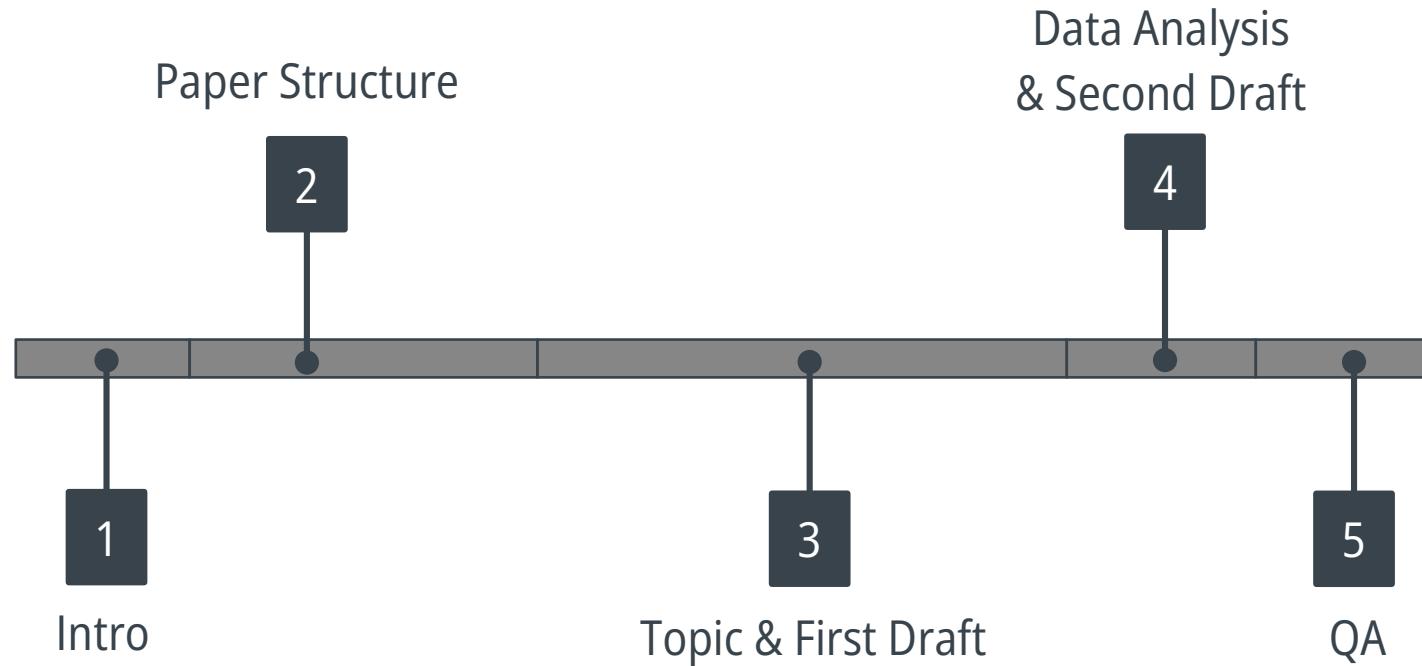


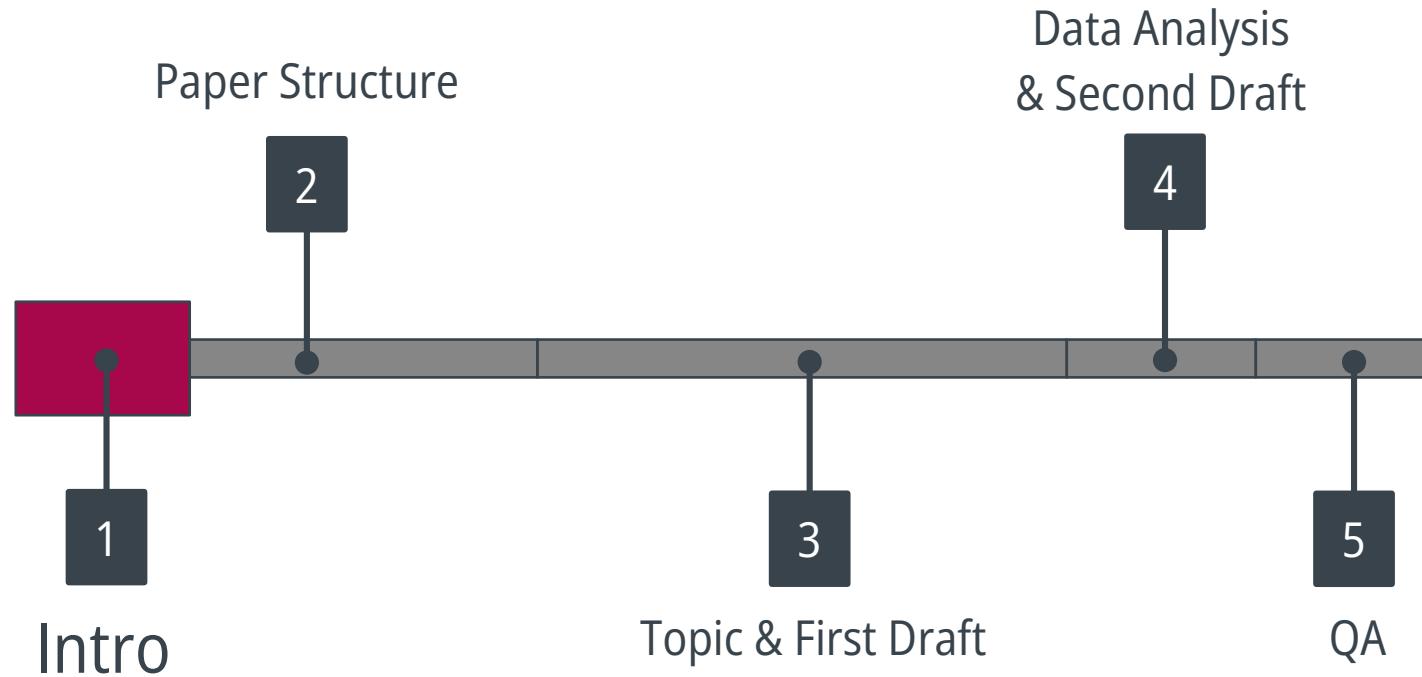
Scientific Methods & Writing 2022

Research Topic

Outline



Outline



Written assignment in SMW

- › Scientific Paper
 - › 4 pages excluding references
 - › IEEE format
 - › You can find the templates in ILIAS
