Content analysis 1: Introduction, uses

LQRPS

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February 10th, 2017

1. What is content analysis?
   - What isn't?
   - Definitions
   - Structured vs. unstructured data
2. The uses of content analysis
   - Motivating examples
   - Pros and cons of content analysis
3. Doing content analysis
4. 1. Research question
5. 2. Unstructured data
   - Sampling strategy
   - Sample size
   - Data sources

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- Narrative analysis
- Discourse analysis
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By convention, 'content analysis' $\approx$ manual, quantitative $\neq$ 'qualitative', 'automated'

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»Quantitative content analysis is the systematic and replicable examination of symbols of communication, which have been assigned numerical values according to valid measurement rules, and the analysis of relationships involving those values using statistical methods in order to describe the communication, draw inferences about its meaning, or infer from the communication to its context, both of production and consumption« (Riffe, Lacy & Fico 1998)

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»Content analysis may be briefly defined as the systematic, objective, quantitative analysis of message characteristics« (Neuendorf p. 1)

»Content analysis is a summarizing, quantitative analysis of messages that relies on the scientific method (including attention to objectivity-intersubjectivity, a priori design, reliability, validity, generalizability, replicability, and hypothesis testing) and is not limited as to the types of variables that may be measured or the contexts in which the messages are created or presented.« (Neuendorf p. 10)

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Unstructured data → *Structured data*

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Structured data

TABLE of the binary Combinations of Oxygen with ſimple Subſtances.

	Names of the ſimple ſubſtances.	First degree of oxygenation.		Second degree of oxygenation.		Third degree of oxygenation.		Fourth degree of oxygenation.	
		New Names.	Ancient Names.	New Names.	Ancient Names.	New Names.	Ancient Names.	New Names.	Ancient Names
Combinations of oxygen with ſimple non-metallic ſubſtances.	Caloric	Oxygen gas	Vital or dephlogiſticated air						
	Hydrogen	Water *							
	Azote	Nitrous oxyd, or baſe of nitrous gas	Nitrous gas or air	Nitrous acid	Smoaking nitrous acid	Nitric acid	Pale, or not ſmoaking nitrous acid	Oxygenated nitric acid	Unknown
	Charcoal	Oxyd of charcoal, or carbonic oxyd	Unknown	Carbonous acid	Unknown	Carbonic acid	Fixed air	Oxygenated carbonic acid	Unknown
	Sulphur	Oxyd of ſulphur	Soft ſulphur	Sulphurous acid	Sulphureous acid	Sulphuric acid	Vitriolic acid	Oxygenated ſulphuric acid	Unknown
	Phoſphorus	Oxyd of phoſphorus	Reſiduum from the combuſtion of phoſphorus	Phoſphorous acid	Volatile acid of phoſphorus	Phoſphoric acid	Phoſphoric acid	Oxygenated phoſphoric acid	Unknown
	Muriatic radical	Muriatic oxyd	Unknown	Muriatous acid	Unknown	Muriatic acid	Marine acid	Oxygenated muriatic acid	Dephlogiſticated marine acid
	Fluoric radical	Fluoric oxyd	Unknown	Fluorous acid	Unknown	Fluoric acid	Unknown till lately		
	Boracic radical	Boracic oxyd	Unknown	Boracous acid	Unknown	Boracic acid	Homberg's ſedative ſalt		
Combinations of oxygen with the ſimple metallic ſubſtances.	Antimony	Grey oxyd of antimony	Grey calx of antimony	White oxyd of antimony	White calx of antimony, diaphoretic antimony	Antimonic acid			
	Silver	Oxyd of ſilver	Calx of ſilver			Argentic acid			
	Arſenic	Grey oxyd of arſenic	Grey calx of arſenic	White oxyd of arſenic	White calx of arſenic	Arſeniac acid	Acid of arſenic	Oxygenated arſeniac acid	Unknown
	Biſmuth	Grey oxyd of biſmuth	Grey calx of biſmuth	White oxyd of biſmuth	White calx of biſmuth	Biſmuthic acid			
	Cobalt	Grey oxyd of cobalt	Grey calx of cobalt			Cobaltic acid			
	Copper	Brown oxyd of copper	Brown calx of copper	Blue and green oxyds of copper	Blue and green calces of copper	Cupric acid			
	Tin	Grey oxyd of tin	Grey calx of tin	White oxyd of tin	White calx of tin, or putty of tin	Stannic acid			
	Iron	Black oxyd of iron	Martial ethiops	Yellow and red oxyds of iron	Ochre and ruſt of iron	Ferric acid			
	Manganeſe	Black oxyd of manganeſe	Black calx of manganeſe	White oxyd of manganeſe	White calx of manganeſe	Manganeſic acid			
	Mercury	Black oxyd of mercury	Ethiops mineral †	Yellow and red oxyds of mercury	Turbith mineral, red precipitate, calcined mercury, precipitate *per ſe*	Mercuric acid			
	Molybdena	Oxyd of molybdena	Calx of molybdena			Molybdic acid	Acid of molybdena	Oxygenated molybdic acid	Unknown
	Nickel	Oxyd of nickel	Calx of nickel			Nickelic acid			
	Gold	Yellow oxyd of gold	Yellow calx of gold	Red oxyd of gold	Red calx of gold, purple precipitate of caſſius	Auric acid			
	Platina	Yellow oxyd of platina	Yellow calx of platina			Platinic acid			
	Lead	Grey oxyd of lead	Grey calx of lead	Yellow and red oxyds of lead	Maſſicot and minium	Plumbic acid			
	Tungſtein	Oxyd of Tungſtein	Calx of Tungſtein			Tungſtic acid	Acid of Tungſtein	Oxygenated Tungſtic acid	Unknown
	Zinc	Grey oxyd of zinc	Grey calx of zinc	White oxyd of zinc	White calx of zinc, pompholix	Zincic acid			

