Shifting discourse-semantics of risk in US newspapers, 1987–2014

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Overview

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- Context of the investigation: risk theory
- Data and research questions
- Linguistic approaches to risk
- Our methods and linguistic findings
- Sociological significance of the results

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The project(s)

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I'm presenting work from closely related projects:

1. Risk words in the NYT, 1963, 1987–2014
2. Risk words in NYT health articles
3. Risk words in six US newspapers, 1987–2014

All investigations involve making longitudinally structured, parsed corpora and looking at how risk words behave.

Context: sociological risk theory

From previous sociological and linguistic research, we know that:

- Risk as concept is sociologically important
  - New global risks (Beck, 1992)
  - Calculative technologies (Dean, 1999)
  - Individualisation (Beck) and Technologies of the Self (Dean, 1998)
  - Risk-taking (Luhmann, 1993)
- Risk as lexical item is increasingly frequent in print journalism (Zinn 2011)
- Risk as a lexical item in naturalistic text may behave contrary to expectations (Hamilton, Adolphs, & Nerlich, 2007)

The data

1. *NYT Annotated Corpus*: 1.8 million articles, 1987–2007 (Sandhaus, 2008)
2. *ProQuest Newsstand* for NYT 2007–2014
3. *ProQuest Newsstand* for five other newspapers, 1987–2014
    1. *Washington Post*
    2. *Tampa Bay Times*
    3. *USA Today*
    4. *Chicago Tribune*
    5. *Wall Street Journal*

Research questions

- What are risk words doing in the NYT?
- How has the behaviour of risk words changed in the NYT between 1963 and 2014?
- Can we connect these findings to sociological theories of risk?
- What kinds of tools and methods can we use/develop to do this kind of research?

New methodologies

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New kinds of data and tools make it possible to empirically analyse risk language in new ways:

- Digitisation of newspapers means we have large, well-structured datasets
- Automatic annotation of text makes it possible to search for lexical and grammatical features in tandem
- Modern programming languages facilitate:
  - Automation
  - Reproducibility
  - Transparency

Frame semantic approach

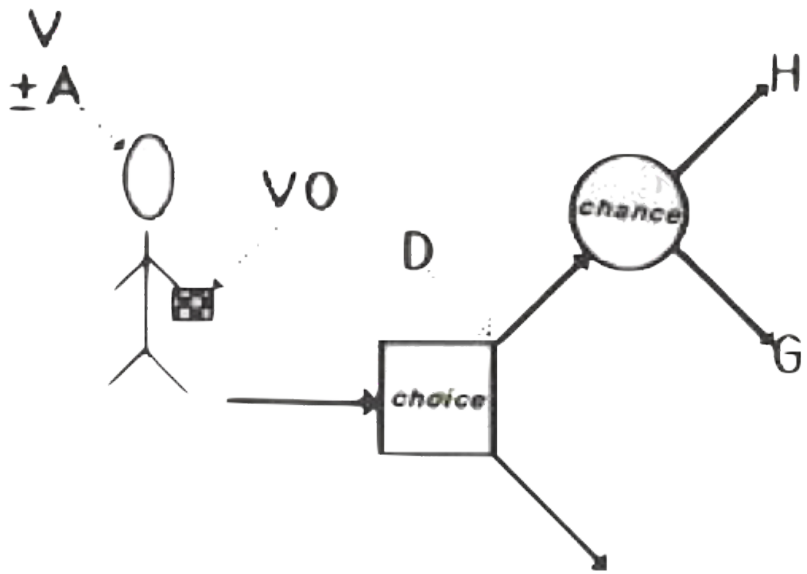
Frame semantics: risk as a cognitive schema (Fillmore & Atkins, 1992)

- Conceptualises risk mostly as experiential Process/Event
  - *What kind of participants and circumstances occur when risk is the Process?*
- Problem: risk often takes less prominent experiential roles
  - Is the risk frame actually invoked when the word is used?
  - Example:

Mr. Tepfer noted that Mr. Douglas, who was in the neighborhood when the body was found and was interviewed by the police at the time, 'preyed on at-risk women, on prostitutes, and he engaged in sex and strangled them to death.'

The risk frame

H = Harm, G = Goal,
D = Deed, VO = Valued Object,
V = Victim, A = Actor.



Corpus linguistic approach

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Corpus linguistics: risk as token (Hamilton et al., 2007)

- Topics and text-types in which risk tokens appear
- Collocates of risk tokens
- Risk appears a lot in discussions of health
- Use of risk words is different to invented examples

Shortcomings:

- Smaller corpus size, heterogeneity of samples
- No parsing, lemmatisation
- No systematic connection of lexicogrammatical patterns to discourse/meaning

Our methods

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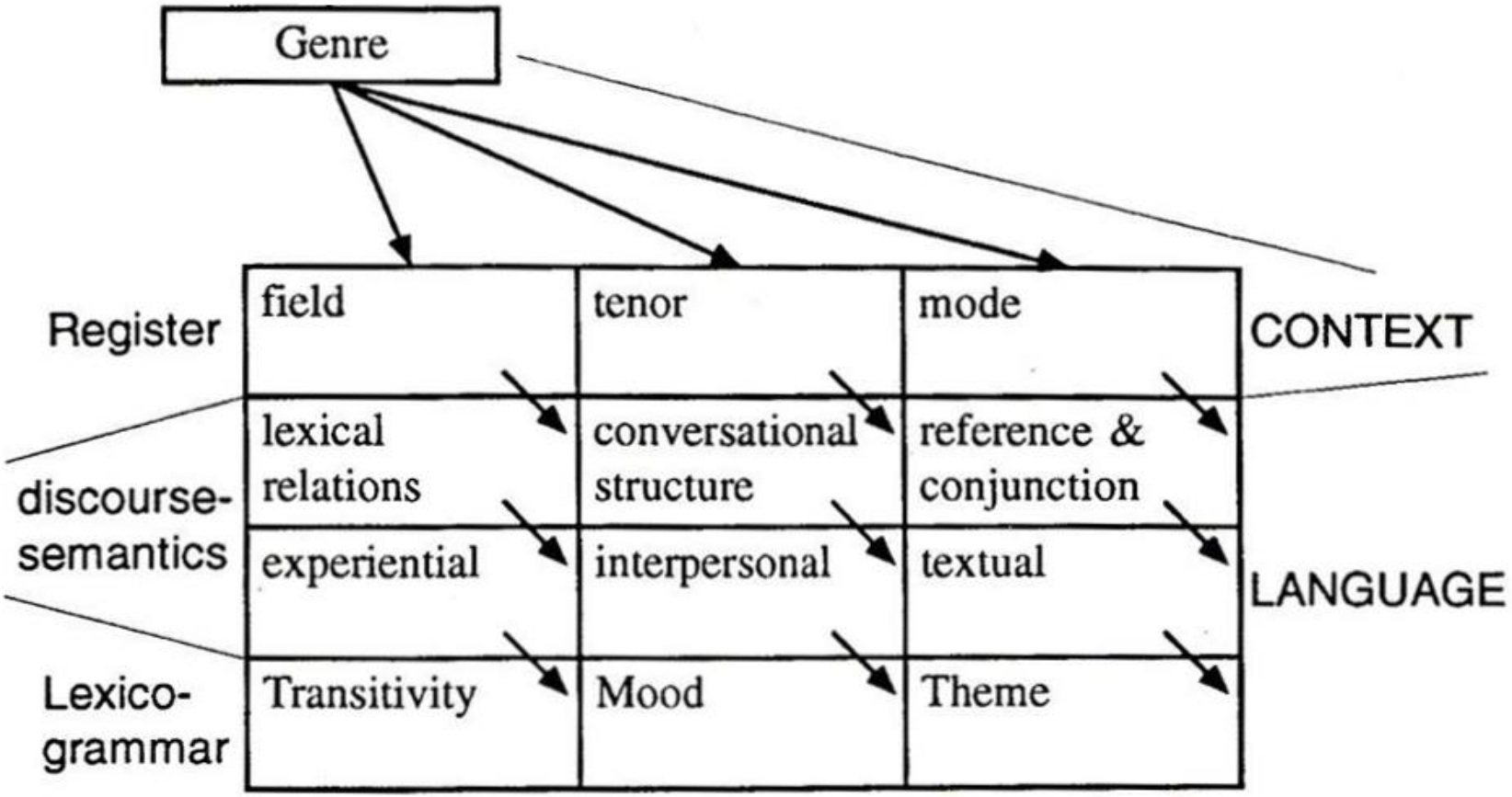
- Get all paragraphs containing `\brisk` in all 1987–mid 2014 articles
- Annotate/parse the data with full *Stanford CoreNLP* suite
- Develop `corpkit`, a toolkit for manipulating the corpus and communicating results
- Interrogate the corpus according to notions from systemic functional grammar
- Connect to sociological theory

