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Downes, Stephen

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Digital Research Methodologies Redux

Stephen Downes

May 23, 2014

Caveats

- This is a report, not a prescription
- I'm not arguing – at best, I'm *explaining*, but not in the sense that you can generalize from that

The traditional view

The steps of the scientific method are to:

- Ask a Question
- Do Background Research
- Construct a Hypothesis
- Test Your Hypothesis by Doing an Experiment
- Analyze Your Data and Draw a Conclusion
- Communicate Your Results

Via *Science Buddies*

http://www.sciencebuddies.org/science-fair-projects/project_scientific_method.shtml

See also: <http://philosophy.hku.hk/think/sci/hd.php>

Research Methods

This model is pretty much the core of most research methods

- Design Research

http://depts.washington.edu/rural/RURAL/design/sci_method.html

- Observational Research

<http://www.public.asu.edu/~kroel/www500/Observation.pdf>

- Qualitative Research / Grounded Theory

<http://www.edu.plymouth.ac.uk/resined/qualitative%20methods%202/qualrshm.htm>

http://www.methods.manchester.ac.uk/events/what_is/gt.pdf

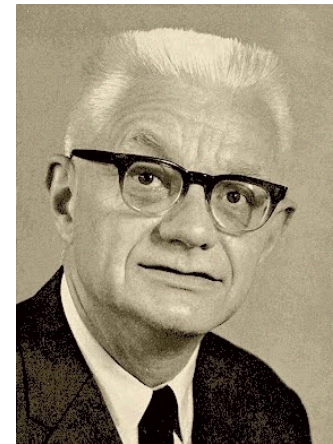
HD-Method

This model is known as the
Hypothetico-Deductive Method

- cf. mid-1800s
- Updated by Carl Hempel as the
Deductive-Nomological Model
- “Inference to the Best Explanation”

http://en.wikipedia.org/wiki/Hypothetico-deductive_model

https://en.wikipedia.org/wiki/Deductive-nomological_model



Hempel

I am an Empiricist

- Observation and experience are the foundation of knowledge
- There is no ‘synthetic *a priori*’

“Hume maintained that all knowledge, even the most basic beliefs about the natural world, cannot be conclusively established by reason. Rather, he maintained, our beliefs are more a result of accumulated *habits*, developed in response to accumulated sense experiences.”

<http://en.wikipedia.org/wiki/Empiricism>



Hume

People Falling Into Holes

- <https://www.youtube.com/watch?v=YABCazKQpfl>
- <https://www.youtube.com/watch?v=MmqhqjRLeNQ>
- <https://www.youtube.com/watch?v=s1C6q42AfqY>

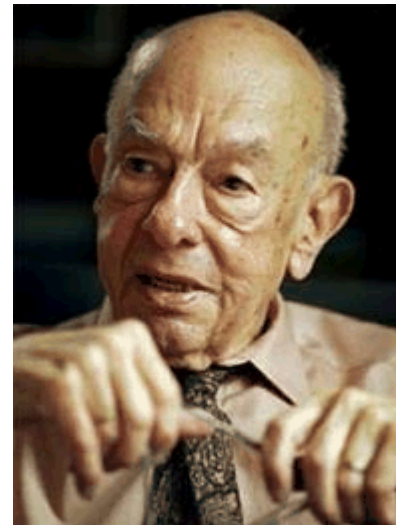
My science is not based on believing there are no holes. On the contrary, my science is based on the realization that there's always the possibility that the earth will open and swallow you up.

Two Dogmas of Empiricism

- that there is a principled distinction between analytic and synthetic propositions
- that reductionism is true

<http://www2.drury.edu/cpanza/quinereview.html>

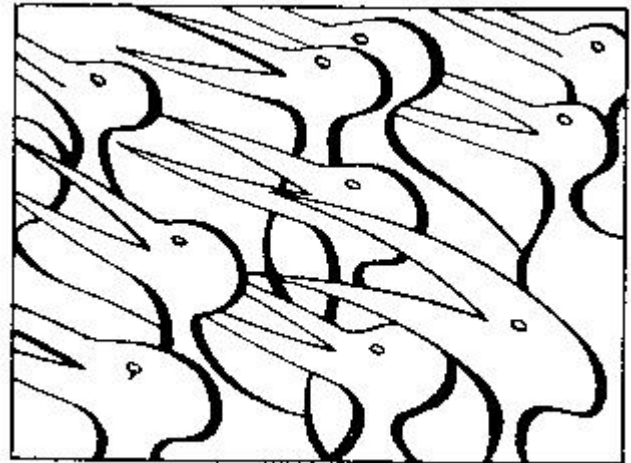
My take: If this is the case, you cannot even *state* a theory, much less find one