* Only one degree of oxygenation of hydrogen is hitherto known.—A

† Ethiops mineral is the ſulphuret of mercury; this ſhould have been called black precipitate of mercury.—E.

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year	s	rv	k	cd	rfb	sf	dkp	df	fk	lc	kd	sp	u	v	vs	fp	el	la	alt	other	total
1953	74	14	30		6		8					1	0	42							175
1957	70	14	30		9		6					1	0	45						0	175
1960	76	11	32		0	11	0					1	6	38						0	175
1964	76	10	36		0	10	0					0	5	38						0	175
1966	69	13	34		0	20	0			4			0	35						0	175
1968	62	27	37		0	11	0			0		0	0	34	4					0	175
1971	70	27	31		0	17	0				0	0		30	0					0	175
1973	46	20	16	14	5	11	6				7			22	0	28				0	175

Unstructured data

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Det moderne, sekulære samfund afvises af nogle muslimer. De gør krav på en særstil når de insisterer på særlig hensyntagen til egne religiøse følelser. Det er uforer med et verdsligt demokrati og ytringsfrihed, hvor man må være rede til at finde sig i hån, spot og latterliggørelse. Det er bestemt ikke altid lige sympatisk og pænt at se på, og det betyder ikke, at religiøse følelser for enhver pris skal gøres til grin, men det er underordnet i sammenhængen.

- »Muhammeds ansigt«, *Jyllands-Posten*, September 30th 2005

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SEP 9, 2016

TESTER ANNOUNCES $450,000 TO HELP LOCAL FIRE DEPARTMENTS IN PARK AND MISSOULA COUNTIES

(Great Falls, Mont.)-Just a week after securing $300,000 in funding for four Montana fire departments, Senator Jon Tester announced today that the Paradise Valley Fire Service and the Missoula Rural Fire District will receive more than $450,000 in federal funding to help them recruit and retain volunteer firefighters and EMTs.

