

Citation networks in economics

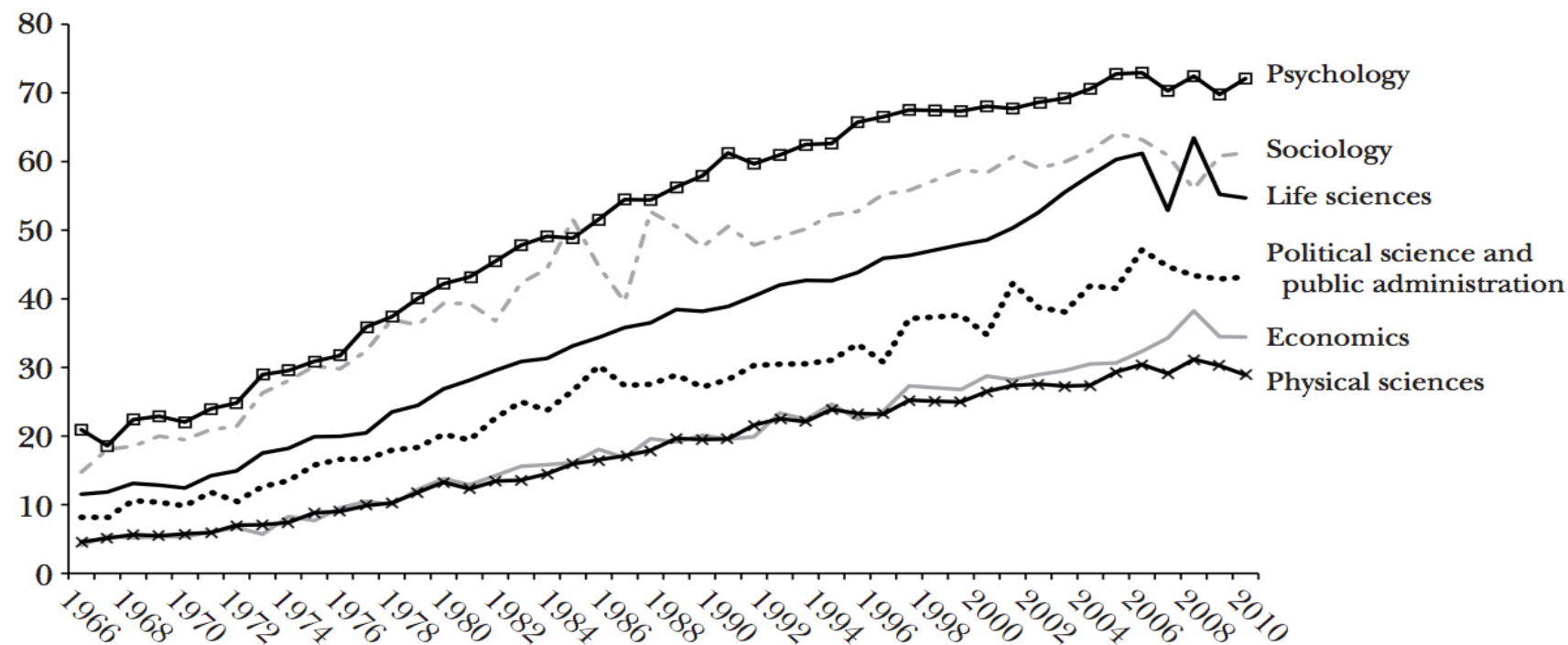
Carlo D'Ippoliti



SAPIENZA
UNIVERSITÀ DI ROMA

The most hierarchical social science

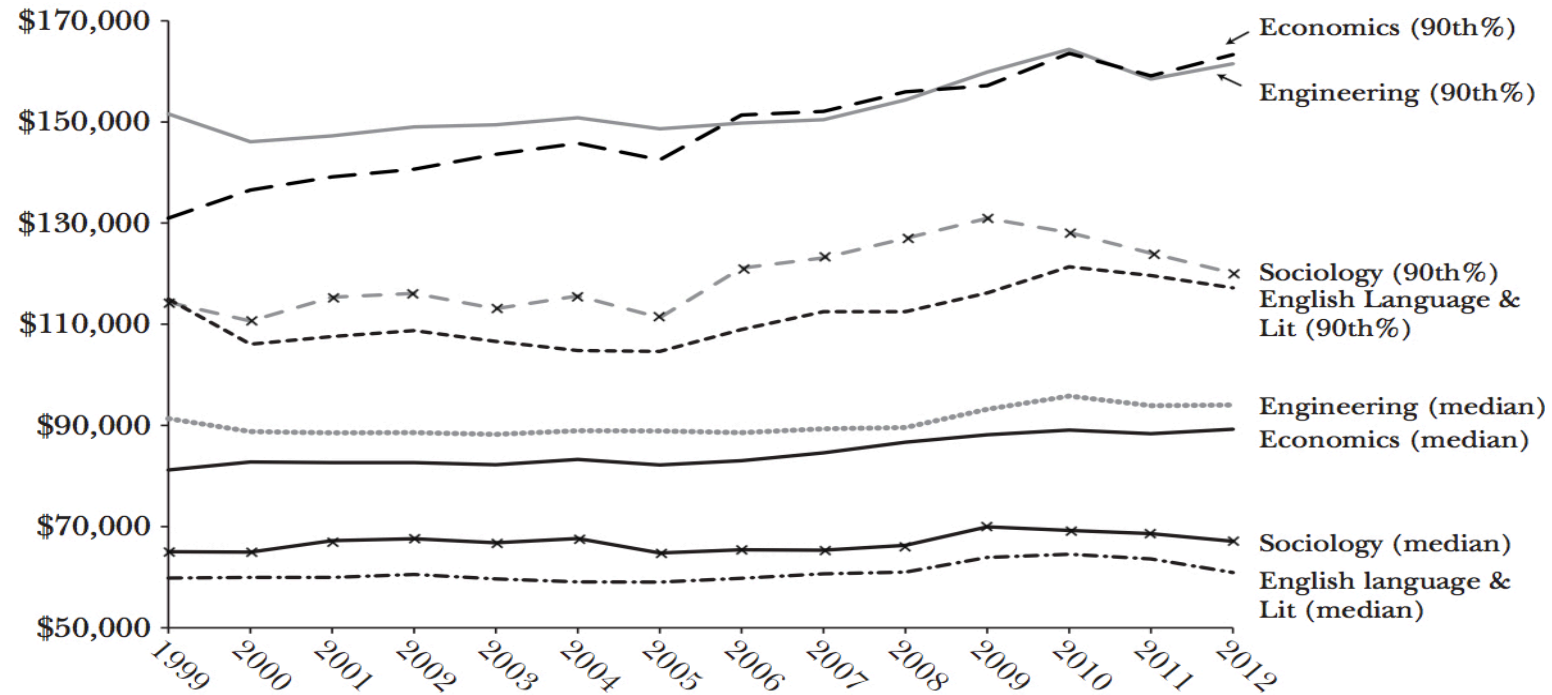
Percentage of Doctorates Awarded to Women in Selected Disciplines, 1966–2011



Source: Fourcade et al. (JEP, 2015)

The “superiority of economists”

Annual Median and 90th Percentile Wages in Selected Disciplines, 1999–2012
(2012 constant dollars)



Source: Fourcade et al. (JEP, 2015)

The “superiority of economists”

Citations from the Flagship Journal to Articles Published in the 25 Top Journals in Each Discipline, 2000–2009

(as a percentage of total citations in each journal)

<i>Citing journal</i>	<i>Cited journals (% of all references)</i>			<i>Total number of papers/citations from this journal</i>
	<i>Top 25 economics journals</i>	<i>Top 25 political science journals</i>	<i>Top 25 sociology journals</i>	
<i>American Economic Review</i>	40.3%	0.8%	0.3%	907/ 29,958
<i>American Political Science Review</i>	4.1%	17.5%	1.0%	353/ 19,936
<i>American Sociological Review</i>	2.3%	2.0%	22%	399/ 23,993

Source: Fourcade et al. (JEP, 2015)