Quine

The Fallacy of Theory

- Elusive Truth – what distinguishes sense from nonsense?
- Theory-laden data – you see what you expect to see (gorilla video)
- Incommensurability and paradigms
- Empty consensus replacing rationality and truth



Scientific Method in Brief

Hugh G., Hugh G Gauch, Jr., pp. 53-66

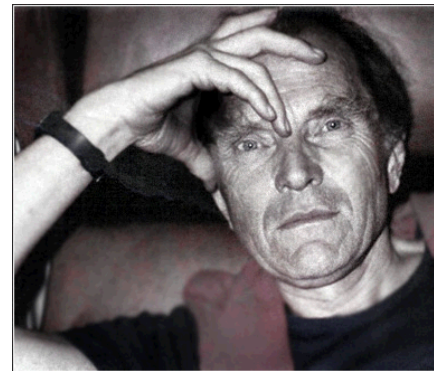
Research Methods...

Research methods, in a certain sense, presuppose their own conclusions: they are silent on complex questions, for example, *whether* certain software ought to be developed, *which* options ought users to be given, *what* subjects ought learners be taught to learn?

Against Method

“Against Method explicitly drew the “epistemological anarchist” conclusion that there are no useful and exceptionless methodological rules governing the progress of science or the growth of knowledge. The history of science is so complex that if we insist on a general methodology which will not inhibit progress the only ‘rule’ it will contain will be the useless suggestion: ‘anything goes’.”

<http://plato.stanford.edu/entries/feyerabend/>

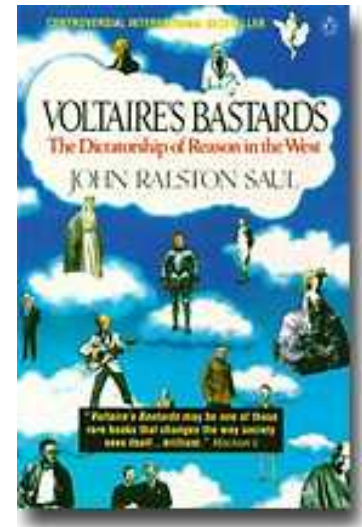


Feyerabend

Voltaire's Bastards

- Voltaire (and contemporaries) – thought (correctly) that reason was the best defense against arbitrary political and religious authority
- However, "Among the illusions which have invested our civilization is an absolute belief that the solutions to our problems must be a more determined application of rationally organized expertise. The reality is that our problems are largely the product of that application."

<http://www.scottlondon.com/reviews/saul.html>



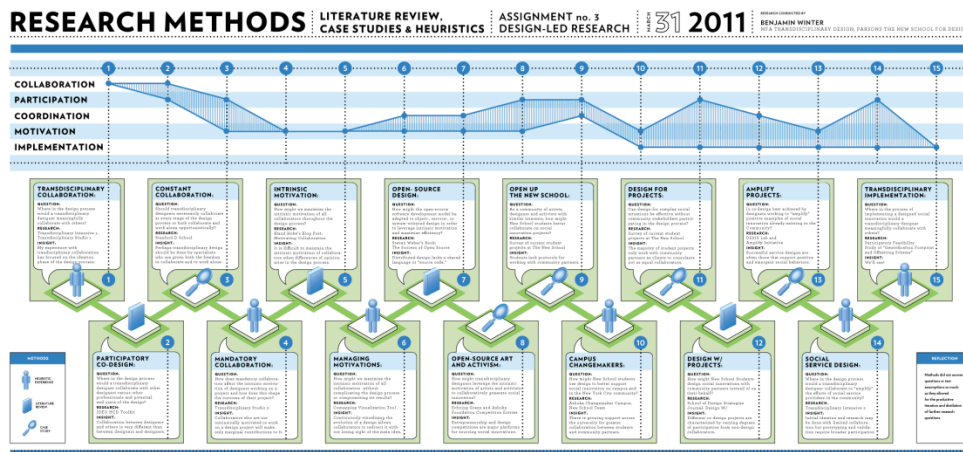
Dimensions of Change

- Design is no longer based on research
 - Because the theory that will be ‘observed’ is presupposed in the theory
- Users are no longer ‘subjects’
 - Because casting myself in the role of ‘expert’ renders illegitimate the valid experiences of others

