Writing the Paper

WRITING A SCIENTIFIC PAPER (the FORMAT):

- A paper is composed of:
    - Title
    - Abstract
    - (Key words)
    - Introduction
    - Procedure, Methods and Techniques
    - Results, Discussion and Future Work
    - Acknowledgements (give credits)
    - Bibliographic list of sources

Writing the Paper

WRITING A SCIENTIFIC PAPER (the FORMAT):

Thesis and dissertation writing: an examination of published advice and actual practice
Brian Paltridge. English for Specific Purposes, Volume 21, Issue 2 , 2002, Pages 125-143
https://www.sciencedirect.com/science/article/pii/S0889490600000259?via%3Dihub

IMRD Structure of a Paper

I. Introduction
•What question or problem was studied?
•Write the whole literature review here, do not continue it elsewhere.

II. Methods (model)
•How was the problem studied?
•Describe the whole system model here (parameters presented with symbols), do not continue the system model description elsewhere.

III. Results
•What were the findings?
•These must be your own results. Plagiarism (also self-plagiarism) strictly forbidden. Give numerical values of all parameters (guarantee repeatability).

IV. Discussion
•What do these findings mean?

Writing the Paper

WRITING A SCIENTIFIC PAPER (the FORMAT):

Ref: Structure of an IEEE paper
From: VTT TECHNICAL RESEARCH CENTRE OF FINLAND 9.5.2007 Aarne Mämmelä

Abstract

1. What the author has done.
2. How it was done (if it is important).
3. Principal results (numerically, when possible).
4. Significance of the results.

I. Introduction

1. Nature of the problem.
2. Background of previous work.
3. Purpose and significance of the paper.
4. Method by which the problem is approached.
5. Organization of the paper.

II. Materials and methods (Model)

III. Results

IV. Conclusions

1. What is shown by this work and its significance.
2. Limitations and advantages.
3. Applications of the results.
4. Recommendations for further work.

Acknowledgments

References

Writing the Paper

WRITING A SCIENTIFIC PAPER (the FORMAT):

Authors' names and affiliations:

Always use the same name (your signature) to avoid any confusion with other researchers in the same Community.

Also give the complete name and address of the institution or Labs the authors belong to.

Do not forget emails!

Writing the Paper

WRITING THE TITLE:

- Specific enough to immediately show what kind of information will be found on the paper, but not so specific that you include unnecessary information
- Short, usually not more than 70 (max limit 100 characters)
- A professional, rather than conversational tone
- Attractive and interesting
- Short and informative as possible
- Precise, unambiguous, specific and complete
- Identifies the main issue of the paper
- Begins with key point / subject of article
- No non-sense words
- No abbreviations or acronyms
- No formulas
- No commercial names

Writing the Paper

WRITING THE ABSTRACT:

- What researchers/referees read or inspect to select readings among tenths of papers
- "Mirror" of the full manuscript - a summary of the various sections of the article
- It is not an introduction to the article, but rather a succinct summary of the entire article
- Summary is one of the most important parts of the article, and in many cases it will be the only part that will be read, together with the title
- It may appear in the form of a single paragraph (check instructions to authors)
- Write the abstract only after you have written the rest of the paper.
- Extremely concise synthesis of your entire paper.
- It contains:
    - the major question, or hypothesis,
    - the basic approach to answering that question,
    - key results and/or data
    - a brief conclusion about what you discovered.
    - About one-half page (of double-spaced) text

Writing the Paper

WRITING THE ABSTRACT (2):

- Precise, coherent, concise, specific, selective, self-contained, i.e. it should be intelligible
- It should not contain
  - Information or conclusions not contained in the manuscript
  - Illustrations
  - Citations
  - References to tables or figures
- Check that it complies with the 4Ws
  - Introduction -> **W**hat is known and why is this study needed?
  - Methods -> **W**hat did you do?
  - Results -> **W**hat did you find?
  - Discussion -> **W**hat does it mean?

