

# Analysis of Peer Review data from WoS

## part 3: temporal analyses

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**PEERE**

Valencia – March 8-11, 2016

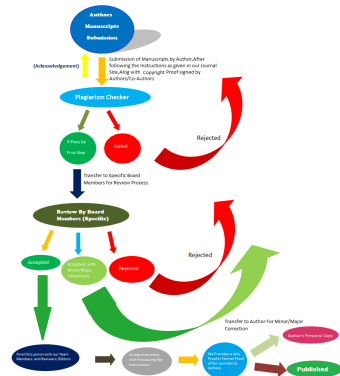
- 1 Data
- 2 Temporal distributions
- 3 Temporal networks
- 4 Results
- 5 Conclusions

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Microbioz Journals

**Current version of slides (March 8, 2016 / 01 : 58):**

<http://vlado.fmf.uni-lj.si/pub/slides/peere3.pdf>

In the previous presentations on analysis of peer review data from WoS we didn't considered the time.

Since we have for each work information about its publication year we can transform networks into temporal networks. We present a simple approach to analysis of temporal networks based on time slices.

Peer Review  
from WoSV. Batagelj,  
A. Ferligoj

Data

Temporal  
distributionsTemporal  
networks

Results

Conclusions

PT J  
 AU Dipple, H  
 Evans, B  
 TI The Leicestershire Huntington's disease support group: a social network  
 analysis  
 SO HEALTH & SOCIAL CARE IN THE COMMUNITY  
 LA English  
 DT Article  
 C1 Rehabil Serv, Troon Way Business Ctr, Leicester LE4 9HA, Leics, England.  
 RP Dipple, H, Rehabil Serv, Troon Way Business Ctr, Sandringham  
 Suite, Humberstone Lane, Leicester LE4 9HA, Leics, England.  
 CR BORGATTI SP, 1992, UCINET 4 VERSION 1 0  
 FOLSTEIN S, 1989, HUNTINGTONS DIS DISO  
 SCOTT J, 1991, SOCIAL NETWORK ANAL  
 NR 3  
 TC 3  
 PU BLACKWELL SCIENCE LTD  
 PI OXFORD  
 PA P O BOX 88, OSNEY MEAD, OXFORD OX2 ONE, OXON, ENGLAND  
 SN 0966-0410  
 J9 HEALTH SOC CARE COMMUNITY  
 JI Health Soc. Care Community  
 PD JUL  
 PY 1998  
 VL 6  
 IS 4  
 BP 286  
 EP 289  
 PG 4  
 SC Public, Environmental & Occupational Health; Social Work  
 GA 105UP  
 UT ISI:000075092200008  
 ER

To the **Web of Science** (WoS) we put the query "peer review\*". In May and June 2015 we got (from Web of Science Core Collection) 17053 hits, and additional 2867 hits for the query refereeing.

In March 2016 we updated the data by adding hits for years 2015 and 2016 and manually prepared descriptions for the most important books (without CR data).

The first analysis in 2015 revealed many papers without WoS descriptions having large indegrees in the citation network. We manually searched for each of them (with indegree larger or equal to 20) and if found we added it into the data set.

After some iterations, we finally constructed the data set used in this analysis.

Using the program **WoS2Pajek** we transformed the WoS data into a collection of *two-mode networks*:

- works  $\times$  authors (**WA**),
- works  $\times$  keywords (**WK**);
- works  $\times$  journal (**WJ**),

and a

- *one-mode* citation network works  $\times$  works (**Ci**);

where works include papers, reports, books, patents etc.

Besides this we get also:

- a partition DC (DC= a work  $w$  has (1) / has not (0) a WoS description),
- a partition year (publication year),
- a vector NP (number of pages); and
- a CSV file titles with basic data about works with DC=1.

```
>>> End of processing of WoS file
number of works      = 721547
number of authors    = 295849
number of journals    = 39988
number of keywords   = 36279
number of records     = 22981
number of duplicates = 887
works + titles       : titles.csv
works index file:    vtxIndex.txt
```

**\*\*\* FILES:**

```
year of publication partition: C:/Users/batagelj/work/Python/WoS/peere2\Year.clu
described / cited only partition: C:/Users/batagelj/work/Python/WoS/peere2\DC.clu
number of pages vector: C:/Users/batagelj/work/Python/WoS/peere2\NP.vec
citation network: C:/Users/batagelj/work/Python/WoS/peere2\Cite.net
works X journals network: C:/Users/batagelj/work/Python/WoS/peere2\WJ.net
works X keywords network: C:/Users/batagelj/work/Python/WoS/peere2\WK.net
works X authors network: C:/Users/batagelj/work/Python/WoS/peere2\WA.net
finished: Sun Mar 6 05:23:41 2016
time used: 0:07:07.905000
```

We removed multiple links and loops from networks. The cleaned citation network has  $n = 721547$  nodes and  $m = 869821$  arcs.