Wittgenstein: meaning is use

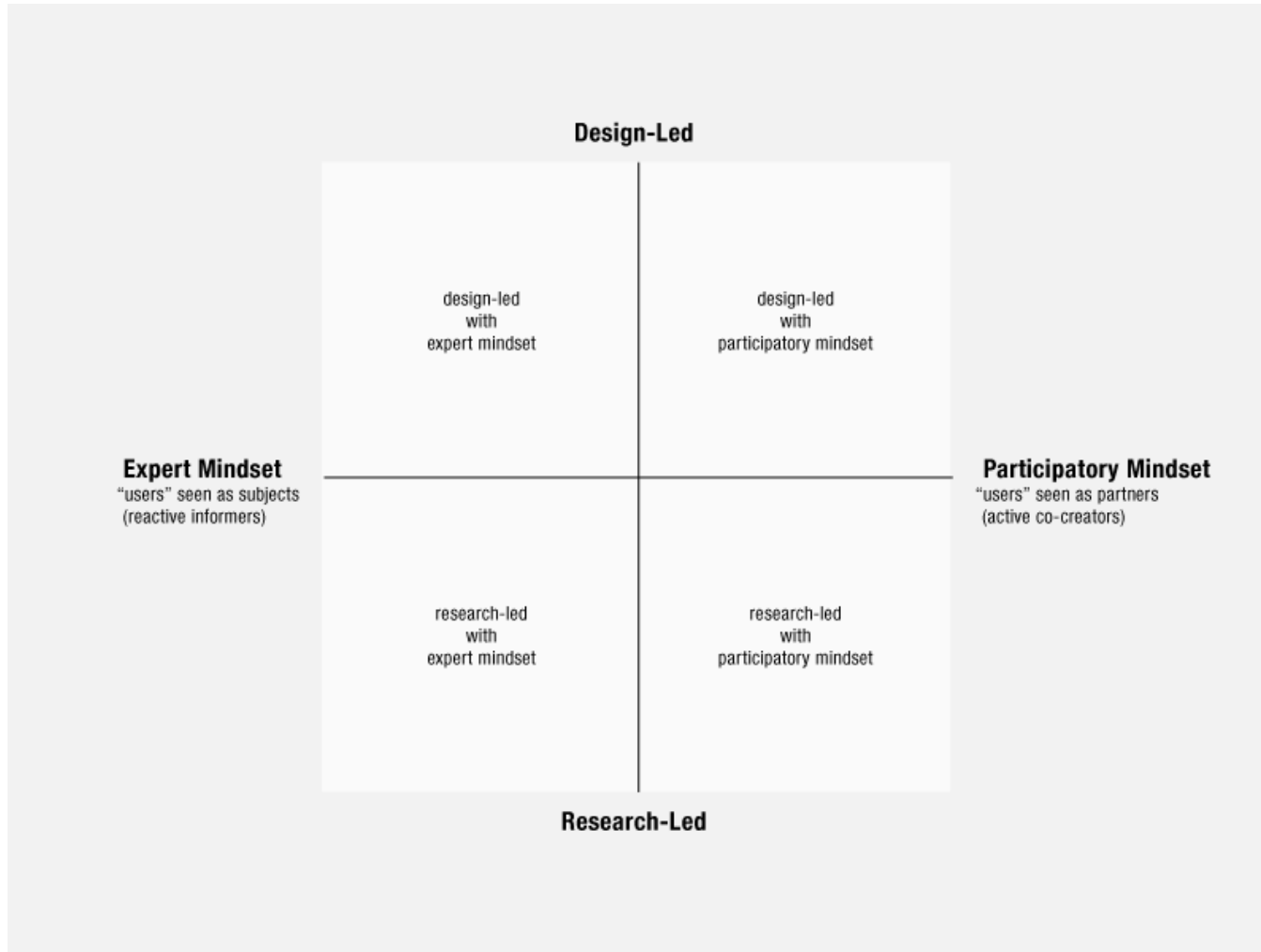
Research-Led Design

- Winter: “I had always assumed that case studies, literature reviews, and ethnographic research were necessary precursors to every well-informed design project I did.”
- Vs. Design-Led Research



