

Template for bachelor and master theses in audiology at SDU

Bachelor/Master thesis in Audiology

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Abstract

The purpose of the abstract is to give a *short and precise summary* of your project. For a bachelor thesis, the abstract should fill ca. 0.5 pages of text (ca. 200-250 words). Start with 1-2 sentences that provide relevant background information (e.g., about an aspect that is currently unclear or of particular interest in audiology). Next, specify the purpose of your project (which is typically to shed light on the aforementioned aspect). Then move on to the methods and materials that you used (ca. 2-4 sentences), followed by a summary of your main findings (ca. 2-3 sentences). Finally, state the main conclusions (ca. 1-2 sentences). If you have some space left, add 1-2 sentences that provide an outlook (i.e., what would be a logical next step to take).

For a master thesis, the abstract can be a bit longer (ca. 250-300 words). However, we encourage you to keep it as short as possible – a reader does *not* want to have to read several pages of text to get an idea about your project. We recommend using max. 300 words.

The abstract should be written in passive voice (e.g., “Measurements were performed...” rather than “I/we performed measurements...”). Furthermore, it should not contain any citations or references. In general, *use neutral language* throughout your thesis, i.e., avoid colloquial and emotional formulations (e.g., “modern hearing aids are simply fantastic”).

It can be a good idea to write the abstract early to nail down the ‘story’ of your thesis. For the same reason, it can be easier to write it at the end when the data analyses are completed, and the results and conclusions are clear. In any case, you should check the abstract carefully before submission to make sure it is an effective summary of your work.

Resumé

Regardless of whether you write your thesis in Danish or not, there needs to be a resumé in Danish. There also needs to be an abstract in another language. In general, this should be English. If you want to write it in another language, you must obtain permission from your supervisor to do so.

If you write your thesis in Danish, place the resumé before the abstract. If you write your thesis in English, it makes more sense to have the abstract before the resumé.

The requirements for the resumé are otherwise identical to those specified above for the abstract.

List of Acronyms

dB: Decibel

HL: Hearing level

DPOAE: Distortion-product oto-acoustic emission

SPL: Sound pressure level

SRT: Speech recognition threshold

...

List of Figures

When there are many figures, it makes sense to make a list of them, too. However, this is not a requirement.

List of Tables

When there are many tables, it makes sense to make a list of them, too. However, this is not a requirement.

1 Introduction

The purpose of the Introduction is to familiarize the reader with the general topic area, and to provide some detailed background information that is directly relevant for the specific topic you have chosen.

Typically, the Introduction starts with 1-2 paragraphs that provide a general overview of the field. The following paragraphs then go into more depth and provide a summary of the most relevant literature (e.g., 3-4 key articles that you have found). You should demonstrate here that you have made an effort to find out what is known about your chosen topic and give credit to this prior work by summarizing and citing it appropriately.

The Introduction should ideally end with a paragraph that outlines the *purpose* of your project. In the case of an empirical study, it typically does so in the form of a *problem formulation* or 1-2 *hypotheses* that you chose to investigate (i.e., based on your review of previous literature findings, what did you expect to find in your project?).

It is not easy to write an effective introduction. Oftentimes, it is a good idea to write the introduction at the end when you know the ‘story’ for your thesis. In this manner, you can make sure that the introduction has a good flow that connects literature findings (or the lack thereof) directly to your problem formulation or hypotheses.

1.1 Sub-section 1

It is a good idea to use sub-sections to structure the Introduction and other chapters. In general, this improves readability. In the introduction, it can make sense to have a sub-section titled “Background theory” and another one titled “Problem formulation”, for example.

1.1.1 Sub-section 2

If needed, a second sub-section level can be used. For example, it can make sense to divide the “Background theory” into smaller sub-sections. However, very short sub-sections (with only a few sentences) should be avoided.