- **Note: Write the abstract only after the full paper**

Writing the Paper

WRITING THE ABSTRACT:

EXAMPLE:

During the last two decades, researchers have collected a decisive amount of experimental evidence about the fundamental role of Emotion on cognitive processing. Emotional phenomena have been correlated with effective decision-making processes, memory, learning and other high-level cognitive capabilities and skills (e.g. risk assessment). In this paper we will describe an ongoing work that aims to design new Agent Architectures influenced by what has been learned in psychology and neurosciences about Emotion-cognition interaction. In particular, we will present an Agent architecture that includes several emotional-like mechanisms, namely: emotional evaluation functions, Emotion–based processing, emotional tagging and mood congruent memory. These emotional-like mechanisms are intended to increase the performance and adaptability of Agents operating in real-time environments. We will also introduce Pyrosim, a MAS platform we have developed to serve as an appropriate test-bed for Emotional-based Architectures. Pyrosim simulates a forest fire in a complex 3D environment where Emotional Agents must take decisions about multiple concerns in real-time.

Topic Methods Hypothesis (expected) Results

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KEYWORDS:

- Include keywords that represent the content of the article
- Use 3 to 7
- Place them after the Abstract

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WRITING THE INTRODUCTION:

- The Introduction has two objectives:
  - To capture the reader's interest in the topic of the article
  - To provide information necessary to understand the article
- To situate the problem
- Why are we doing this work?
- Does it follow on from previous work or the work of others?
- What areas have not yet been studied?
- What will be the hypotheses tested (What will be the problem studied)?
- Recommendations:
  - You should convince editor and readers that your study is superior to previous ones
  - If possible, you should try to cite relevant references that are less than 10 years old
  - Many journals "require" that at least half of the references are less than 5 years old.

Writing the Paper

WRITING THE INTRODUCTION:

- A chance to explain the research motivation (including relevance).
- Present your ideas in a clear and orderly fashion.
- The reader will follow your logic and anticipate what happens throughout the rest of your paper.

- Includes:

    1) why did you undertake this study?

    2) what is the state of existing knowledge?

    3) what specifically are you going to present and highlight?

Writing the Paper

WRITING THE INTRODUCTION:

Structured as a funnel:

a. General context of the article

b. What is known and unknown about the topic.

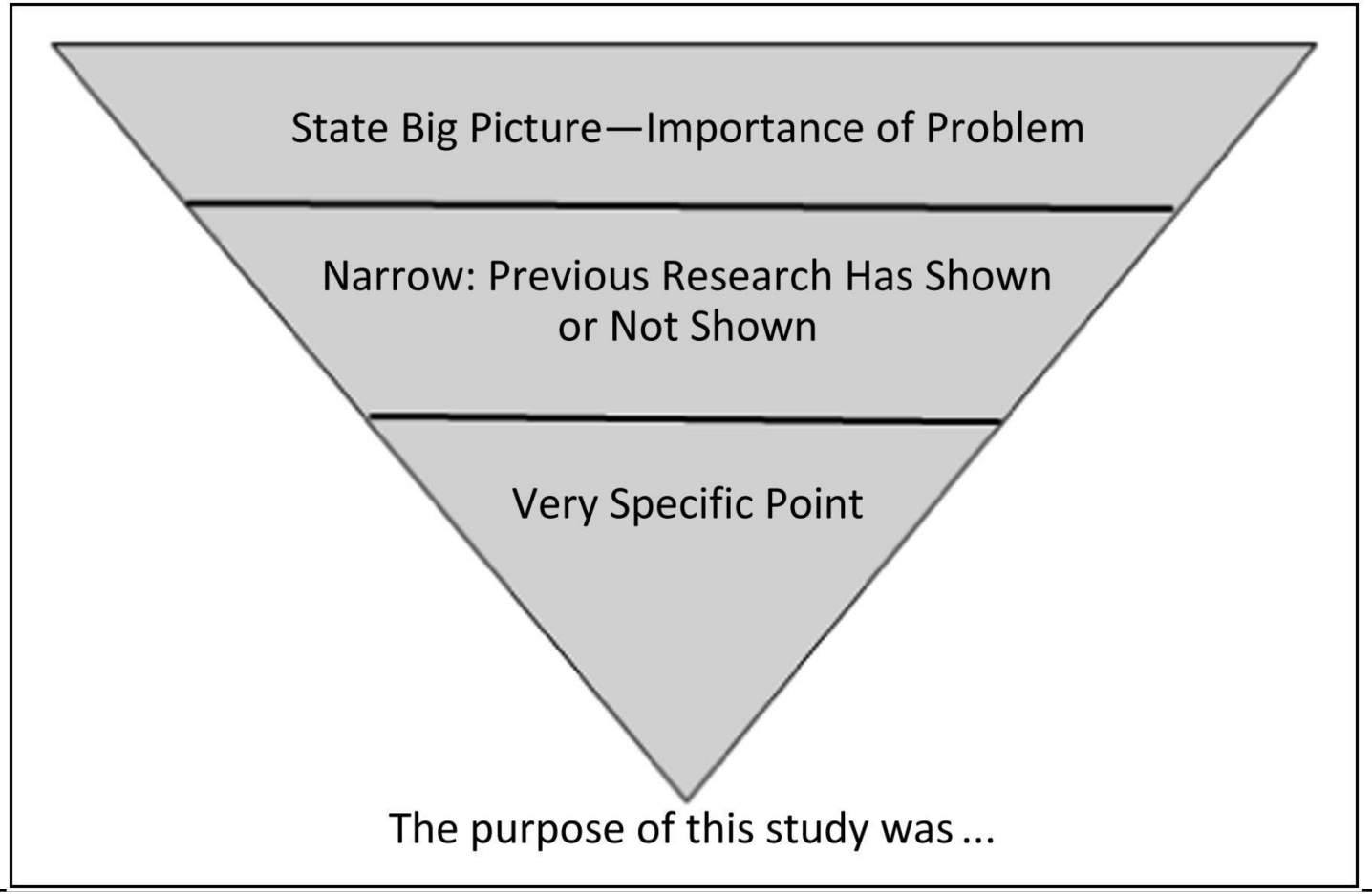
c. Explanation/justification about the need to conduct the study

