Literature Reviews

Arguments not lists

Richard Herriott, Associate Professor, ID, DSKD

CONTENT DAY 1

- 0900 -1000 **Introduction. Literature Review Lecture 1. An overview of literature review aims and methods and the relation to the research question.**
- (Break for coffee at 1100)
- **1100 – 1200 – Lecture 1 continued (26).**
- 1200- 1300 Lunch
- 1300 1400 Workshop 1 introduction. The workshop is designed to guide PhD students to placing the literature review in relation to the rest of their PhD project. Break for coffee at 1400).
- 1400-1500 Workshop 1 continued.
- (1500 – 1600 Review: students present their findings which is the expected main themes of the literature review and the implications for the research question. Plenum discussion.

CONTENT DAY 2

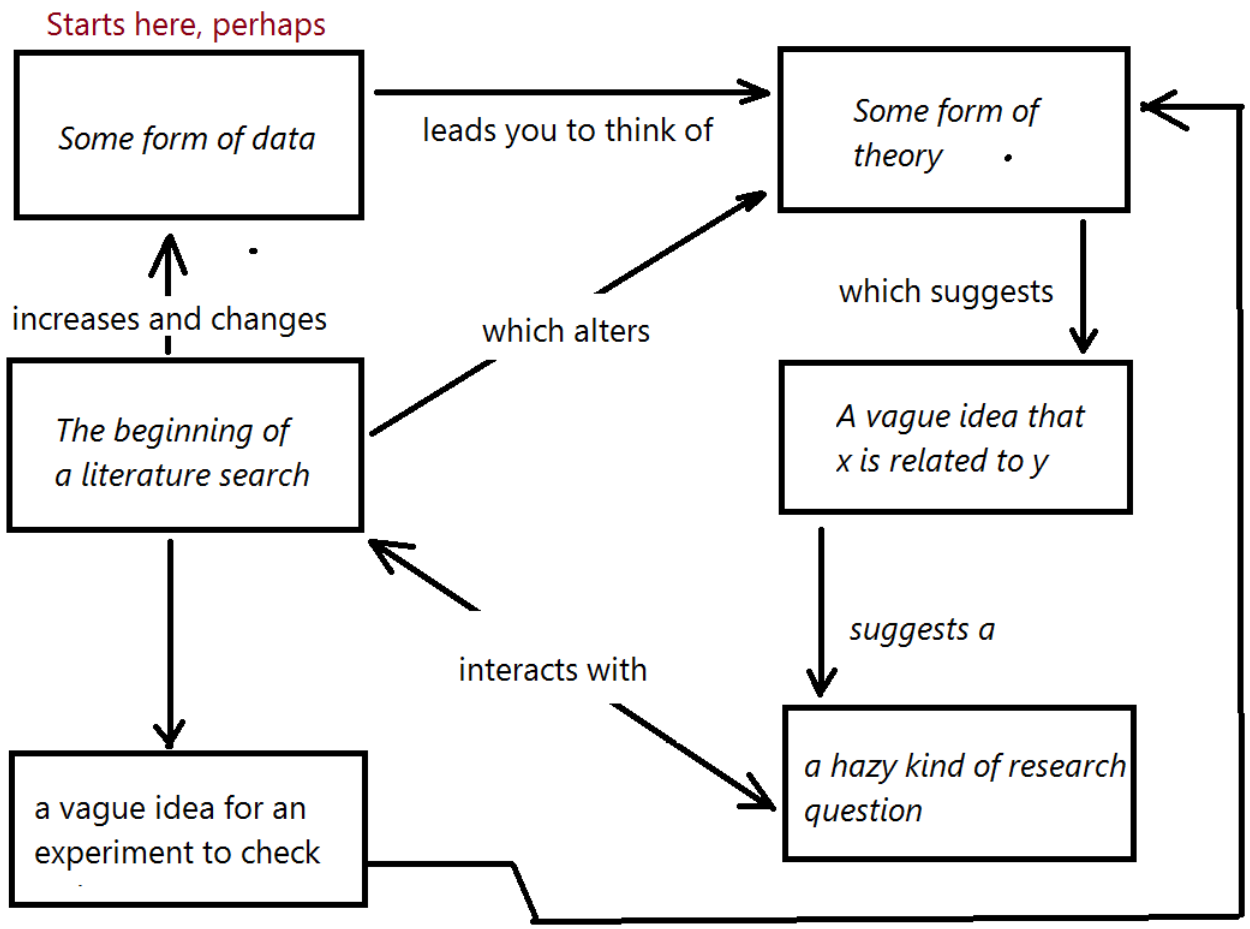
- 0900 – 0915 Introduction
- **0915 – 1100 Lecture 2. Notes and writing, examples of literature reviews in the arts and humanities (33).**
- 1100-1200 Workshop. Reading and discussing sample material from reading list (from the lecture) (Sample material needed)
- 1200-1300 Lunch.
- **1300-1400 Lecture 3. Lecture 3 Organising the literature review material, from a reticular structure to a dendritic structure (mind-map to table of contents). Approaches to data organisation (30).**
- (Coffee at 1400)
- 1400 -1500 Workshop. Applying ideas to your literature list: PhD with paper, scissors and glue. Students need to bring a print out of their literature list (on paper).
- 1500- 1600 Discussion and wrap up. Selected cases are discussed with the class. The product is a mind-map and tentative TOC-style list of articles.

Lecture 1 What *is* a literature review?

- What is a literature review for you?
- What is a literature review according to others.
- Levels of literature review.
- What´s in the literature review?
- Literature review as contextualization.
- Where does the LR go in the text?
- Where does the data come from?
- Tools for the job
- “Methodology”
- How this relates to the research question (RQ)
- Types of RQ
- Stabilisation

Lecture 1

- Literature Review Lecture 1. An overview of literature review aims and methods and the relation to the research question.



First you write a sentence

- *“First I write a sentence. I get a tickle of an idea for how the words might come together, like an angler feeling a tug on the rod’s line. Then I sound out the sentence in my head. Then I tap it on my keyboard, trying to recall its shape. Then I look at it and say it aloud, to see if it sings. Then I tweak, rejig, shave off a syllable, swap a word for a phrase or phrase for a word. Then I sit it next to other sentences to see how it behaves in company. And then I delete it all and start again.”* Joe Moran, 2018 (source)

- It doesn´t have to be like that. If you know what you want to write, it can be done with less pain.

What *is* a literature review? Ask the class…

- A structured overview of what has been written already
- State of the field
- It´s guided by the empirical foundation… and then to check hypothesis…
- Checking
- It´s a discussion with the author´s in the field
- Identifying gaps in the literature….
- Identifying your relation to given theory in supplemental areas…

What is a literature review?

- It is two things:
- 1) something you produce as in “Chapter 2 is a literature review”, the finished product of the process.
- 2) Something you do as “I am going to conduct a literature review”, as in the process that is involved in making the literature review.
- It´s *three* things
- 3) Writing a literature review involves a synthesis of a complex range of analytical and rhetorical skills as well as academic writing, and an understanding of what is meant by critical analysis and argument (Turner and Bitchener, 2008: 1)

What is a literature review?

- It is the part of the thesis where there is extensive references to related research and theory in your field; it connects the material needed to conduct your PhD and is the start point for being able to formulate the research question because it shows where there may be a fruitful gap in the knowledge of the field.
- It is a chance to position your work in relation to other researchers in the field
- And shows you have gained a credible grasp of the main themes of your field and the principle debates.
- It is an argument, a presentation of a case about the state-of-the-field.

What is a literature review?

- “Literature reviews should be succinct and give a picture of the state of the knowledge and of major questions in your field” (Bell, 2010: 112)
- “….is to locate the research project, to form its context or background and to provide insights into previous work” (Blaxter et al. 2010: 124)
- “(a literature review should) demonstrate… a fully professional grasp of the background theory to your topic” (Philips and Pugh, 2010, 64)
- the literature review is supposed to be “a coherent argument that leads to the description of a proposed study” (Rudestrom and Newon, 2007: 63)
- “The literature review is an important sub-genre of postgraduate research proposals, dissertations and theses, and also is a significant research genre in its own right (Cooper,
  1988 cited in Turner and Bitchener, 2008).
- It´s also a bit frightening. It need not be.

What level of literature review?

- We are assuming the primary purpose of this is for the PhD but we also have the shorter literature review in academic articles as part of a larger project and there is the systematic literature review which is stand-alone.

- **Academic article: sections 1 and 2:**

  Gemser, G., & Leenders, M. A. (2001). How integrating industrial design in the product development process impacts on company performance. *Journal of Product Innovation Management: an International Publication of the Product Development & Management Association*, *18*(1), 28-38.