1.1.2 Number of pages

For bachelor and master theses in audiology, there are *no formal requirements* regarding the minimum and maximum number of pages. To help students find out if they are on the right track, the following *guidelines* can be used:

For a typical bachelor thesis, the Abstract, Introduction, Methods and Materials, Results, Discussion and Conclusions chapters should fill ca. 15-20 normal pages (the title page, table of contents, list of acronyms, list of figures, list of tables, references, appendices, acknowledgments etc. do not count here). For a typical master thesis, these chapters should fill ca. 20-30 pages.

If more than one student contributes to a project, the thesis should increase in length by a factor of 1.5 (or 50% extra) per student.

OBS: *Quality matters more than quantity!* This means that if you produce a high-quality piece of work that you manage to document in a short but effective manner, you can certainly get a very good grade for your thesis 😊

1.1.3 Language

You can write your thesis in Danish or English. If you choose to write your thesis in English, you can reach a wider audience. To do so, you will need to obtain permission from the study board in audiology, but this is typically approved.

Unlike the abstract and resumé, the remainder of the thesis can be written in active voice (e.g., “I/we performed the measurements...”), but passive voice is also possible. Just make sure to *be consistent* with your use of active or passive voice.

Remember to *proofread* your thesis carefully. If possible, ask somebody else to do this for you. Note that MS Word has a built-in spellchecker (→ Review → Spelling & Grammar). The language for this can be set under Review → Language.

OBS: You are allowed to use AI-tools (e.g., Copilot) for making language improvements. In the Acknowledgments chapter, you should then explicitly state what tools you used and for what purpose!

1.1.4 Citations

It is crucial that you cite previous work correctly and completely – always remember that *plagiarism is the greatest sin* in academic writing! Identify direct quotes by using double citation marks around the cited text (“...”). If referring to a publication in the text, use the following convention:

In a recent study, the influence of the stimulus presentation level on auditory brainstem responses was investigated (Andersen *et al.*, 2009).

Alternatively, if you want to name the authors explicitly in the text, use the following convention:

In a recent study, Andersen *et al.* (2009) investigated the influence of stimulus presentation level on auditory brainstem responses.

Note that there is professional software available at SDU for managing references and citations (e.g., EndNote), but it takes time getting used to it. Our recommendation is that students start using it for their Master projects.

2 Methods and Materials

This chapter contains all the details about the methods and materials that you used for your study. The examples given below are representative for an empirical study. In case you performed a literature study, you would present the theoretical methods that you used (e.g., for a literature search) here instead.

Typically, this chapter is the easiest to write, so you probably want to start here.

2.1 Participants

In the case of an empirical study, this section contains all the information about your participants.

2.2 Hearing aid fittings

In the case of a project about hearing aids, you need to specify the hearing aids that you used, how you fitted them etc.

2.3 Test setup

A description of your physical test setup (e.g., the test environment, hardware, software...) is always a good idea.

2.4 Measurements

Typically, there is a sub-section detailing all the measurements that you made, e.g., speech recognition thresholds or oto-acoustic emissions.

2.4.1 Speech recognition thresholds

If you have any equations to specify, use MS Word's built-in function for creating them (→ Insert → Equation). Equations should be numbered consecutively. Here's an example:

Equation 1 specifies the logistic function that was used for fitting the data from the speech recognition measurements:

$$f(x) = \frac{1}{1+e^{-x}} \quad (1)$$

2.4.2 Distortion-product oto-acoustic emissions

Bla, bla, bla, bla, bla...

2.5 Test protocol

Sometimes it can make sense to have a sub-section about your test protocol (e.g., how many visits there were, what their duration was, which measurements were performed when...).

2.6 Statistical analyses

It makes sense to describe your approach to the statistical analyses that you performed in a dedicated sub-section.

3 Results

This chapter contains all your results. These are typically presented in tables and figures. Tables and figures must be numbered, and there needs to be a caption for each table and figure that summarizes the contents (based on the information given in the caption, the reader needs to be able to understand what is presented in the table/figure). You can use MS Word's built-in caption function for this (→ References → Insert Caption → Label: Table or Figure); this will take care of the numbering for you.