"Rural fire departments are sustained in large part by their communities," Tester said. "And while that can do a lot, this kind of outside support really helps bolster their recruitment and training efforts so they can continue to protect our families and communities."

`https://www.tester.senate.gov/?p=press_release&id=4755`

Unstructured data

Unstructured data

	Analog	Digital
Structured	data table in a book	.csv file
Unstructured	text in a book	online text

How do American news media portray people on welfare?

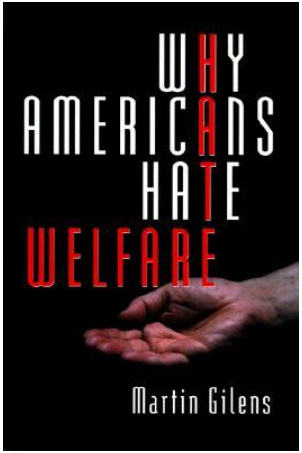

Table 4. Percent African Americans in Pictures of the Poor by Topic of Story

Topic	Number of Stories	Number of Poor People Pictured[a]	Percent African American
Underclass	6	36	100
Poor	33	147	69
Housing/homelessness[b]	96	195	66
Education for the poor[c]	4	17	65
Poor children[d]	24	70	60
Public welfare	25	97	57
Employment programs for the poor[e]	9	52	40
Medicaid	7	6	17
Miscellaneous others[f]	14	13	43
Total	182	560	62

NOTE.—Column entries exceed totals shown because stories may be indexed under more than one topic.

[a] Excludes 75 people for whom race could not be determined.

[b] Includes Housing [city/state], U.S.; Housing projects; Housing, federal aid; Housing vouchers; Department of H.U.D.; Homeless; Poor, housing; Welfare hotels; Habitat for Humanity; Covenant House.

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How do American news media portray people on welfare?

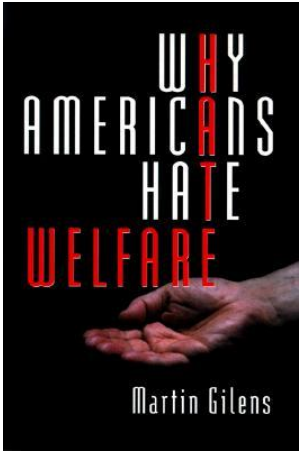

Table 4. Percent African Americans in Pictures of the Poor by Topic of Story

Topic	Number of Stories	Number of Poor People Pictured[a]	Percent African American
Underclass	6	36	100
Poor	33	147	69
Housing/homelessness[b]	96	195	66
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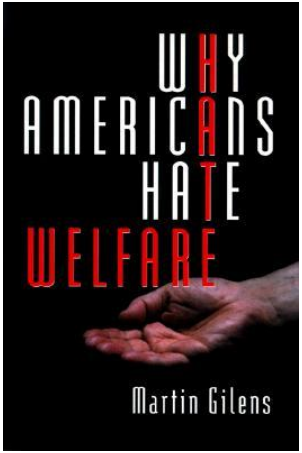

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Are political campaigns in Denmark negative?

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Are political campaigns in Denmark negative? (Hansen & Pedersen, 2008)

Table 1. Party Advertisements Coded for Tone (Number of Advertisements)

	Positive	Primarily positive	Balanced	Primarily negative	Negative	Total	Percentage negative or primarily negative of total number of party advertisements
Danish Red-Green Alliance	17	0	2	2	2	23	17
Socialist People's Party	74	8	19	15	0	116	13
Minority Party	2	0	0	0	0	2	0
Social Democrats	86	12	45	0	28	171	39
Social Liberals	21	0	3	6	0	30	20
Centrum-Demokraterne	33	0	0	0	0	33	0
Christian Democrats	3	1	0	0	0	4	0
Danish People's Party	122	0	4	0	4	130	3
Venstre	178	0	0	6	0	184	3
Conservatives	64	0	7	0	0	71	0
Government & support party	367	1	11	6	4	389	4*
Opposition	233	20	69	23	30	375	14
Frontrunners	354	8	31	29	2	424	7
Runners-up	246	13	49	0	32	340	9
Total	600	21	80	29	34	764	8
Percentage of total	78	3	10	4	5	100	