Most of the works were referenced only once. We decided to remove all only cited nodes with indegree smaller than 3 (boundary problem).

We also removed all cited only nodes starting with strings "[ANONYM", "WORLD\_", "INSTITUT\_", "U\_S", "WHO\_", "AMERICAN\_", "DEPARTME\_", "NATIONAL\_", "UNITED\_", "CENTERS\_", "INTERNAT\_", "EUROPEAN\_", "\*WHO", "\*DEP", "\*US", "WHO(".

The final set of works  $W$  contains 45917 works.





# All peer review related publications in WoS by year distribution

Peer Review  
from WoS

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A. Ferligoj

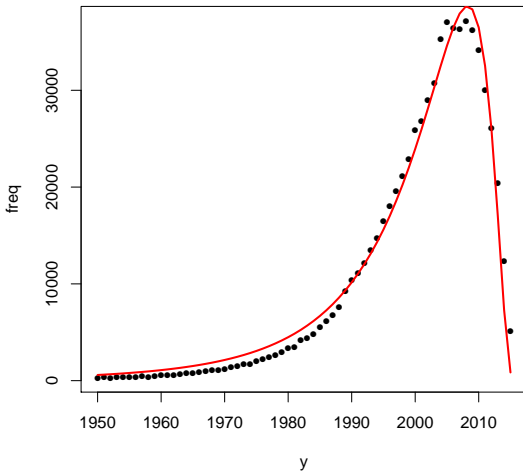
Data

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# Peer review publications in WoS by year distribution

Peer Review  
from WoS

V. Batagelj,  
A. Ferligoj

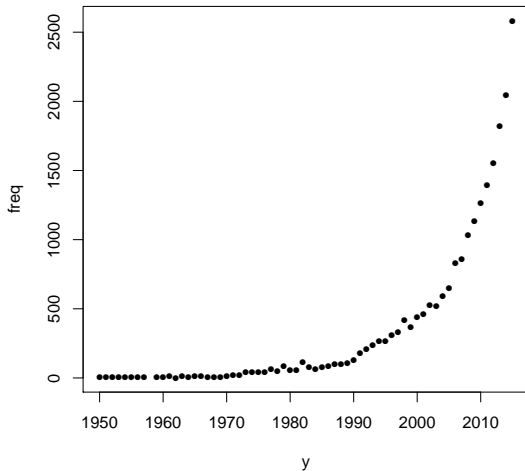
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A *temporal network*  $\mathcal{N}_{\mathcal{T}} = (\mathcal{V}, \mathcal{L}, \mathcal{P}, \mathcal{W}, \mathcal{T})$  is obtained by attaching the *time*,  $\mathcal{T}$ , to an ordinary network where  $\mathcal{T}$  is a set of *time points*,  $t \in \mathcal{T}$ .

In a temporal network, nodes  $v \in \mathcal{V}$  and links  $l \in \mathcal{L}$  are not necessarily present or active in all time points. Let  $T(v)$ ,  $T \in \mathcal{P}$ , be the *activity set* of time points for node  $v$  and  $T(l)$ ,  $T \in \mathcal{W}$ , the activity set of time points for link  $l$ .

Besides the presence/absence of nodes and links also their properties can change through time.

In program Pajek we extended (in 1999) its input format to enable inclusion of temporal information

```
*vertices 325
```

```
...
17 "bla" [3-9, 12, 16-23, 27-*]
```

```
...
*arcs
```

```
...
37 42 5 [5-9, 12, 14, 17-21]
```

```
...
```

In Pajek, the time set,  $T$ , is discrete and consists of a subset of natural numbers  $T \subset \mathbb{N}$ . Its interpretation is left to the user. In Pajek's input format the data about the times when an element is present (active) are given in the continuation of the line describing the element inside the brackets [ in ]. Time periods are separated by commas, ,. Continuous time periods between a starting time,  $s$ , to the ending time,  $e$ , can be written as  $s-e$ . Pajek uses the symbol, \*, for 'infinity' or, in most practical situations, the last time point for a data set.

Let  $\mathcal{N} = (\mathcal{V}, \mathcal{L})$  be a two-mode network on the set of events  $E$  and the set of participants  $P$ ,  $\mathcal{V} = E \cup P$ : There is an arc  $(e, p) \in \mathcal{L}$  iff a participant  $p$  participated in the event  $e$ .

