

Scientific Writing

Steve Smith
(Person Who Writes Stuff)

Components of a Paper

- Abstract
- Introduction
- Methods
- Results
- Discussion
- Extras (references, figures, tables, etc.)

Components of a Paper: Abstract

- Sentence 1: Introduce the general topic.
- Sentence 2: Describe previous research—either a general trend in the data or a specific result related to your study.
- Sentence 3: Explain what is missing from the research literature.
- Sentence 4: “In the current research, ____ participants...”
- Sentence 5: Describe more of the methods.
- Sentences 6-7: Describe the key results.
- Sentence 8: Have a concluding sentence explain what the results mean (i.e., the “take-home message”).

Separating Neural Activity Associated With Emotion and Implied Motion: An fMRI Study

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Previous research provides evidence for an emo-motoric neural network allowing emotion to modulate activity in regions of the nervous system related to movement. However, recent research suggests that these results may be due to the movement depicted in the stimuli. The purpose of the current study was to differentiate the unique neural activity of emotion and implied motion using functional MRI. Thirteen healthy participants viewed 4 sets of images: (a) negative stimuli implying movement, (b) negative stimuli not implying movement, (c) neutral stimuli implying movement, and (d) neutral stimuli not implying movement. A main effect for implied motion was found, primarily in regions associated with multimodal integration (bilateral insula and cingulate), and visual areas that process motion (bilateral middle temporal gyrus). A main effect for emotion was found primarily in occipital and parietal regions, indicating that emotion enhances visual perception. Surprisingly, emotion also activated the left precentral gyrus, a motor region. These results demonstrate that emotion elicits activity above and beyond that evoked by the perception of implied movement, but that the neural representations of these characteristics overlap.

Components of a Paper: Introduction

- Paragraph 1: Introduce the topic and attract the reader.
- Middle paragraphs: Discuss previous research
- Final paragraph: Lead in to your Methods and discuss your hypotheses.

The Opening Paragraph

- This is the most important paragraph of your paper!
- Introduce the topic (2-3 sentences...don't be vague).
- Explain a general pattern of results related to this topic (1-3 sentences).
- Highlight something that is missing in our knowledge.
- Have a **thesis statement**.

The Middle Paragraphs

- How do you create a narrative that keeps the writing following the intended path?
 - Make a list with major points (paragraphs) and sub-points (ideas that might be described within specific paragraphs).
 - Helpful hint: Use subheadings to divide the introduction into sections.

The Paragraph Itself

- **Topic sentence**
 - Not about a specific paper unless the entire paragraph is about that paper.
- Supporting material
- Concluding sentence that leads into the following paragraph (remember the image of a barrel of monkeys linking arms)

Common Problems with Introductions

- Including information that isn't directly relevant to your story.
 - Problem 1: Poor understanding your own story
 - Problem 2: Trying to show off how much you read
- Using jargon or using words incorrectly.
- Being overly dramatic.

Components of a Methods Section

- **Participants**

- Include the number of participants, demographic characteristics (e.g., age range), and where you found them (e.g., undergraduate students).
- If you have exclusion criteria, list them after this first section.
- If you have healthy control participants, explain how you found them and how you screened them.
- Finish with a discussion of written, informed consent.

Components of a Methods Section

- **Stimulus Sets** (and/or Questionnaires)
 - Explain which tools will be used for your study.
 - Include references.
 - Describe as many details about the tools as possible (e.g., number of questions, size of the stimuli).
 - Figures are helpful.

Components of a Methods Section

- **Experimental Task**

- This is sometimes included as part of the Procedure (talk to your supervisor).
- Explain the types and number of experimental trials (e.g., 48 presentations of fearful faces and 48 presentations of neutral faces).
- Then, walk the reader through an individual trial (if applicable).
- A figure is worth a thousand words...

If you can depict something visually rather than verbally, do it.

Components of a Methods Section

- **Procedure**

- Visualize yourself going through the experiment. What are the steps?
- Write those steps in simple language.

- **Data Analysis**

- Think about the steps you would take to analyze the data. What are the steps?
- Write those steps in simple language.

Remember: Other researchers should be able to reproduce your methods based on how you wrote your Methods sections.

The Results Section

- This will vary widely based on your subfield of psychology/neuroscience.

Components of a Discussion Section

- Paragraph 1: Review of your major results.
 - The final sentence should tell the readers where you're going to take them for the rest of the paper.
- Middle paragraphs
 - Discuss the implications of the results.
 - Relate your findings to the topics discussed in your Introduction.

Components of a Discussion Section

- Second-to-Last Paragraph : Limitations
 - Highlight some short-comings.
 - Don't be too negative!!!
 - For each limitation, present ways that it could be addressed in future research.
 - This turns a negative into an opportunity.

Components of a Discussion Section

- The final paragraph!
 - In conclusion, the current study demonstrates that...
 - The next 2-3 sentences expand on what you found so that the reader has no doubt.
 - Final sentence: Explain the major implication of your study.

CONCLUSIONS

The results of the current study highlight the complexity of the ASMR experience. When viewing ASMR-eliciting videos, individuals with ASMR showed increases in neural activity in regions of the cortex related to attention, audition, emotion, and movement. This activity was not observed in control participants. When responses of ASMR and control participants viewing ASMR videos were compared, individuals with ASMR showed greater activity in the thalamus, anterior cingulate cortex, precuneus, and medial sensorimotor regions. Together, these analysis demonstrate that ASMR is not simply a sensory *or* an emotional phenomenon. Instead, the data suggest that ASMR involves sensory, motoric, affective, and attentional components.

Generalizability of the Formula

- This “writing formula” works for Honours theses, research papers, grant proposals, and scholarship applications.

Writing Your CGS-M Proposal

- Pick a topic that relates to one (or more) of your potential graduate supervisors.
- You need a CCV, reference letters (don't ask at the last minute), **and a one-page proposal.**
- Introduction (40-50% of page)
- Methods (40%-ish of page)
 - Typically 1-2 experiments
- Conclusion (10% of page)

HAVE A PROFESSOR CRITIQUE YOUR
RESEARCH PROPOSAL.

(DON'T DO THIS AT THE LAST MINUTE).