SFL: Introduction

- *Systemic*: focus on relationships between signs in the sign-system
- *Functional*: focus on language as a tool for the performance of functions
  1. Interpersonal: negotiating relationships
  2. **Experiential: representing the world**
  3. Textual: reflexive organisation into meaninful sequences

  In general, print news in a single publication is fairly stable in terms of interpersonal and textual features.

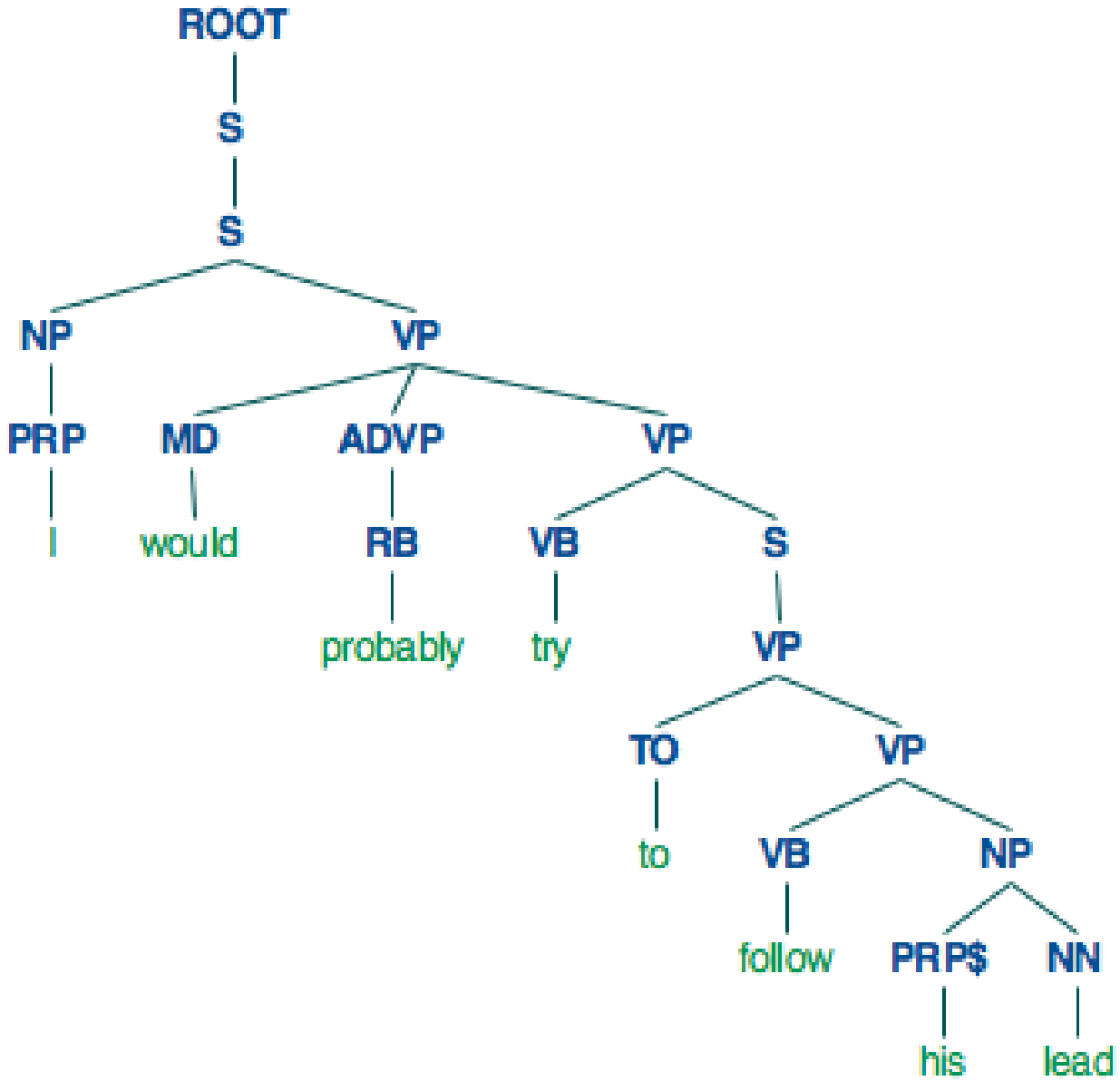
Overview of SFL



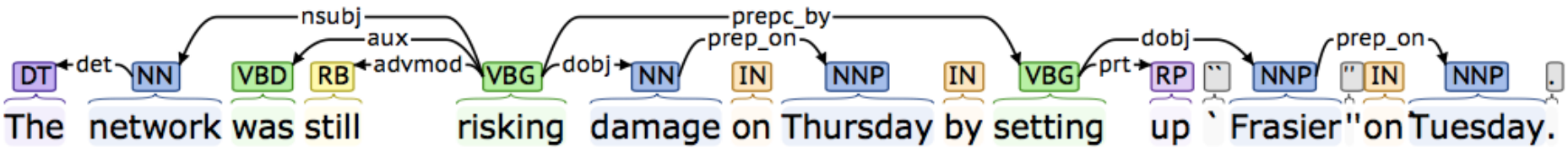
Transitivity system

- Focus on the clause as a unit of analysis
- Centre on the *process* (i.e. rightmost verb in VP)
- Processes *select* participants (i.e. arguments of the verb)
- PPs and RBs are typically *circumstances*

