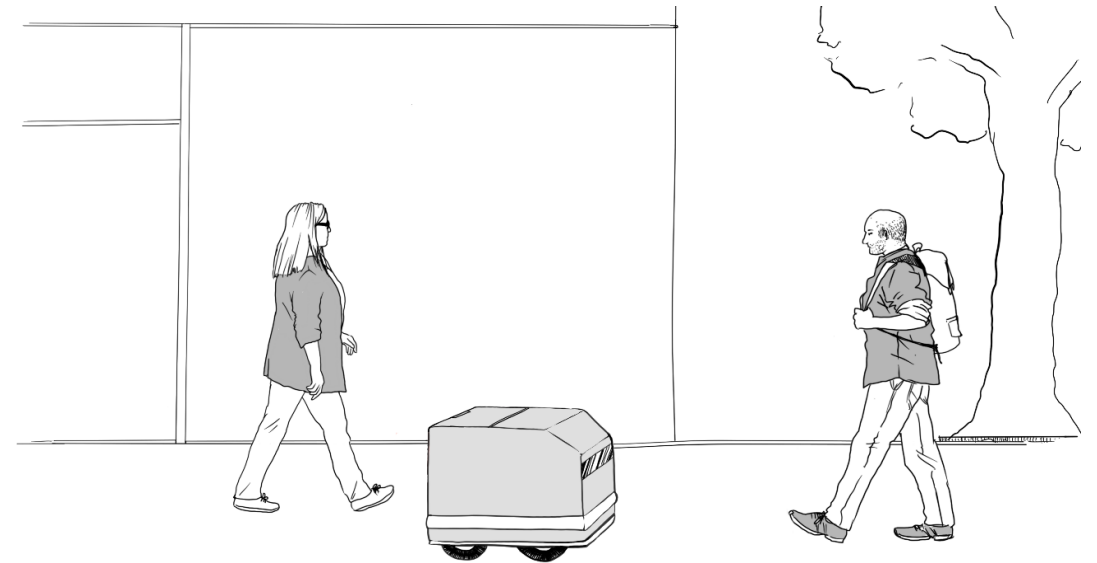


# Individuals and Technology – Advancing Seminar 2

How to write a scientific report

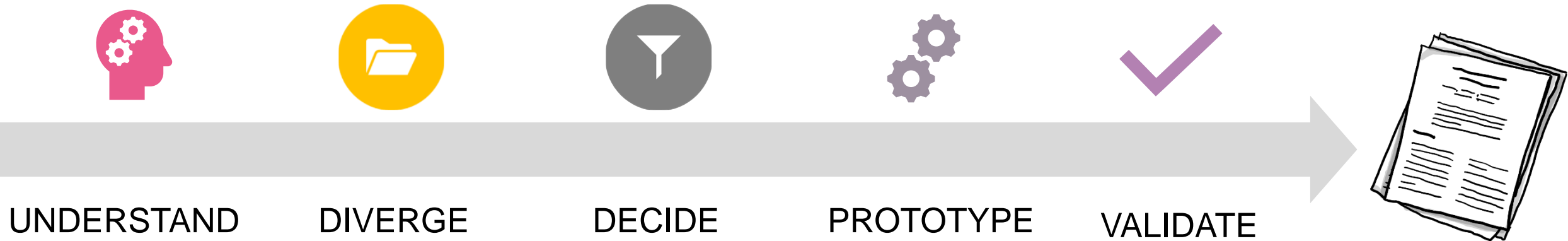
Slides are from an older seminar



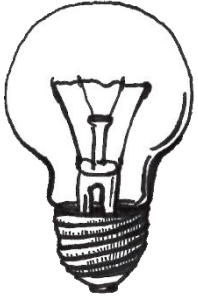
# Introduction

## At last: The Scientific or Research Report

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### What is a *research report*?



„ A **research report** is a written description of a research study that includes a clear statement of the purpose of the research, a review of the relevant background literature that led to the research study, a description of the methods used to conduct the research, a summary of the research results, and a discussion and interpretation of the results.” (Gravetter & Fozano, 2012, S. 489)

- **Highly structured** text that follows certain **conventions** of the respective scientific community
- Not meant to entertain, surprise, or confuse the reader

### Why do we write reports?

- Knowledge gains from scientific studies is meant to be shared
- In your case: Document your findings

A research report should provide information on:



(A) *What did you **do**?*

(B) *What did you **find**?*

(C) *How does your study **relate to knowledge in the field**?*

“[I]f you have kept notes or maintained a journal of your research, you have an excellent foundation for preparing a formal report.” (Gravetter & Fozano, 2012, S.488)



Abstract

1. Introduction

2. Method

3. Results

4. Discussion

References

(Appendix)

### Overall Structure

Think of an hourglass:



From the **braod** (context, related work)...

