

Quantitative sociology of academic work

Aliakbar Akbaritabar (Ali)

Flaminio Squazzoni

18/7/2019

DZHW

German Centre for Higher Education Research
and Science Studies

A hyper-competitive academic landscape (Chapter 2)

DZHW

- Quantity vs. quality and the hegemony of quantitative research evaluation
- Funding, promotion and reputation circulation in 21st century
- Responsible [use of] metrics
 - Peer review vs. bibliometrics, informed peer review and contextualized scientometrics
- Goal displacement?!

- **Matteo effect**, winner takes all?
 - Highly prolific scientists attract higher collaborations from other scientists
 - Attaching preferably to a few **star scientists**/leaders?
- **Fragmentation** of ideas, sociology as a *interstitial science*!
 - Methodologists bridging the islands?
- [Sociological] **small world** of disconnected islands?
- Embeddedness and **organizational ambiguity** at work?
- **Core** of leaders and **periphery** of followers?
- **Sum up**: Some farther away, some closer to our quantitative focus

- **Two** data sets, one **national**, one **international**

- ① All Italian sociologists (chapters 3, 4 and 6)

- 1,029 professors & 198 postdocs
 - 3,168 papers, 1973-2016
 - 55% Male, 45% Female
 - Only 64% of 1,227 had at least 1 article

- ② Whoever published in AJS & ASR (chapter 5)

- 4,709 authors
 - 2,593 papers, 1946-2016
 - ASA members: 47% Male, 53% Female
 - AJS & ASR: 70% Male, 30% Female
 - 40% of papers, at least one female author(s)
 - 84% of papers, at least one male author(s)
 - 80% solo or team of Americans

- Computational social science at work
 - Cross-fertilization between **computational sociology** & **science studies**
 - API calls & web scrapping for data gathering
 - Hierarchical linear models (nested & mixed membership and negative binomial)
 - Repeated measurement models
 - Text analysis, structural topic models, VOS algorithm
 - Network analysis, [temporal & Leiden] community detection and ERGM
 - Code, data, analysis and report are all reproducible (hosted on Gitlab)

- 1 A community that is between **humanities** scholars, who are predominantly qualitative, anti-bibliometric and “**hard**” scientists, who are quantitative with tendencies close to *big science*
- 2 The **co-existence** of different epistemic communities makes sociologists an interesting case to examine contrasting forces towards internationalization
- 3 Research on scientists' productivity in Italy have looked mainly at the case of *hard sciences* stating that research in humanities and social sciences cannot be examined quantitatively

- **Looked at:**
 - Internationalization
 - Co-authors similarity
 - Individuals embedded in organizational settings (*University, department and sectors*)
- **Found that:**
 - **Male** scientists
 - Those working more **internationally**
 - Those working with a *similar* group of coauthors *are more productive*
 - But **not** necessarily more cited by other members of the community
- On Scientometrics, DOI=10.1007/s11192-017-2606-5

Top-down process of inspiring research productivity^{DZHW}

(Chapter 4)

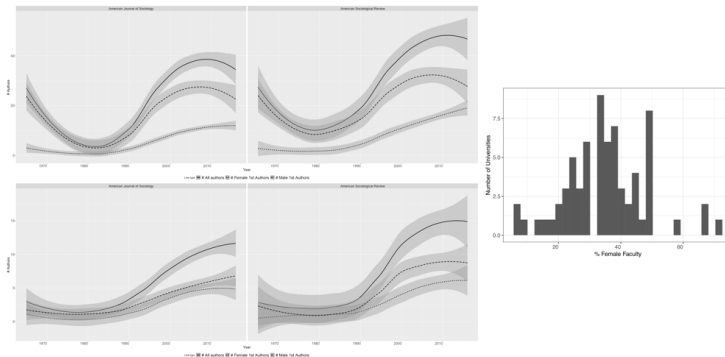
- **Looked at:**
 - ANVUR, VQR 2004-2010 effect on research productivity
 - Five full years **before** and **after** assessment 2006-2015
- **Found that:**
 - ANVUR had a **limited** influence on research productivity
 - **No clear pattern** of increase or decrease inspired by top-down process
 - Most differences were due to individual characteristics

- **Looked at:**
 - **Gender** diversity in research productivity & impact
 - *Ivy-League* effect in research productivity & impact
- **Found that:**
 - These prestigious journals especially considered solo/teams of **male** authors (60% papers)
 - These gender penalties persist even when looking at *citations* and after controlling *affiliation* (both PhD and current affiliation)
 - The “**Ivy-League**” effect greatly benefits *only male* authors
 - We looked at the **ethnicity** of AJS/ASR authors but it is excluded from the current report and presentation.
- On ST&HV, DOI=in-press

Table 5.11: Multilevel regression models on star sociologists

	Total Publications	Publications before 2000	Publications after 2000	Total Citations
Constant	0.12 (0.03)***	0.04 (0.05)	0.12 (0.04)***	4.20 (0.07)***
Gender Male	0.09 (0.03)**	0.10 (0.05)	0.06 (0.04)	0.04 (0.06)
Star sociologist	1.16 (0.03)***	0.79 (0.05)***	0.91 (0.04)***	1.35 (0.07)***
AIC	6610.52	2751.34	4310.07	28380.56
BIC	6645.37	2781.28	4342.54	28415.42
Log Likelihood	-3299.26	-1369.67	-2149.03	-14184.28
Num. obs.	2463	1086	1655	2463
Num. groups: latest_uni	444	256	336	444
Num. groups: phd_awarded_university	329	195	250	329
Var: latest_uni (Intercept)	0.00	0.00	0.00	0.16
Var: phd_awarded_university (Intercept)	0.00	0.00	0.00	0.05