Constituency grammar



Dependency grammar



The controversial question

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The question: *Can we get systemic functional information from constituency and dependency parses?*

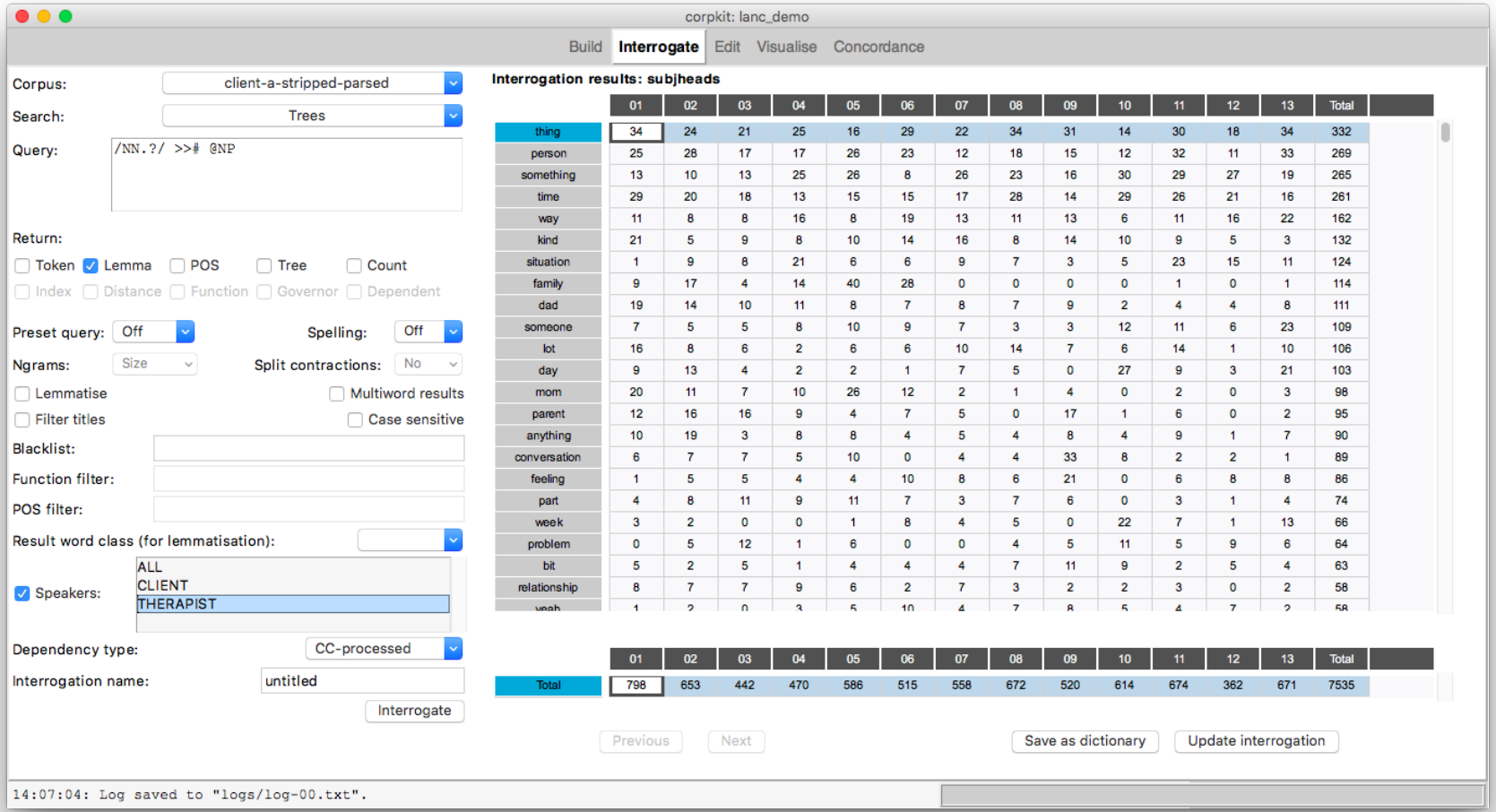
The answer: *Yep, quite a lot.*

Developing tools

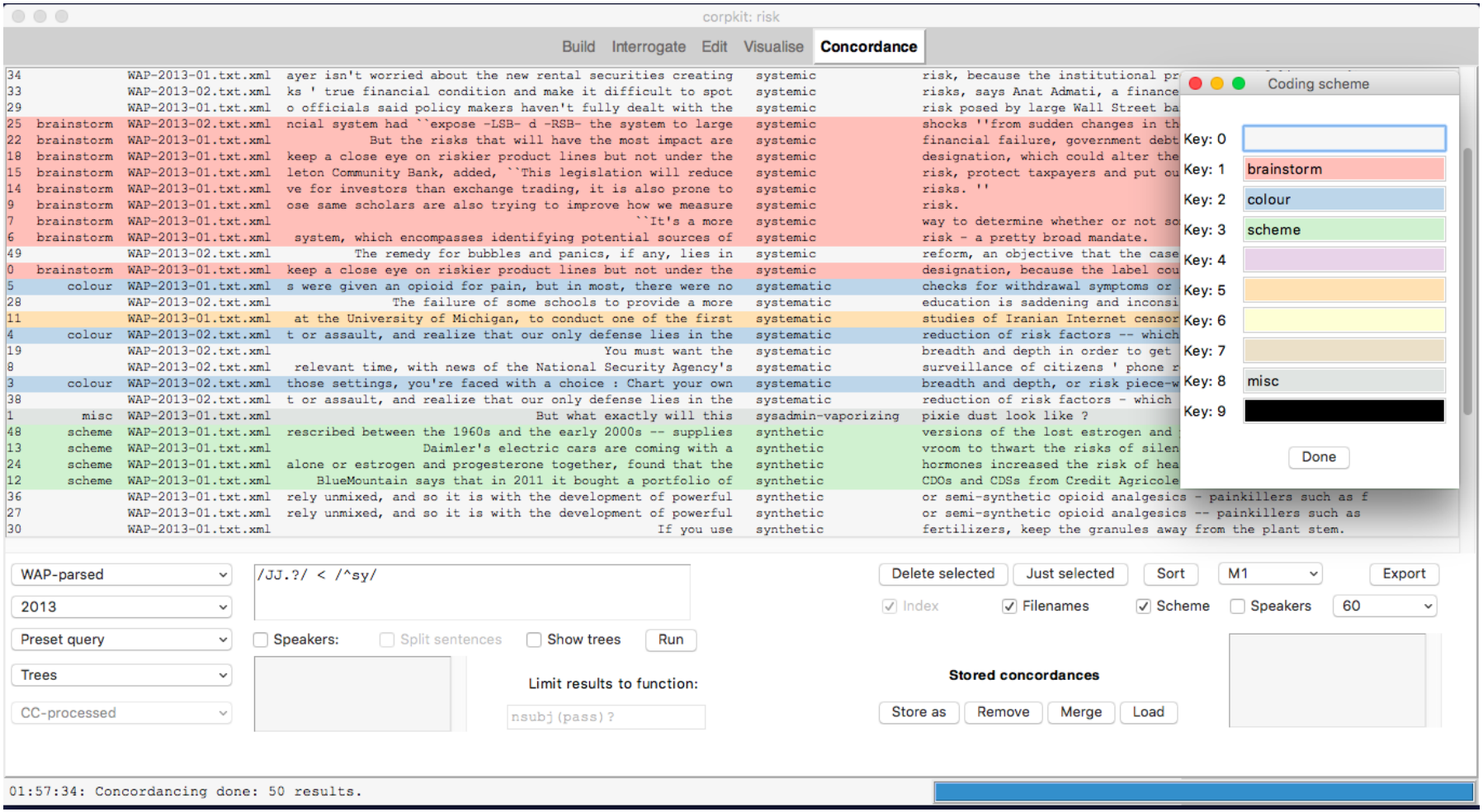
How to investigate this huge dataset, and make the investigation transparent/reproducible?