The function  $d : E \rightarrow \mathcal{T}$  assigns to each event  $e$  the date  $d(e)$  when it happened.  $\mathcal{T} = [first, last] \subset \mathbb{N}$ . Using these data we can construct two temporal two-mode networks with Pajek's time intervals as values:

- **instantaneous**  $\mathcal{N}_i$ , where we assign to each arc  $(e, p)$  the time interval  $[d(e)]$ , to each event  $e$  the time interval  $[d(e)]$ , and to each participant  $p$  the time interval  $\mathcal{T} = [first-last]$ .
- **cumulative**  $\mathcal{N}_c$ , where we assign to each arc  $(e, p)$  the time interval  $[d(e)-last]$ , to each event  $e$  the time interval  $[d(e)-last]$ , and to each participant  $p$  the time interval  $\mathcal{T} = [first-last]$ .

We denote a network consisting of lines and vertices active in time,  $t \in \mathcal{T}$ , by  $\mathcal{N}(t)$  and call it the (network) *time slice* or *footprint* of  $t$ . Let  $\mathcal{T}' \subset \mathcal{T}$  (for example, a time interval). The notion of a time slice is extended to  $\mathcal{T}'$  by

$$\mathcal{N}(\mathcal{T}') = \bigcup_{t \in \mathcal{T}'} \mathcal{N}(t)$$

The time  $\mathcal{T}$  is usually either a subset of integers,  $\mathcal{T} \subseteq \mathbb{Z}$ , or a subset of reals,  $\mathcal{T} \subseteq \mathbb{R}$ .  $T(v)$  and  $T(l)$  are usually described as a sequence of intervals.

To get time slices in Pajek the relevant command is:

Network/Temporal Network/Generate in time

The generating in time operation creates a sequence of temporal networks for subsequent study.

In this talk: the most important units through time.

Peer Review  
from WoS

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1	96	BORNMANN_L	32	SMITH_M	25	ANDERSON_P	23	DAVIDOFF_F
2	89	SMITH_R	31	THOENNES_M	25	EYSENBAC_G	23	KIM_H
3	87	ALTMAN_D	30	REYES_H	25	CALLAHAM_M	22	KENNEDY_D
4	77	MOHER_D	29	FORD_J	25	MOED_H	22	ANDERSON_M
5	60	LEE_J	29	ZHANG_L	25	DICKERSI_K	22	JONES_M
6	58	RENNIE_D	29	CASTAGNA_C	25	WILSON_D	22	VONELM_E
7	55	GARFIELD_E	29	HELSEN_W	25	LI_Y	22	THOMAS_J
8	53	DANIEL_H	29	DAVIS_J	25	WANG_H	22	SQUIRES_B
9	53	SMITH_J	29	ZHANG_Y	25	ANDERSON_J	22	KRUMHOLZ_H
10	45	COHEN_J	29	LEE_C	24	LI_J	22	COLE_J
11	45	WILLIAMS_J	29	SCHULZ_K	24	GROL_R	22	CICCHETT_D
12	43	WILLIAMS_A	28	MEYER_J	24	GODLEE_F	21	KOSTOFF_R
13	42	GUYATT_G	28	LEE_M	24	BROWN_J	21	PALMER_A
14	41	HARNAD_S	28	JONES_R	24	BAKER_D	21	THOMPSON_S
15	40	IOANNIDI_J	28	JONES_A	23	MARSHALL_E	21	FLETCHER_R
16	39	JOHNSON_C	28	COOK_D	23	CHENG_J	21	GRIMSHAW_J
17	38	CURTIS_K	28	DRUMMOND_M	23	COLE_S	21	HAYNES_R
18	37	BROWN_D	27	WAGER_E	23	SMITH_D	21	DEGENHAR_L
19	37	LEE_S	27	ERNST_E	23	YANG_Y	21	PATEL_M
20	36	WANG_J	27	BROWN_C	23	SMITH_A	21	LIU_J
21	34	JOHNSON_J	27	BERO_L	23	WILLIAMS_M	21	SMITH_E
22	34	ADAMS_J	27	BROWN_R	23	KIM_J	21	MULROW_C
23	33	WANG_Y	26	JOHNSON_D	23	LEE_K	21	DEANGELI_C
24	33	MAZEROLL_S	26	SMITH_S	23	HIGGINS_J	21	SACKETT_D
25	32	BJORK_B	26	GOTZSCHE_P	23	ZHANG_X	21	DAVIS_S

