Conveys the authors' thoughts in a logical manner such that the reader arrives at the same conclusions as the author
  - ✓ Constructed in the format that best showcase the author's material, and written in a style that transmits the message clearly

# Work hard to satisfy readers' expectation

**What readers want** –

- "The potential readers of your paper have a diverse level of expertise in your field…the paper should be written simply enough to make it understandable and reproducible by graduate students and deep enough to attract the interests of experts."
- "All scientists (students or their advisors) are usually very busy... They usually hope to find the most important information in a paper very quickly...it is important to write a well-structured (linked) paper that allows readers to search for information quickly."
- "In addition, a paper will be widely cited/used only if its significance can be understood without much effort. Letting readers to find things where they expect to find is the key to the clarity of a paper. "

– ZHOU Yaoqi, professor, Indiana University School of Informatics,IUPUI
http://sparks.informatics.iupui.edu/Publications_files/write-english.pdf

- **Review of the Two Paper Types**

# Research Article


- The most common type of journal manuscript
- To publish full reports of data from research
- Including Introduction, Methods, Results and Discussion, Conclusion, and References
- Suitable for many different fields and types of studies (Natural/Social/Medical Science…)
- Also called Original Research, Research or just Article (depending on the journal)

# The Structure of Research Articles


- Title (precise & attractive)
- Authors
- Abstract (informative & insightful)
- Keywords
- Introduction (love at first sight)
- Data and Method (reproducibility)
- Results and Discussion (clear & concise)
- Conclusion (highlight)
- Acknowledge
- References

# Review Articles


- Providing a phased summary of a field or subject
- A perspective on the state of the field where it is heading
- Often written by leaders in a particular discipline
- Commonly citing approximately **100** primary research articles
- Often widely read and highly cited
- Useful for beginner with background information and additional references

# The Structure of Review Articles


**Introduction:**

- Defining the topic and appropriate contexts;
- Establishing your reasons for reviewing;
- Explaining the organization of the review;
- Stating the scope of the review.

**Main body:**

- Organizing the literature according to common themes;
- Providing insight into the relation between your chosen topic and the wider subject area;
- Moving from a general, wider view of the literature being reviewed to the specific focus of your research

**Conclusion:**

- Summarizing the important aspects of the existing body of literature;
- Evaluating the current state of the literature reviewed;
- Identifying significant flaws or gaps in existing knowledge;
- Outlining areas for future study;
- Linking your research to existing knowledge.

- **Writing from the Outline**

# How to write a good manuscript for an international journal?

## ➢ Preparations before starting

## The outline

➢ Construction of an article

Following the structures

➢ Technical details

Tables, Figures, Citations

Decide the type of your manuscript

Choose the right journal

Read the “Guide for Authors” again and again

# The reasons for outline

An outline stands at the central place in writing papers, preparing seminars and planning research.

# The reasons for outline

- An outline  is a written plan of the organization of a paper, including the data on which it rests.
- An outline itself contains little text. You should, in fact, think of an outline as a carefully organized and presented set of data, with attendant objectives, hypotheses, and conclusions, rather than an outline of text.
- It can be relatively efficient in time to go through several (even many) cycles of an outline before beginning to write text; writing many versions of the full text of a paper is slow.

*Do not, under any circumstances, wait until the collection of data is "complete" before starting to write an outline, because the collection may never end at all!!!*

# How to construct your outline?

1. Write down, in any order, all important ideas that occur to you concerning the paper, sketch possible equations, figures, and schemes.

Why did I do this work?

What does it mean?

What hypotheses did I mean to test?