- **Systematic literature review (the entire paper is a review):**

  Heymans, A., Breadsell, J., Morrison, G. M., Byrne, J. J., & Eon, C. (2019). Ecological urban planning and design: A systematic literature review. *Sustainability*, *11*(13), 3723. (this includes a detailed methodology)

What level?

- The arts-design PhD seems to be a mix of two levels defined by Hart (1998:15)
- MA, MSc, MPh: *"It is analytical and summative, covering methodological issues, research techniques and topics, Possibly two literature based chapters, one on methodology, which demonstrates knowledge of the advantages and disadvantages, and another on theoretical issues related to the problem"*

- PhD, Dphil, Dlitt thesis *"Analytical synthesis, covering all known literature on the problem including that in other languages… High level of conceptual thinking within and across theories, Summative and formative evaluation of previous work on the problem. Depth and breadth of discussion on relevant philosophical traditions and the way they relate to the problem.*

What´s covered?

- There are two classes of material you have to deal with.
- 1) the knowledge related to your field
  - A) Theory and models
  - B) Practice (past work and also field-related methodology e.g. co-design, or other methods and tools)
- 2) the methodological approach to data gathering and analysis which is some mix of social science and natural science-type methods.
- See: John W. Creswell: Research Design - Qualitative, Quantitative, and Mixed Methods Approaches

Why? Where?

- Your research project is part of a bigger body of work conducted in your field and you will need to position the work in relation to that.
- That is, explain not only your part in the field but the relation to the rest of the research that has been done.
- It is contextualizing your work.

Example of contextualized research

- Ludvigsen, M. (2006). Designing for social interaction. *Department of Design. Aarhus School of Architecture*.

Where in the text?

- 1) Either as one or two chapters at the start.
- 2) The recursive literature review – appropriate for PhDs made up of a number of different studies
- 3) Both (as in RH´s own PhD).

A bit more now about the various uses of the literature review (4 things)

- What are you looking for in the material you are reviewing? Answering this helps you focus your search.
  - Historical background
  - The professional language and terminology of the field.
  - Signalling the gap in the knowledge: something is incomplete or wrong in the existing knowledge; something has changed or is changing in the world and needs to be reflected in the work.
  - The significance of the problem for research.

Argument not a laundry list

- “The construction of a logical argument is central to an effective literature review, and can be defined as logical sequencing of propositions, or a logical process of reasoning, which is realized in the relationships between propositions” (Turner and Bitchener, 2008: 2)
- Often students do okay at the paragraph level but have a weak macro-structure.

Arguments look like this:

- Short structural example:

- *"It is often the case that we think thing A leads to result B. This theory is supported by X and Y, (and N, M and P, (REFs), but the theory of REF says Z; further information/data from A and B seems to support REF Z; in the light of REF C, it would seem that we might want to ask RQ? as to the validity of X and Y which up until now have been taken as read."*

Where do I get my information from?

- The literature search is a comprehensive survey of published material relevant to your work.
- How do I know it´s relevant? You don´t until you look.
- Don’t forget the library.
- Books

  Textbooks, specialiased books, reference books.
- Journal articles

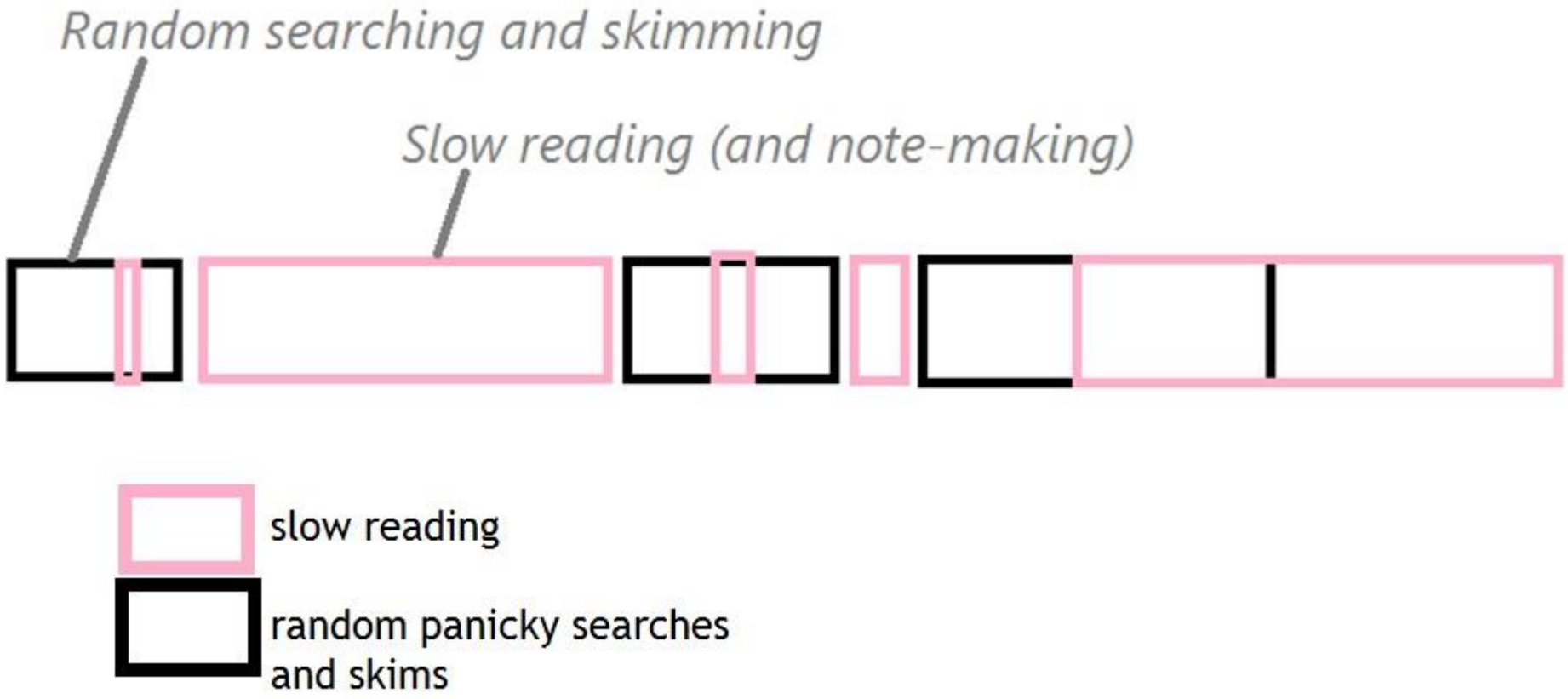
- Published literature reviews of a field
- Grey literature, (“that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers.” - Mahood et al 2014)

What tools are there for this? (7 items)

- Catalogues (Online public access catalogues e.g. Statsbibliotek)
- Bibliographical databases (Web of Knowledge, ProQuest, Index to Theses, EthOS)
- Internet search engines (Google Scholar)
- Open Access Databases (Directory of Open Access Journals)
- Professional organisation web sites e.g. Design Society
- WorldCat https://www.worldcat.org/
- More on grey literature here: https://onlinelibrary.wiley.com/doi/full/10.1111/jebm.12266

“Methodology” for random rooting about

- The literature search often starts off with good intentions such documenting word searches/keywords, the databases consulted and so on.
- Use of keywords and Boolean logic can help you in the stage where you have no clue as to which way to go.
- It ends up with random snowballing and rattling around the internet like a pinball. Often one key paper is the Rosetta stone for a topic.
- What drives this is insatiable curiosity and a panicky sense of there not being enough time.
- It is important to put in firewalls into the literature search by which I mean periods where you stop looking and start reading deeply and slowly.


Random searching and skimming
Slow reading (and note-making)
slow reading
random panicky searches and skims

Types of Research Questions (RQ)

- Contextual research questions seek to describe the nature of what already exists.
- Descriptive research questions attempt to describe a phenomenon.
- Emancipatory research questions aim to produce knowledge that allows for engagement in social action, especially for the benefit of disadvantaged people.
- Evaluative research questions assess the effectiveness of existing methods or paradigms.
- Explanatory research questions seek to expound on a phenomenon or examine reasons for and associations between what exists.
- (Ritchie et al 2013)

Types of RQ

- Exploratory research questions investigate little-known areas of a particular topic.
- Generative research questions aim to provide new ideas for the development of theories and actions.
- Ideological research questions are used in research that aims to advance specific ideologies of a position.
- (Ritchie et al 2013)

The evolving RQ and literature review.