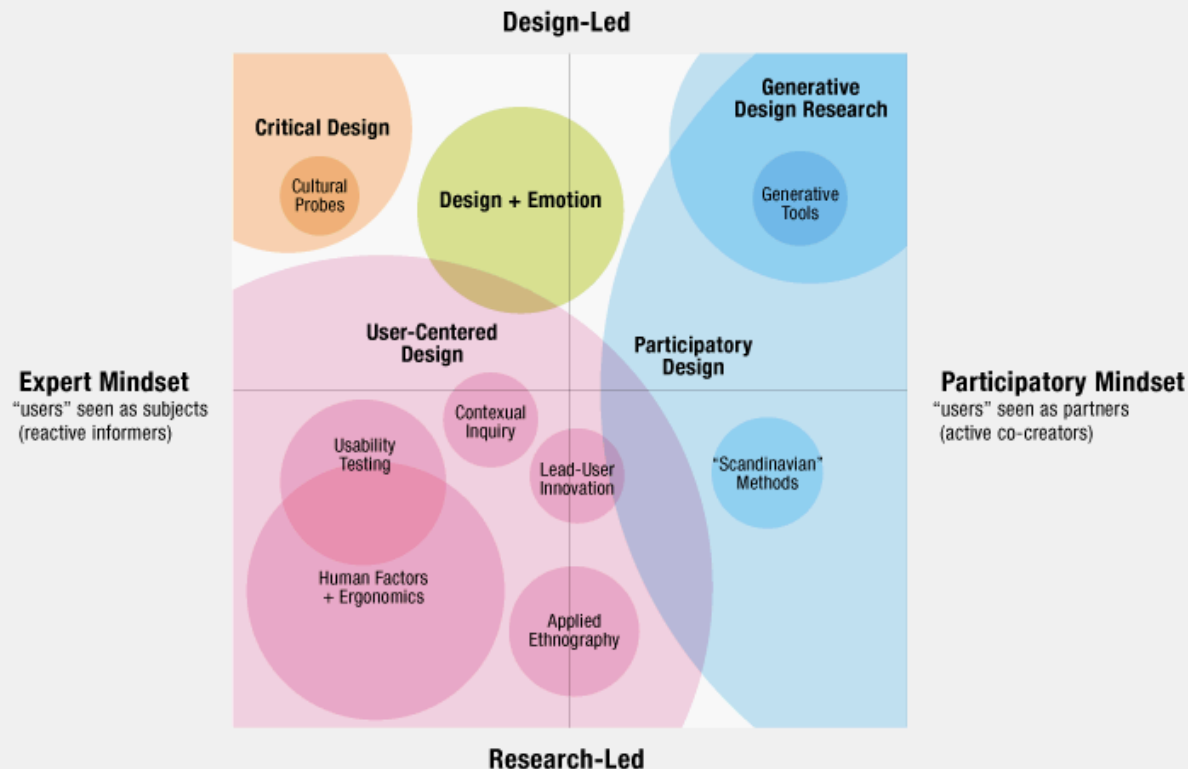
<http://transdesign.parsons.edu/wp-content/uploads/2011/04/DLR-Research-Methods-01.png>