d. Clearly state the aim of the study (or the hypothesis)
(literature review on the topic under study)



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WRITING THE INTRODUCTION:



Writing the Paper

WRITING THE INTRODUCTION:

- Observations — General: What brought you to this area of inquiry?
  What did you observe that caused you to begin this study?
  (Start with a general observation, and then get more specific).
  Specific: Set of observations during experiments
- Hypothesis — Based on your observations, what is your hypothesis?
- Structure — Name and briefly describe all the sections of the paper
- Prediction — What is the prediction(s) that accompanies your hypothesis?
- Expected results — As you conclude your introduction, always write what you expected to see prior to beginning your research.
- The introduction might have one or two pages (for a 12 pp. paper)

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WRITING THE DESCRIPTIVE PART: Procedures, Methods and Techniques

- Although It can be done, it is not necessary to explicitly discuss the approach in philosophical terms.

- Justify the use of the selected methods, techniques and algorithms.

In this section you tell your reader exactly what you did to test your hypothesis, but don't write unnecessary detail.

- provide enough description to make it possible to repeat your experiment (mainly for reports, thesis, book chapters...)

Writing the Paper

WRITING THE DESCRIPTIVE PART: Procedures, Methods and Techniques

- They serve 2 functions:
  - Allow them to evaluate your work
  - To enable it to be replicated
- Important section because it provides crucial information for assessing the validity of the findings and conclusions
- Easiest section to write, you should start here
- It has 4 basic elements / sub-sections:
  1. Study design (bibliographic review)
  2. Selection of participants
     - How the sample was recruited or selected; inclusion and exclusion criteria
  3. Data collection
     - Defining the exposure or intervention, and what outcomes it measured, when and how
  4. Data analysis
     - Providing detail on statistical techniques used

Writing the Paper

WRITING THE DESCRIPTIVE PART: Procedures, Methods and Techniques

Take into consideration:

- Explain how you tested your hypothesis - This is the main goal
- Write in paragraph form - Don't make a list of procedures or equipment.
- Write in past tense – the work has been done…
- Decision making - Include a paragraph on data analysis and how you arrived at your decisions regarding your hypothesis.
- Give enough information that someone could repeat what you've done

Writing the Paper

REPORTING THE RESULTS:

Results section

- Here you report the results of your experiment/System.
- Describe the chosen scenario (advantages and limitations)
- Be strict about your observed results. Do not discuss them here.
- Include graphs or tables.

If a figure can be used to show the data, use the figure (e.g. a graph) instead of a table. Most people understand graphs more quickly than tables.

- Don't present the same data in several ways, choose the one best way.
- Every graph, figure, or table you include should be referred to in the text of your results section.

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REPORTING THE RESULTS:

Remember the following:

- First - Show updated data
- Second - Include results of any statistical tests
- Third - State whether your hypothesis was accepted or rejected
- Write in past tense - You've already found the results

Tables and Graphs - Include these only in the results Section

- Do always some explanation in your text about figures
- Don't interpret the results - You'll interpret your results in the discussion section.