 - › MS Word or LaTeX

Topic

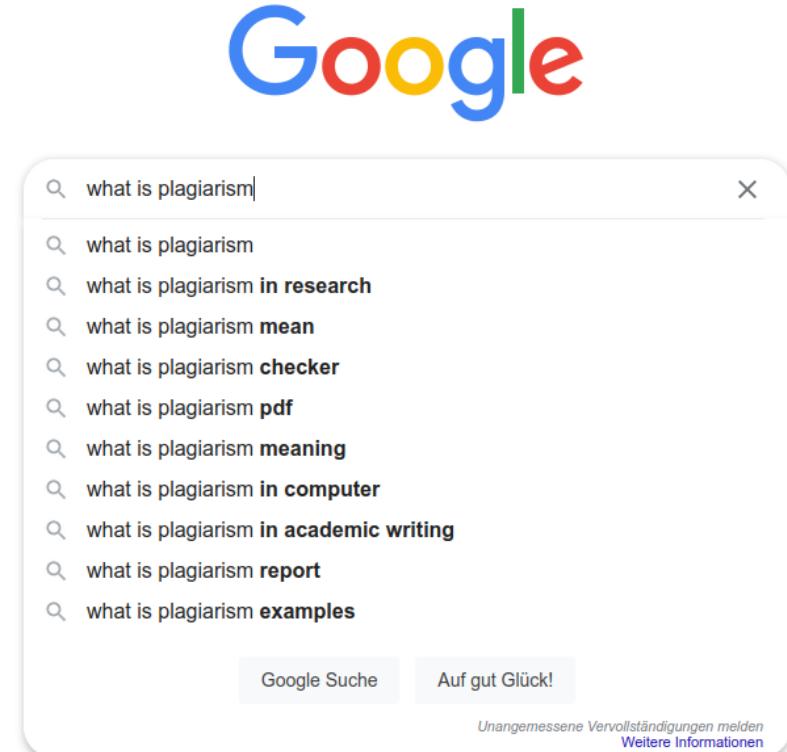
- › Assigned to you
 - › One main topic
 - › 2-3 sub-topics
 - › Choose one sub topic

Scientific work in SMW

- › Using data from a questionnaire based study
- › Designed together for entire class
 - › Explained later in detail

