Writing an abstract: For a research article

Disclaimer

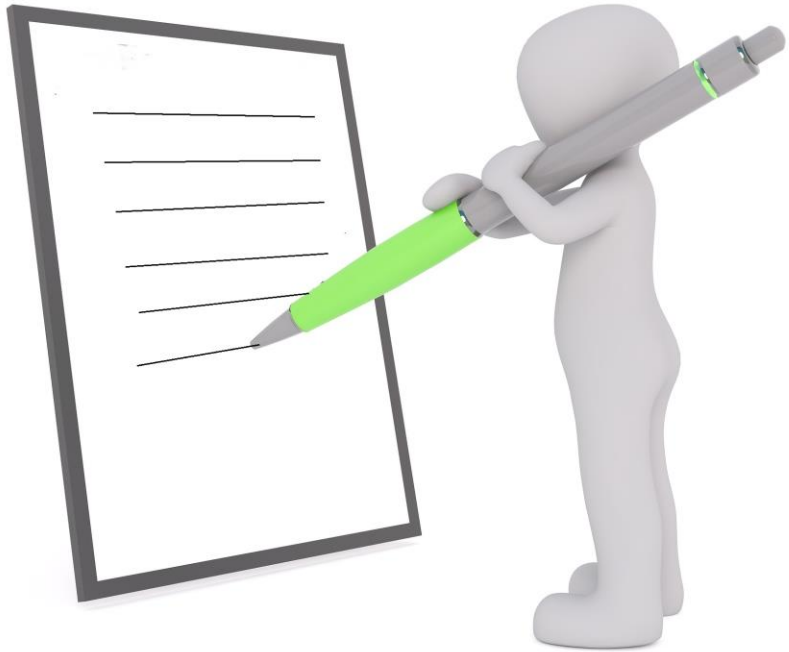
This slide set from the video is intended to support your learning after watching the video. Note that the slides don't contain all the explanations in the accompanying video.

Writing an abstract

For a research article

Diane Pilkinton-Pihko, Ph.D.

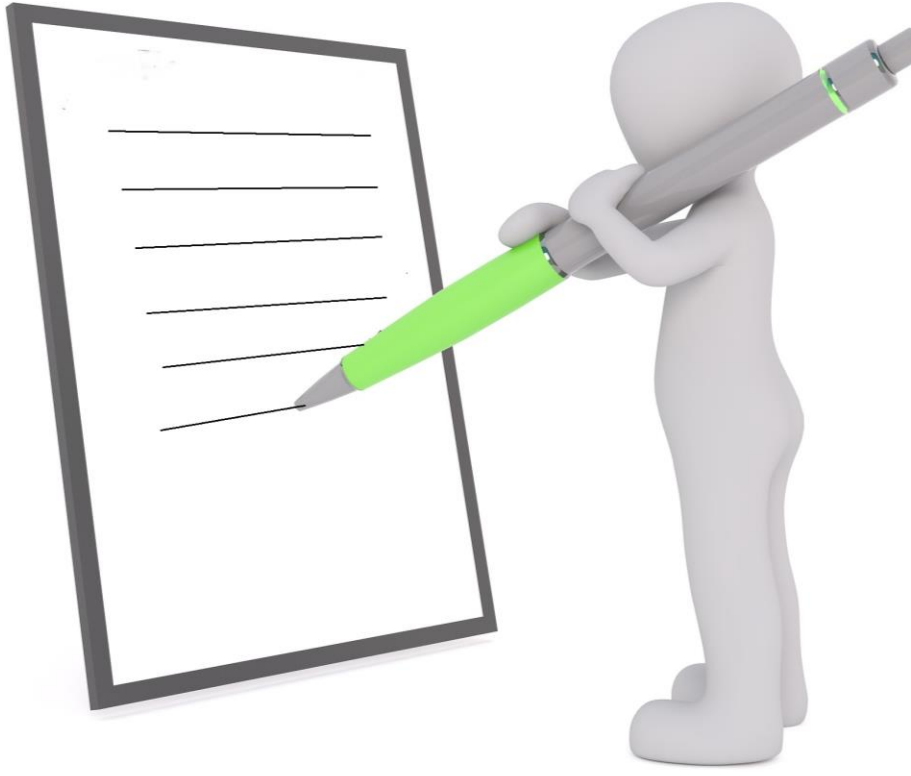
Aalto University
Language Centre



The challenge

- In a clear, efficient style
- Within a limited space
- Convey the purpose, general experimental design, and conclusions
- Plus, if possible, explain the significance of the work

➢ Not merely copy and paste sentences from the article that result in a dull, meaningless list