	-1970	1971-1980	1981-1990	1991-2000
1	13 CLARK_G	10 GARFIELD_E	21 GARFIELD_E	34 RENNIE_D
2	12 FISHER_H	7 GORDON_M	15 SQUIRES_B	31 SMITH_R
3	9 MILSTEAD_K	7 CICCHETT_D	12 LOCK_S	22 ALTMAN_D
4	9 ASTON_F	7 COLE_J	11 RELMAN_A	21 HARNAD_S
5	9 SMITH_J	6 ZUCKERMA_H	11 CHALMERS_T	19 KOSTOFF_R
6	8 WILEY_F	6 MERTON_R	10 COHEN_L	16 ERNST_E
7	8 REINDOLL_W	6 BROOK_R	9 CHUBIN_D	15 HORTON_R
8	8 MERTON_R	6 LINDSEY_D	8 COHEN_J	14 GARFIELD_E
9	8 GRIFFIN_E	6 WEINSTEI_P	7 RENNIE_D	14 MARSHALL_E
10	8 ROBERTSO_A	6 MILGROM_P	7 COLE_S	13 REYES_H
11	7 ALFEND_S	6 RATENER_P	7 HAYNES_R	13 BERO_L
12	7 SALE_J	6 MAHONEY_M	7 DONABEDI_A	13 SACKETT_D
13	7 MARSHALL_C	6 MORRISON_K	7 ROY_R	13 MOHER_D
14	-----	-----	7 MACROBER_M	-----
	4 GARFIELD_E	4 RELMAN_A	-----	
			6 HARNAD_S	
			6 SACKETT_D	
			5 ALTMAN_D	
			5 MARSHALL_E	

Indegrees in time slices for network  $WA_i$ .



Peer Review  
from WoS

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	1991-2000	2001-2005	2006-2010	2011-2015
1	34 RENNIE_D	21 SMITH_R	54 BORNMANN_L	36 LEE_J
2	31 SMITH_R	18 ALTMAN_D	31 DANIEL_H	33 BORNMANN_L
3	22 ALTMAN_D	14 BENNINGE_M	28 ALTMAN_D	31 BROWN_D
4	21 HARNAD_S	13 JOHNSON_J	28 MOHER_D	27 MAZEROLL_S
5	19 KOSTOFF_R	13 MOHER_D	20 ANDERSON_P	26 ZHANG_L
6	16 ERNST_E	12 CASTAGNA_C	20 HELSEN_W	26 WANG_J
7	15 HORTON_R	12 EYSENBAC_G	18 SMITH_R	25 LEE_S
8	14 GARFIELD_E	11 DAVIDOFF_F	17 JOHNSON_C	24 CURTIS_K
9	14 MARSHALL_E	10 KENNEDY_D	17 KAISER_M	23 WANG_Y
10	13 REYES_H	10 HARNAD_S	17 RESNICK_D	22 MOHER_D
11	13 BERO_L	10 JACKLER_R	-----	21 LEE_C
12	13 SACKETT_D	10 SMITH_J	14 LEE_J	-----
13	13 MOHER_D	10 RUBEN_R		15 JOHNSON_C
14	-----	10 PALMER_A		14 SMITH_R
		-----		13 ALTMAN_D
		9 RENNIE_D		
		9 BERO_L		
		7 BORNMANN_L		

Peer Review  
from WoS

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1115	JAMA-J AM MED ASSO	115	ARCH GEN PSYCHIAT	80	J CLIN ENDOCR METAB
914	NEW ENGL J MED	110	AM PSYCHOL	79	ANN PHARMACOTHER
669	LANCET	108	SPINE	79	CRIT CARE MED
604	BRIT MED J	106	J GEN INTERN MED	79	AM J ROENTGENOL
515	BMJ OPEN	105	LEARN PUBL	77	J SEX MED
395	SCIENCE	104	MED J AUSTRALIA	77	ANESTH ANALG
392	NATURE	103	ENVIRON HEALTH PERSP	76	J ADV NURS
346	ANN INTERN MED	102	SCIENTIST	75	J ASSOC OFF AGR CHEM
331	SCIENTOMETRICS	101	J AM SOC INF SCI TEC	75	AM J EPIDEMIOL
282	CIRCULATION	99	NEUROLOGY	73	OBSTET GYNECOL
223	ACAD MED	98	J AM COLL RADIOL	73	RES POLICY
205	STROKE	93	DIABETES CARE	73	STAT MED
180	J AM COLL CARDIOL	92	J PROSTHET DENT	73	PSYCHOL BULL
178	STRAHLENTHER ONKOL	92	SOC SCI MED	72	P NATL ACAD SCI USA
178	PLOS ONE	92	NUCLEIC ACIDS RES	70	J THORAC CARDIOV SUR
163	J UROLOGY	91	ARCH PATHOL LAB MED	69	J BONE JOINT SURG AM
163	PEDIATRICS	90	J SPORT SCI	68	RES EVALUAT
157	J CLIN EPIDEMIOL	90	PHYS TODAY	68	J NATL CANCER I
151	ARCH INTERN MED	86	RADIOLOGY	67	ABSTR PAP AM CHEM S
146	AM J PUBLIC HEALTH	85	ANN THORAC SURG	67	ANN ALLERG ASTHMA IM
145	J CLIN ONCOL	85	CHEST	67	ANN EMERG MED
133	AM J PSYCHIAT	84	MED SCI SPORT EXER	67	BRIT J PSYCHIAT
133	CAN MED ASSOC J	84	BRIT J SPORT MED	66	PLAST RECONSTR SURG
128	AM J PREV MED	83	BEHAV BRAIN SCI	65	J TRAUMA
118	MED CARE	81	MED EDUC	65	ANN SURG