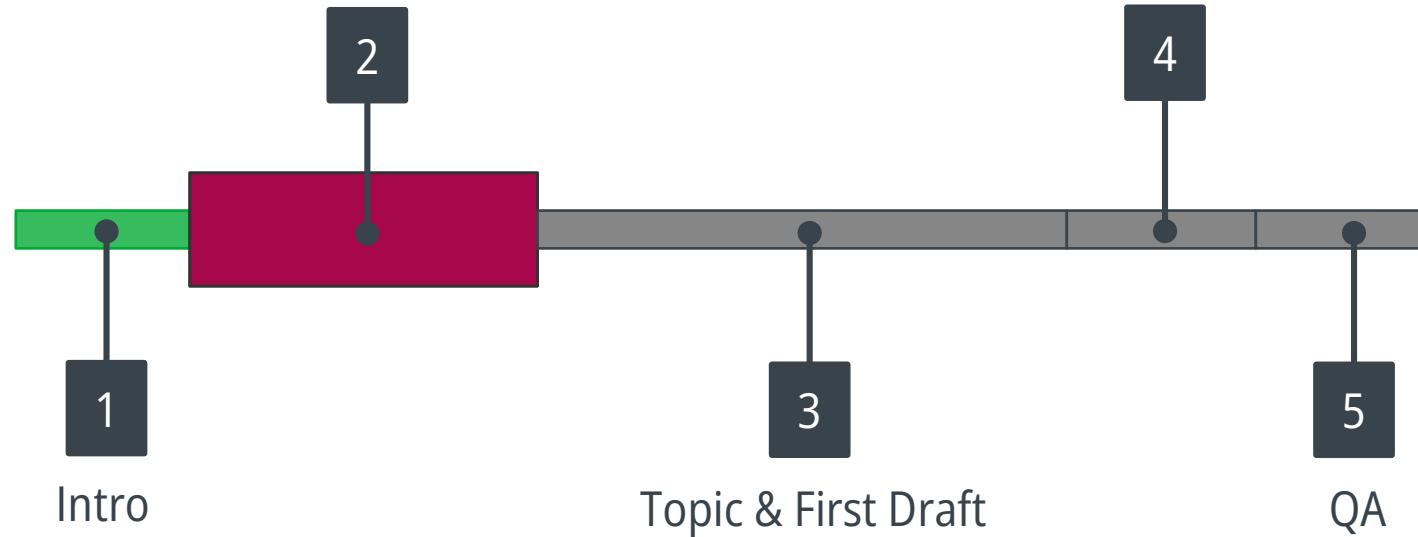
Writing Guidelines

- › Plagiarism → 5.0
- › Follow writing style
- › IEEE template
 - › Line/Paragraph Spacing
 - › Font Style & Size
 - › DO NOT CHANGE THEM!



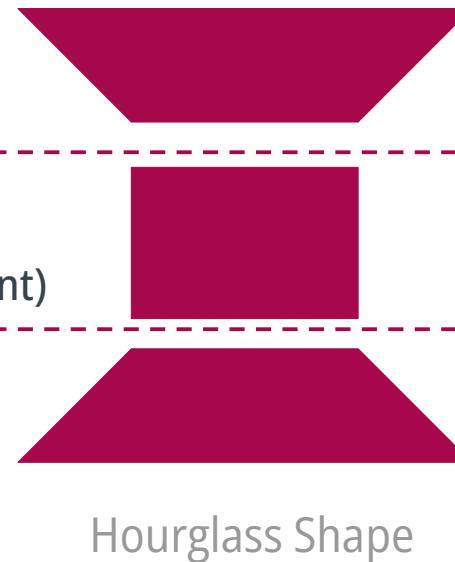
Outline

Paper Structure



Methodology

- › Parts of a paper
 - › Title
 - › Abstract
 - › Introduction
 - › Others' Past Work
 - › Authors' Work (Study Method + Experiment)
 - › Discussion
 - › Conclusion
 - › References



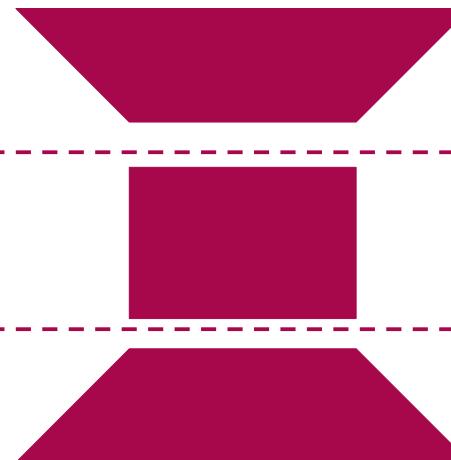
- General: why is topic important?
- Specific: investigate particular variables
- General: how do your findings impact the bigger picture?

Example: Car/Engine size & CO₂ Emissions

- › Hypothesis 1: Car size positively relates to CO₂ Emissions
- › Hypothesis 2 : Engine volume positively relates to CO₂ Emissions

Example: Car/Engine size & CO₂ Emissions

- CO₂ emissions are important in climate change
- Engine volume & vehicle size are an important contributor.
- Do larger engines and cars contribute more to CO₂ emissions than smaller engines and cars?
- What do results mean for climate change?
E.g. smaller engines and cars are better etc.