Writing the Paper

REPORTING THE RESULTS:

Details:

- Table captions are always above a table,
- while figure captions are placed below a graph, picture, or sketch.
- Present the results in a logical order: this will usually be in order of importance
- If appropriate, end the section with a short paragraph on additional or unexpected results
- Keep the data supporting the manuscript for 5 years
- Provide the data for consultation whenever requested by a reviewer or reader

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REPORTING THE RESULTS: USING TABLES / FIGURES / IMAGES

- When citing Tables and Figures, emphasise the result not the Table or Figure
  - Example: The values of the quality index were between 64 and 100% (Fig. 1)
  - Example: Researchers who attended the workshop published twice as many papers per year (Table 3)
- Figures and Tables are numbered independently and in the sequence they are referred to in the text
  - Example: Figure 1, Figure 2, Table 1
- Legend/Title of Tables
  - Placed above the table body and justified to the left
- Figure Caption
  - Placed below the figure or graph and justified to the left
- Legend/Title: summarises what it is about
- References in the text
  - Figure is abbreviated to Fig.
  - Table is not abbreviated

Writing the Paper

REPORTING THE RESULTS: COPYRIGHT

- To republish pictures you must first get permission from the copyright author - it is a legal requirement
- You should create your own tables wherever possible
- Anything you use on loan, images or phrases the source must be given - this protects against accusation of plagiarism
  Example: In the caption put: "Adapted from....[ref]"
- Standard permission requests are normally available from publishers

Writing the Paper

DISCUSSION PART AND CONCLUSION:

- Can be divided into 2 separate sections
  - ➔ Discussion
  - ➔ Conclusions
- The most difficult section to write

- Provides an interpretation of the results, and should never present new results

- Do not ignore inconvenient or unexpected results
  - weakens the study if you try to hide or omit them

Writing the Paper

DISCUSSION PART:

Discussion

- Interpret the results (or discuss, comparing to other researchers results).
- Start with a specific conclusion about your results
- To tell the reader what your results add to what was already known about the topic
- It is time to be honest about limitations of the study, explain how the results fit with established knowledge and explain inconsistencies
- It is better to mention limitations than for reviewers to think you were unaware of them

No more than six paragraphs - one point per paragraph = 1 key idea

- Enlarge the overview of what those results mean.
- Consider the following:
    - Conclusions - Did you accept or reject you hypothesis?
        - What does this allow you to conclude about your questions?
        - Is this what you expected to see, or is it very different from what you expected?
    - Interpretation - If your results were not what you expected, consider possible reasons for this.