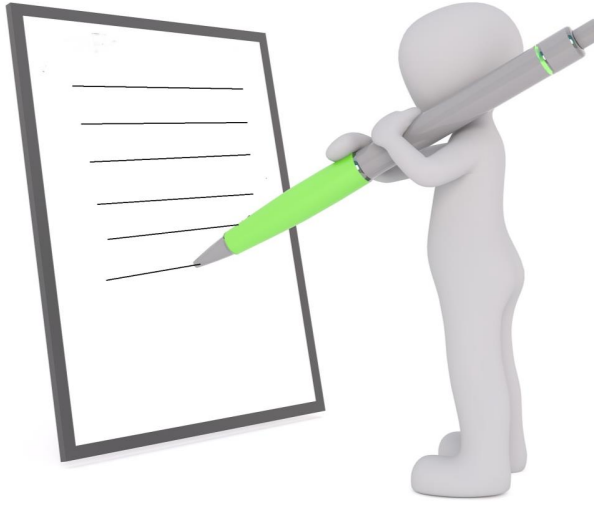
Research paper abstracts as a tool for success	
Getting read	A screening device for convincing scholars to read your research
Connecting with editors	Who use the abstract to encourage potential reviewers to review your research
Being discovered	From a database, where scholars find your abstract via embedded key words and proper nouns that may not appear in your title
Getting cited	Scholars may cite your work based on reading your abstract
Solving problems	Writing an abstract helps you to clarify your research Can't write an abstract > then your research lacks focus

Five potential parts

An approach to writing abstracts

Examples

Language tips



Five potential parts

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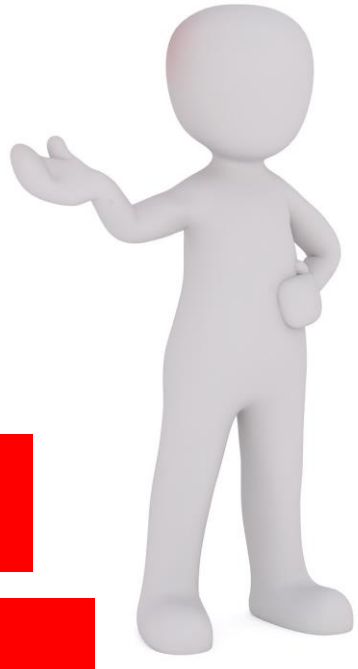
1. Background/problematization
2. Purpose
3. Methods/materials/subjects/procedure
4. Results/findings/product
5. Conclusion/discussion/implication/recommendation



Five potential parts

1. Background/problematization
Establish research context and relevance

2. Purpose
Intention, thesis, purpose, goal, or hypothesis

3. Methods/materials/subjects/procedure
Kind and treatment of data; procedure, scope and limits

4. Results/findings/product
Indicate your findings and summarize your results

5. Conclusion/discussion/implication/recommendation
Draw inferences; state implications or recommendations

An approach to writing abstracts

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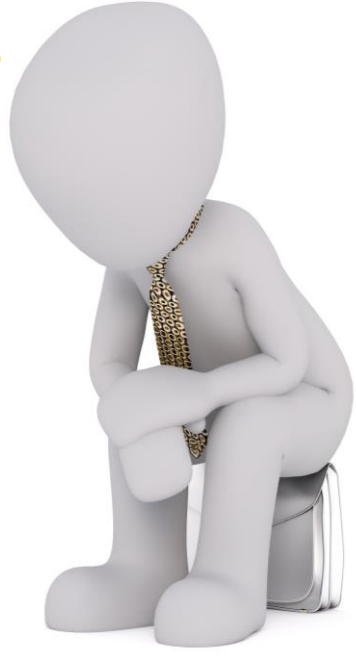
Language Centre

Structure	Use questions to guide your writing
1. Background Context and relevance *Length: 1-2 sentences*	• *What is known about the topic?* • *Why is the topic important?*
2. Purpose Intent, thesis, purpose, goal, or hypothesis *Length: 1-2 sentences*	• *Why was this study done?* • *What motivated the study?* • *How does this goal differ from others?*
3. Methods/materials/subjects/procedure Kind and treatment of data; scope and limits *Length will vary*	• *What was done and how?* • *What was the methodology or experimental design?* • *What limits were imposed?*
4. Results Indicate findings; summarize results *Length: Comprises the bulk of the abstract*	• *What did you find?* • *What was achieved?*
5. Conclusion/discussion/ implication/recommendation Draw inferences; state implications or recommendations *Length: 1-2 sentences*	• *What do the findings mean?* • *What is the value of your findings?* • *What may be concluded?* • *How do your findings apply to a broader context?*

- **Gets better results!**
- **Eliminates copying sentences from your paper!**

Common problems to avoid

- Parts imbalanced
- Results too brief or missing
- No implications of the findings
- Excessive length



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Write it as a stand alone!