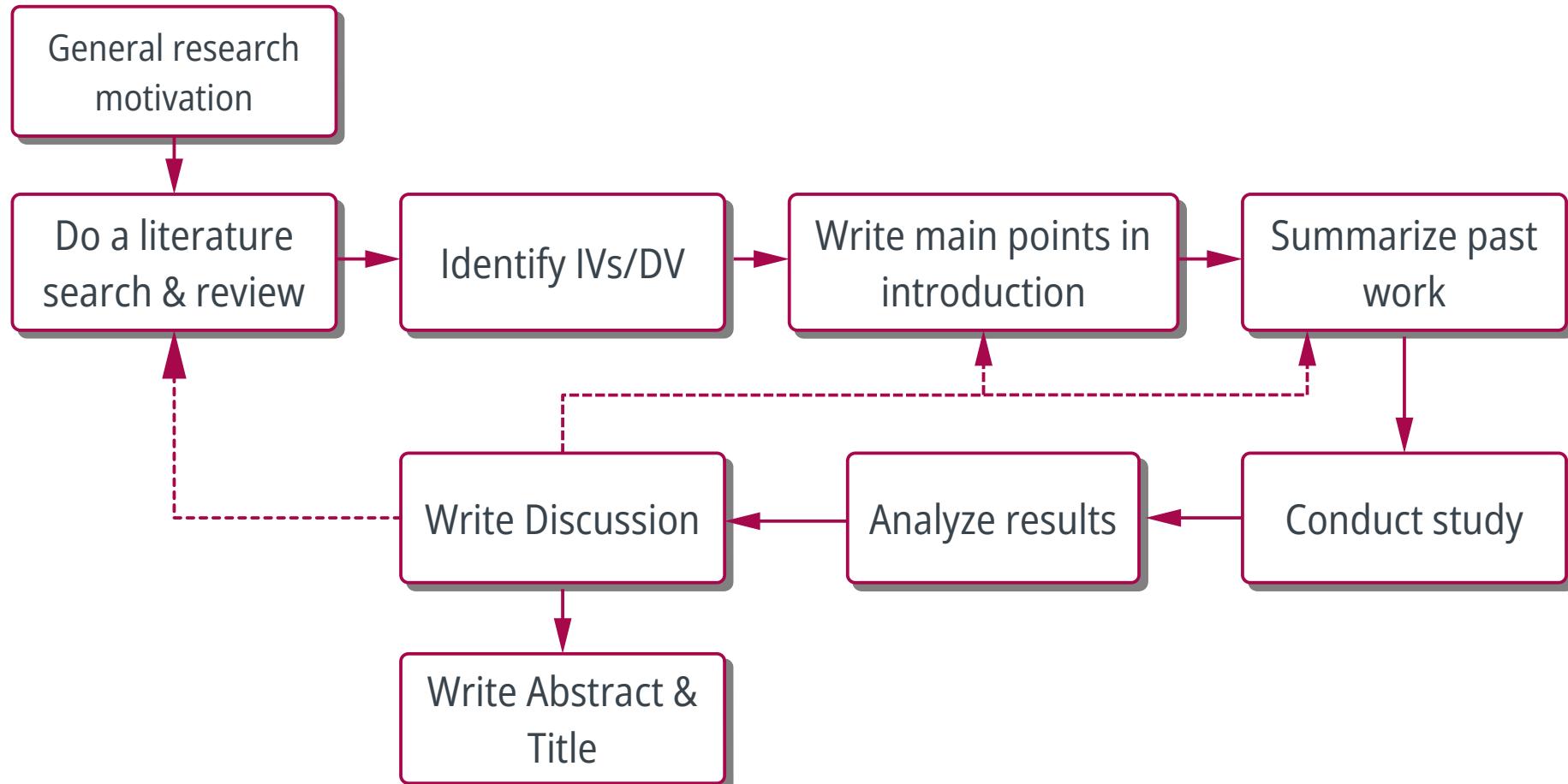


General: why is topic important?
↓
Specific: investigate particular variables
↓
General: how do your findings impact the bigger picture?