- Eventually either the literature review ends up by finding the answer already existing or…
- it stabilizes and no amount of new reading fundamentally alters the RQ.
- The essence of the previous content is that the literature review is linked to the RQ and vice versa. As well as the matter of what your PhD is about (e.g. “it´s about adaptive vernacular architecture” there is the matter of the *precise question* you have to begin with.
- First attempts at RQs and the initial stages of reading will be messy and uncertain but whereas you can´t know if you´ve read everything you can more easily see if your RQ is meaningful, fruitful and do-oable.
- The literature review leads to a useful, neat RQ:

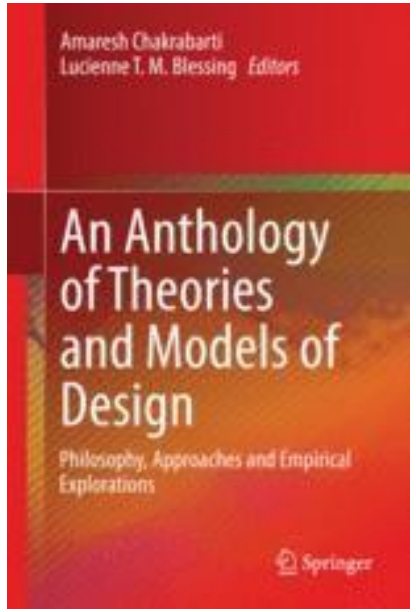
We have to connect this to the research question

- Writing a fruitful research question is a multi-stage process involving repeated checks of the knowledge against the question.
- “The primary importance of framing the research question is that it narrows down a broad topic of interest into a specific area of study” (Creswell, 2014).
- We all know that defining the problem is part of the problem.
- There is a dynamic relationship between the literature search and the research question.
- Thus as the literature review develops the research question develops and feeds back to the RQ.

This relates also to the theory

The literature review helps develop an all around view of the theory/ies.

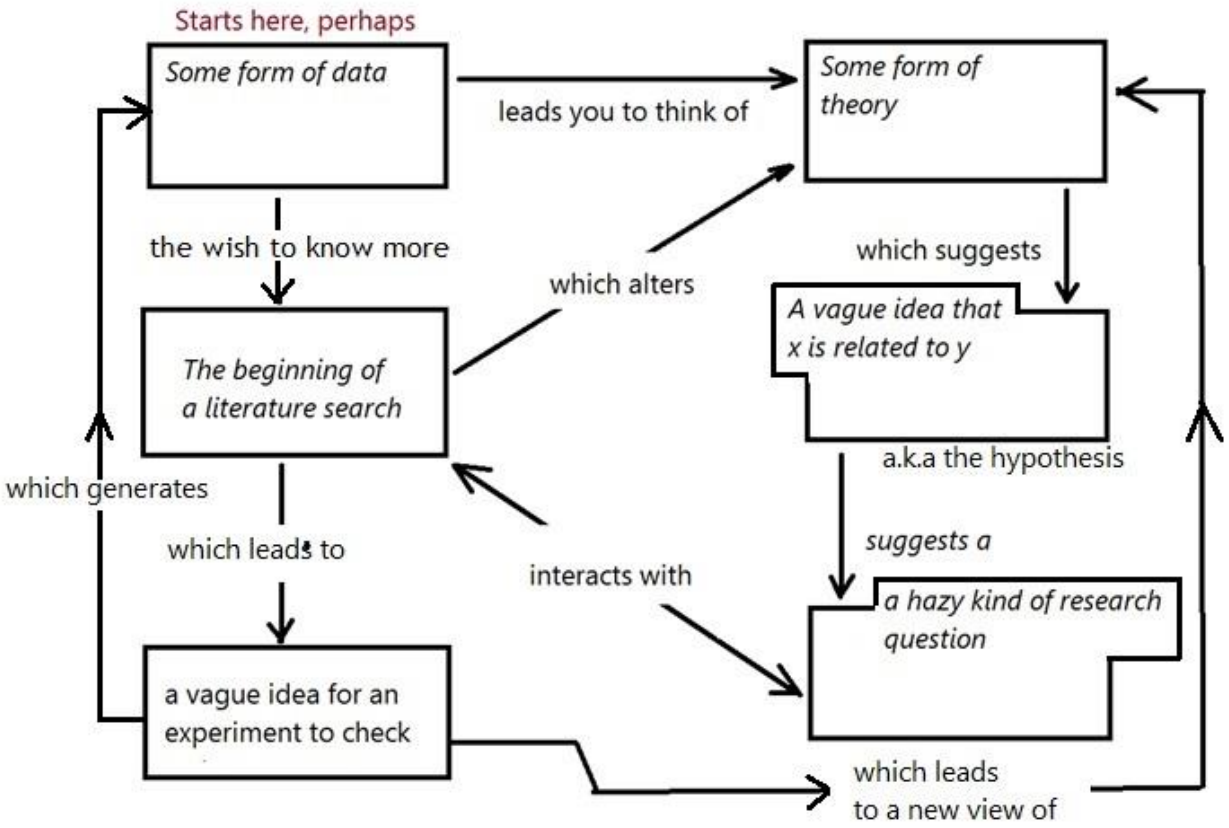
- Theory describes a set of constructs and their interrelationships, with specifically bounded explanatory and predictive power (Wacker, 2008, p. 7).
- For more information on theories in design see (Chakrabarty and Lessing, 2016).



That´s the sermon over for now…

- Next we do something…

We have to connect this to the research question – here´s that diagram again



Workshop 1

- Workshop 1 introduction. *The workshop is designed to guide PhD students to placing the literature review in relation to the rest of their PhD project*.

In the first hour we will let you work on your own and to look at the reference list you brought.

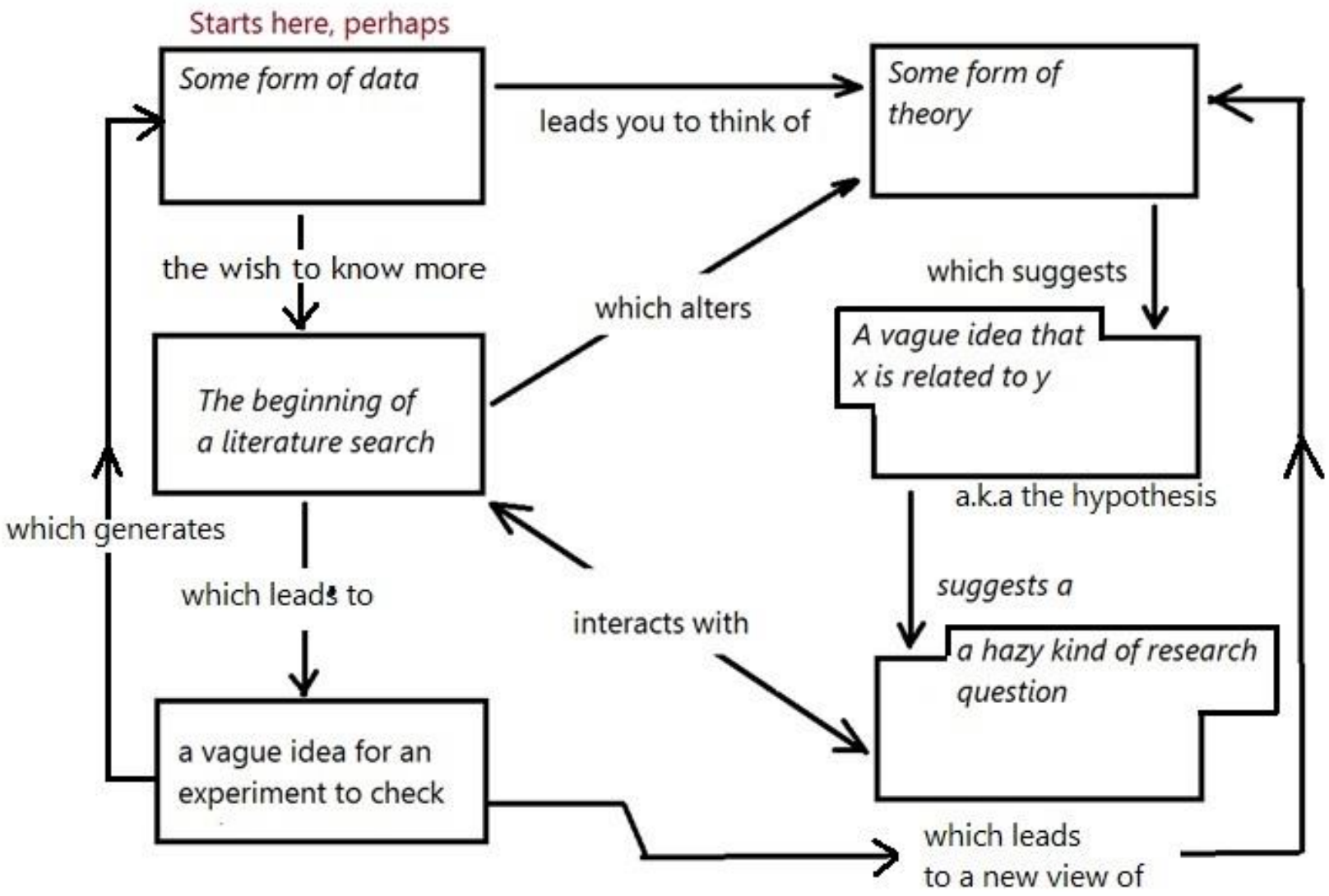
What you have to do is go back to the diagram and use it as a basis for understanding where the literature review fits into the whole structure.