It is very important that you present your results in a clear fashion, so the reader can get a good overview of them! Always remember to include the units of your measurements, and clearly label all axes, legends etc. In the text, describe your results in as neutral a way as possible (i.e., do *not* discuss them in the Results chapter).

Typically, this chapter is also relatively easy to write.

3.1 Speech recognition thresholds

Here is an example for which cross-references were used to keep track of the numbering (→ Insert → Cross-reference → Reference type: Table → Insert reference to: Only table and number):

Table 1 summarizes the results from the SRT measurements.

	SRT (dB SNR)		
	Condition 1	Condition 2	Condition 3
Group 1	-5.0 (-6.3, -2.1)	-4.2 (-7.1, -3.1)	-4.6 (-6.8, -3.5)
Group 2	-3.5 (-6.6, -1.9)	-3.0 (-6.4, -3.0)	-5.0 (-7.3, -3.1)

Table 1: Mean SRT measurements for the two groups of participants and three test conditions. Data in parentheses correspond to minimal and maximal values.

3.2 Distortion-product oto-acoustic emissions

Here's an example of a figure (again, cross-references were used):

Figure 1 shows an example OAE measurement.

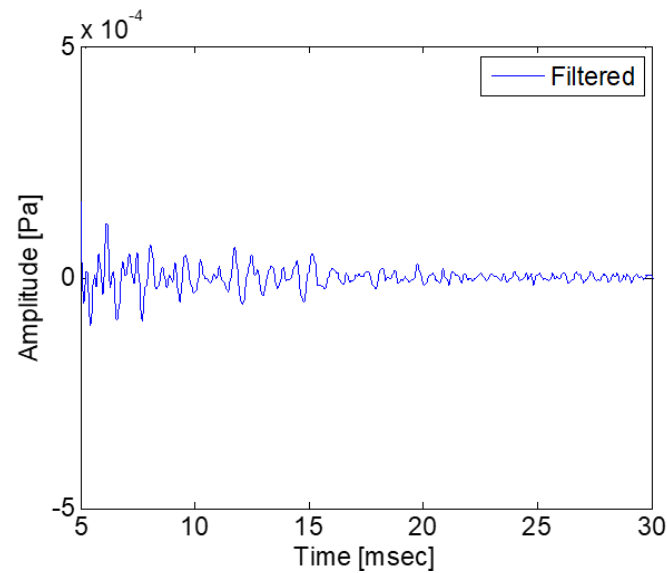


Figure 1: Example oto-acoustic emission measurement (in Pascal) as a function of time (in milliseconds). In this case, the filtered recording is displayed, as indicated in the figure.

4 Discussion

It is a good idea to start the Discussion chapter with a short summary of what you did and found out in your project (3-5 sentences). This can then lead nicely over to a discussion of any interesting (expected or unexpected) aspects. Think about the purpose and/or hypotheses of your project. Was the purpose achieved? If no, what could be the reasons for this? Did you obtain results consistent with your hypotheses? If yes, what are the possible consequences, e.g., for clinical practice? If no, what could be the reasons for this? Are there any clear limitations that prevent you from drawing firm conclusions (there typically always are some)? Then you should acknowledge and discuss them.

The Discussion is a very important part of the thesis. Here, you can demonstrate that you have a good grasp of your topic area, your results, and the possible implications. The focus should not be on summarizing your work but rather on *reflecting critically* upon it! By doing so, you can provide inspiration for follow-up work. What would be a logical next step to take? Which aspects would be interesting to investigate further?

The Discussion chapter is not easy to write because you need to evaluate your own work carefully in light of literature findings and your own findings. Based on this evaluation, you should then be able to draw some valid conclusions (i.e., conclusions that are supported by your findings) in the next chapter.

5 Conclusions

Based on your discussion of the most important and interesting aspects in the previous chapter, you should draw some valid conclusions here.