- `corpkit`: a Python module designed for parsed and structured corpora, with some systemic functional awareness
  - `interrogator()`: search for lexicogrammatical phenomena in each subcorpus, tally results, output Pandas objects
  - `editor()`: edit results, calculate keyness, linear regression
  - `plotter()`: visualise via *matplotlib*
  - `conc()`: concordance via parses
- Sciptable, multiprocessing, handles arbitrary data, open-source
- More recently, a GUI, aimed at corpus linguists

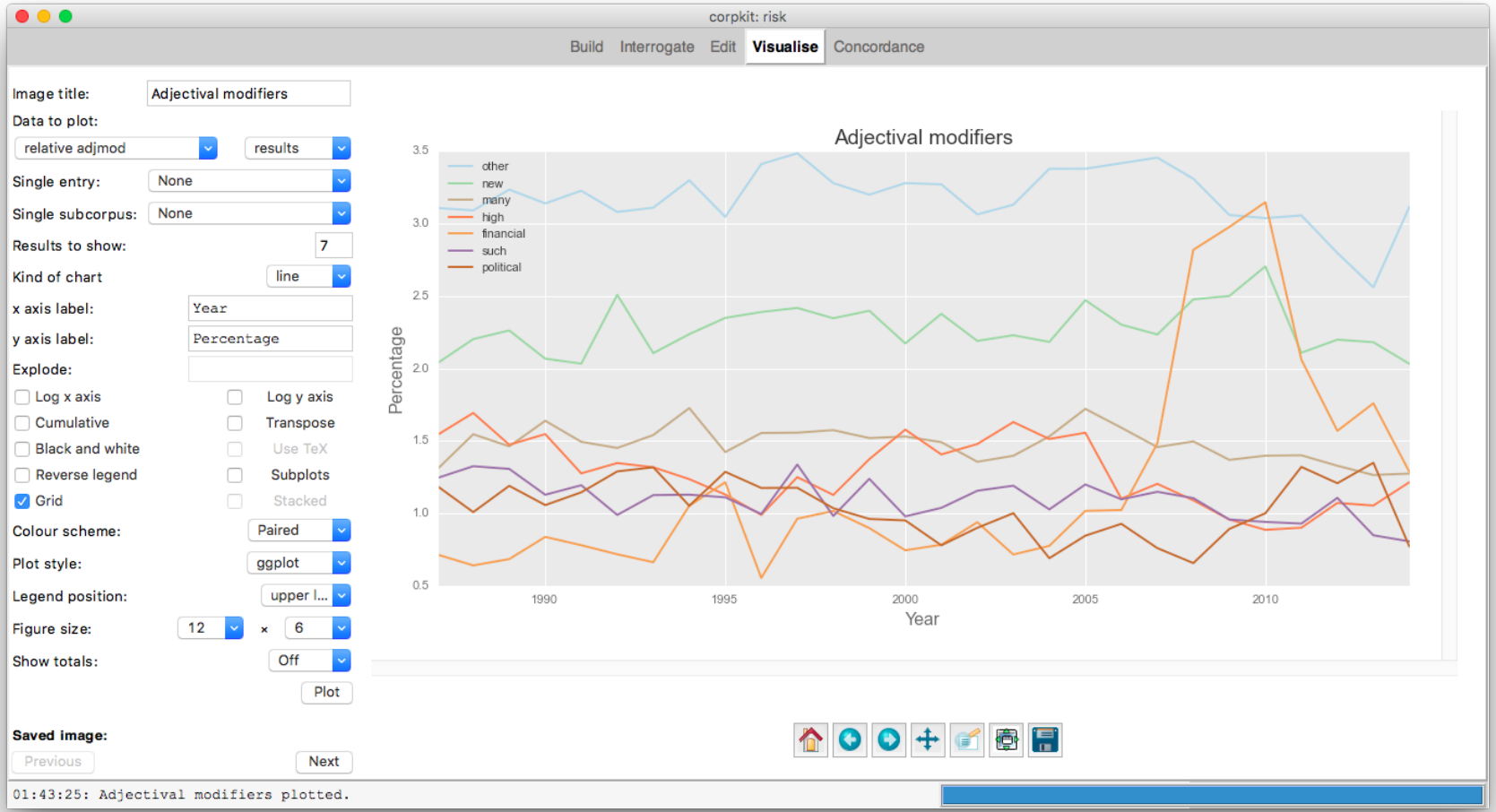
corpkit: GUI


corpkit: lanc_demo
Build
Interrogate
Edit
Visualise
Concordance
Corpus:
client-a-stripped-parsed
Search:
Trees
Query:
/NN.?/ >># @NP
Return:
Token
Lemma
POS
Tree
Count
Index
Distance
Function
Governor
Dependent
Preset query:
Off
Spelling:
Off
Ngrams:
Size
Split contractions:
No
Lemmatise
Multiword results
Filter titles
Case sensitive
Blacklist:
Function filter:
POS filter:
Result word class (for lemmatisation):
Speakers:
ALL
CLIENT
THERAPIST
Dependency type:
CC-processed
Interrogation name:
untitled
Interrogate
Interrogation results: subjheads
01 02 03 04 05 06 07 08 09 10 11 12 13 Total
thing 34 24 21 25 16 29 22 34 31 14 30 18 34 332
person 25 28 17 17 26 23 12 18 15 12 32 11 33 269
something 13 10 13 25 26 8 26 23 16 30 29 27 19 265
time 29 20 18 13 15 15 17 28 14 29 26 21 16 261
way 11 8 8 16 8 19 13 11 13 6 11 16 22 162
kind 21 5 9 8 10 14 16 8 14 10 9 5 3 132