Remodel the diagram to make it specific to your project.

What sorts of gaps are you filling in? Where do you think the “unknown unknowns” might be?

Where do the literature items you have related to the boxes?

In the second hour we will review the work by discussing selected examples.


Starts here, perhaps
Some form of data
leads you to think of
Some form of theory
the wish to know more
which alters
which suggests
The beginning of a literature search
A vague idea that x is related to y
a.k.a the hypothesis
which generates
which leads to
interacts with
suggests a
a hazy kind of research question
a vague idea for an experiment to check
which leads to a new view of

Discussion

- Points raised: (to be added in the class)

Summary of Day 1

- What is a literature review?
- Levels of literature review.
- What´s in the literature review?
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- Where does the LR go in the text?
- Where does the data come from?
- Tools for the job.
- “Methodology”
- How this relates to the research question (RQ)
- Types of RQ.
- Stabilisation is the rolling end point.

CONTENT DAY 2

- 0900 – 0915 Introduction
- **0915 – 1100 Lecture 2. Reading, notes and references; examples of literature reviews in the arts and humanities.**
- 1100-1200 Workshop. Reading and discussing sample material from reading list (from the lecture)
- 1200-1300 Lunch.
- **1300-1400 Lecture 3. Lecture 3 Organising the literature review material, from a reticular structure to a dendritic structure (mind-map to table of contents). Approaches to data organisation.**
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Lecture 2: Bolts, nails and nuts of reading a lot.

- Reading and note taking,
- References and reference management.
- Examples of literature reviews in the arts and humanities.

Reading and note-taking approaches

- 1.Reasons for reading
- 2. How to be efficient
- 3. Approaching the texts critically analytically and making evaluations
- 4. Strategies
- 5. Writing a summary

1. Reasons for reading

- Reasons for reading:
- Exploratory – to ascertain the lie of the land and to begin orientating yourself in the field in which you´re working.
- Focused – to home in on areas of interest as your theory and RQ evolve. This is looking in detail at the fine-grain of the subject. You also begin to delineate the shape of the topic (its chunks and joins and, of course, gaps).
- And don´t forget re-reading. You are not simply ploughing through sludge but looking to develop a good recall of the material. Also, you will re-evaluate work as time goes by.

2. Efficiency (not to be mistaken for speed)

- How to be efficient: SQ3R.
- That is Survey, Question, Read, Recall and Review.
- Survey is a general scan (top bit, end bit, references).
- Question: why am I reading this? What do I hope to find out?

  The next bits are done in manageable chunks and eventually for the whole text.

- Read in a detailed way. Allow an hour for a middling paper. Don´t hurry. Try to make connections.
- Recall: can you remember the main points of the text?
- Review: what did you read, and where was it right, wrong, puzzling or missing something.

3. Critical reading

- Approaching the texts critically analytically and making evaluations.
- Questions such as:
  - What´s the main argument the author is putting across? Can you identify a clear argument?
  - What´s the take-away conclusion?
  - What´s the evidence like? Qualitative or quantitative or rhetorical?
  - Where are the gaps and omissions?
  - What is the cultural/historical background of the author that might affect the balance?
  - Which of it can you use and is relevant? What does not align with your view?

4. Strategies for notes (a)

- The note-taking part. You are reading and writing. Inevitably you will want to write your own comments as well as record the author´s content.
- 1) Identify the main points, to aid recall, to use later, to help concentration, makes connections and organise information for writing, and
- 2) to avoid plagiarism (notes help you remember content and source)
  - You must clearly distinguish between your work and the work of your sources. You must be able to paraphrase the source for dealing with large chunks and use quote marks for sentences and paragraphs you have to use verbatim.
  - *Duggan (1973) discusses the prevalence of design failure in small scale projects.*
  - *"Out of 287 projects in Belgium (1960-1970), 88% produced unusable devices" (Duggan, 1973: p.46)*

Strategies for notes (b)

- Make them readable and intelligible as stand-alone chunks of data.
- Don´t forget the verbs.
- Bad example: Duggan – reason for small scale failure – Belgium – 88% percent failed. Funding?
- Good example:
- **Duggan, J (1973) Socio-technical challenges of small-scale design projects in Brabant. Int. Jl. Belgian Studies Vol 3 Nr 2. pp 34-49.** Duggan proposes differences in social values between Flemish and Walloon designers lead to miscommunication. The work is an ethnographic study of 12 consultancies. It points to a need for agreed work practices among stakeholders and better funding for training and eating more waffles and fries.

Strategies for notes (c)

- Clearly demarcate your words from the summarization i.e. if you have a comment put it in another colour or highlight it. These as-you-go comments can become the basis of the new text you will write.
- ***Duggan, J (1973) Socio-technical challenges of small-scale design projects in Brabant. Int. Jl. Belgian Studies Vol 3 Nr 2. pp 34-49.*** *Duggan proposes differences in social values between Flemish and Walloon designers leads to miscommunication. The work is an ethnographic study of 12 consultancies. It points to a need for agreed work practices among stakeholders and better funding for training and eating more waffles and fries.*
- *(Your comment)* Duggan´s argument is only based on the consultancies and not other stakeholders. Jeffords et al (1978) triangulated the data using interviews and the JKL Report information. Compare this with Bufford & Bafford (1980) who don´t mention the waffles or fries.

Summarisation

- This is not a matter of just boiling things down. Summaries are kind of building block for your literature review.
- Each paper you look at for more than just scanning purposes should be documented in your readings file. You´ll need to be scrupulous with the reference data (more on this later).
- “When you summarize, you explain the main idea(s) from someone else’s work. Note that you must include citation information for summaries – think of your citation as showing your reader where they can find the original or “full” version of the work that you have summarized.”

Summarisation

- “In They Say/I Say, Gerald Graff and Cathy Birkenstein describe summarizing as “putting yourself in the shoes of someone else” (2014, p. 31). They use this description because effective summarizing requires that you engage with and aim to understand someone else’s ideas or perspective, even if you disagree. It can be helpful to think of a summary as a brief description of someone else’s work that they, themselves, would recognize and consider to be a fair representation.” (source)

Summarisation: how to

- Select a short passage () that supports an idea in your paper.
- Read the passage carefully to fully understand it.
- Take notes about the main idea and supporting points you think you should include in your summary. Include keywords and terms used by the author and think, too, about how the source ideas are relevant to the argument(s) that you are presenting in your paper.
- Using only your notes, explain the original author's main ideas to someone else. Then explain how those ideas support or conflict with your own argument.
- Reread the original source. Is there important information that you have forgotten or misremembered? Is your summary very similar to the original source?
- Add in-text citation and check the required formatting style. (Source)

Example

- **Original source to be summarized**
- "Before 1994, diabetes in children was generally caused by a genetic disorder – only about 5 percent of childhood diabetes cases were obesity-related, or Type 2, diabetes. Today, according to the National Institutes of Health, Type 2 diabetes accounts for at least 30 percent of all new childhood cases of diabetes in this country. Not surprisingly, money spent to treat diabetes has skyrocketed, too. The Centers for Disease Control and Prevention estimate that diabetes accounted for $2.6 billion in health care costs in 1969. Today's number is an unbelievable $100 billion a year." (source)

Example

- **Ineffective list-like summary**
- The author says that only 5 percent of children had Type 2 diabetes before 1994. In addition, they mention that today at least 30 percent of new childhood diabetes cases in the USA are Type 2. They also say that more money is being spent to treat diabetes now - $100 billion a year.
- **Effective summary**
- In author's article “Don’t Blame the Eater,” David Zinczenko supports their position on the fast food industry by comparing today’s rates of Type 2 diabetes to those prior to 1994. David makes it clear that instances of Type 2 diabetes have increased dramatically, as has the cost of preventing the spread of this disease. (Source)

Example: conclusion of summary

- An effective summary doesn't just report source information but also indicates concisely how the ideas connect and why they matter. You will also notice that the second example mentions the name of the author and the article, which is an important way of signalling to your reader that you are referring to someone else's work, rather than presenting your own original ideas. (source)

Types of notes

- Global summary – the whole thing boiled down
- Selective summary – parts of a text picked out and boiled down.
- Diagrammtic.
- Tabular format.

Note the source.

Make a record of the main points of the text.

Rewrite the draft in a logical order

Check the original text to ensure how you summarise is accurate and representative.

Signal which parts are your own comments.