References

The examples below illustrate how you should present and format your references. The references should appear in alphabetical order. If there is more than one reference from the same author(s), start with the newest publication and add ‘a’, ‘b’, ‘c’... to the year of publication (e.g., 2011a, 2011b, 2011c). A program like EndNote will do all of this for you automatically.

Journal articles:

- Cameron, S. & Dillon H. (2008). “The listening in spatialized noise-sentences test (LISN-S): Test-retest reliability study”, *International Journal of Audiology*, 46 (3), 145-153, DOI: <https://doi.org/10.1080/14992020601164170>
- Gatehouse, S. (1989). “Apparent auditory deprivation effects of late onset: The role of presentation level”, *Journal of the Acoustical Society of America*, 86 (6), 2103-2106, DOI: <https://doi.org/10.1121/1.398469>
- Kemp, D. T., Ryan, S. & Bray, P. (1990). “A guide to the effective use of otoacoustic emissions”, *Ear & Hearing*, 11 (2), 93-105

Books:

- Moore, B. C. J. (1998). *Cochlear Hearing Loss*. Whurr Publishers, London, UK

Book chapters:

- Baran, J. A. (2007). “Test battery considerations”, in: F. E. Musiek & G. D. Chermak (Eds.) *Handbook of (Central) Auditory Processing Disorders. Vol. I. Auditory Neuroscience and Diagnosis*. Plural Publishing, San Diego, CA, 163-192.

Appendix A

Appendices are useful for presenting ancillary information that would disturb the flow of the main text. For example, you may want to put a questionnaire here that you used for your study. Or you may want to include the individual data from all your participants (e.g. in a table). Another example could be written instructions that you gave to your participants or a graphical user interface used for the data collection (see below).

Figure 2 shows the graphical user interface that was used for the psychoacoustic measurements.

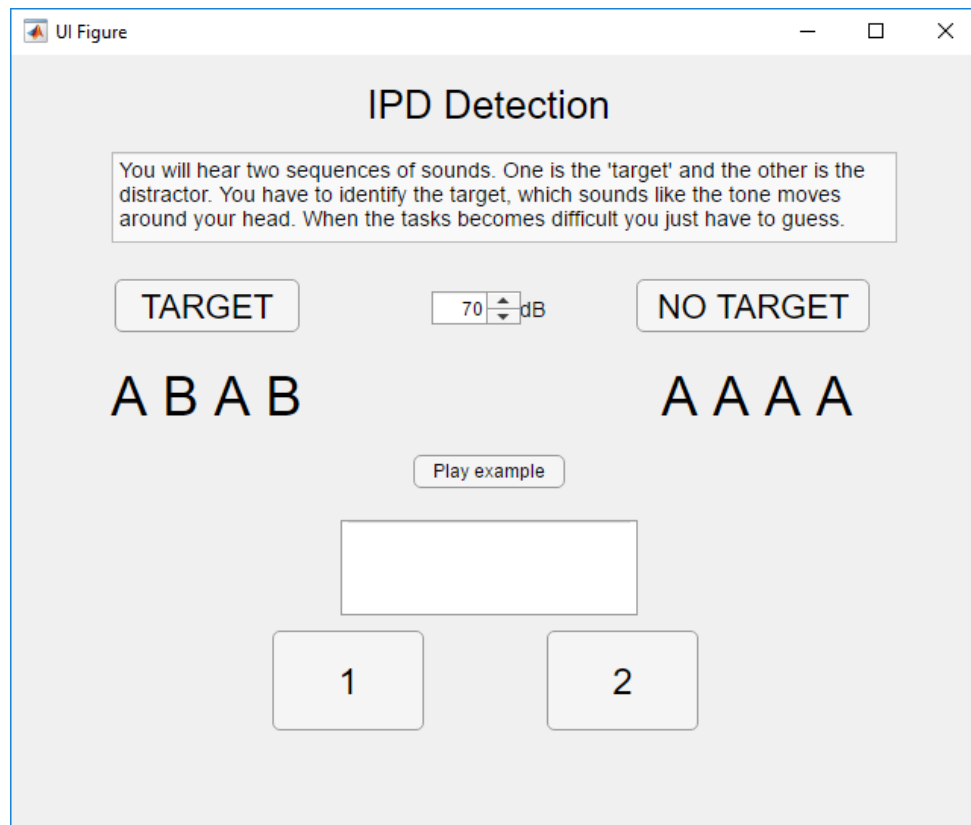


Figure 2: Graphical user interface used for the psychoacoustic measurements.