Design-Led Research

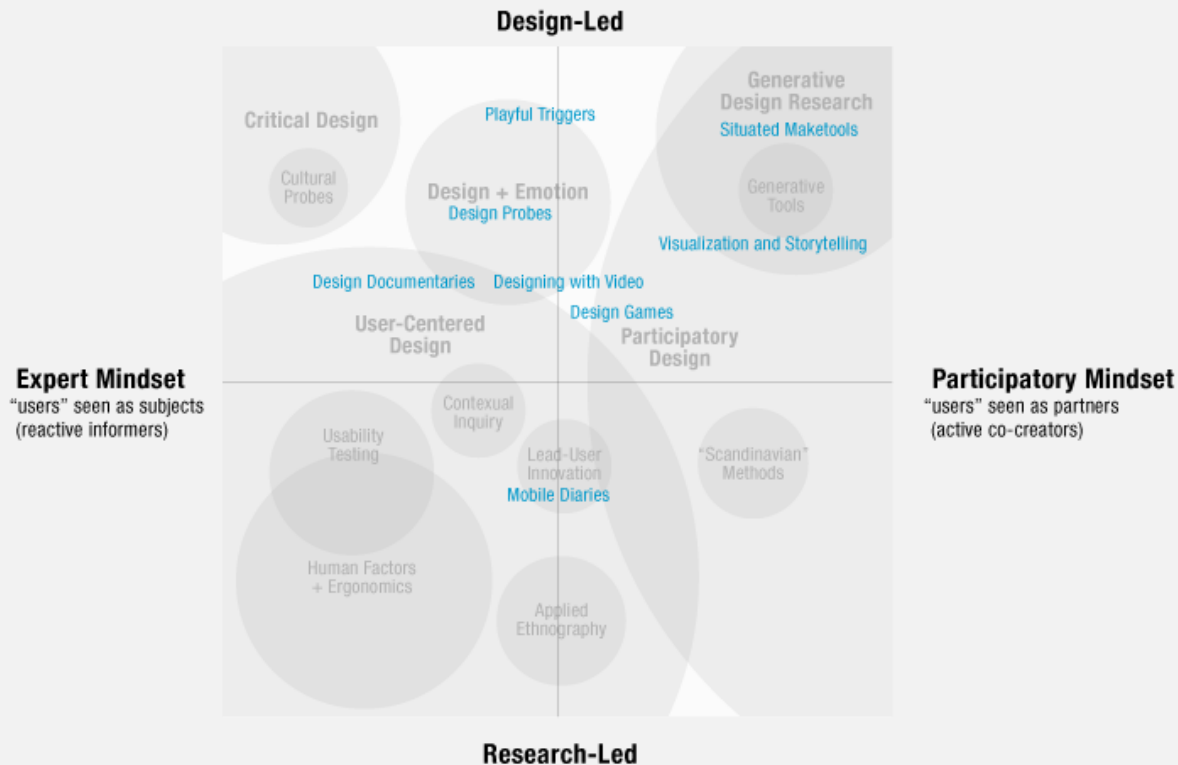


Liz Sanders <http://www.dubberly.com/articles/an-evolving-map-of-design-practice-and-design-research.html>

Design-Led Research



Design-Led Research



Situated Maketools

- They situated the study at the workplace
- Then grounded the designing in the workers' explanations
- And scaffolded the designing, i.e. used temporary stuff

Salu Ylirisku

http://designresearch.fi/blogs/uid10/wp-content/uploads/2010/11/frame_it_simple_handouts.pdf

Example of scaffolding in Konkari project

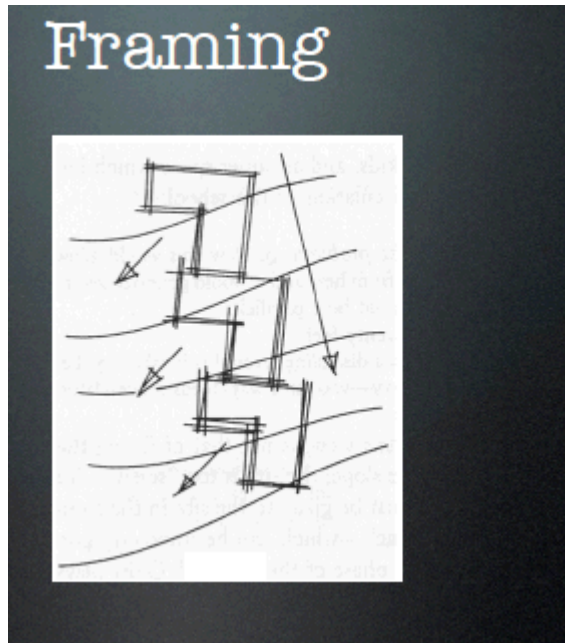
- Situated MakeTools



Aalto university, Salu Ylirisku, 2.11.2010

Situating as Framing

- To 'situate' is to theorize, only with a smaller universe of discourse
- Lakoff – 'Framing'



Lakoff

Beyond Theory

- Design without theory is *discovery*
- (And I recognize that I am able to sample only the edge of a complex landscape)



Reading the World

- I don't see the world as neat and ordered, like logic and mathematics – I see it as messy and complex, like a language



“We see the future in the same way that we see the past, by reading the signs”

Wittgenstein: Meaning is Use

Method as Literacy

What we call 'theory' is just one aspect of world literacy, and not even the most important one