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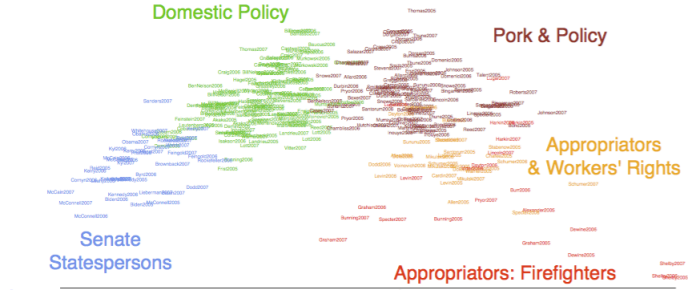

Senate Position Taker	Domestic Policy	Pork & Policy	Appropriators
- Iraq War	- Environment	- WRDA grants	- Fire Grants
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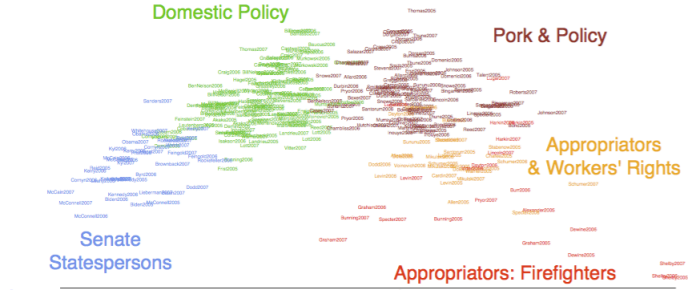

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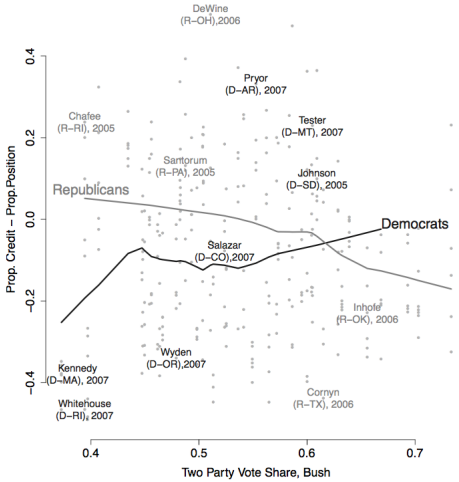

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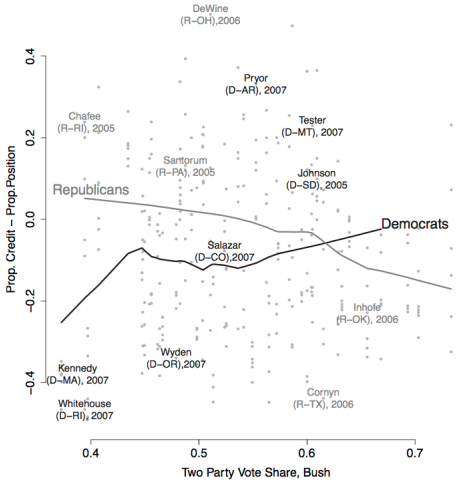

Are cartoons about Islam more negative than cartoons about Christianity? (Kaylor, 2012)

TABLE 1
Tone of Cartoons by Religion

	Positive	*Negative*	*Neutral*	*Total*
Christian	14 (7.2%)	148 (76.3%)	32 (16.5%)	194 (100%)
Muslim	1 (1.9%)	45 (84.9%)	7 (13.2%)	53 (100%)
Other religions	0 (0%)	3 (100%)	0 (0%)	3 (100%)
Atheist/Agnostic	0 (0%)	4 (80%)	1 (20%)	5 (100%)
All religions	0 (0%)	10 (100%)	0 (0%)	10 (100%)
Total	15 (5.7%)	210 (79.2%)	40 (15.1%)	265 (100%)