...to the **specific** (your study)...

... to the **broad** again (generalization, context, future research, ...)

### Abstract

1. Introduction
2. Method
3. Results
4. Discussion

References

(Appendix)

### Give a short overview of what to expect in your report – Spoilers wanted!

- Summarize your research report in 200-250 words
- Typically written last
- Formatting: single paragraph

Abstract

### 1. Introduction

2. Method

3. Results

4. Discussion

5. Conclusion

References

(Appendix)

### Lead your reader from the general to the specific.

- 1. Introduces your reader to the **general context** and **relevance** of the problem you want to address
- 2. Presents a **review of relevant literature** and establish an understanding of key concepts → definitions!
- 3. Lead up to and describe **your focus** within this problem – your **research question** and **hypotheses**

After reading the introduction, your readers should know everything they need to understand what you did and why. That also means: Stick only to what you need to reach this goal!

Abstract

1. Introduction

**2. Method**

3. Results

4. Discussion

5. Conclusion

References

(Appendix)

### Describe what you did (and why).

- Usual subsections:
  - **Participants:** sample size, exclusion criteria, recruitments strategy, demographic and other relevant characteristics
  - **Procedure:** research design, manipulations and number of conditions, type of study, location & setting, task/instruction, stimulus material, questionnaires, steps of the study, ethical/safety standards, assignment to conditions, payments...



Abstract

1. Introduction

2. Method

**3. Results**

4. Discussion

5. Conclusion

References

(Appendix)

### Give an overview on your data and statistical analyses.

- Start with a sentence on the outcome of the study
- Give **descriptive statistics** on your dependent variables
- Report the **inferential statistics** (results of the hypotheses tests); more on that later
- You can use tables/figures to present your results

Stick to describing your results – do not yet interpret / discuss the findings!

Abstract

1. Introduction

2. Method

3. Results

**4. Discussion**

5. Conclusion

References

(Appendix)

### Interpret your findings, their implications and applicability and discuss limitations.

- After focusing only on your own work on 2./3., you now go from the specific **back to the general**
- Start by restating in a few sentences what you did and with what results in your hypotheses (without statistics)
- **Relate your findings to existing knowledge** in the area
- **Evaluation/Limitations:** How meaningful and generalizable are your results and why?
- What should **future research** address (open questions) and how (methodological implications/learnings)?

Abstract

1. Introduction
2. Method
3. Results
4. Discussion
5. Conclusion

**References**

**(Appendix)**

**References: List all the literature you cited in alphabetical order**

- (see slide 16)

**Appendix: If necessary, include additional material**

- The appendix begins on a new page
- Includes what is relevant but cannot be presented in the report itself, e.g. questionnaires, stimulus material,...

# Form and contents

## Tables, diagrams and pictures

According to the APA style, the **caption** of a table is placed **above the table**.

### Tables

to report relevant exact data/values

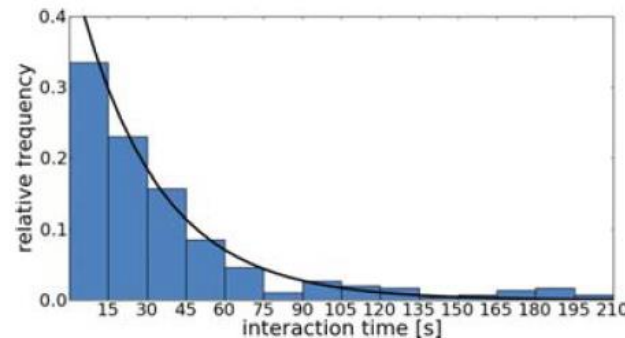
**Table 1. Statistics of interaction (SD values in brackets).**

	probability of abuse	interaction time [s]	pedestrian density [per./min]	other children [child/15s]	parents present [%]
Passage-way	0.085 (±0.0104)	45.2 (±10.70)	40.6 (±1.17)	0.78 (±0.074)	54.1 (±5.4)
Square	0.139 (±0.0110)	72.6 (±10.60)	12.6 (±0.28)	1.52 (±0.122)	50.0 (±5.0)

...whereas captions of figures are placed **below**.