<http://www.downes.ca/presentation/233>

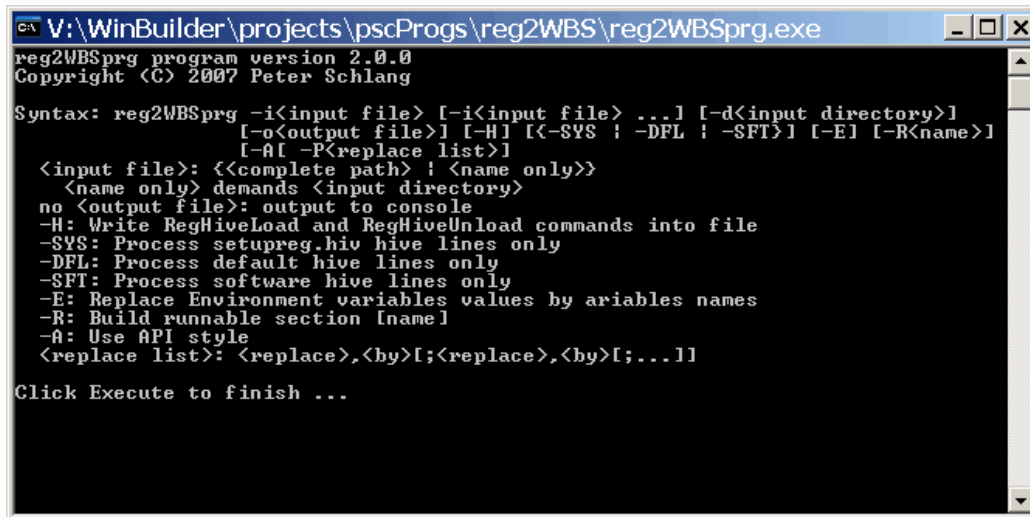
Morris, Derrida and a little Lao Tzu

Syntax	Cognition
Semantics	Context
Pragmatics	Change

We need this frame because (as Jukes said) if we aren't looking for these things, we just won't see them.

Theories / Syntax

Not just rules and grammar



```
C:\V:\WinBuilder\projects\pscProgs\reg2WBS\reg2WBSprg.exe
reg2WBSprg program version 2.0.0
Copyright (C) 2007 Peter Schlang

Syntax: reg2WBSprg -i<input file> [-i<input file> ...] [-d<input directory>]
      [-o<output file>] [-H] [{-SYS ! -DFL ! -SFT}] [-E] [-R<name>]
      [-A] -P<replace list>]
  <input file>: <<complete path> ! <name only>>
  <name only> demands <input directory>
  no <output file>: output to console
  -H: Write RegHiveLoad and RegHiveUnload commands into file
  -SYS: Process setupreg.hiv hive lines only
  -DFL: Process default hive lines only
  -SFT: Process software hive lines only
  -E: Replace Environment variables values by ariables names
  -R: Build runnable section [name]
  -A: Use API style
  <replace list>: <replace>,<by>[!;<replace>,<by>[!;...]]

Click Execute to finish ...
```

Forms: archetypes? Platonic ideals?

Rules: grammar = logical syntax

Operations: procedures, motor skills

Patterns: regularities, substitutivity (eggcorns, tropes)

Similarities: Tversky - properties, etc

Semantics

theories of truth /
meaning / purpose /
goal

[[SEMANTICS]]
of a structure

By Tom 7



= carrot



= bowling pin

<http://www.cs.cmu.edu/~tom7/csnotes/fall02/semantics.gif>

- Sense and reference (connotation and denotation)
- Interpretation (Eg. In probability, Carnap - logical space; Reichenbach - frequency; Ramsey - wagering / strength of belief)
- Forms of association: Hebbian, contiguity, back-prop, Boltzmann
- Decisions and decision theory: voting / consensus / emergence

Pragmatics

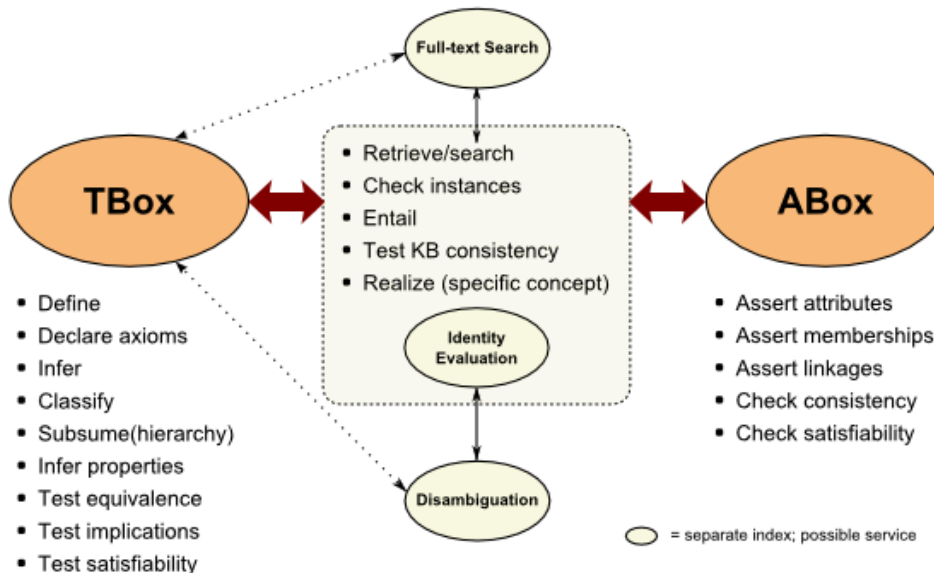
use, actions, impact



- Speech acts (J.L. Austin, Searle) assertives, directives, commissives, expressives, declarations (but also - harmful acts, harassment, etc)
- Interrogation (Heidegger) and presupposition