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Do liberals and conservatives have different living spaces? (Carney et al., 2008)

Table 4. Relations between Political Conservatism of Occupant and Room Cues in Bedrooms and Office Spaces (Study 3)

	Relation with liberalism-conservatism			
	Bedrooms		Offices	
	β	*b* (*SE*)	β	*b* (*SE*)
Sports-related décor (posters, paintings, photos)	.34**	.23 (.07)	n/a	n/a
Event calendar	.31**	.27 (.10)	n/a	n/a
Postage stamps	.30**	.29 (.11)	n/a	n/a
Presence of string/thread	.29*	.33 (.12)	n/a	n/a
Iron and/or ironing board	.28*	.20 (.08)	n/a	n/a
Laundry basket	.25*	.11 (.05)	n/a	n/a

Table 4. (cont.)

	Relation with liberalism-conservatism			
	Bedrooms		Offices	
	β	*b* (*SE*)	β	*b* (*SE*)
Many (vs. few) items of stationery	−.26*	−.27 (.12)	−.18	−.10 (.07)
World music CDs	−.26*	−.13 (.05)	n/a	n/a
Art supplies	−.27*	−.12 (.05)	n/a	n/a
Variety of music	−.27*	−.34 (.14)	n/a	n/a
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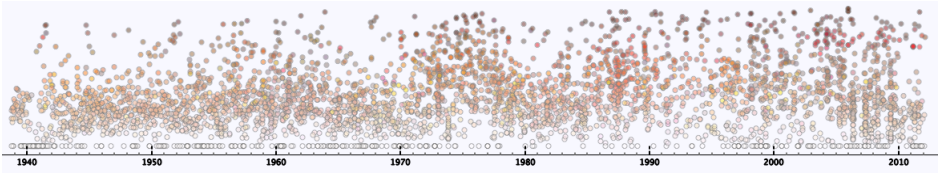

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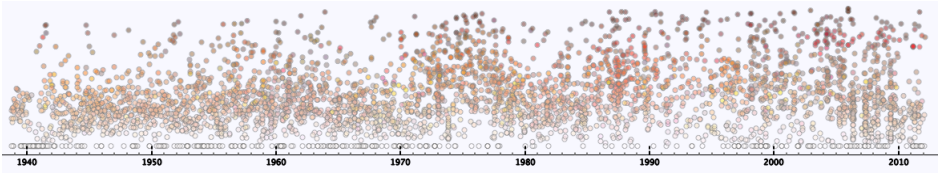

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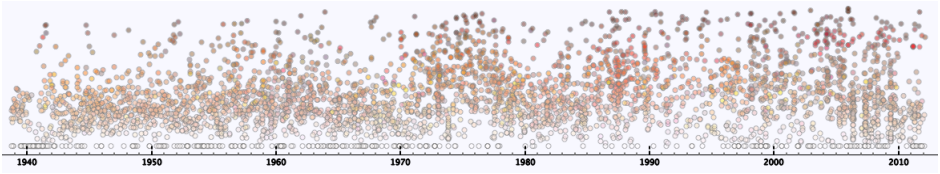