References – the building blocks of your work

- Correct and meticulous reference management is a pre-requisite of your work as an academic. It ensures that your work is distinguished from others and that the basis of your work is totally transparently registered.
- "*References are guides to evidence found in publications and documents. A proper citation enables the reader to locate that evidence*" (Friedman, 2001, p.6)

References

Managing your search is like herding kittens.

1) You could record key word searches and the target databases to avoid repetition.
2) Record bibliographical details. Bibliography is a list of material you haver read. References are a subset, the material you cited or referred to.
3) Record the bibliographical details meticulously. The project 3 years long. It will be a horror to have to try find nice quotes lost in something you found in Google books 24 months previously.

Plus: it is a formal and deadly serious requirement for transparency´s sake. The validity of your work depends on full, clear, open referencing.

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Referencing

- Find a reference standard and stick to it e.g. these

- **APA:** Herriott, R. (2019, September). What kind of research is research through design. In *IASDR 2019 Conference Proceedings. International Association of Societies of Design Research, Manchester* (Vol. 11).
- MLA: Herriott, Richard. "What kind of research is research through design." *IASDR 2019 Conference Proceedings. International Association of Societies of Design Research, Manchester*. Vol. 11. 2019.
- ISO 690: HERRIOTT, Richard. What kind of research is research through design. In: *IASDR 2019 Conference Proceedings. International Association of Societies of Design Research, Manchester*. 2019.

Referencing in text, examples

Many studies have examined the causes of boredom among PhD students (McGregor, 2002; Burberry et al., 2004; James & Bell, 2009a; Charleroi 2010; Artoo & Deetoo, 2011).

and

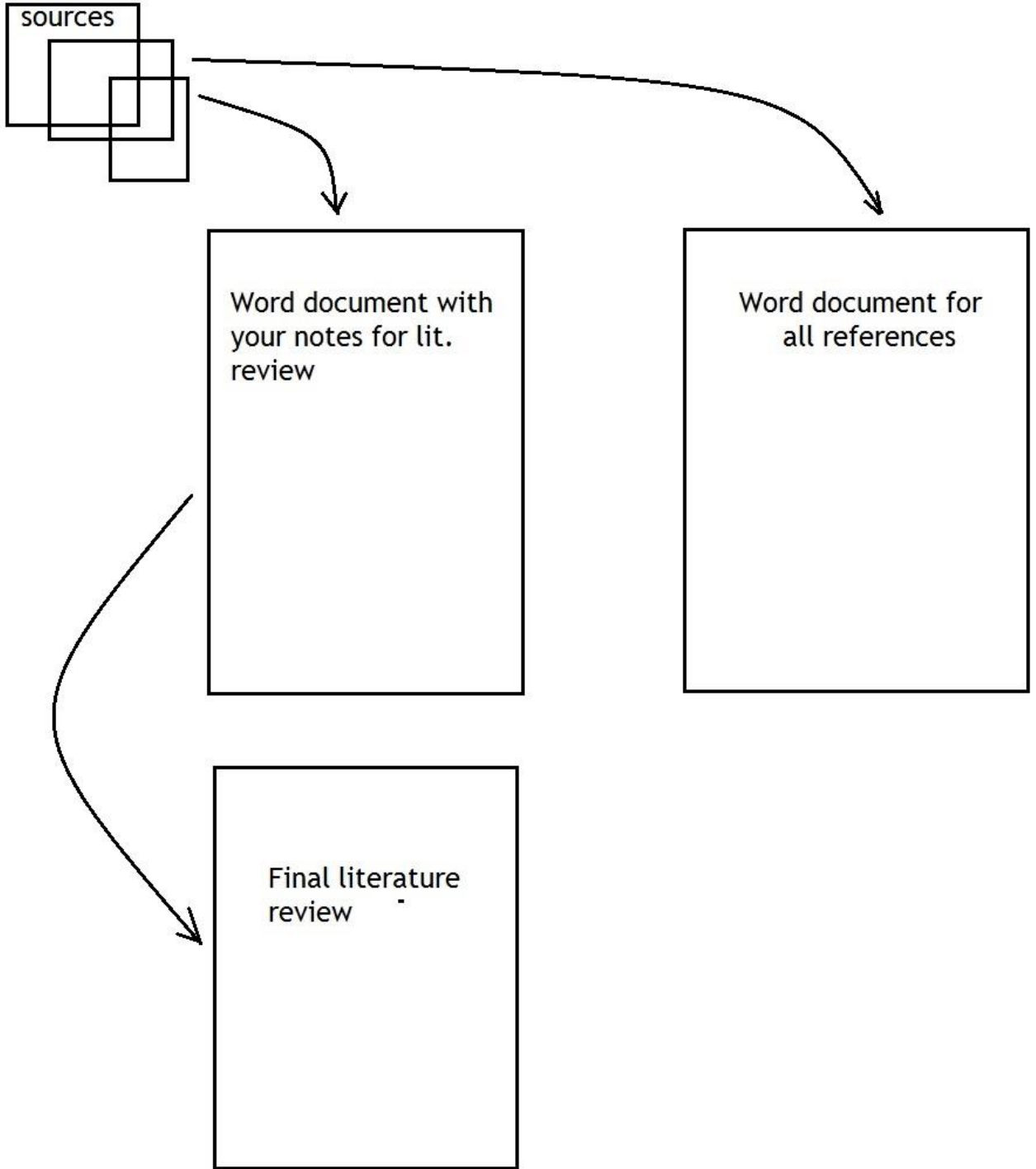
Two principle reasons have been proposed for the experience of tedium. As Charleroi (2010: 23) says ´Teacher training seems designed to make life unbearable for students´.

Among the symptoms of ennui are `a constant need to drink coffee` (Juniper, 1986 cited in McGregor 2010).

Further work was carried out to investigate the role of tonal variation in teachers´voices (James and Bell, 2009b).

Referencing

- Personal library: if you can manage this, try creating physical folders of the material you photocopy. (I couldn´t manage this)
- Organise it by themes and alphabetical order (author´s names). Use index pages to sequence it.
- When saving PDFs ensure that the file name includes the author name (a surname will do), year and short title for clarity e.g. ”Jones 1971 explains co-design limitations.” which might not be the actual title.
- But…


sources
Word document with your notes for lit. review
Word document for all references
Final literature review

Bibliographical software packages (a passing mention).

- Endnote
- Reference Manager
- ProCite
- RefWorks

- These constitute a subject fit for its own tutorial. The EndNote user manual is 600 pages long, for example. Like MS Word these seem to be more like something you explore on your own time.

Record keeping checklist

- A record of keyword searches
- Identified major databases and catalogues, journals and authors
- A meticulous system of noting reference data.
- A standard format for noting reference e.g. APA
- A scheme for categorizing themes
- A filing system
- The notes I am making include the full reference information and my own notes are visibly highlighted.

Example: Müller & Thoring 2012

- **Müller, R. M., & Thoring, K. (2012). Design thinking vs. lean startup: A comparison of two user-driven innovation strategies. *Leading through design*, *151*, 91-106.**
- Aim: "This article analyzes two different strategies that both aim at creating innovative design or business concepts based on a user-centered approach: design thinking and lean startup."
- Method: "For re-engineering the two strategies, we analyze two types of data sources about lean startup and design thinking: 1) published literature and case studies, and 2) process models for the two "different processes.

Let´s look at a literature review

- ”First, we analyze relevant literature and published case studies for both strategies (e.g. Blank (2006), Blank & Dorf (2012), Brown (2008), Brown (2009), Cooper & Vlaskovits (2010), Kelley & Littman (2001), Kelley & Littman (2005), Kolko (2011), Martin (2009), Maurya (2012), Plattner, Meinel & Leifer (2011), Plattner, Meinel & Weinberg (2009), Ries (2011), Sims (2011), and Thoring & Müller (2011a, 2011b, 2011c)).
- ”The literature review reveals that the two communities of lean startup and design thinking do not interact and cite each other very often. They use similar methods and tools, but have developed different names for them. This reveals potential for learning from each other’s strategy”.

Example: Osmond 2007

- **Identifying Threshold Concepts in Design**
- **Jane Osmond 2007. Coventry University**
- a PhD by articles and papers.
- Is about "*focus on the journey towards, and impact of the identification of,*
- *threshold concepts in industrial design. Specifically, the focus is on a threshold*
- *concept identified during the research period – 'the toleration of design*
- *uncertainty'." (p.5)*
- The literature review is a framing device at the start: "outline of the theory of the threshold concept framework and its relevance to pedagogic research" (p.6)

Another one (Osmond 2007) How the articles were set out

- Introduces the concept of ¨threshold concepts" (cites large part of the work of some key authors);
- links to another concept of personal biographies;
- defines concept and delimits it; finds a key aspect ("troublesome knowledge") and gives examples;
- introduces sub-concept ("liminal space");
- leads to the authors suggesting 9 considerations for design and evaluation of higher education Courses;
- concluding with the concept being used as a framework for further research;
- this leads to a re-statement of three research questions (devised by another author);
- links are made to earlier educational theory;
- And then follows a set of papers examining design teaching at BA/MA level.