The abstract can be understood independently in a database

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Examples

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During joint actions, people typically adjust their own actions according to the ongoing actions of the partner, which implies that the interaction modulates the behavior of both participants. However, the neural substrates of such mutual adaptation are still poorly understood. Here, we set out to identify the kinematics-related brain activity of leaders and followers performing hand actions. Sixteen participants as 8 pairs performed continuous, repetitive right-hand opening and closing actions with ~3-s cycles in a leader–follower task. Subjects played each role for 5min.Magnetoencephalographic (MEG) brain signals were recorded simultaneously from both partners with a dual-MEG setup, and hand kinematics was monitored with accelerometers. Modulation index, a cross-frequency coupling measure, was computed between the hand acceleration and the MEG signals in the alpha (7–13 Hz) and beta (13–25 Hz) bands. Regardless of the participants' role, the strongest alpha and beta modulations occurred bilaterally in the sensorimotor cortices. In the occipital region, beta modulation was stronger in followers than leaders; these oscillations originated, according to beamformer source reconstructions, in early visual cortices. Despite differences in the modulation indices, alpha and beta power did not differ between the conditions. Our results indicate that the beta modulation in the early visual cortices depends on the subject's role as a follower or leader in a joint hand-action task. This finding could reflect the different strategies employed by leaders and followers in integrating kinematics-related visual information to control their own actions.

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The combined effect of dissolved ions and water temperature on the adsorption of a xanthate collector on chalcopyrite and pentlandite was investigated using multiple linear regression. Cationic species improved the adsorption of the collector on sulphide minerals through xanthate adsorption activation. Thiosulphate ions generally had a negative effect on collector adsorption, and the interaction of thiosulphate ions and cations effectively reduced collector adsorption on the sulphide minerals. With regards to temperature variation caused by seasonal variation, this study suggests that temperature can influence the adsorption of collectors in the flotation process and this should be approached on a case by case basis as it seems to differ with the type of mineral under investigation. These fundamental results prompt a discussion on how complex water matrices can affect interactions of reagents and sulphide minerals at the solid–liquid interface and the possible effect on flotation performance.

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Text source: Mhonde, N., Schreithofer, N., Corin, K., & Mäkelä, M. (2020). Assessing the combined effect of water temperature and complex water matrices on xanthate adsorption using multiple linear regression. *Minerals*, 10(9), 1-18. [733]. https://doi.org/10.3390/min10090733.

Language tips

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Use language signals

- This study introduces/proposes/identifies/explores/…
- As a result, …
- The findings suggest/imply …
- Overall, [signal the conclusion]

Keep sentences short!

Use key terms > think databases!

What verb tense?

What verb tense?

- ✓ Past tense for theories, methods, results

5 Potential Parts Metalanguage Verb tense: past

Background

Purpose

Subjects & Procedure

Results

Conclusions

During joint actions, people typically adjust their own actions according to the ongoing actions of the partner, which implies that the interaction modulates the behavior of both participants. However, the neural substrates of such mutual adaptation are still poorly understood. Here, we set out to identify the kinematics-related brain activity of leaders and followers performing hand actions. Sixteen participants as 8 pairs performed continuous, repetitive right-hand opening and closing actions with ~3-s cycles in a leader–follower task. Subjects played each role for 5 min. Magnetoencephalographic (MEG) brain signals were recorded simultaneously from both partners with a dual-MEG setup, and hand kinematics was monitored with accelerometers. Modulation index, a cross-frequency coupling measure, was computed between the hand acceleration and the MEG signals in the alpha (7–13 Hz) and beta (13–25 Hz) bands. Regardless of the participants' role, the strongest alpha and beta modulations occurred bilaterally in the sensorimotor cortices. In the occipital region, beta modulation was stronger in followers than leaders; these oscillations originated, according to beamformer source reconstructions, in early visual cortices. Despite differences in the modulation indices, alpha and beta power did not differ between the conditions. Our results indicate that the beta modulation in the early visual cortices depends on the subject's role as a follower or leader in a joint hand-action task. This finding could reflect the different strategies employed by leaders and followers in integrating kinematics-related visual information to control their own actions.

Text source: Zhou, G., Bourguignon, M., Parkkonen, L., & Hari, R. (2016). Neural signatures of hand kinematics in leaders vs. followers: A dual-MEG study. NeuroImage, 125, 731-738. DOI: 10.1016/j.neuroimage.2015.11.002.

What verb tense?

- ✓ Past tense for theories, methods, results
- ✓ Present tense for conclusions and implications

5 Potential Parts Metalanguage Verb tense: present

Background

During joint actions, people typically adjust their own actions according to the ongoing actions of the partner, which implies that the interaction modulates the behavior of both participants. However, the neural substrates of such mutual adaptation are still poorly understood.

Purpose

Here, we set out to identify the kinematics-related brain activity of leaders and followers performing hand actions.