-1970	1971-1980	1981-1990	1991-2000
75 J ASSOC OFF AGR CHEM	54 NEW ENGL J MED	132 NEW ENGL J MED	467 JAMA-J AM MED ASSOC
29 SCIENCE	44 SCIENCE	126 JAMA-J AM MED ASSOC	278 NEW ENGL J MED
26 PHYS REV	23 AM PSYCHOL	77 SCIENCE	272 BRIT MED J
26 NATURE	20 MED J AUSTRALIA	64 BRIT MED J	203 LANCET
23 LANCET	20 AM J PSYCHIAT	50 ANN INTERN MED	178 STRAHLENTHER ONKOL
18 BRIT MED J	20 JAMA-J AM MED ASSOC	44 BEHAV BRAIN SCI	134 ANN INTERN MED
13 PHYS TODAY	17 SOC STUD SCI	42 NATURE	121 NATURE
10 PSYCHOL BULL	16 PHYS TODAY	35 LANCET	107 SCIENCE
9 AM PSYCHOL	15 BRIT MED J	35 PHYS TODAY	78 STROKE
7 AM SOCIOL REV	15 AM SOCIOL	31 MED CARE	77 ACAD MED
7 AM SOCIOL	14 NATURE	29 SCIENTOMETRICS	61 CIRCULATION
7 NEW ENGL J MED	13 FED PROC	28 CAN MED ASSOC J	60 SCIENTOMETRICS
7 J AMER MED ASSOC	12 J MED EDUC	27 SCIENTIST	57 AM J PSYCHIAT
7 REV MOD PHYS	11 PSYCHOL BULL	26 AM PSYCHOL	56 ARCH INTERN MED
	10 MED CARE		53 J UROLOGY
2001-2005	2006-2010	2011-2015	
288 JAMA-J AM MED ASSOC	171 NEW ENGL J MED	489 BMJ OPEN	
206 NEW ENGL J MED	158 JAMA-J AM MED ASSOC	146 PLOS ONE	
178 LANCET	156 LANCET	89 SCIENTOMETRICS	
164 BRIT MED J	95 SCIENTOMETRICS	75 J AM COLL RADIOL	
94 CIRCULATION	83 CIRCULATION	66 NEW ENGL J MED	
83 NATURE	63 NATURE	63 LANCET	
73 ANN INTERN MED	61 J AM COLL CARDIOL	53 MATER TODAY-PROC	
68 STROKE	61 BRIT MED J	52 JAMA-J AM MED ASSOC	
65 ACAD MED	60 ANN INTERN MED	47 PROCEDIA COMPUT SCI	
52 SCIENTOMETRICS	58 J CLIN ONCOL	47 PROCEDIA ENGINEER	
51 SCIENCE	54 SCIENCE	43 ARCH PATHOL LAB MED	
50 J AM COLL CARDIOL	52 J AM SOC INF SCI TEC	43 NATURE	
50 PEDIATRICS	47 J SEX MED	41 BMC PUBLIC HEALTH	
45 AM J PUBLIC HEALTH	47 PEDIATRICS		