Over the top

Table 3: Social ties and publication outcomes

	Pooled	Same faculty	PhD advisor	Same PhD	Co-authors	Same field
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Articles						
InCharge	0.2419*	0.2670**	0.1456*	-0.0570	0.0463	0.0704
	(0.1373)	(0.1046)	(0.0777)	(0.0776)	(0.0575)	(0.0922)
Panel B: Pages						
InCharge	10.9883**	10.2054***	6.0008**	-1.3440	2.7016	4.6627
	(4.4484)	(3.4194)	(2.7478)	(2.4186)	(1.9209)	(2.9171)
Panel C: Lead articles						
InCharge	0.0714	0.0921**	-0.0098	-0.0075	0.0315	-0.0199
	(0.0505)	(0.0377)	(0.0290)	(0.0234)	(0.0219)	(0.0331)

Source: Colussi (RES, 2017)

Citations: skewed, biased, and widely used

- indexes based on citations are applied to the evaluation of individuals, journals, departments, universities, and even whole countries
- citation counts correlate with:
 - at the publication level: number and reputation of authors, publication age, language, kind of publication, reputation of the journal, number of pages, title length;
 - at the author level: academic age, field and degree of specialization, and gender.
- Systematic differences across and within disciplines, self-citations, selective/implicit citations, citations inflation, etc.
 - h index is not robust to even trivial changes in the papers or citation counts