Appendix B

This appendix specifies the layout that we used for the template above. For visual consistency with other theses from SDU, we would like you to adopt this.

Order of chapters/sections

The general order of chapters and sections should be as in this template (title page, table of contents, abstract/resumé, list of acronyms, list of figures/tables, introduction, methods and materials, results, discussion and conclusions, references, appendices, acknowledgments, declaration of authorship).

Title page

SDU logo: In top right-hand corner

Title: Arial, 24 pt, **bold**, left justified, 18 pt spacing before and after

Other text: Arial, 14 pt, plain, left justified, 18 pt spacing before and after

Table of contents

The layout of the table of contents should be as in this template. Unfortunately, when you update the table of contents to reflect any changes that you made to the structure and headings of your thesis, MS Word reformats it as per the original style. So before you finalize your thesis, you need to reformat it (there does not seem to be a more elegant way). To do so, select all the text in the table of contents (except for the heading) and change the font back to Times New Roman, 12 pt. Also, change the first line indentation of the text back to 0 cm. You can do this either by going to Home → Paragraph → Indentation → Special → First line → 0 cm, or by manually moving the little arrow on the ruler above the document to 0 cm.

Numbered headings

First level: Arial, 20 pt **bold**, 18 pt before, 12 pt spacing after, left justified

Second level: Arial, 16 pt **bold**, 0 pt spacing before, 6 pt spacing after, left justified

Third level: Arial, 14 pt plain, 0 pt spacing before, 6 pt spacing after, left justified

Large unnumbered headings (e.g. Abstract, References...)

Arial, 20 pt **bold**, left justified, 18 pt spacing before and after

Flow text

Times New Roman, 12 pt plain, justified, line spacing of 1.5 lines, 1.5 cm indentation at the beginning of a paragraph, 0 pt spacing before and 6 pt spacing after each paragraph

Captions for tables and figures

Times New Roman, 12 pt *italics*, centred, single line spacing

Text in tables

Times New Roman, 12 pt plain or **bold**, centred, single line spacing, 6 pt spacing before and after

Figures and equations

Numbered and centred

Page numbers

No page number on the title page, afterwards large Roman numerals until the start of the main document (i.e. the introduction). Then Arabic numerals until the end of the thesis. All page numbers should appear at the bottom of a page and be centred.

Section headers

The chapters in the main document (Introduction, Methods and Materials, Results, Discussion and Conclusions) should have corresponding headers (Times New Roman, 12 pt, *italics*) in the top right-hand corner (e.g., “1. Introduction”).

Acknowledgements

Acknowledge any help that you got from colleagues, friends... If you want to, you can also thank your participants, supervisors, parents, goldfish...

Important: If you used any AI-tools when writing your thesis, you should mention here what tools you used and for what purpose.

Declaration of Authorship

It is essential that you fulfil all formal requirements for your thesis and that you explicitly state that this was the case. You do this by including and signing the following statement in your thesis. If you reused material from another course (e.g., the “projektorienteret forløb”), you must explicitly say so (otherwise, you can delete the concerned sentence from the text below).

I hereby confirm that I authored this thesis independently, and that I did not use any sources or aids other than those specified in the text. I hereby also point out that the introduction of this thesis is largely based on a report I wrote for another course (“Projektorienteret forløb”) with the title “.....”. Finally, I confirm that when producing this thesis, I adhered to the principles of good scientific practice of the University of Southern Denmark.

Date, name, signature