1	7375	review	1132	treatment	673	meta-analysis	487	reviewer
2	3835	peer	1122	outcome	672	woman	485	injury
3	2546	research	1097	assessment	656	prevention	480	safety
4	2139	quality	1086	medical	630	datum	476	population
5	2085	health	1008	model	628	policy	474	rate
6	1973	systematic	1004	intervention	623	experience	474	follow-up
7	1671	journal	979	performance	604	information	471	knowledge
8	1590	management	961	program	586	bias	471	infection
9	1573	care	948	education	586	association	470	perspective
10	1460	peer-review	930	control	582	behavior	467	prevalence
11	1447	trial	917	child	572	service	459	survey
12	1432	study	911	cancer	569	protocol	459	new
13	1362	analysis	901	evaluation	567	method	455	international
14	1354	referee	891	practice	544	human	455	activity
15	1354	use	846	scientific	523	peer-reviewed	452	manuscript
16	1349	publication	777	medicine	521	social	450	change
17	1337	impact	775	effect	518	drug	449	strategy
18	1304	patient	767	guideline	516	united-states	442	academic
19	1292	therapy	760	process	513	adult	438	support
20	1278	science	747	report	512	evidence	437	chronic
21	1208	literature	736	factor	506	mortality	435	acute
22	1193	randomize	733	controlled-trial	504	article	432	design
23	1188	clinical	720	disorder	503	community	422	role
24	1181	disease	688	surgery	500	improve	418	work
25	1152	risk	682	development	494	student	418	cell
							418	recommendation

	1-1970	1971-1980	1981-1990	1991-2000
Peer Review from WoS	1 180 referee	234 review	647 peer-review	759 review
V. Batagelj, A. Ferligoj	2 89 report	228 peer	159 referee	631 peer
Data	3 70 recommendation	116 referee	67 journal	423 peer-review
Temporal distributions	4 58 subcommittee	87 peer-review	51 peer	335 quality
Temporal networks	5 38 medical	15 care	51 review	279 research
Results	6 11 act	15 reply	48 process	264 journal
Conclusions	7 11 committee	14 method	35 research	217 referee
	8 10 insurance	14 comment	34 editorial	190 medical
	9 9 bankruptcy	14 medical	33 reviewer	185 care
	10 7 compensation	14 quality	32 quality	174 publication
	11 7 science	14 role	31 medical	166 trial
	12 6 scientific	13 study	28 science	151 clinical
	13 6 workman	13 use	28 scientific	147 management
	14 5 review	13 research	26 publication	138 science
	15 5 national	12 journal	25 reply	134 study
	16 5 drug	12 scientific	22 editor	134 assessment
	17 5 society	11 science	20 policy	129 therapy
	18 5 payment	11 impact	20 manuscript	128 analysis
	19 5 peer	10 papers	19 report	128 health
	20 4 study	10 experience	18 author	126 use
	21 4 jurisdiction	10 process	18 balance	125 control
	22 4 association	10 anonymous	16 comment	119 evaluation
	23 4 company	9 ambulatory	16 program	119 patient
	24 4 medicine	9 evaluation	16 evaluation	114 program
	25 4 malinger	9 problem		112 process
		9 guideline		
		9 audit		

# Main keywords through time

1991 - 2015

## Peer Review from WoS

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	1991-2000	2001-2005	2006-2010	2011-2015
1	759 review	872 review	1753 review	3588 review
2	631 peer	592 peer	974 peer	1413 systematic
3	423 peer-review	336 research	620 research	1321 peer
4	335 quality	294 quality	551 quality	1234 health
5	279 research	245 trial	471 health	1225 research
6	264 journal	232 journal	424 journal	885 quality
7	217 referee	196 health	385 systematic	847 management
8	190 medical	186 management	379 management	833 care
9	185 care	184 referee	369 publication	811 study
10	174 publication	180 publication	342 care	755 impact
11	166 trial	177 clinical	340 treatment	746 use
12	151 clinical	171 medical	338 patient	698 analysis
13	147 management	170 science	331 impact	688 trial
14	138 science	170 analysis	331 analysis	678 patient
15	134 study	162 care	330 randomize	677 literature
16	134 assessment	160 therapy	329 therapy	651 therapy
17	129 therapy	156 control	315 trial	649 journal
18	128 analysis	154 disease	311 clinical	647 intervention
19	128 health	149 patient	308 science	638 outcome
20	126 use	146 randomize	300 study	619 risk
21	125 control	145 use	298 use	613 randomize
22	119 evaluation	141 literature	294 literature	609 disease
23	119 patient	137 study	293 assessment	603 science
24	114 program	135 impact	287 risk	574 publication
25	112 process	130 treatment	287 disease	561 model
		128 model		

Multiplying the network  $\mathbf{WA}$  from left with its reverse we get the *co-authorship* network  $\mathbf{Co} = \mathbf{WA}^T * \mathbf{WA}$ . The value  $co(u, v)$  of a link  $(u, v)$  is equal to the number of works co-authored by authors  $u$  and  $v$ .

On the following slides the link cuts of co-authorship networks for time slices of peer review  $\mathbf{WA}$  network are presented.