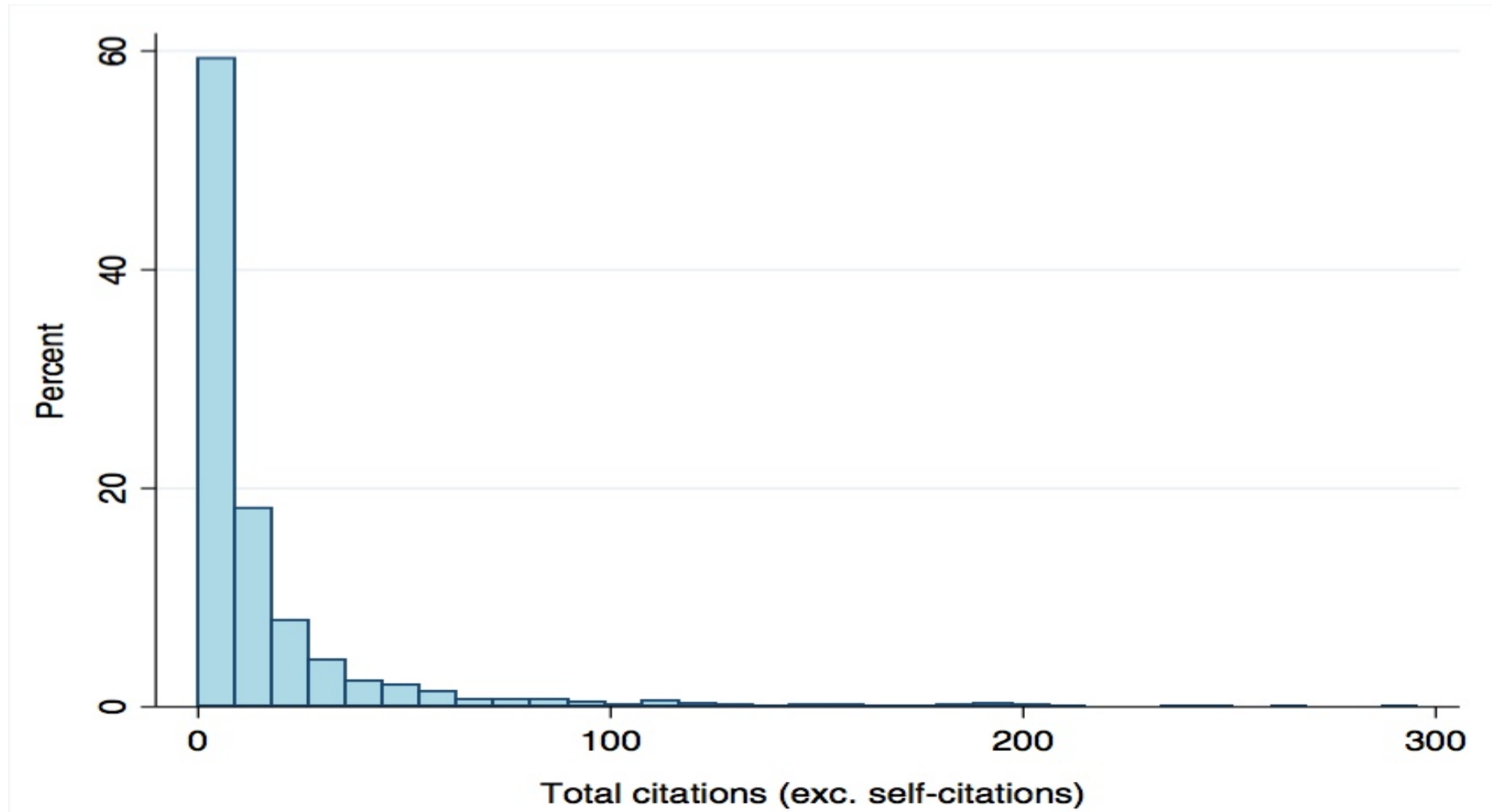
Data on articles published in 1981

	American Economic Review	Econometrica	Journal of Public Economics	Economic Journal	Journal of Industrial Economics	Oxford Bulletin of Economics and Statistics
<i>Mean cites per article in that issue</i>	68	63	22	30	9	7
<i>Median cites per article in that issue</i>	23	22	9	11	3	2
<i>Combined cites to the 4 least-cited articles in that issue</i>	6	5	23	3	4	1
<i>Cites to the single most-cited article in that issue</i>	401	355	88	199	43	50

Source: Oswald (2007)

Simply the best?

Italian economists in Web of Science, 2011-2016



Productive and ceremonial motivations

- “we didn’t want to be told we had neglected to cite certain people. So **there are people in here, for example, X is one of these people we anticipated being a referee**” (quoted in White and Wang, 1997, p. 145)
- “[i]n economics there are all different kinds of levels of journals, and the theoretical level that we were aiming at is most closely matched by the *Journal of Economic Theory*, *Review of Economic Studies*, and *Econometrica*. The paper that we actually wrote was ultimately submitted to *Econometrica*. So, **when we picked out references, we tried to stay in that group. It is a little bit of gamesmanship in a way, to be citing the right people**” (ibid., p. 136)

Citations don't count: they are counted

Do Bibliometricians Cite Differently From Other Scholars?

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Why authors cite particular documents has been the subject of both speculation and empirical investigation for decades. This article provides a short history of attempts to understand citation motivations and reports a replication of earlier surveys measuring reasons for citations. Comparisons are made among various types of scholars. The present study identified six highly cited articles in the topic area of bibliometrics and surveyed all of the locatable authors who cited those works ($n = 112$). It was thought that bibliometricians, given that this is their area of expertise, might have a heightened level of awareness of their own citation practices, and hence a different pattern of responses. Several reasons indicated by the 56% of the sample who identified themselves as bibliometricians differed in statistically significant ways from nonbibliometricians, and also from earlier samples of scholars in Communication and Psychology. By far the

supportive of their own conclusions (Ziman, 1968), and written by noted authorities (Kaplan, 1965)—a “persuasive” citation strategy (Gilbert, 1977).

Over the years a variety of reasons for citation have been suggested by scholars, based on close reading, speculation, and empirical measures. Among the various typologies of citation motivations are the 15 reasons identified by Garfield (1965), 28 by Lipetz (1965), 26 by Duncan, Anderson, and McAleese (1981), and the variety of smaller (e.g., 7 to 10 types) typologies reviewed by Cronin (1984) and Cano (1989). All of these were considered in the development of the study described below.