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- Results are often 'merely descriptive' (though see Gerring, 2012; Grimmer, 2015)
- Data often (seemingly) idiosyncratic
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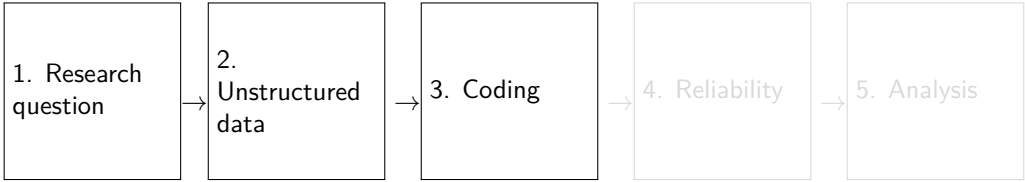
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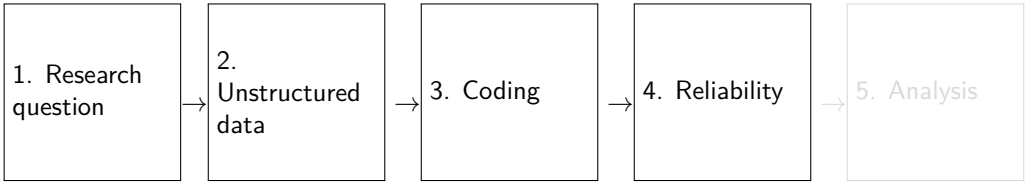
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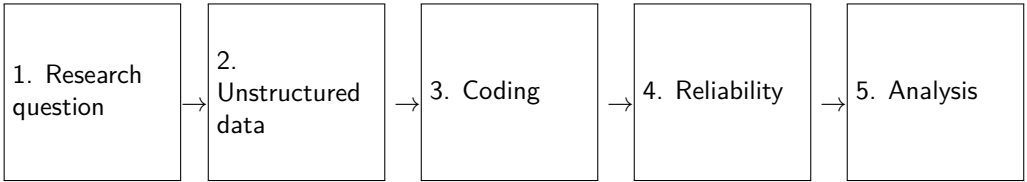
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Exercise 1

What would be a research question (relevant to your project) answerable using unstructured data?

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- Entire content universe of interest
- E.g.: State of the Union speeches

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»A sample is said to be representative of a population if studying leads to results that are approximately the same as those that one would reach by studying the entire population.« (Krippendorff, p. 112)

- Ideal: simple random sampling
- Special problem in content analysis: exhaustive sampling frame $(u_1, u_2, \ldots, u_i, \ldots, u_N)$ rarely available

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When sampling frame is not indexed: *systematic random sampling*

- select random starting position and random sampling interval m, sample every mth unit N times
- potential issue: periodicity
- (in)famous example: Hatch & Hatch sample 413 June wedding announcements from the 1932-42 NYT $\rightarrow$ absence of Jewish weddings as sign of low social status

Cahnman (1948): »Jewish weddings are not performed in the seven weeks between Passover and the Feast of Weeks and in the three weeks preceding the day of mourning for the destruction of the Holy Temple in Jerusalem. Almost invariably, June falls into the one or the other period.«

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Dansk taleradio bliver mere ensformigt

For at nå bredere ud, har P1 siden 2007 skåret ned på diversiteten.

»A major part of the thesis is an analysis of P1's shows in one week in 2007 compared with P1 and Radio 24syv in the same week in 2015. (...) Her data suggest a clear narrowing in the ways radio is made. (...) Though the analysis is not fully representative, it suggests some general tendencies in Danish talk radio.«

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Stratified random sampling

Example: Coverage of 'Political Scandal' in two newspapers

- Newspaper 1: 150 articles
- Newspaper 2: 3000 articles

Random sampling (1/10)

- Newspaper 1: 15 articles
- Newspaper 2: 300 articles

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Better approach: power analysis

$$\beta = \Phi\left(\frac{|\mu_t - \mu_c|\sqrt{N}}{2\sigma} - \Phi^{-1}(1 - \frac{\alpha}{2})\right) \quad (1)$$

β= prob. of observing significant result at level α, sample size N, true effect size $\frac{|\mu_t - \mu_c|}{\sigma}$

In applied psychology, estimated avg. power≈.52 (Mone et al., 1996); in neuroscience≈.21 (Button et al., 2013).

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Countervailing concern: *cost*

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- Comparative Manifesto Project (European party manifestos)

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