Another example: Bordal 2018

- **Unfuzzing Design - how progress is made towards unknown Goals**
- **Sidse Bordal, DSKD, 2018.**
- “The aim of the dissertation is pursued by revising current design theory, including the concepts and assumptions by which design processes are described and understood, and by in-depth study and analysis of in-vivo design practice in an educational setting. (p.32).
- This appears to be a recursive and experimental PhD in that there are chunks of theory-laden text and sections where experiments are reported.

Part of Bordal 2018 Table of Contents

Workshop. Reading and discussing sample material from reading list

- *The workshop is designed to help see examples of literature use; be critical and practice a short bit of summarization.*
- 1) Take a look at the sample texts printed out; read them in groups; discuss the way the material has been crafted.
- What is the role of the text in relation to the main work?
- How have they used the references? (20 minutes)
- Find one of the references and see if you think on the face of it looks like a credible use of the material (about ten minutes).
- 2) Read the selected text and provide a summary in about five lines. This is a test of how you orientate yourself in the text and makes sense of it. (20 minutes)

Discussion

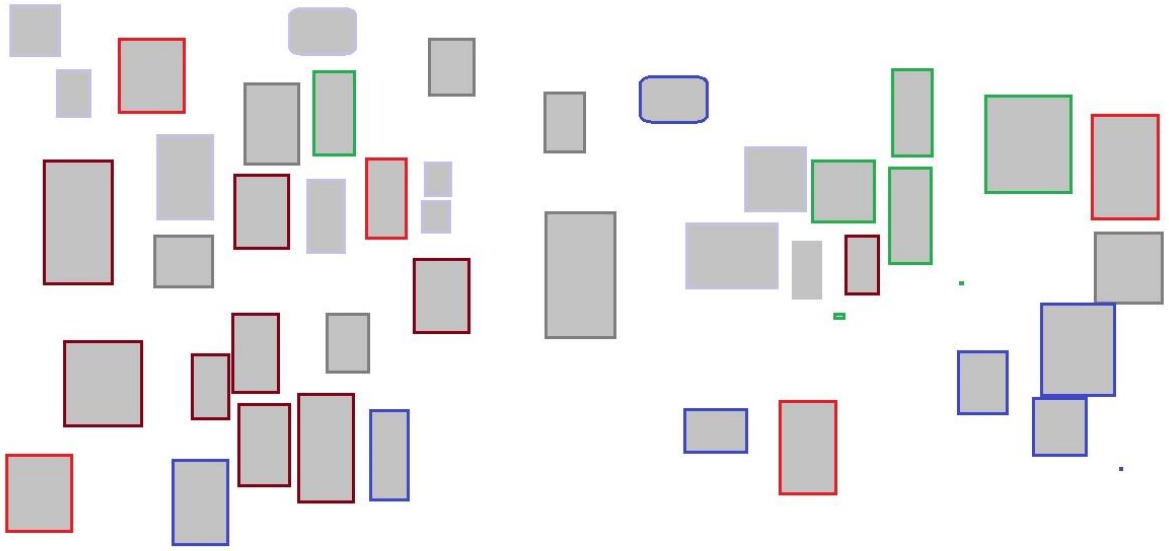
- (Let´s add some points here)

Lecture 3 Organising the literature review.

- Ontology and Mind maps
- From a multi-nodal reticular structure to a linear, dendritic structure.
- How this turns into an argument and not a laundry list.

Making the mess of reading into a linear explanation

- After you have read a sufficient amount of material, you will need to begin organising it. How do we do this?



Each box represents an item of literature

Finding relations and hierarchies

- Assuming you know and understand what each item deals with and argues for, you need to arrange the material into thematic groups.
- *"In computer science and information science, an **ontology** encompasses a representation, formal naming and definition of the categories, properties and relations between the concepts, data and entities that substantiate one, many, or all domains of discourse. More simply, an ontology is a way of showing the properties of a subject area and how they are related, by defining a set of concepts and categories that represent the subject." (Wikipedia!)*

Finding relationships and hierarchies

- One way to visualise relations is to use a mind map.

- **"-Concept mapping as is traditionally understood today was first referred to in the 1970s by**
- **Stewart, Van Kirk, and Rowell (1979)**
- *In general terms, concept mapping is a technique that can demonstrate how people visualize relationships between various concepts (Lanzing, 1996).*
- *Traditionally, concept maps have been used in quantitative research based on strict definitions in*
- *the fields of science education, engineering, mathematics, psychology, and health…*
- *Although concept maps can include labeled concepts, linking words, and clear*
- *hierarchies, they might also include other sorts of visual or graphic representation of concepts*
- *and/or propositions that attempt to convey an understanding or relationship among different*
- *concepts within a map. These might include word links, directional arrows, or just simple*
- *connectors like lines or overlapping circles (Ahlberg & Ahoranta, 2004)."*

- ***(from Wheeldon and Faubert, 2009).***

Mind maps are useful

- *“In education, they have been shown to be more effective in promoting knowledge retention than attending class lectures, reading, or participating in class discussion (Poole & Davis, 2006).*

  Furthermore, concept maps can influence concentration and overall test performance, in part because they promote interaction and engagement between the student and material (Hall & O’Donnell, 1996). It has also been suggested that concept maps are an easier way to communicate one’s knowledge than text writing (Czuchry & Dansereau, 1996).” – Wheeldon and Faubert, 2009

Mind maps

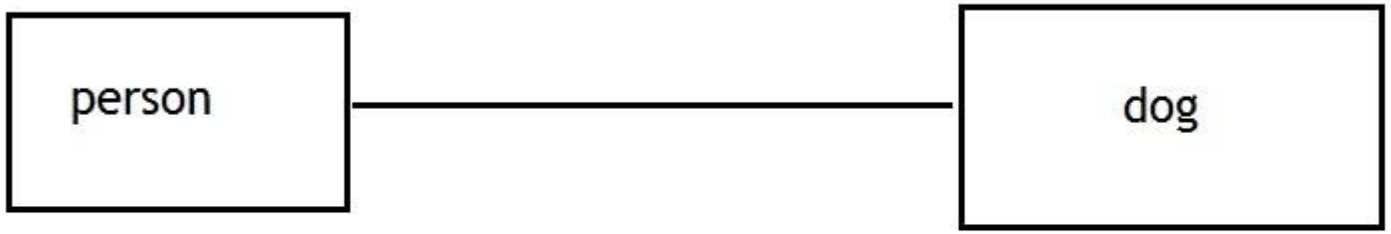
- *“Mind maps were chosen because they can represent ideas that are linked around a central theme. There are also very few rules to creating mind maps and it has been said that the main rule is simply to bring your brain and imagination (Buzan and Abbott 2005). It is this lack of rules that makes creating mind maps an easy and natural method of organising and visualising complex data, such as research methods, and the interactions among the data.*

  Furthermore, mind maps can also help people learn concepts better than traditional linear formats and note taking (Farrand et al. 2002; Williams et al. 1997)” (Crowe & Sheppard, 2012)
- Crowe and Sheppard´s paper is useful generally also in that is uses mind mapping to show the relations of research methods. Their mind maps don´t have relational explanations though.

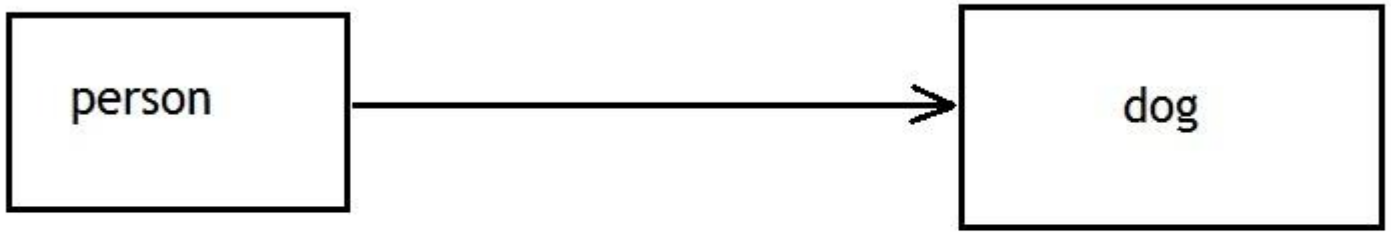
Mind maps

- *“In addition, because concept maps can be designed in a variety of ways, they may be important tools for qualitative researchers to organize research, reduce data, analyze themes, and present findings (Daley, 2004).”* – in Wheeldon and Faubert, 2009.