The degree to which we can study an author's decision to cite another document has been debated for many years. Investigating motivations for citing papers epistemological

The case of Italy

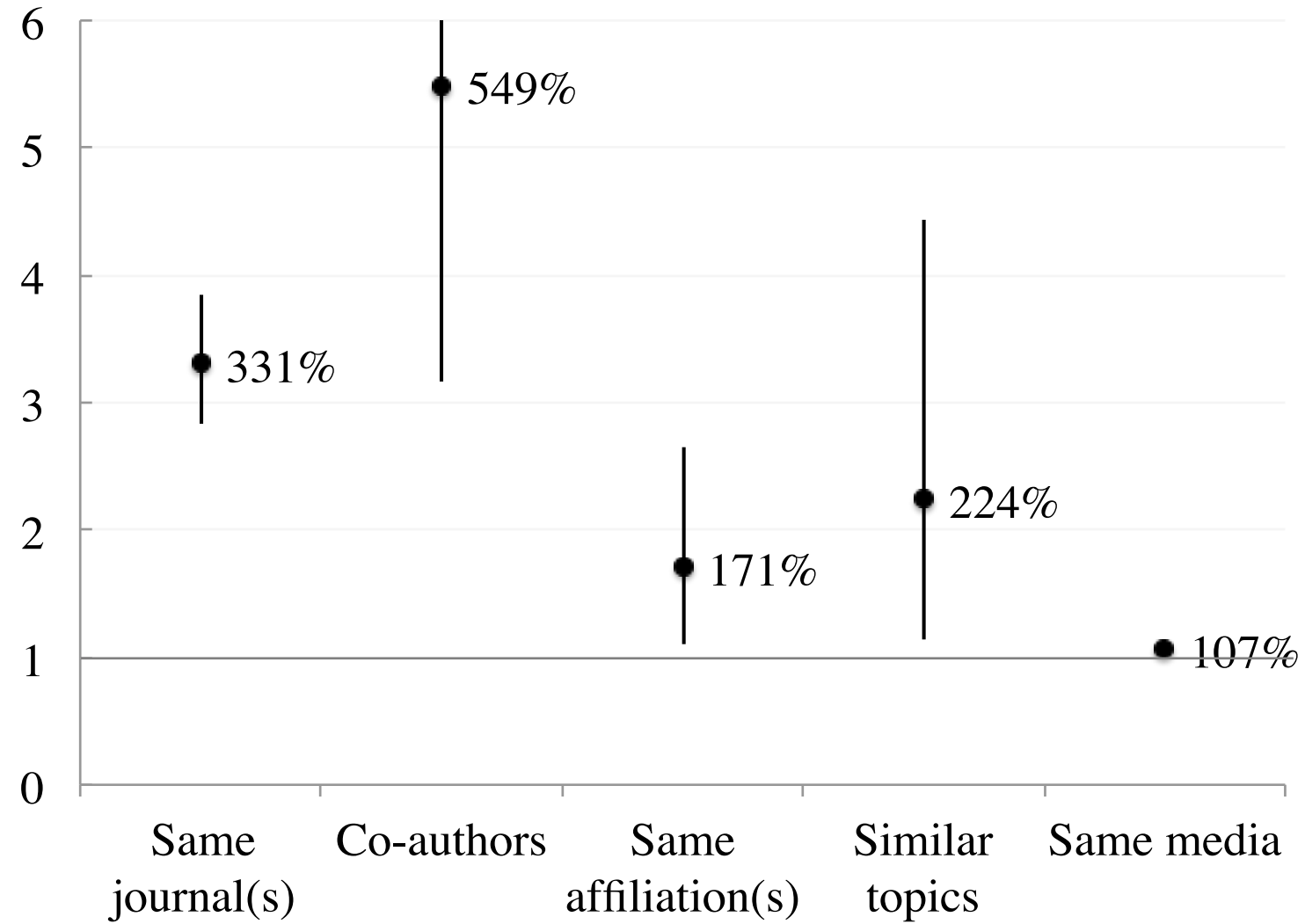
- 948 economists with tenure in an Italian university in 2011-2016
 - 439 have at least one paper in “economics” in Web of Science. They were cited 1969 times, of which 621 times by at least another economist in the sample
 - 142 economists cited and 151 were cited by another economist in the sample
- For each pair of authors, I collected:
 - Measures of *proximity*: **co-authorship** (number of jointly written papers) and the number of common institutional **affiliations**
 - Measures of *similarity*: the number of **journals** in which both published, and the cosine similarity of the metadata of all papers written up to time t
 - Measure of common *ideology*: the number of **newspapers, magazines** (68) and **blogs** (10) in which both gave an interview or wrote an article

