Knowledge Mapping for Literature Reviews: A Science of Conceptual Systems Approach

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Basics of Literature Review

1. Choose a topic *(whatever makes you happy)*
2. Choose key papers *(whatever makes your supervisor happy)*
3. Synthesize “existing knowledge” *(often fuzzy!)*
4. Use that synthesis as a base for your study
One Simple Assumption

If we live in a world of systems that world would be best understood using theories that are systemic
This approach will help you to:

- Re-think what you think you know
- Organize information
- Clarify research question
- Understand the literature
- Synthesize theories
- Accelerate the advance of science
- Communicate your research findings in a visual way to facilitate learning
- Communicate research findings in a structured way to facilitate learning
- Support collaborative decision making for effective action.
Definitions

A **theory** is a set of interrelated propositions.

(useful for understanding and engaging the world)

A **proposition** is typically made up of concepts (which are, or may be used as, variables) and connections. For example:

The **more** CATS you have, the **fewer** MICE you will have.
Importance of Causality

- Improves Understanding (Johnson-Laird, 1980)
- Useful for Creating Knowledge Maps (Axelrod, 1976)
- Best Path for Scientific Understanding (Pearl, 2000)

**KEY: Nothing Happens Without Causality. So... Causality enables application.**

Let’s remember to differentiate between “simple causality” (leads to unanticipated consequences) and “complex causality” (really confusing – but that’s why we’re here)
Where to find a theory in a journal article:

NO:
- Methods
- Data
- Abstract

YES:
- Theory
- Literature Review

SOMETIMES:
- Diagrams
- Discussion
- Introduction

KEY: You are looking for propositions
Complexity researchers have identified three qualities that distinguish positive self-organization from non-self-organized processes: self-referencing, increased capacity, and interdependent organizing. The more of each of these qualities, the more self-organized the emergent order will be, and the greater the resulting performance.
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Activity #1:
Creating Maps From Text

- Read Theories
- Identify concepts
- Identify causal connections
- Draw maps

Then...

- Share your results with others
  - Did you get the same results?
  - Does the whole process make sense?
This is what SYNTHESIS is all about
Activity #2: Synthesizing/Integrating Maps

• Connect with another group
• Share maps
• Look for same/similar concepts where maps might overlap
• Redraw... or somehow creatively connect them
Clarifying research questions

Where are the loops?

Poor Understanding – What causes this?

Is each casual relationship supported by good research?

What if we “drill down” explore this concept – and create a map just for it?

What new concepts might be added?

What if we “drill down” explore this concept – and create a map just for it?

Good understanding – no need for more research (“transformative“ – multiple independent variables, dual description, dialectic)

What causal arrows might be found with primary research?
Synthesizing multiple theories

Theory #2

B

C

Theory #3

B

A

Causes More

Causes Less

Y

X

Causes More

Z

Theory #1

Y
Activity #3: Identifying directions for research

1) Look at your maps.
2) What gaps exist in the structure?
3) What research might you do to fill those gaps?
IPA (Integrative Propositional Analysis)

Divide the number of concatenated concepts by the total number of concepts

Number of Concatenated Concepts = 1
Total Number of Concepts = 3

Systemicity = 0.33
(result of one divided by three)
Total Number of Concepts = 5
“simple complexity” or Conceptual Breadth

Number of Concatenated Concepts = 1

Systemicity = 0.20
(result of one divided by five)
Showing Progress in Creating Knowledge
(not simply adding to dusty “storehouse” of human knowledge)

We will find our theories increasingly useful / effective as we move them toward this quadrant

Most theories of the social sciences are down here
Platforms

Paper and pen – tabletop ASK MATT Solutions
https://kumu.io/ - great for presentations
https://insightmaker.com/ - easier to use
Resources

• More detailed webinar: https://www.youtube.com/watch?v=-15wyiyaiZQ


• Range of related publications: http://meaningfulevidence.com/publications

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Thank You!

Questions & Conversations

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Bonus Content
False Focus on “data”

KEY: Data is not enough.

Without structure, we loose reasoning ability
Data or Structure?

Addresses
Coherence or Correspondence?

- Availability
- Environmental impact
- Style
- Price
- Color
- Happy wife

(Concetto, Variabile)
Importance of Concatenation

Empirical Base

Concatenated structures support good empirical research (results are more reliable with more independent variables).

Philosophical Base

- Dual description
- Dialectic
- Multiple variables
- Partial Cause
Loops: Where can you find sustainable success?
Leverage Points
Where your efforts can have the most impact
Util: Finding “core” & “belt” of a theory

“Core” concepts are those with MORE connections

“Belt” concepts are those with FEWER connections

Suggests which areas are better known (core) or need more research (belt)
Seek similar levels of abstraction (or categorization)

To create, improve, or repair an automobile or a knowledge map it is important to choose “parts” on the related steps.

KEY: We make better knowledge maps if are concepts are at a similar level of abstraction.