Peer Review  
from WoS

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A. Ferligoj

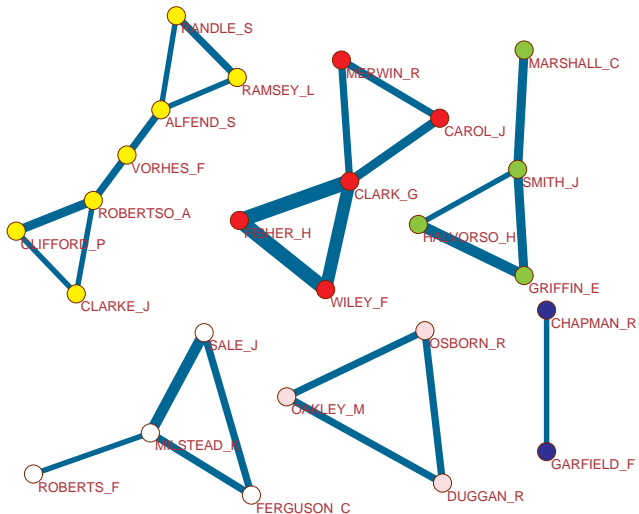
Data

Temporal  
distributions

Temporal  
networks

Results

Conclusions





# Co-authors 1971 – 1980

link cut at level 2

Peer Review from WoS

V. Batagelj,  
A. Ferligoj

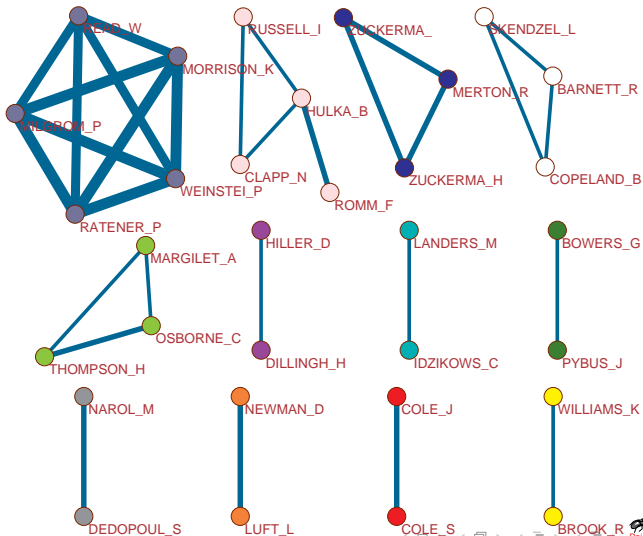
Data

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# Co-authors 1981 – 1990

link cut at level 2

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from WoS

V. Batagelj,  
A. Ferligoj

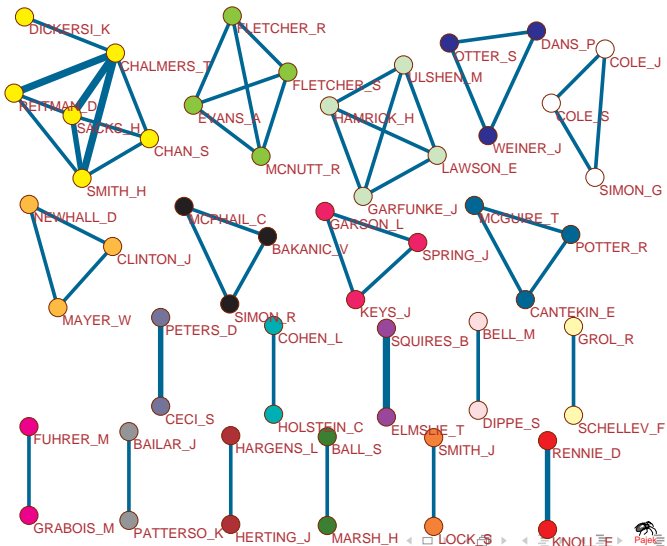
Data

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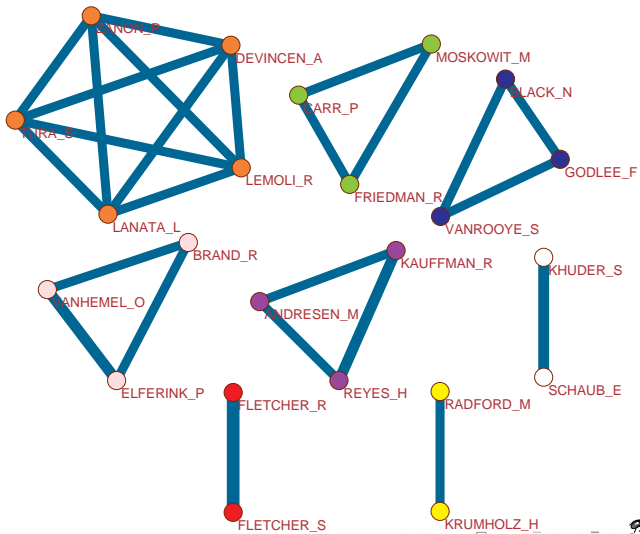
Conclusions