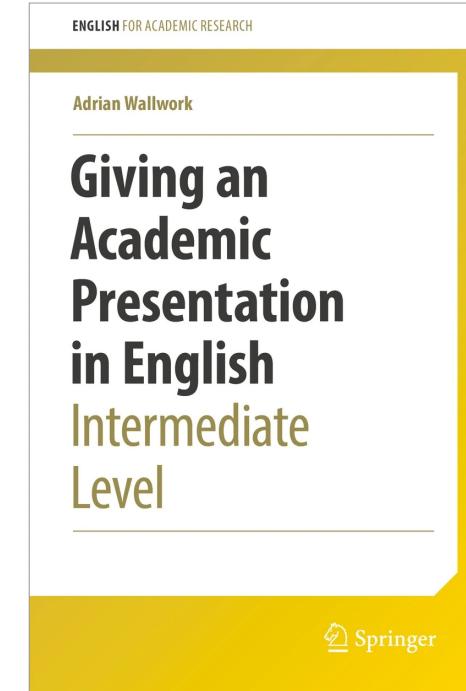
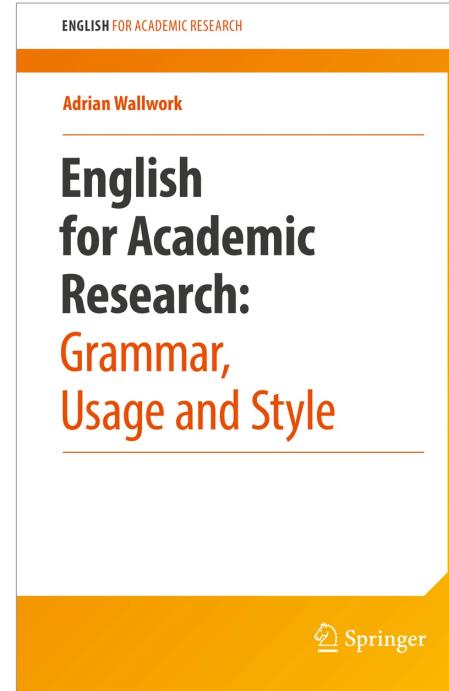
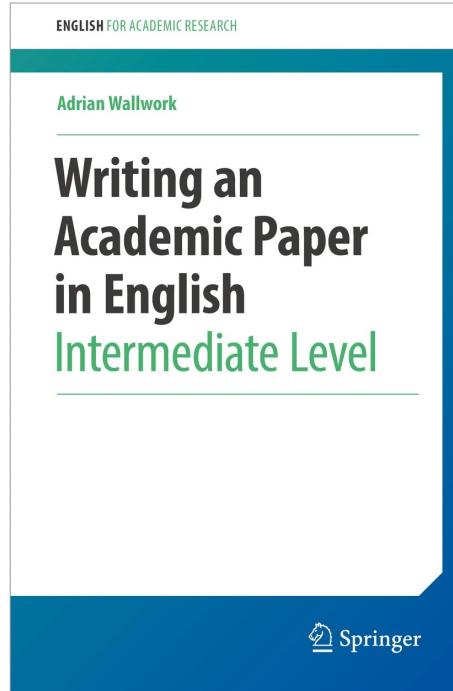
Usually

- › General topic → Big Picture → CO₂ Emissions → DV
- › Your specific sub-topic → Small Picture → IV
(Engine and Car size) → Content of your study
- › Fix the Context → e.g. Highway/City driving,
Geography, Age/Gender