Cognition

reasoning, inference and explanation

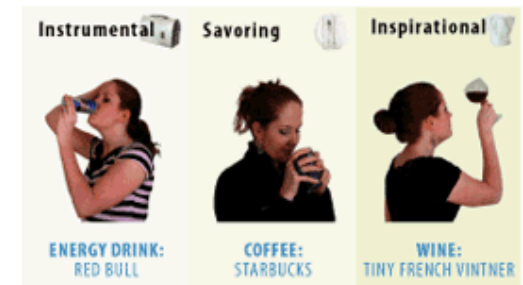


<http://www.mkbergman.com/category/description-logics/>

- description - X (definite description, allegory, metaphor)
- definition - X is Y (ostensive, lexical, logical (necess. & suff conds), family resemblance - but also, identity, personal identity, etc)
- argument - X therefore Y - inductive, deductive, abductive (but also: modal, probability (Bayesian), deontic (obligations), doxastic (belief), etc.)
- explanation - X because of Y (causal, statistical, chaotic/emergent)

Context

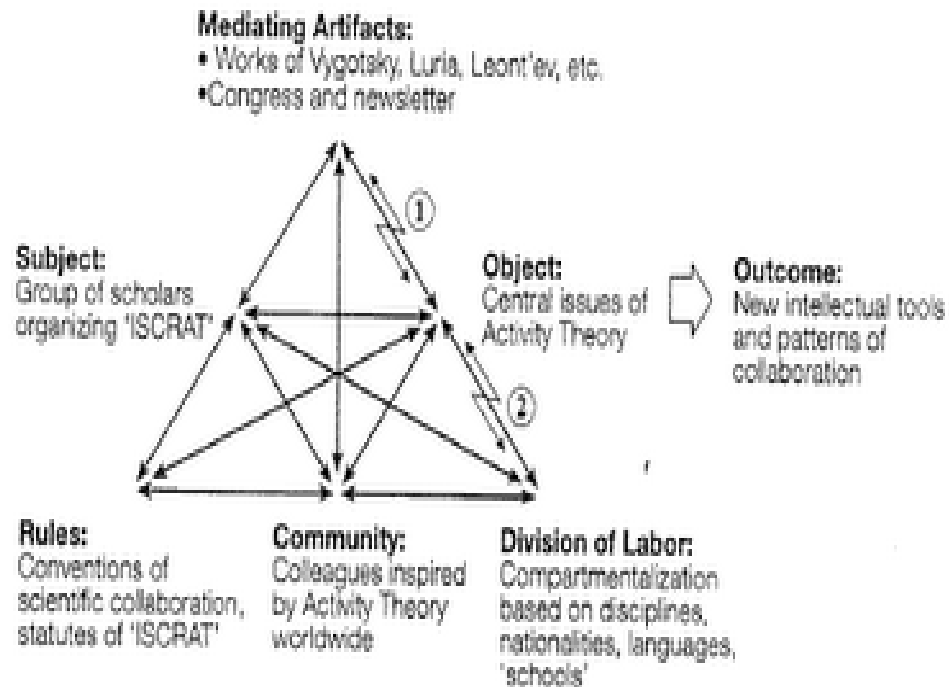
placement, environment



<http://www.occasionbasedmarketing.com/what-it-is>

- explanation (Hanson, van Fraassen, Heidegger)
- meaning (Quine); tense - range of possibilities
- vocabulary (Derrida); ontologies, logical space
- Frames (Lakoff) and worldviews

Change



- relation and connection: I Ching, logical relation
- flow: Hegel - historicity, directionality; McLuhan - 4 things
- progression / logic -- games, for example: quiz&points, branch-and-tree, database
- scheduling - timetabling - events; activity theory / LaaN

21st Century ~~Science~~ Languages



http://spotlight.macfound.org/btr/entry/new_media_literacies/

The 'skills' described by Jenkins –
performance, simulation, appropriation, etc -
are actually *languages* and should be
understood in terms of these six dimensions