# Co-authors 1991 – 2000

link cut at level 5

- Peer Review from WoS
- V. Batagelj, A. Ferligoj
- Data
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- Conclusions



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A. Ferligoj

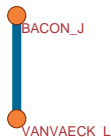
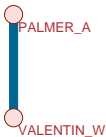
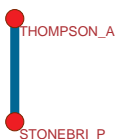
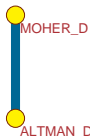
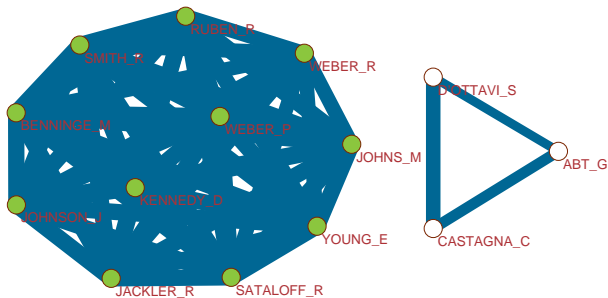
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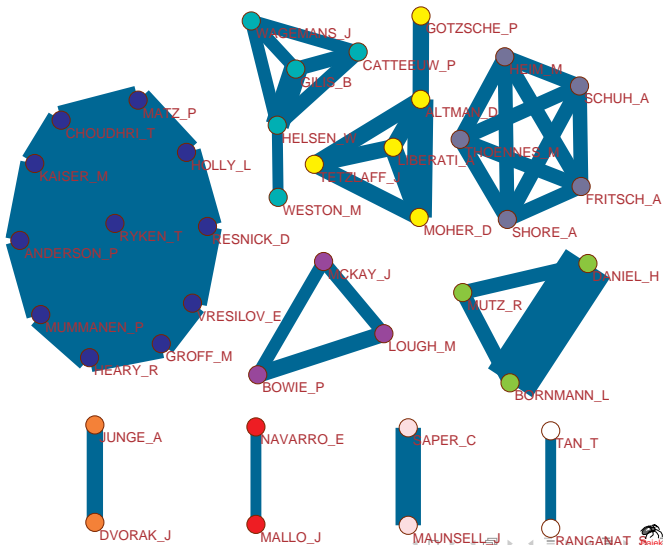
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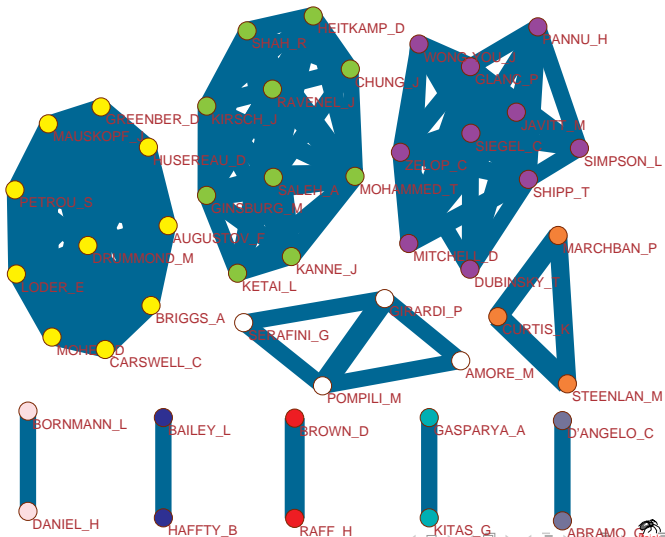
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A problem with the presented approach is the selection of intervals and their impact on the results. Another option would be to use the cumulative networks with damping of older data.

In searching for the most characteristic keywords for a given time slice instead of the most frequent keywords we could change the criterion and use the TF-IDF (Term Frequency-Inverse Document Frequency) index ([tf-idf: Wikipedia](#)).

We are developing a new approach to analysis of temporal networks based on temporal quantities that can be assigned to nodes and links as values. A temporal quantity is a generalization of Pajek's description of activity sets – to each time interval we also add a value. For details see [TQ/ArXiV](#).

Some applications of this approach to Peer review data will be presented at one of the Peere meetings.