Starting with unfamiliar topics

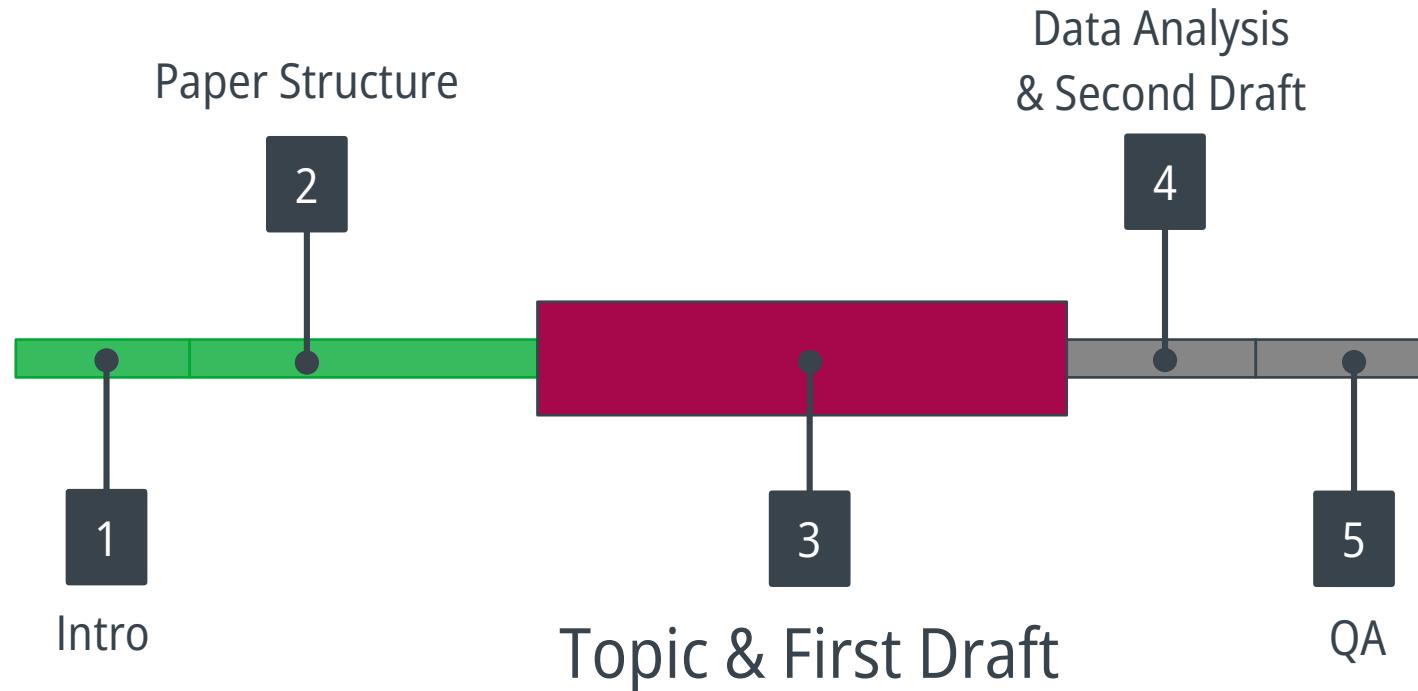


Book Recommendation(s)



Download (free if using Eduroam/VPN): <https://www.springer.com/series/13913>

Outline



Research topic for SMW 22

- › 1 Main topic → general, fixed
- › 2 Sub topics → specific, fixed
 - › Choose 1 sub topic for your paper
 - › Choose IV and DV
- › 1 Specific context → fixed

Research topic for SMW 22

Supporting employee well-being at work

Research topic for SMW 22

Supporting employee well-being at work



DEPENDENT VARIABLES

- Motivation & Goal Commitment
- Positive Emotions
- Meaning
- Growth / Competence
- Autonomy
- Relatedness

Why is well-being (W.B.) important?

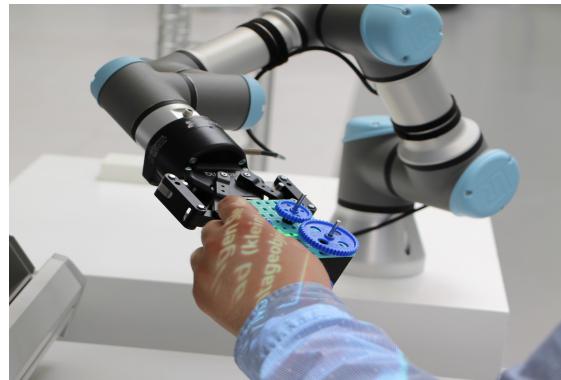
- › For the employee
 - › Positive emotions
 - › Feeling well
 - › Motivation
 - ...
- › For the employer
 - › Performance
 - › Engagement
 - › Retention
 - ...

2 sub-topics (choose 1)

- › Job/Task Feedback
 - › How to provide feedback that increases employee W.B.?
 - › Characteristics of feedback is conveyed → Independent Variables
 - › Measure of W.B. → Dependent Variable
- › Job/Task Significance
 - › How to communicate job significance to improve employee W.B.?
 - › Characteristics of how significance is conveyed → Independent Variables
 - › Measure of W.B. → Dependent Variable

Specific context

- › Working with an Intelligent Assistant in the manufacturing domain



What are Intelligent Worker Assistants?

- › Digital applications that support employees in industry
 - › Provide instructions e.g. for assembly
 - › Enhance employee knowledge
 - › Provide feedback
- › Many different ways of interaction
 - › Augmented/Mixed Reality, Robots etc.

Take a look in the smart factory!

Specific context

- › Interaction with an intelligent assembly assistant
- › How to
 - › Provide feedback in a way that supports worker well-being
 - › Present task significance in a way that supports worker well-being



Study to be conducted

- › Vignette based study
 - › We present a short hypothetical situation → not actual system
 - › In our case → working with an assistant in manufacturing, e.g. assembly
 - › Manipulate IV by designing screenshots of application
 - › Measure DV