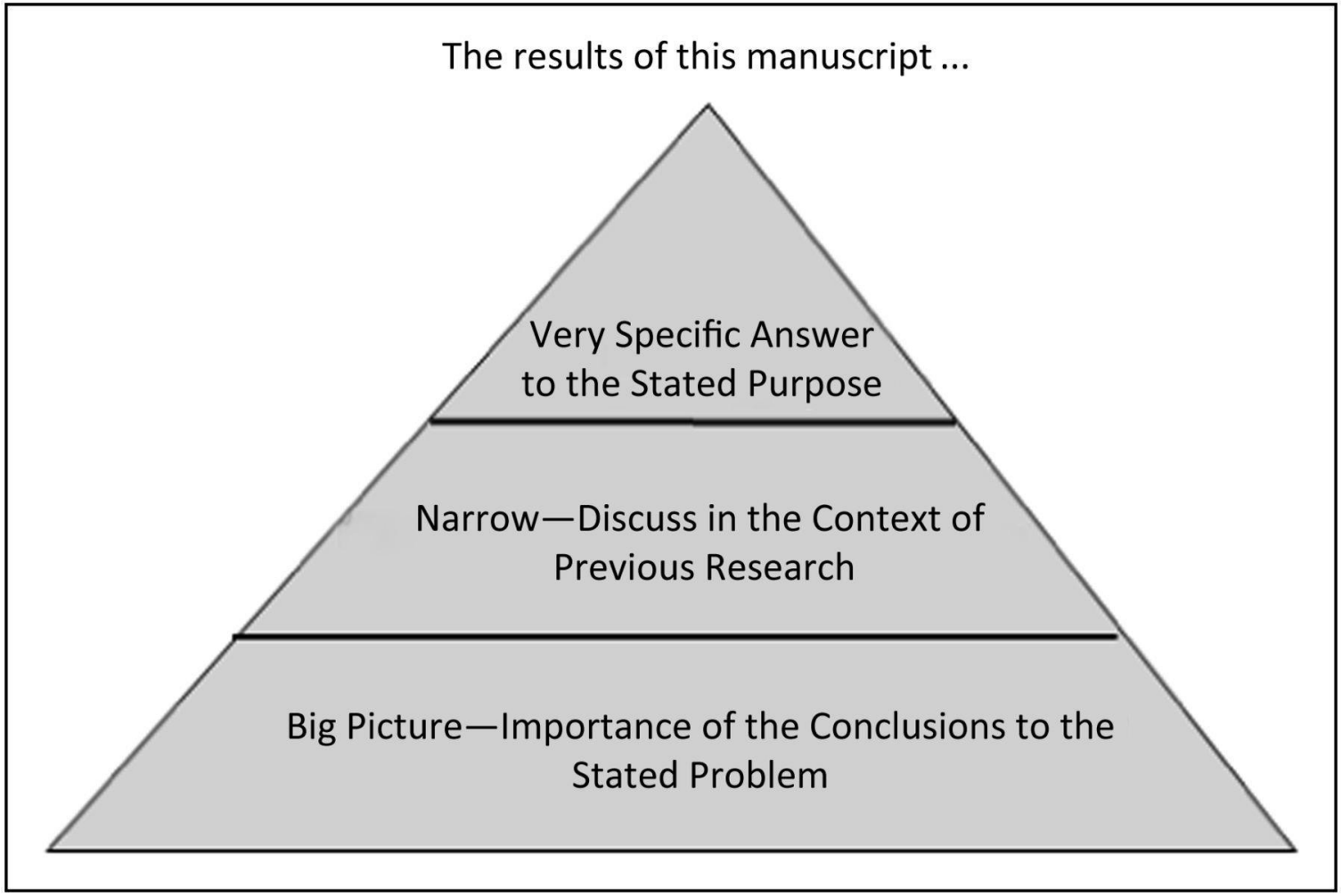
Writing the Paper

DISCUSSION PART:

Discussion

- To tell the reader what your results add to what was already known about the topic
- Time to be honest about limitations of the study, explain how the results fit into established knowledge, and explain inconsistencies
- It is better to mention limitations than reviewers think you have not been aware of them

Writing the Paper
Discussion



Writing the Paper

DISCUSSION PART AND CONCLUSION:

- Do you need to collect more data?
- Identify sources of error or inadequacy of the research.
    -- Did anything go wrong while you performed the experiment?
    -- Were there problems with the methods that may have made it difficult to test your hypothesis effectively?

- Does the whole issue need to be re-examined based on your unexpected results?
- If your results were what you expected, what is the significance of this?
- How do your results fit in with what other researchers have found?
- Do your results and conclusions generate new questions and predictions?

Writing the Paper

DISCUSSION PART AND CONCLUSION:

- The bigger picture:

  -What have you, and the research community gained from this research?

  - What is the real impact of the research?

  -Speculate upon broader meaning of the conclusions

- Discussion should be around two to three double-spaced pages (for a paper in a journal or in a book)

- Always more than ¾ of page for short papers

Writing the Paper

OTHERS:

- Acknowledgments:

  (optional, depending on the study, the project, the team)
  give credit to those who helped in your research through advice, work, permission, technical advice, suggestions, funding and logistic support, etc.

  Names, Institutions, projects, grants,…

Writing the Paper

Bibliographic references:

What are the citations / references for ?

→ Avoiding plagiarism

→ Giving credit to others for their work

→ Give credibility and scientific validity to the work by showing that you have used valid resources

→ Give context - how your work relates with previous studies

Writing the Paper

Bibliographic references:

→ Make sure your literature review is comprehensive and up-to-date - not including key articles in the area or citing outdated articles is a reason for rejection of the manuscript

→ You need to not only obtain the relevant papers, but also read them!

→ Avoid excessive self-citation

→ Avoid excessive citation of the same author / paper

→ First and most important: check which format required in the instructions to authors of the journal

→ Place in the order requested:

- First author alphabetical (APA)
- Numerical citation in the text (Vancouver)

Writing the Paper

Bibliographic and citation management tools

https://www.library.yorku.ca/web/research-learn/citations/zotero-vs-mendeley-comparison/

https://ci-islagaia.pt/formacao-online/

https://ci-islagaia.pt/bibliografia-ferramentas/