Discovery

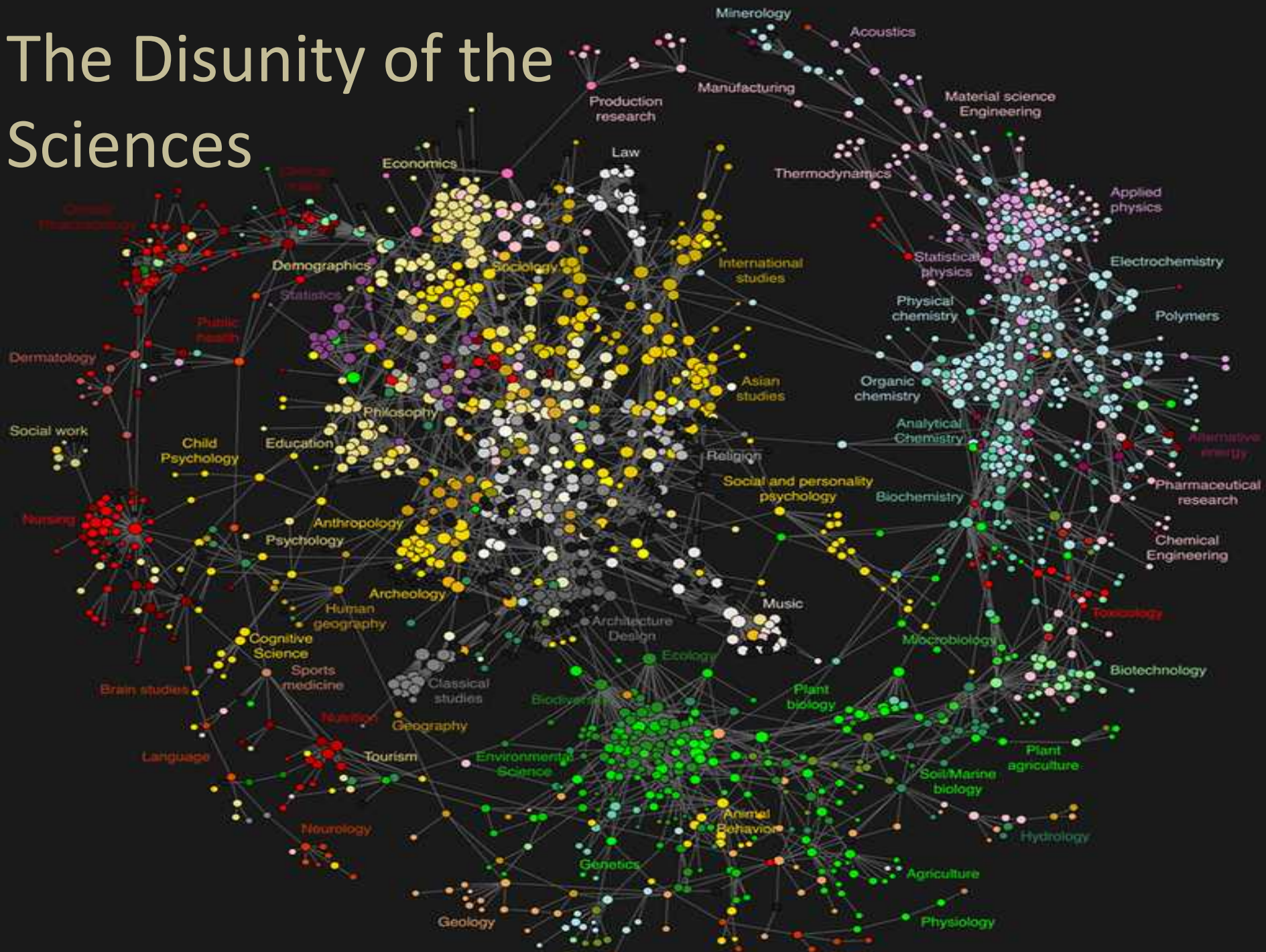
- You don't learn a language, you *discover* it
- To discover a language is to be *immersed* in it, to speak it and listen to people speaking in it
- My scientific method (if it can be called that) is to go to the office each day and immerse myself in the world – to try listening, and to try speaking

/ am the universe of
discourse

I'm not trying to
theorize, I'm just trying
to do

- The ‘theory’ (not properly-co-called) *emerges* from the interactions between myself and my colleagues

The Disunity of the Sciences





<http://www.downes.ca>