### Diagrams

to show how data relates to on another (e.g. group comparisons)



**Figure 6. Histogram of interaction times.**

### Pictures

e.g. to present examples of stimulus material, show the exact study set-up or show typical findings in an observation study)



**Figure 3. Persistent obstruction.**

➡ All these elements must be **referenced** at the relevant point in the text (e.g., “see Figure 4”)

(All three images taken from Bršćić et al. (2015))

### Impersonal Style

- Use clear, objective, precise language
- Do not use literary devices, colloquial expressions, or jargon to embellish your style
- You may use *we* when reporting what you did, but not to express your personal opinion

### Consistent Use of Terms

- Avoid ambiguity: Define your key concepts in the introduction
- Stay consistent in your use of terms (if you want to refer to the same thing twice, do not use another term!)

### Verb Tense

- Use **past tense** to report
  - The studies in your theoretical background (e.g., „Several studies have investigated...“),
  - Your method (e.g., „Participants completed a total of eight runs“), and
  - Your own analyses (
- Use **present tense** to refer to your findings in the discussion („As the results indicate, ...“)

### Why cite?

- To credit ideas of others – anything else is **Plagiarism!**
- To give your reader an idea of the paradigms / research lines you are following (or not)



### How to cite:

Use some **software** to collect and cite your literature (Citavi, Zotero,..)

Cite according to the **APA guidelines**. They require you do give the **author(s)** and **year of publication** in the text. There are two typical formats:

A) Name a finding /fact, followed by the source in parentheses at the end of the sentence

In an observation study, unsupervised children were most likely to show abusive behavior towards robots (Brščić, Kidokoro, Suehiro & Kanda, 2015).

B) Name the source as the subject of your sentence; in this case, only the year of publication

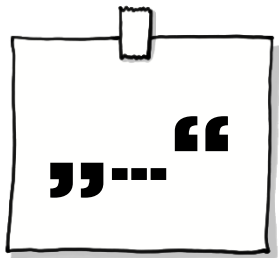
Brščić, Kidokoro, Suehiro and Kanda (2015) found that unsupervised children were most likely to show abusive behavior towards robots.

### How many authors?

- One or two authors: Name all of them each time
- Three to five authors: Name all of them the first time, then switch to ([first author] et.al., [year])
- Six authors or more: Only name the first author ([first author] et.al., [year])

### More than one references for a statement

Name the sources as described above in alphabetical order of the first authors' name, separated by a semicolon  
(e.g., Brščić et al., 2015; Salvini et al., 2010)



### Direct citations

In some rare cases (e.g. definitions), you will use the exact wording from another text  
In this case, you are required to give the page number as well (e.g., „...“ (Brščić et al., 2015, p. 60))

### How to list your references?

- Include every source you referenced in your text in your reference section at the end of the report.
- Strictly follow the **APA guidelines** (using a software of your choice and double checking the format in end)
- The format is **different for different types of texts** (journal paper, conference proceedings, book chapter, ...)



### How to report statistical data

Reports of statistical test should in general ...

- identify the type of test used,
- the degrees of freedom,
- the outcome of the test,
- the level of significance (usually report the  $p$ -value),
- the size and direction of the effect.

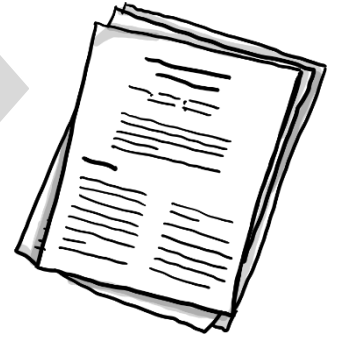
E.g., "The results indicated a significant mean difference between groups,  $F(1,36) = 4.37$ ,  $p = .006$ ,  $n = 0.12$ ."



Again, you can find **APA guidelines** on how to report results and how to report your test(s)

### At last...

- Check your text once again for...
  - correct referencing (to chapters, pages, figures, tables, sources,...)
  - consistent wording,
  - correct and consistent spelling, grammar, punctuation
  - formatting (especially if you use word)



### The Report must ...

- be 5 - 10 pages long (incl. images and table, excl. references and appendix)
- be written in English (use one standard variety, e.g. American English, consistently)
- be formatted appropriately (Arial or a comparable font in 11pt, max. 1.5 line spacing)
- include a table of contents, numbered chapters and page numbers
- Be handed in via email until to
  - as a **PDF**
  - please also attach the signed and scanned statement ("Erklärung"...) 

arvdp@humtec.rwth-aachen.de  
&  
nikolai.bock@humtec.rwth-aachen.de
- Include a **front page** that indicates
  - Your name, matriculation number and subject of study
  - **Please make sure your name is only on this front page and not on the other pages** – we want to review and grade the papers anonymously!



**Deadline:**  
28th August 2020  
23:59pm

Reports will be graded individually; the grade will make up 50% of your final grade for this course

# Thank you for your attention. See you next week!

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