situation 1 9 8 21 6 6 9 7 3 5 23 15 11 124
family 9 17 4 14 40 28 0 0 0 0 1 0 1 114
dad 19 14 10 11 8 7 8 7 9 2 4 4 8 111
someone 7 5 5 8 10 9 7 3 3 12 11 6 23 109
lot 16 8 6 2 6 6 10 14 7 6 14 1 10 106
day 9 13 4 2 2 1 7 5 0 27 9 3 21 103
mom 20 11 7 10 26 12 2 1 4 0 2 0 3 98
parent 12 16 16 9 4 7 5 0 17 1 6 0 2 95
anything 10 19 3 8 8 4 5 4 8 4 9 1 7 90
conversation 6 7 7 5 10 0 4 4 33 8 2 2 1 89
feeling 1 5 5 4 4 10 8 6 21 0 6 8 8 86
part 4 8 11 9 11 7 3 7 6 0 3 1 4 74
week 3 2 0 0 1 8 4 5 0 22 7 1 13 66
problem 0 5 12 1 6 0 0 4 5 11 5 9 6 64
bit 5 2 5 1 4 4 4 7 11 9 2 5 4 63
relationship 8 7 7 9 6 2 7 3 2 2 3 0 2 58
01 02 03 04 05 06 07 08 09 10 11 12 13 Total
Total 798 653 442 470 586 515 558 672 520 614 674 362 671 7535
Previous
Next
Save as dictionary
Update interrogation
14:07:04: Log saved to "logs/log-00.txt".

corpkit: concordancer



corpkit: plotting



corpkit: Example code

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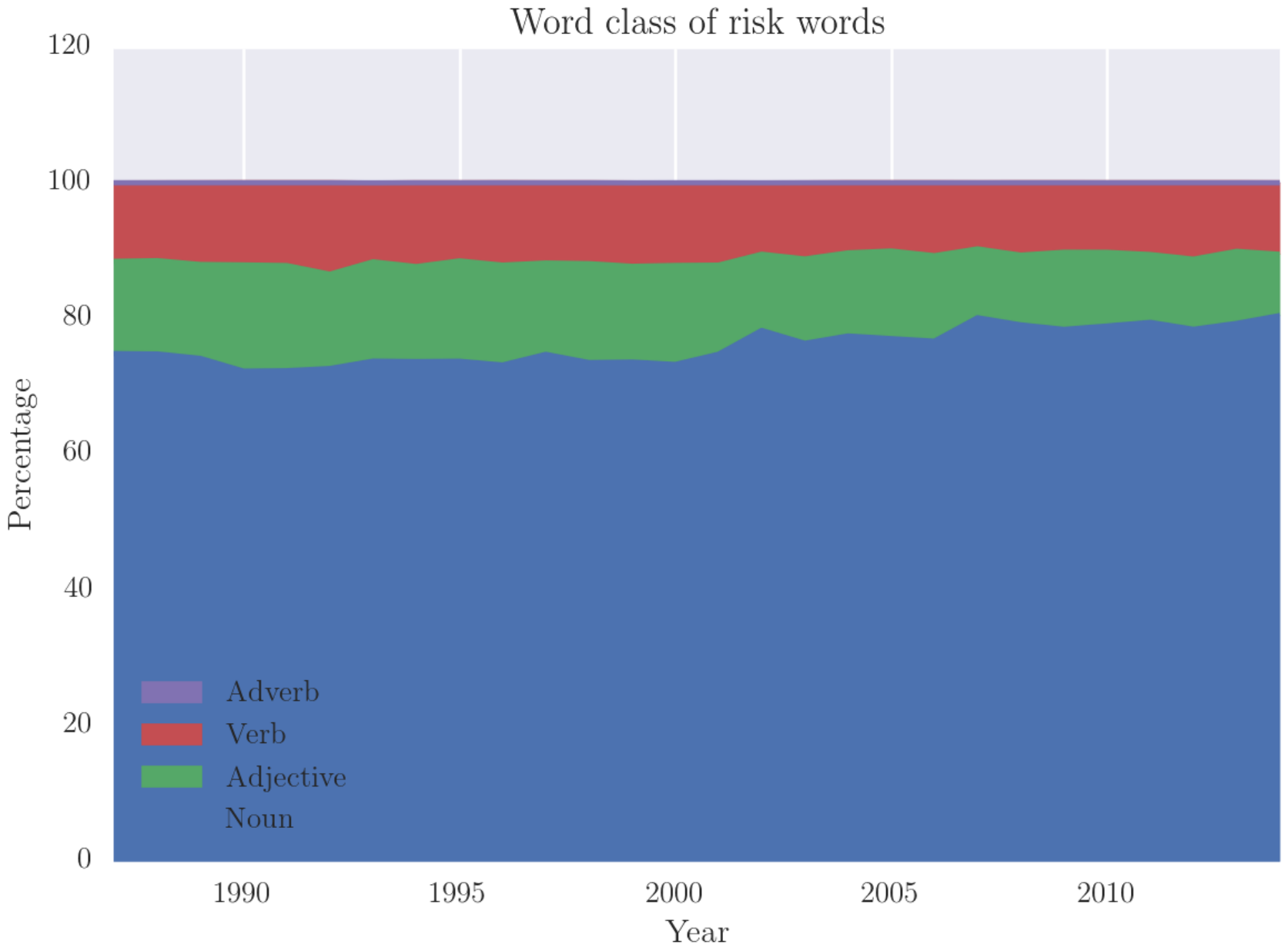
```
# import module and set data path
>>> from corpkit import *
>>> corpus = 'data/NYT-parsed'

# get pos of risk words, show word class
>>> res = interrogator(corpus, 'words', r'\brisk',
...     show = ['p'], lemmatise = True)

# get relative frequency
>>> rel = editor(res.results, '%', res.totals, keep_top = 4)

# visualise
>>> plotter('Word class of risk words', rel.results,
...     kind = 'area', style = 'seaborn-talk')
```