Subjects & Procedure

Sixteen participants as 8 pairs performed continuous, repetitive right-hand opening and closing actions with ~3-s cycles in a leader–follower task. Subjects played each role for 5 min. Magnetoencephalographic (MEG) brain signals were recorded simultaneously from both partners with a dual-MEG setup, and hand kinematics was monitored with accelerometers. Modulation index, a cross-frequency coupling measure, was computed between the hand acceleration and the MEG signals in the alpha (7–13 Hz) and beta (13–25 Hz) bands.

Results

Regardless of the participants' role, the strongest alpha and beta modulations occurred bilaterally in the sensorimotor cortices. In the occipital region, beta modulation was stronger in followers than leaders; these oscillations originated, according to beamformer source reconstructions, in early visual cortices. Despite differences in the modulation indices, alpha and beta power did not differ between the conditions.

Conclusion

Our results indicate that the beta modulation in the early visual cortices depends on the subject's role as a follower or leader in a joint hand-action task. This finding could reflect the different strategies employed by leaders and followers in integrating kinematics-related visual information to control their own actions.

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In abstracts, is it ok to use *I* and *We*?

- ✓ Generally, **I** and **we** are preferred to passive voice
- ✓ But, check the instructions to authors for your target journal

5 Potential Parts Metalanguage Verb tense: present Pronoun: I, we

Background

During joint actions, people typically adjust their own actions according to the ongoing actions of the partner, which implies that the interaction modulates the behavior of both participants. However, the neural substrates of such mutual adaptation are still poorly understood.

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Here, we set out to identify the kinematics-related brain activity of leaders and followers performing hand actions.

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5 Potential Parts | Metalanguage | Verb tense: present | Passive voice (low usage)

Background	During joint actions, people typically adjust their own actions according to the ongoing actions of the partner, which implies that the interaction modulates the behavior of both participants. However, the neural substrates of such mutual adaptation are still poorly understood.
Purpose	Here, we set out to identify the kinematics-related brain activity of leaders and followers performing hand actions.
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Can I use abbreviations?

- ✓ Generally, avoid using abbreviations

5 Potential Parts | Metalanguage | Verb tense: present | Pronoun: I, we | Abbreviations

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Purpose Here, we set out to identify the kinematics-related brain activity of leaders and followers performing hand actions.

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Eliminate unnecessary spaces to reduce word count

55 % → **55%**	(-1 word)	between the number and the percentage sign (%)

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55 % → **55%**	(-1 word)	between the number and the percentage sign (%)
P < 0.01 → **P<0.01**	(-2 words)	between (Greek) symbols or operators (<, >, ≤, ≥, =, ±)

Eliminate unnecessary spaces to reduce word count

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P < 0.01 → **P<0.01**	(-2 words)	between (Greek) symbols or operators (<, >, ≤, ≥, =, ±)
5 out of 10 → **5/10**	(-3 words)	within numerical ranges and fractions

Eliminate repetition of units to reduce word count

2 kg vs. 5 kg for the experimental and control groups, respectively

→ 2 vs. 5 kg (-1 word)

Eliminate repetition of units to reduce word count

2 kg vs. 5 kg for the experimental and control groups, respectively

→ 2 vs. 5 kg (-1 word)

Samples were collected at **0.5 h, 1 h, 2 h, 4 h, 8 h, and 16 h**

→ Samples were collected at **0.5, 1, 2, 4, 8, and 16 h** (-5 words)

Research Paper Abstract: Checklist	
	Include sufficient “parts” – generally 3 to 5 of the five potential parts
	Use the questions for guiding the writing of the abstract (on the previous slides) This helps prevent the temptation to copy sentences from the text
	Check that the parts of the abstract are balanced
	Abstract is understandable when independent of the research paper Why is this necessary? Abstracts often float in databases separately from the paper itself, and therefore cannot depend on it
	Use language signals (e.g. This study identifies; The findings suggest)
	Past tense for theories, methods and results; present tense for conclusions and implications
	Prounouns, **I** and **We,** preferred to passive voice > but check the journal’s instructions to authors
	Use active verbs (as the preferred voice)
	Keep sentences relatively short
	Use key terms (useful in databases) and avoid abbreviations
	Eliminate unnecessary details

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Language Centre

Thank you!

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Special thanks: This video slide set was produced by Diane Pilkinton-Pihko as part of an Aalto University Online Learning (A!OLE) project.

Film credits

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3D white male writing on a whiteboard

3D white male gesturing with right hand

3D white male with a green check mark

3D white male sitting on briefcase

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Kretzschmar, N., Lipponen, S., Klar, V., Pearce, J. M., Ranger, T. L., Seppälä, J., & Partanen, J. (2019). Mechanical properties of ultraviolet-assisted paste extrusion and post extrusion ultraviolet-curing of three dimensional printed biocomposites. 3D Printing and Additive Manufacturing, 6(3), 127-137.https://doi.org/10.1089/3dp.2018.0148

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