Network Formation: probability of dyadic citations

Dependent variable: $\Pr(C_{ij,t})$, probability that i cites j in year t

	Pooled logistic	2D fixed eff. LPM	Panel logistic
J_i : n. of common journals	1.196*** [0.0955]	0.00308*** [0.000772]	1.102*** [0.0841]
P_i : n. of co-authored papers by i and j	1.703*** [0.320]	0.119*** [0.0128]	1.740*** [0.223]
A_i : n. of common affiliations	0.537** [0.230]	0.00195 [0.00126]	0.787*** [0.239]
S_i : cosine similarity of metadata	0.808* [0.415]	-0.00341 [0.00395]	0.835** [0.348]
POL_i : n. of common media	0.0648*** [0.0212]	0.000210* [0.000123]	0.0727* [0.0387]
Publications by j until t	0.0118 [0.0129]	-2.35e-06 [4.59e-05]	0.0416*** [0.0124]
Publications by i in t	0.0406 [0.0735]	0.000170** [7.16e-05]	0.0651 [0.0571]
Year 2012	1.764*** [0.667]	0.000328*** [9.96e-05]	
Year 2013	2.606*** [0.614]	0.000649*** [0.000138]	
Year 2014	3.468*** [0.588]	0.00108*** [0.000165]	
Year 2015	3.675*** [0.579]	0.00140*** [0.000181]	
Year 2016	4.243*** [0.837]	0.000811 [0.000854]	
Constant	-10.70*** [0.579]	-0.00136*** [0.000178]	-9.781*** [0.294]
Individual effects	Pairs (1 set)	Authors (2 sets)	Pairs (1 set)
Observations	354,187	354,187	354,187
Clusters	360 citing authors; 360 cited authors	360 citing authors; 360 cited authors	128,349 pairs
Wald Chi ² (12)	1369.6		876.5
R ² / Pseudo R ²	0.2284	0.0642	
F (730, 353456)		0.48	