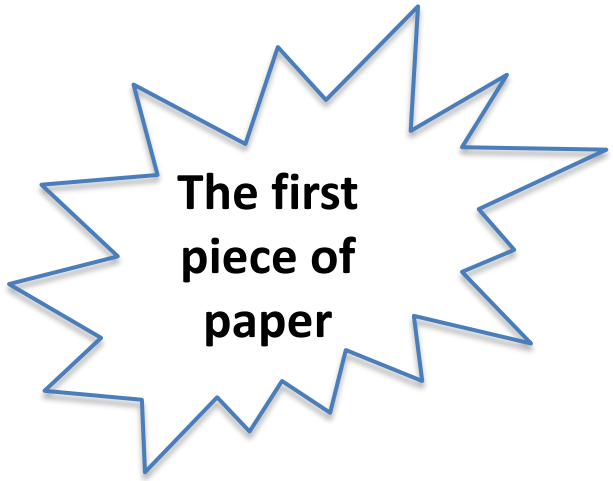
What ones did I actually test?

What were the results?

Did the work yield a new method?

What measurements did I make?

How were they characterized?"



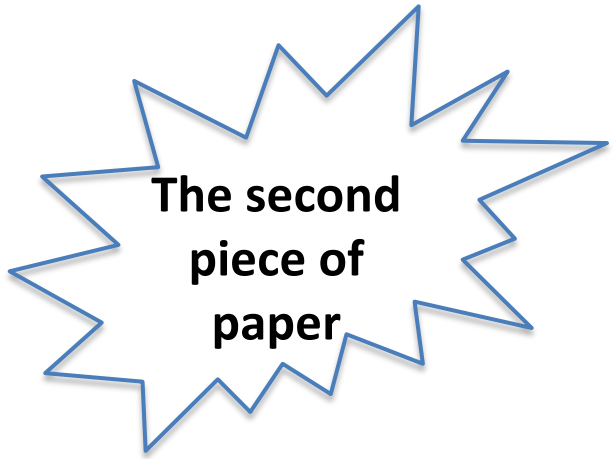
# How to construct your outline?

2. Organize the jumble of the first piece of the paper. Sort out all of your ideas into three major heaps.

**1). Introduction**
Why did I do the work? What were the central motivations and hypotheses?

**2). Results and Discussion**
What were the results? How were data made and characterized? What was measured?

**3). Conclusions**
What does it all mean? What hypotheses were proved or disproved? What did I learn? Why does it make a difference?



# How to construct your outline?

3. Take a look at each of these sections, and organize it on a yet finer scale. Concentrate on organizing the data(or that you know what additional data you intend to collect). Construct **figures**, **tables**, and **schemes** to present the data as clear and compact as possible(indicate where missing data will go, how you think they will look, and how you will interpret them if your hypothesis is correct).

4. Put everything-outline of sections, tables, sketches of figures, equations-in a good order.

5. Exchange your outline with your mentor and keep on modifying it. It usually takes four to five iterations (often with additional experiments or materials) to agree on an outline.

# How to construct your outline?

What's in your outline?

- ✕ Title
- ✕ Authors
- ✕ Abstract
- ✓ Introduction
  - Objectives
  - Justification
  - Background
  - Guidance
  - Summary/Conclusion

# How to construct your outline?

What's in your outline?

- ✓ Results and Discussion (or Main Body for Review)
  - Subheadings
  - Figures, tables, equations, and schemes
- ☐ Conclusions
  - Do not repeat  unless special emphasis is needed.
- ☐ Experimental
  - Include, in the correct order to correspond to the order in the Results section, all of the paragraph subheadings of the Experimental section.

# Some points to remember

- Start writing possible outlines for papers **early** in a project. Do not wait until the "end". The end may never come.

- Organize the outline and the paper around easily assimilated data-tables, equations, **figures**, schemes-rather **than** around **text**.

- Organize in order of importance, not in chronological order. An important detail in writing papers concerns the weight given to topics. Neophytes often organize a paper in terms of chronology: that is, they give a recitation of their experimental program, starting with their cherished initial failures and leading up to a climactic successful finale. This approach ***is completely wrong***. Start with the most important results, and put the secondary results later, if at all. The reader usually does not care how you arrived at your big results, only what they are.

# Questions to Think !

- Why do we need to publish? (From the scientific Community point of view)
- Why the articles have a relative fixed structure?
- How to extract the outline when you read a paper?
- How to formulate the outline for your own manuscript?

# Thanks!