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$



Networks effect in research productivity (Chapter 6) DZHW

- Looked at:
 - *Community* membership & evolution
 - *Substantive* similarity & research communities
 - ERGM with *homophily*, structural and community effects
- Found that:
 - High **disconnectedness** vs. mathematical simulations (512 Comp., 25.92% (29.15%) nodes (ties) in G-comp)
 - Relatively **high** rate of change in communities (even G-comp) members, compared to all sociology & other cases
 - **Male newcomers** are more likely to stay, join the core and continue in academia
 - Two *largest* and *most stable* research communities in Italian sociology are **economic** and **political** sociologists
 - Collaboration ties were mainly driven by the *research focus*
 - Other factors, such as *preferential attachment*, *gender* and *affiliation* homophily were also important
 - Political sociologists tend to be *more international*

A glimpse of Chapter results 1/2

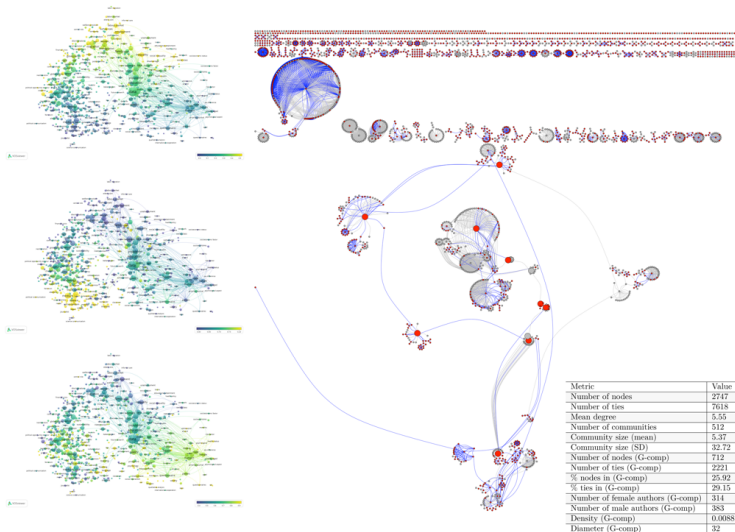


Table 6.8: ERGMs results explaining effect of author attributes and structural variables on coauthorship tie existence

	The Giant component of Italian sociologists and their coauthors			
	ERGM Models			
	(1)	(2)	(3)	(4)
Ties	-4.549*** (0.022)	-4.354*** (0.050)	-11.348*** (0.997)	-11.254*** (1.012)
Preferential attachment	15.095*** (4.421)			4.063*** (0.976)
Homophily Females		0.002 (0.059)	0.049 (0.060)	0.067 (0.060)
Homophily Males		0.281*** (0.049)	0.267*** (0.049)	0.258*** (0.054)
Community 0			7.207*** (0.996)	7.136*** (1.015)
Community 1			8.318*** (0.996)	8.216*** (1.015)
Europe		1.226*** (0.051)	1.099*** (0.053)	1.113*** (0.059)
Italy		0.600*** (0.057)	0.718*** (0.059)	0.716*** (0.067)
Other countries		1.546*** (0.170)	1.188*** (0.177)	1.170*** (0.216)
Homophily Total Pubs		0.060*** (0.002)	0.063*** (0.002)	0.063*** (0.003)
Homophily First Pub		-0.092*** (0.006)	-0.095*** (0.006)	-0.095*** (0.007)
Homophily Last Pub		-0.372*** (0.014)	-0.367*** (0.014)	-0.369*** (0.016)
Akaike Inf. Crit.	25,237.220	22,732.670	19,277.840	19,154.370
Bayesian Inf. Crit.	25,268.540	22,826.640	19,392.700	19,290.110

Note:

*p<0.1; **p<0.05; ***p<0.01

- We aimed to provide a quantitative look at academic work in 21st century
- Academics today are embedded in a dual context as if they were living a double life
- We were focused on the tension between “**publish or perish**” from one hand and **being part of the “scholarly community”** on the other
- In different chapters, we studied a variety of **embeddedness scenarios** to see how sociologists reacted to this hyper-competitive academic landscape
- We found that the **quantitative evaluation** mantra in sociology is **not** inspiring a clear stream of behavior, mixture of ambiguous signals with disconnect from reward system causes sociologists to continue in an unknown state
- They are *not* yet as close to hard sciences to be competition driven, thus causing them to present humanities like behaviors (e.g. lack of care for citations)
- There are many criticisms of **quantitative evaluation** while not much alternatives are introduced
- I feel it is time to *give voice* to those under evaluation to tell us why they don't comply with the currently introduced motivations

- Success stories only!
- Positive collaboration only!
- Scopus indexed publications only!
- One mode projection of bipartite *paper-author* ties which causes artificially high cliquish behavior and could be better studied with bipartite modelling frameworks
- We couldn't account for motivations (more on this in next slides)

Next steps. Work, still in progress!

- I joined [DZHW](#) (German Center for Higher Education Research and Science Studies) on September 2018 for DEKiF (3 years) project
- **DEKiF**: Determinanten und Effekte von Kooperation in homogenen und heterogenen Forschungsverbunden; Determinants and effects of cooperation in homogeneous and heterogeneous scientific networks
- I am involved in 3 mixed methods (quantitative, qualitative and bibliometric) case studies of scientific collaborations (example pilot study below)
- I hope to resolve some of the limitations that exist in this dissertation
- I hope to look at *decision making process* of scientists before any scientific collaboration has taken place, to see **why they do what they do!**



Thanks a lot for your attention

Email: akbaritabar@DZHW.eu

Twitter: @akbaritabar