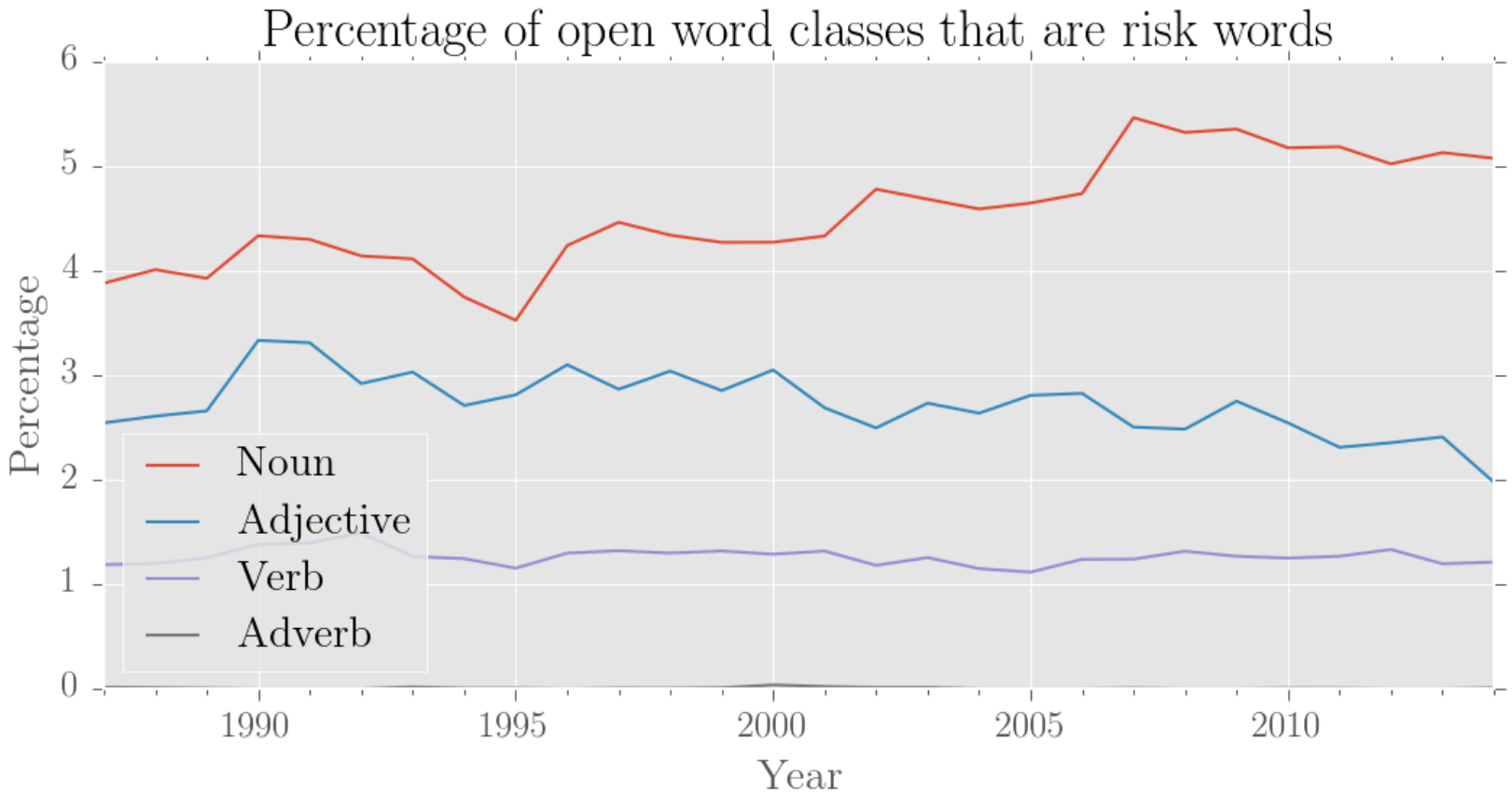
Example output



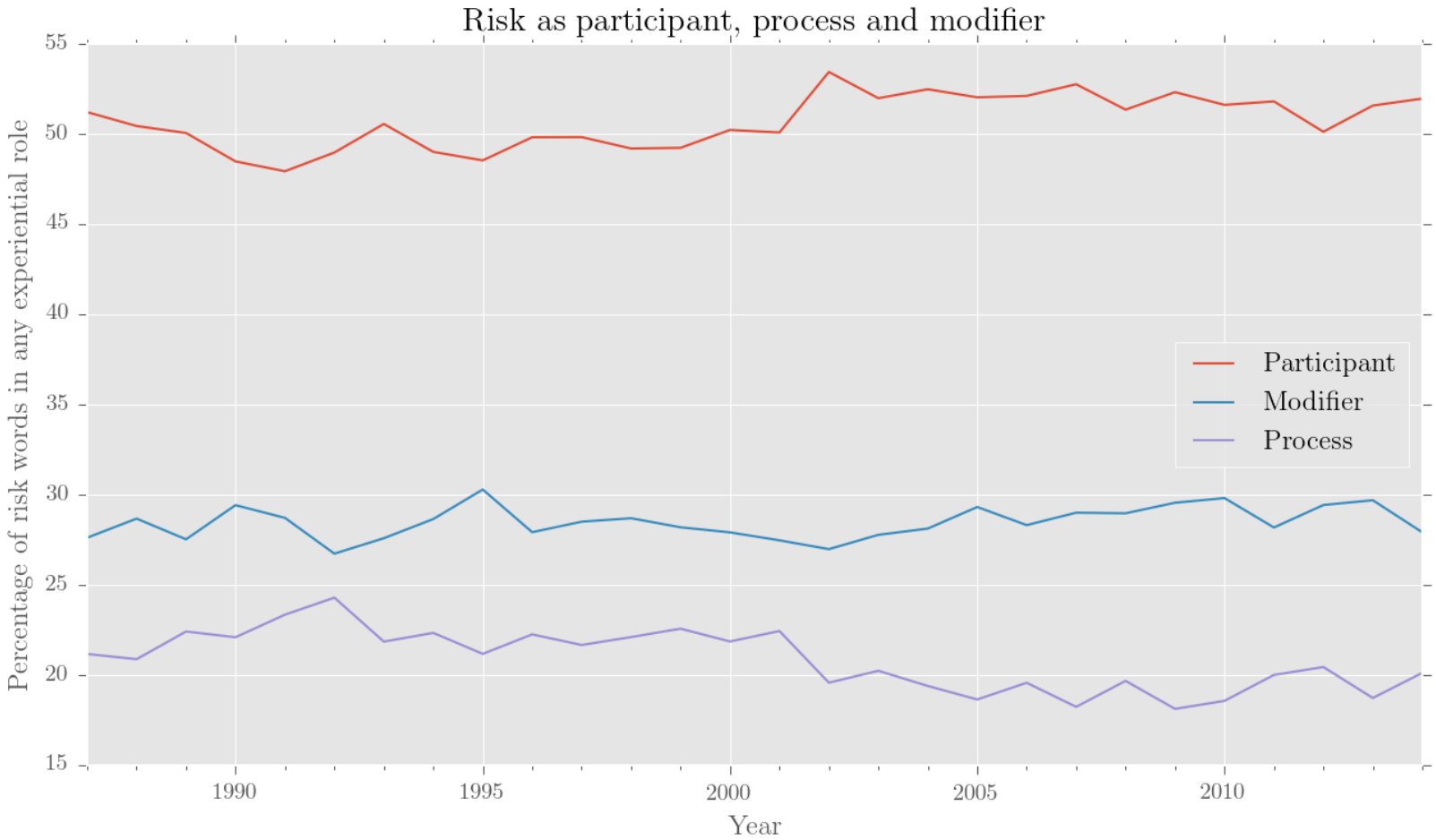
Initial investigation: NYT

Our first investigation was of the NYT only:

Nominalisation of risk

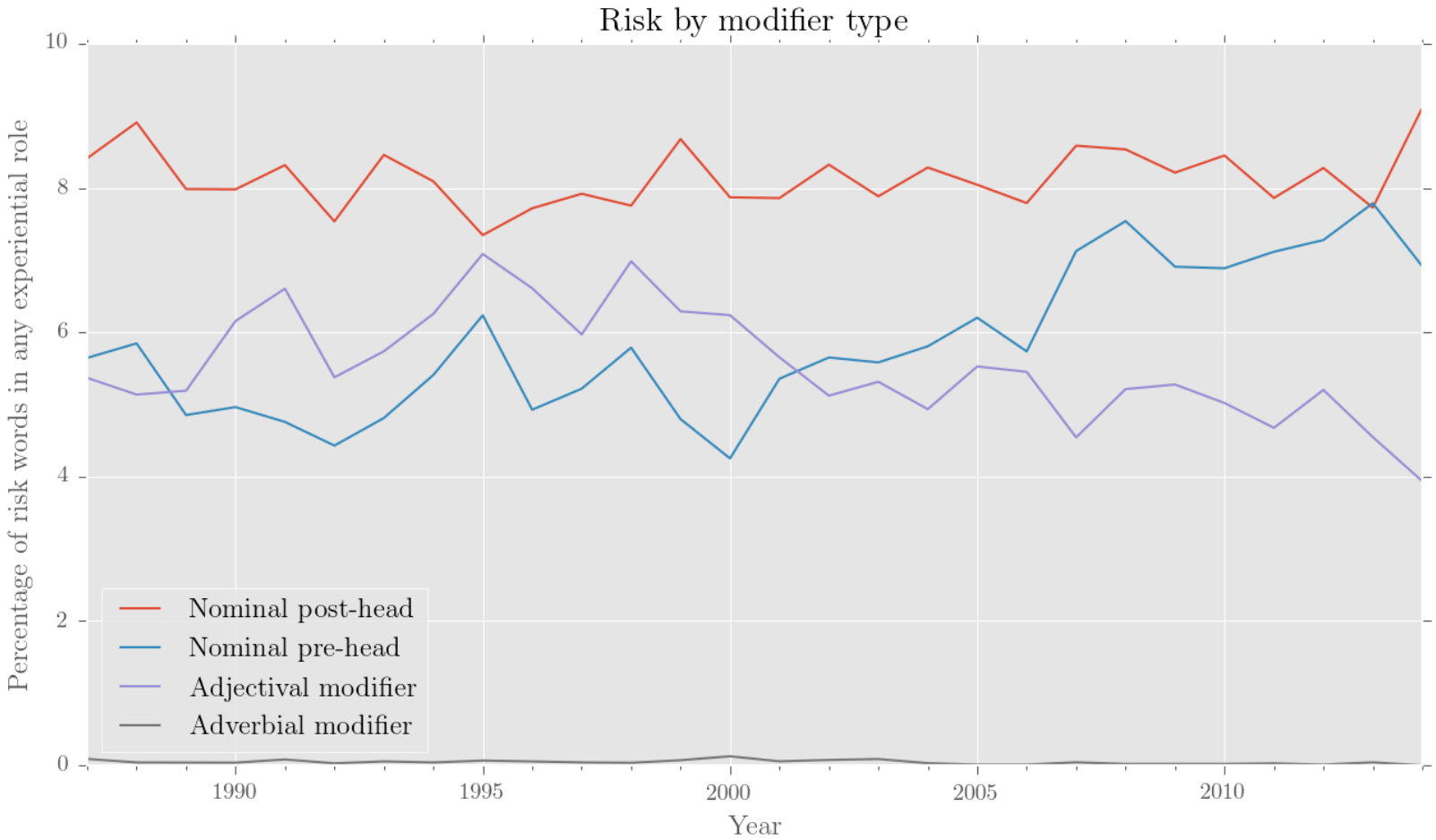


Experiential roles of risk words



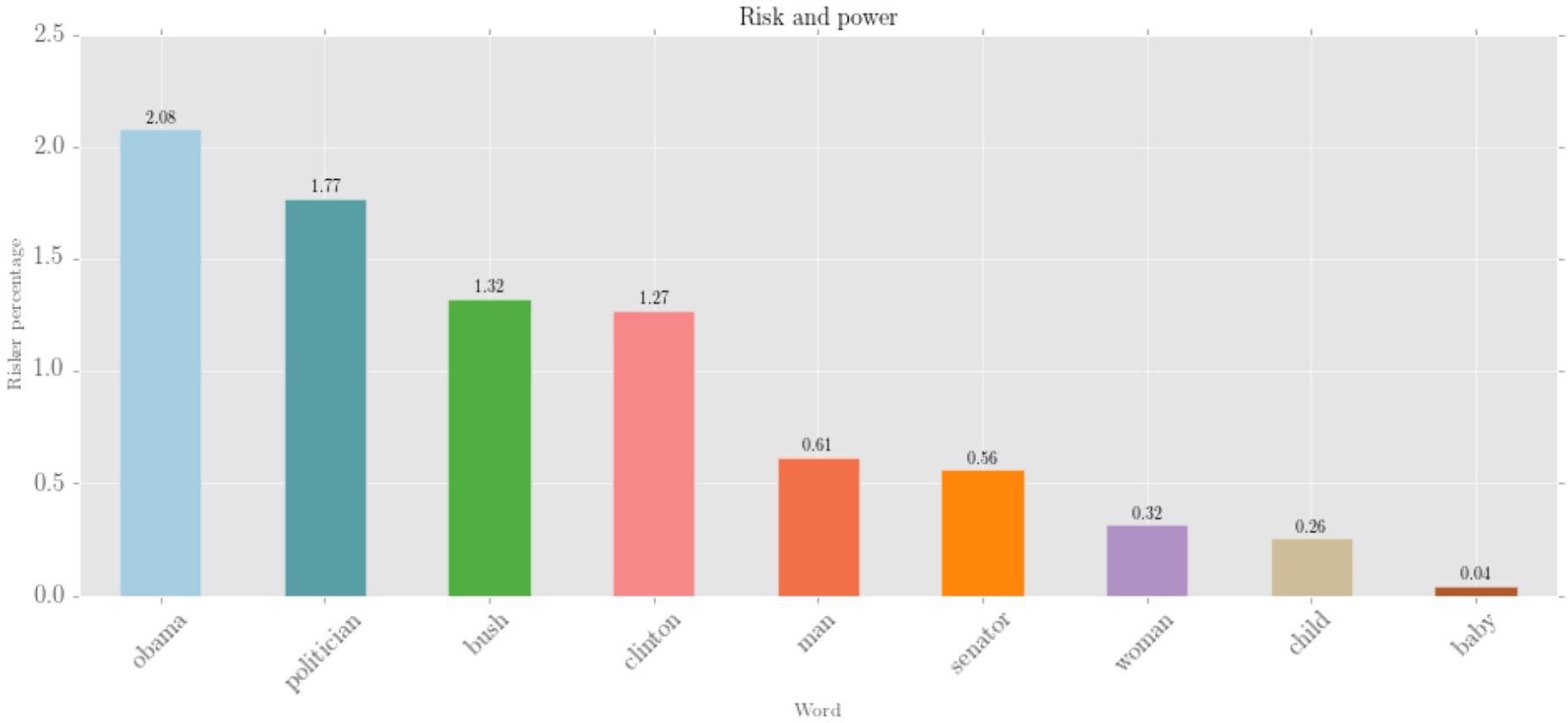
They risked their life → It was a risk

Risk as modifier

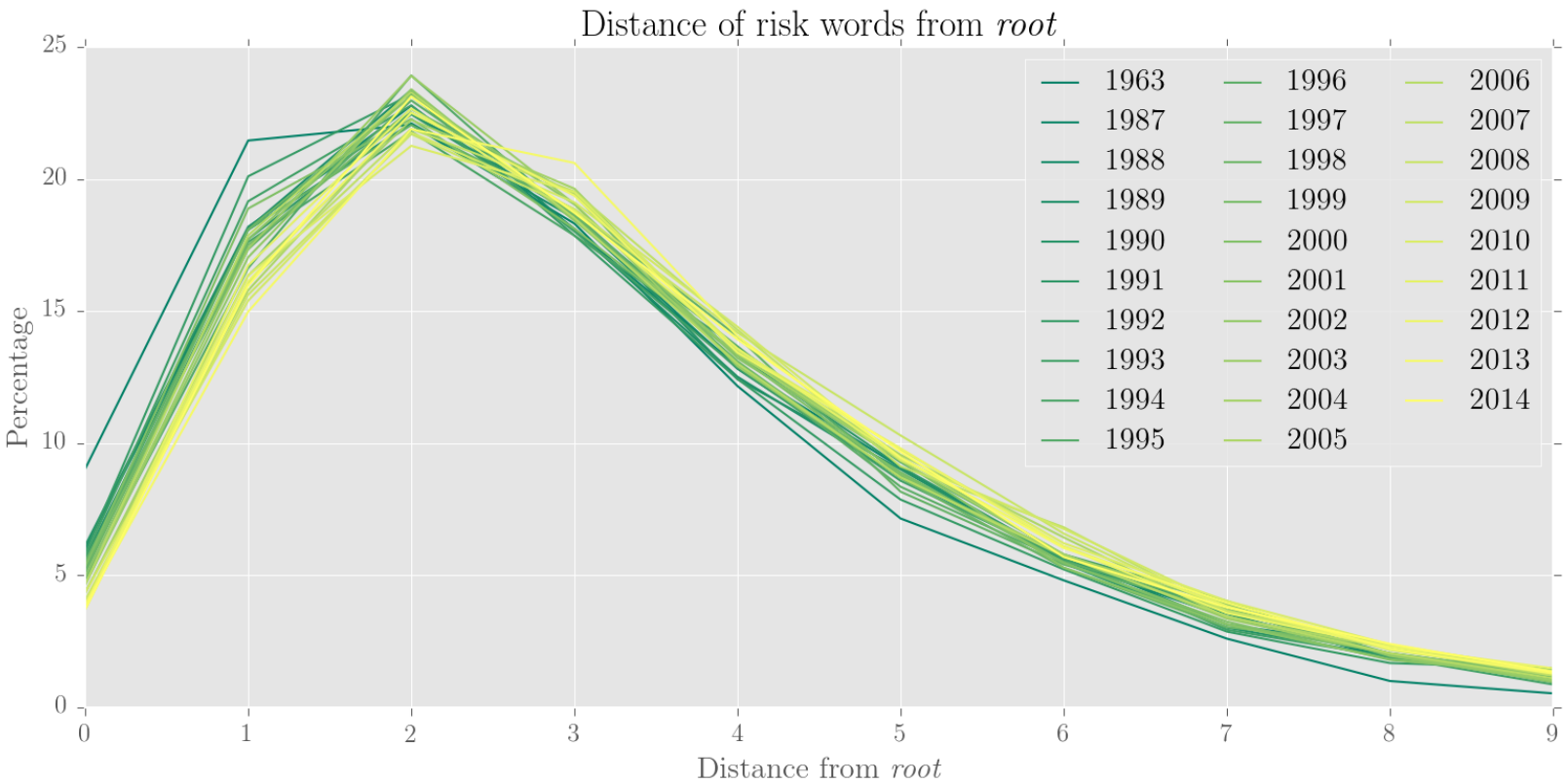


Risky decision → risk assessment

Risk and power



Distance of risk word from *root*



... looked promising, but seems to be a general phenomenon.

First investigation: key findings

- Nominalisation and *participantification*
  - risking harm → risk assessment
  - Meaning of risk expanding beyond the *risk frame*
- Risk words becoming more implicit
  - Routinisation of the management of risk
  - Risk as increasingly present, but decreasingly debated
- More everyday exposure to risk, but less risking
  - Neoliberal conceptualisations of agency: institutional expectation to take risk
  - Reporting of '*the scandal of not being in control*' (Beck, 1992)

Health risk

Six newspapers

- We've only just started interrogating the six newspaper corpus.
- First, we'd like to check if the NYT findings are generalisable to other publications.
- Would love help on dealing with the complexity of the data structure

Health risk

Health risk

Preliminary findings

- Most phenomena generalisable
- Some newspaper specific constructions: *risk appetite* in the WSJ
- Fewer grammatical riskers, but risk characterising more participants and processes
- Hints of influence of newspaper's politican position
-

Discussion of methodology

- SFL proves a useful means of dividing up and investigating the behaviour of a given word
- SFL parsing is difficult, as is converting concepts from (esp. formal) grammars
- Difficult SF concepts: rank shift, grammatical metaphor, appraisal, process types (Yan, 2014; Costetchi, 2013; Heyvaert, 2003)
- That said, though theoretical orientations are different, much of the grammar (esp. at group/phrase levels) are similar

Discussion: sociology and linguistics

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Though SFL treats context as embedded in the lexicogrammar of texts, sociological theory can theorise the influence of salient events, people

- Did Chernobyl/Sept. 11 *change* language use in the NYT?

Functional linguistic theory and corpus/computational linguistic provide sociology research with:

- Empiricism
- Reproducibility

It's all open source

Data and tools are available for reuse:

- `https://www.github.com/interrogator/risk`
- `https://www.github.com/interrogator/corpkit`

Findings are presented dynamically in an IPython Notebook:

- `http://git.io/vIM2W`

This slideshow:

- `http://git.io/vBfbw`

References I

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