Example: fitness app vignette

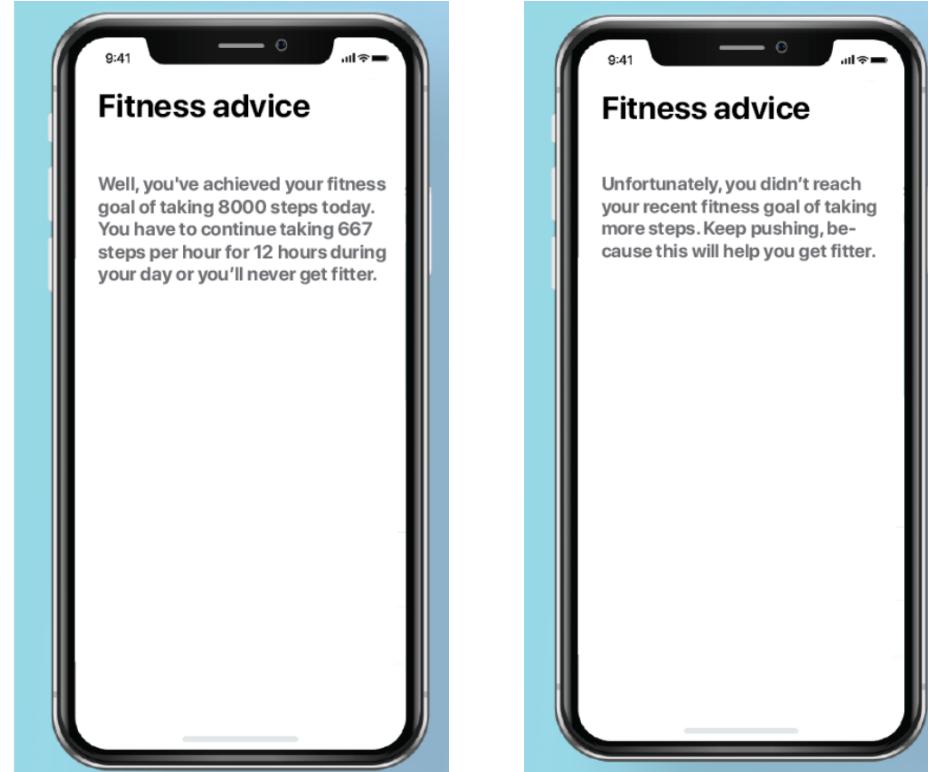
„Imagine that you have recently downloaded a fitness app, in order to become more active.

You have used it all week and have recently increased your step goal to 8000 steps per day.

You wake up in the morning and the fitness app presents you with the following feedback“

Feedback is about whether user achieved a step goal, i.e.
number of steps per day

Example: fitness app vignette



IVs are manipulated by formulating two different suggestions.
One set of participants sees the picture on the left, the other the picture on the right.

Content of feedback/significance in our context

- › Task time
- › Task error rate
- › Task quality
- › Number of completed assemblies
- › Impact on broader context
- › Use of assembled component
- › Others...

Your job for first draft

- › Perform literature review, write introduction
 - › Basic points, paragraphs not necessary
- › Identify 1 IV & 1 DV
 - › Why are they important? What did other researchers find out?
- › Create a Hypothesis
 - › Think about how to manipulate IV?
 - › Avoid variables that cannot be manipulated in our study
 - › E.g. money

After your first draft

- › We provide feedback to
 - › Refine your hypothesis
 - › Refine your IV & DV

Our job after your first draft

- › Integrate IVs and DVs
- › Create Vignettes to manipulate IV & Questionnaire to measure DV
- › Send you a link to the survey with instructions
 - › Last week November / First Week December

Data collection

- › Online software records responses
 - › ~ 10 Minutes to fill
- › Each student → send it to atleast 10 people
 - › Share it on social media: facebook, whatsapp etc.
- › More respondents → larger dataset → helps everyone

Data Collection

- › Each student receives a code
 - › Randomly generated
 - › I will upload a table in ILIAS
- › Please ask your participants to use the code when filling in the survey

Sample Distribution

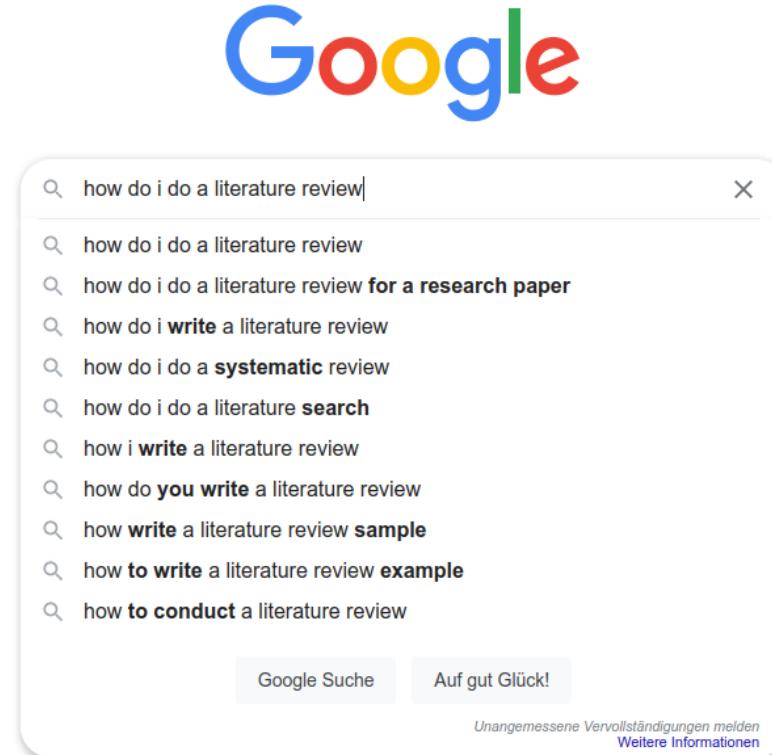
- › Keep it homogenous
 - › 50% males, 50% females
 - › 50% age group < 50
 - › 50% age group > 50