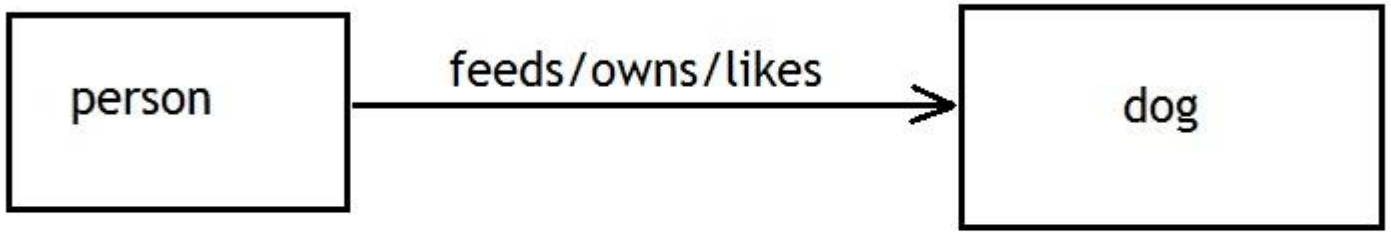
A simple mind map



A simple mind map

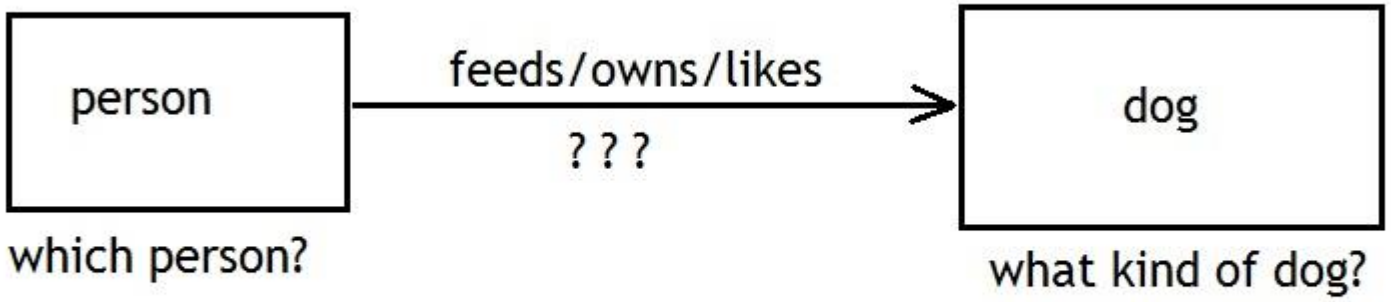


A simple mind map: affords making explicit what we think…

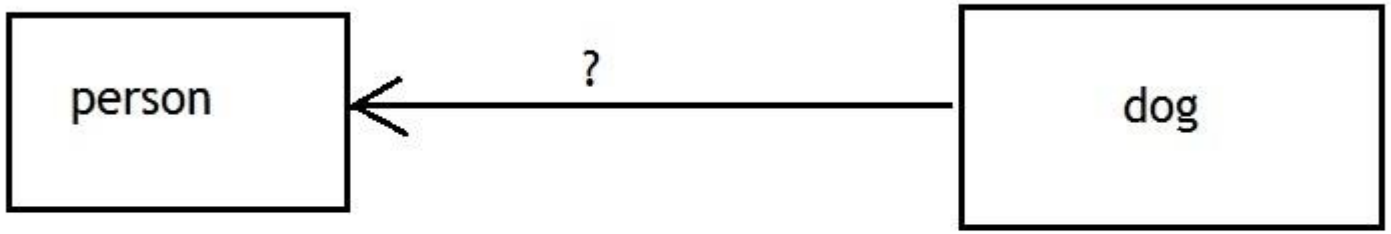


"The knowledge in concept maps is mostly presented in form of relations between the concepts (Novak and Gowin 1984) – as propositions (…SEA has SANDY FLOOR). Since relations between nodes within (fuzzy) cognitive maps are established by (fuzzy) rules, it is vital to rebuild the concept structure and to add new causal relations." - (Mls, 2004)

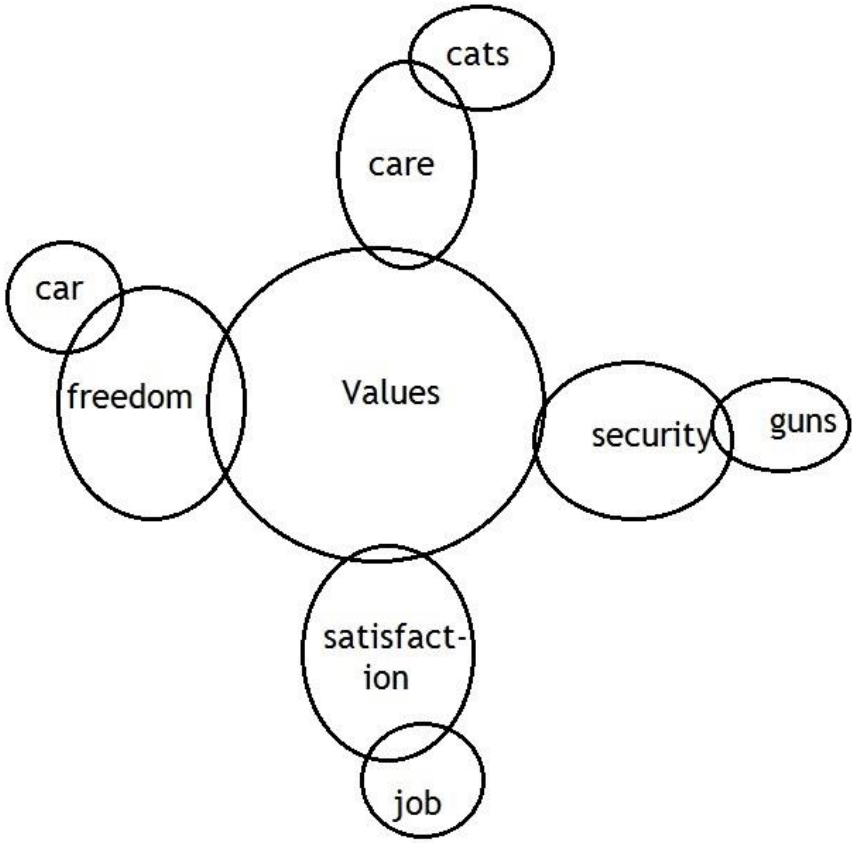
Or do we?



Simple mind map: affords identifying unknown relations



Not such a useful mind map



Mind maps: how about this material?

- Wacker, J. G. (2008). A conceptual understanding of requirements for theory building research: Guidelines for scientific theory building. Journal of Supply Chain Management, 44(3), 5e15.

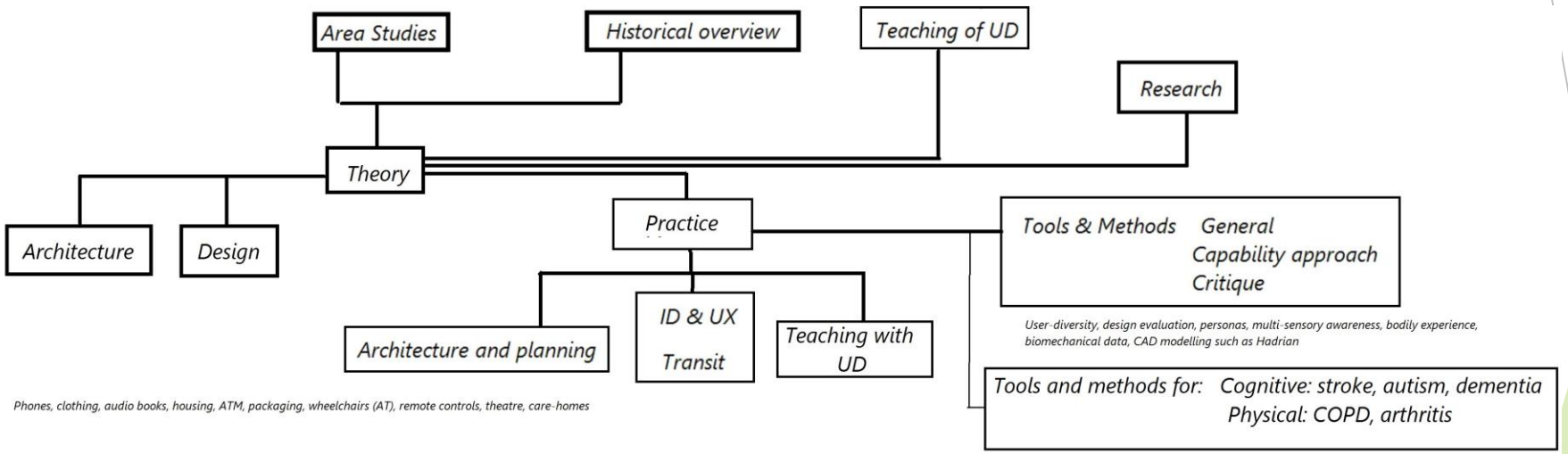
- Chakraborty, A., & Blessing, L. T. (2016). *Anthology of Theories and Models of Design*. Springer London Limited.

- Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (Eds.). (2013). *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. Thousand Oaks, CA: Sage. http://jbposgrado.org/icuali

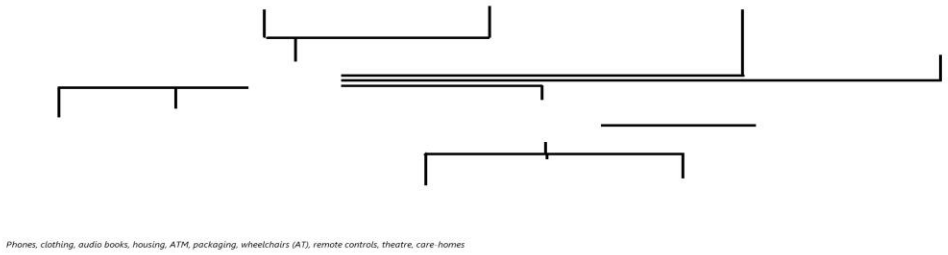
- Friedman, K (2001) Reference, argument, and evidence How good referencing and citation serves design research and professional design practice. Working paper, Stoke-on-Trent.

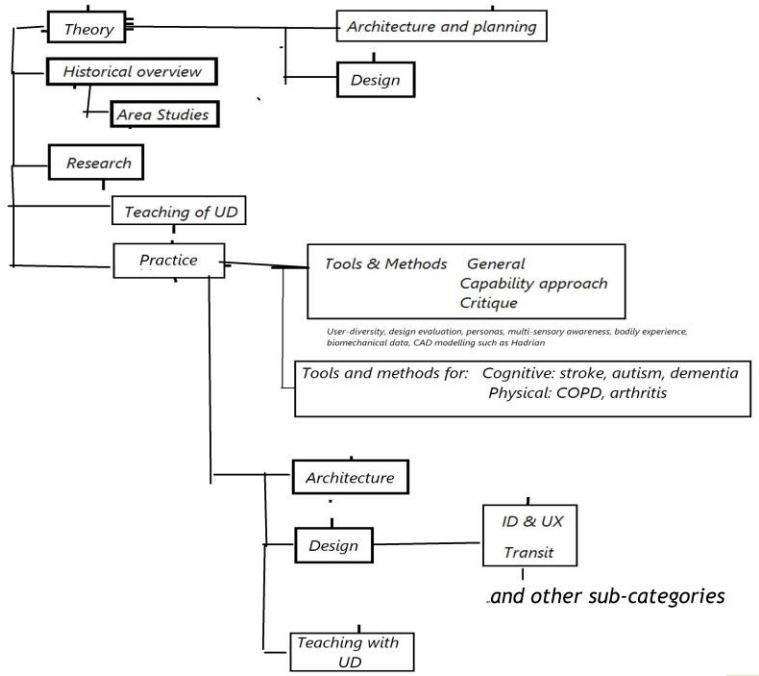
Ludvigsen, M. (2006). Designing for social interaction. *Department of Design. Aarhus School of Architecture*

Mind maps: Here´s one I made earlier

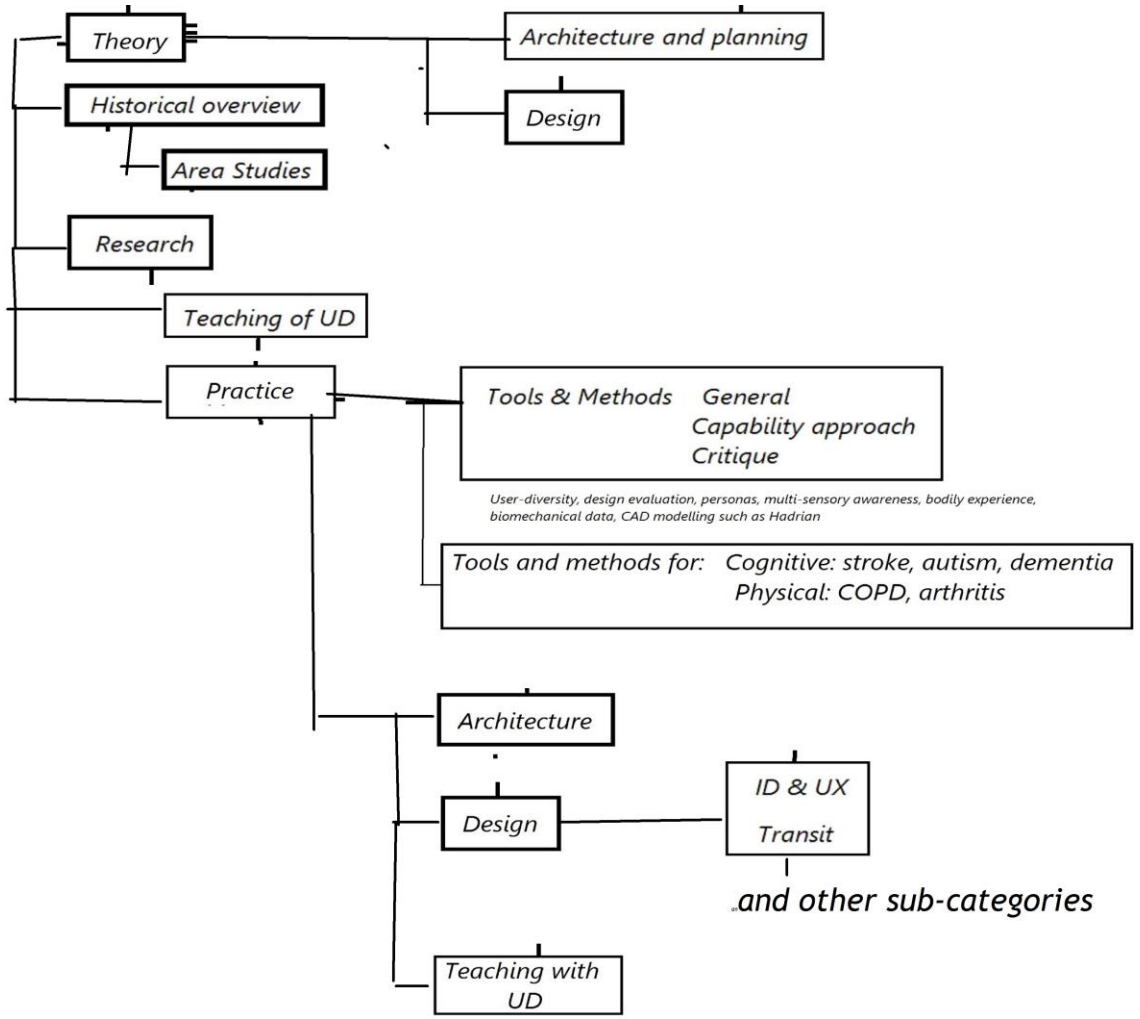


Mind map turned into a dendritic form





Mind map turned into a dendritic form



The next step is to make that into a TOC

- The dendritic form allows you to set out the sections thematically. It also allows you tell the reader what is happening in the explanation: "meta discourse links"
- The original UD mind map was not very interconnected (multi-modal) so it was comparatively easy to un-link it into a dendritic form.
- In certain sub-sections of your themes it there will be more connections meaning you may need to use bridge sentences such as *"Although this subject X is connected to A and B and to C, I will deal first with C and return to A and B below in section, 2.3"*

Putting it all together

- You have read a lot of material (and kept scrupulous notes of reference sources).
- You have organised it into themes on a preliminary basis. It is non-linear at this point.
- You make a mind map (with explanatory arrows) – still non-linear.
- The reticular mind map is converted to a dendritic, linear diagram (this is the argument´s structure). The TOC is derived from the linear diagram
  - Section 1
    - Section 1.1
    - Section 1.2
    - Section 1.3 etc

Workshop 3

- This workshop is designed to get you to engage with the content of your reference list and to organise it from non-linear mess into a linear, dendritic structure.

  Get out your literature list.

  Chop it into pieces, one piece per reference

  Set it down in themed groups.

  Arrange the groups in a mind map.

  Convert the mind map into a dendritic tree.

  Turn that into a sequence of sections in a way that supports an argument leading to your RQ.

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- (grey literature) https://onlinelibrary.wiley.com/doi/full/10.1111/jebm.12266

Some reading material

- https://hedgehogreview.com/web-features/thr/posts/field-notes-of-a-sentence-watcher
- https://guides.lib.uoguelph.ca/c.php?g=130964&p=5000948
- Schirmer, B. (2018). Framework for conducting and writing a synthetic literature review.
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