Odds ratios

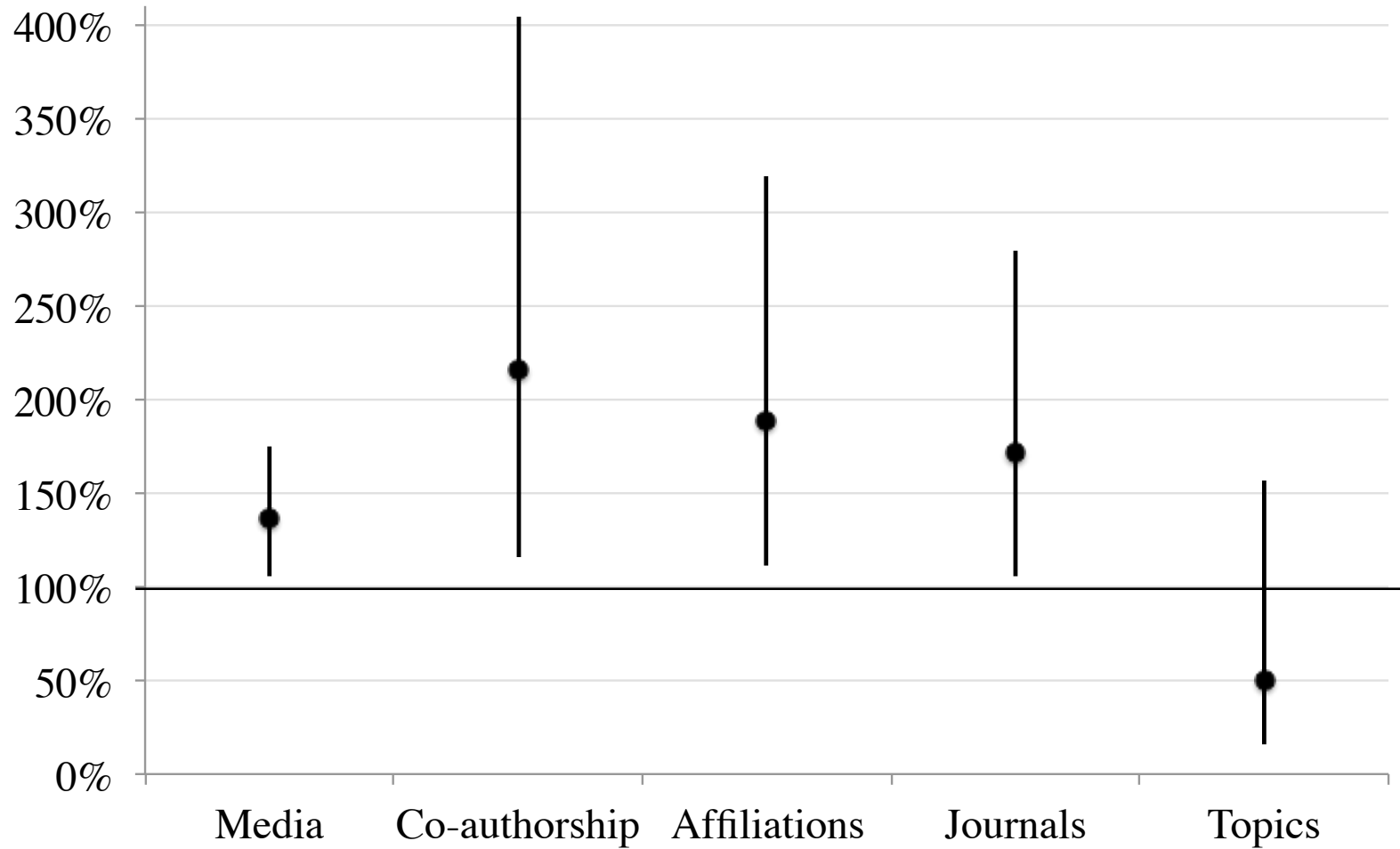


	Mean	Std. Dev.
Citation link	0,11%	0,04
Journal link	2,98%	0,25
Co-authorship link	0,23%	0,06
Affiliations link	1,42%	0,12
Topics similarity	4,31%	0,07
Media outlets link	2,58%	0,56

Citations per author: Poisson Pseudo-ML

	Network:	Baseline	Media	Co-authorship	Affiliations	Journals
Age		0.0353*** [0.00773]	0.0356*** [0.00757]	0.0354*** [0.00777]	0.0344*** [0.00763]	0.0343*** [0.00774]
Year		0.121*** [0.0152]	0.0885*** [0.0195]	0.0954*** [0.0148]	0.0819*** [0.0178]	0.0882*** [0.0185]
Publications		0.0405*** [0.0122]	0.0393*** [0.0153]	0.0468*** [0.0146]	0.0426*** [0.0149]	0.0557*** [0.0127]
Woman		-0.413** [0.162]	-0.408*** [0.148]	-0.409** [0.162]	-0.413*** [0.158]	-0.404** [0.161]
Citations in 2010		0.00172*** [0.000326]	0.00175*** [0.000326]	0.00171*** [0.000331]	0.00173*** [0.000322]	0.00176*** [0.000321]
Indegree centrality			0.0338*** [0.0103]		0.00266 [0.00941]	-0.00780 [0.00820]
Betweenness centrality			0.000343 [0.00117]	0.00673 [0.00992]	0.000103** [4.74e-05]	-9.12e-05** [3.67e-05]
Closeness centrality			0.303** [0.137]	0.771** [0.336]	0.640** [0.284]	0.559** [0.261]
Constant		2.142*** [0.106]	2.211*** [0.0985]	2.228*** [0.0975]	2.262*** [0.0976]	2.280*** [0.1000]
Observations		2,107	2,107	2,107	2,107	2,107
Clusters		360	360	360	360	360
Wald Chi² (7)		288.5	345.4	370.6	401.7	390

Closeness centrality: incidence rate ratios



Scientific = perfunctory ?

Henk Moed (2005, p. 219):

“In any field there are leading groups active at the forefront of scientific development. Their **leading position is both cognitively and socially anchored**. Cognitively, their important contributions tend to be highlighted in a state-of-the-art of a field. But **to the extent that the science system functions well** in stimulating and warranting scientific quality, leading groups, and particularly their senior researchers, tend at the same time to acquire powerful social positions.”

**‘Many-citedness’:
Citations Measure More Than Just Scientific Impact**

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