Final Data Set

- › E.g. 40 students, each sends to 10 persons.
 - › = 400 total responses for you to analyze
 - › Use the data set corresponding to your IV and DV
- › CSV file generated by survey software
 - › I will upload in ILIAS after survey is complete
- › How to analyze data → I will explain in a second session

Literature search

- › Databanks
 - › IEEE Explore
 - › ACM Library
 - › Google Scholar
 - › EBSCO Host

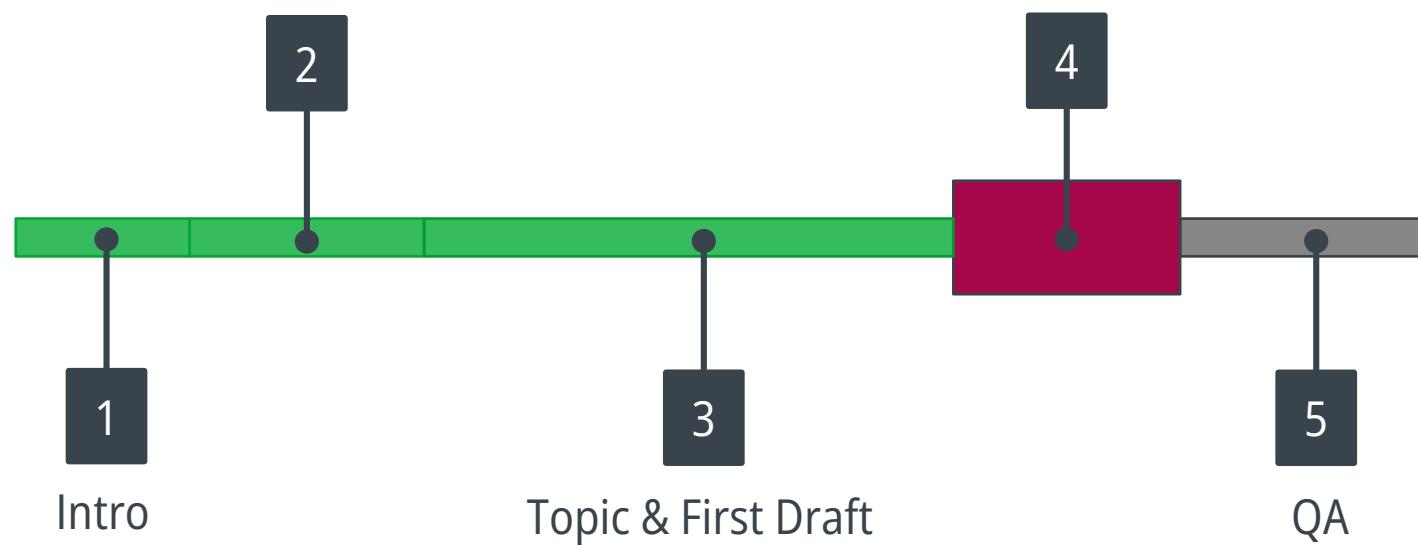


Save your references early

- › Use software such as
 - › Zotero
 - › Mendeley
- › Manually not recommended

Outline

Data Analysis & Second Draft



Data Analysis

- › JASP → Will be covered in next session
 - › Download at <https://jasp-stats.org>
 - › Free
 - › Tutorials on YouTube
- › Another recommendation is R / R-Studio
 - › Download at <https://www.rstudio.com/>
 - › Free
 - › Tutorials on YouTube and several websites

Data Analysis

- › You can also use Matlab/SPSS/Excel if you like
 - › Limited support from our side
 - › Tutorials on YouTube and several websites

Next Session

- › JASP Tutorial
 - › After study is underway
- › Not compulsory
- › 1.12.2022, 09:45 to 10:30

Second Draft

- › After completing data analysis
- › Should contain most text in prose
- › Main focus
 - › Paper meets guidelines (formatting, language etc.)
 - › Arguments flow logically
 - › References are in place
- › Feedback upon request

Outline

Data Analysis & Second Draft

