

Knowledge Networks in European Political Science

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Abstract

The existence of subfields, theoretical schools and even citation circles in political science is often taken for granted, but empirical studies of these phenomena are scarce. We analyse the network structure of copublications and citations in three major national political science journals – Politische Vierteljahresschrift (PVS, Germany), Political Studies (PS, UK) and British Journal of Political Science (BJPS, UK) to shed some light on these issues. As it turns out, Political Science is rather fragmented (certainly more fragmented than the sciences). There are, however, some tight-knit communities.

Outline

Theory

Data and Methods

Findings

Co-Publications

- Overview

- Germany

- UK

Citations

- Overview

- Germany

- UK

Conclusion

What do we know about communication/collaboration in Political Science?

- ▶ Mostly counting exercises: rankings of departments, scholars, countries (Plümper 2003, 2007; Hix 2004, a, b 2005; Dale/Goldfinch 2005, Garand/Giles 2007)
- ▶ Little is known about relationships
- ▶ Recent interest in networks in Political Science (Fowler et al. 2007, Carter/Spirling 2008)
- ▶ Largely uncharted territory

Why bother?

- ▶ Intellectual exchange crucial for *all* sciences
 - ▶ Comment and criticism
 - ▶ Reviewing prior knowledge
 - ▶ Sharing new methods and results
- ▶ Political Science a low consensus discipline
- ▶ Degree of fragmentation/connectivity a (rough) indicator for the quality and state of the discipline
 - ▶ „Small World“ vs. „poorly connected islands of specialisation“
 - ▶ National cultures (history, US-influence, humanities vs. modern social sciences approach ...)

What are our basic assumptions/expectations?

1. The top *national* journals provide a focus for the national scientific communities
 - ▶ Although they tend to be exclusive
 - ▶ Although monographs/edited volumes are still important
 - ▶ Although US journals may be more important, at least in subfields
2. If **A** *cites* **B** ...
 - ▶ This signifies some sort of (directed) communication
 - ▶ Even if **B** criticises **A**, **A**'s message was received by **B** and **A** is not ignored
 - ▶ We learn something about the structure of communication and knowledge transfer
3. If **C** and **D** collaborate ...
 - ▶ This signifies intense bi-directed communication and
 - ▶ Shared interests and knowledge, even if this not collaboration between equals
4. Co-publication more common in empirical subfields
5. Germany probably more traditional (monograph/single-author focus)

What do we want to do?

Research Questions

1. What patterns of communication/collaboration do exist (subfields, islands)?
2. How do these patterns vary across journals and countries?
3. (Who are key players in national/journal based communities?)

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Very much work in progress

Which data would we use in an ideal world?

- ▶ Identify between two and four national top journals
- ▶ Build data base of articles, authors and references (including chapters, monographs) in these journals
- ▶ Would allow us to identify the most important authors/sources including those not on the commercial data bases (Lipset/Rokkan)
- ▶ Would require \approx 80 hours of RA per journal per year \approx 8,000-10,000 hours per country

What data *do* we use?

- ▶ Social Science Citation Index/ISI Web of Knowledge
- ▶ Covers three important national journals: British Journal of Political Science (BJPS), Political Studies (PS), Politische Vierteljahresschrift (PVS)
- ▶ Provides information on references going back to (at least) the 1960s
- ▶ SSCI Problems:
 - ▶ Selection criteria anglocentric, otherwise ill-defined (important journals excluded, rather obscure sources included)
 - ▶ Available information unreliable and inconsistent (less of a problem for any given journal)
 - ▶ Access is a pain: mass downloads not permitted/possible
- ▶ Alternatives: ?

Journal Quick Facts: PVS



- ▶ Founded 1960, covered by SSCI since 1966
- ▶ Official journal of the (largest) German Political Science Association
- ▶ Largely seen as the most important general journal in German Political Science
- ▶ ≈ 650 research articles since mid-1960s

Journal Quick Facts: PS



- ▶ Founded 1953, covered by SSCI since 1970
- ▶ Official journal of the (largest) British Political Science Association
- ▶ Largely seen as one of the two top UK Political Science journals
- ▶ \approx 1,300 research articles since early 1970s

Journal Quick Facts: BJPS



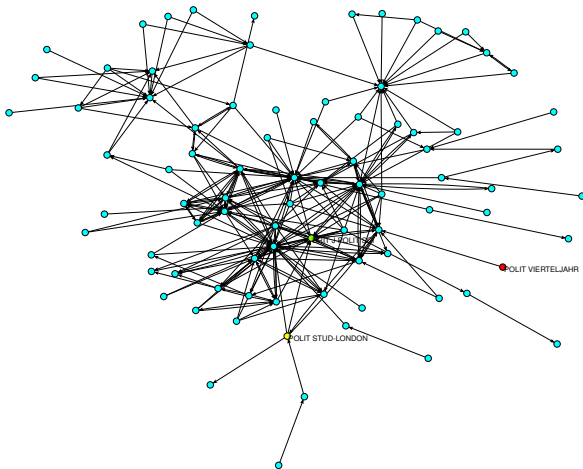
- ▶ Independent (with strong Essex and international links)
- ▶ Covered by SSCI since its first volume in 1971
- ▶ A national journal, but largely seen as the only non-US top-ten outlet for Political Science
- ▶ \approx 800 research articles since early 1970s

The Three Journals in Global Perspective

In terms of the global political science citation network ...

- ▶ PVS is at the outer periphery of those 84 journals connected by at least 20 citations between 2000-2008
- ▶ PS is at the periphery
- ▶ BJPS is not only a national champion but a well-integrated global player

The Three Journals in Global Perspective



How Common are Joint Publications?

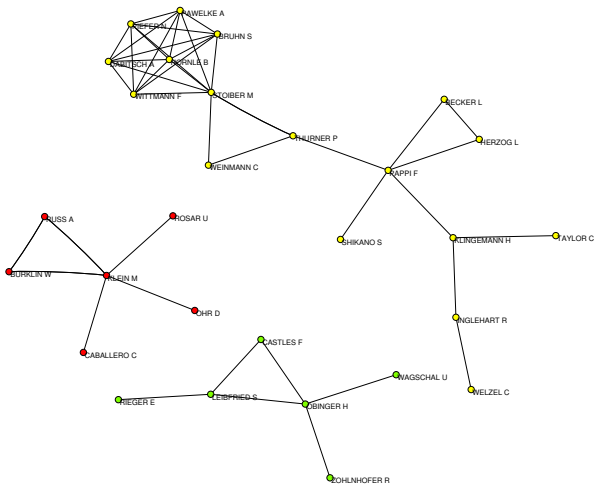
| | BJPS | PS | PVS |
|-----------------------------|-----------|-----------|-----------|
| Articles | 833 | 1277 | 647 |
| Authors | 938 | 1206 | 594 |
| Gini | 0.261 | 0.199 | 0.202 |
| Authors with single article | 76% | 81% | 81% |
| Co-authored articles | 364 (44%) | 246 (19%) | 109 (17%) |
| Collaborating Authors | 607 (65%) | 439 (36%) | 213 (36%) |



Co-publication in PVS

- ▶ A small-scale endeavour
- ▶ 213 scholars \Rightarrow 78 co-publication networks (weak components) of median size 2
- ▶ Usually one-off co-operations
- ▶ Only three components ≥ 6
- ▶ Single article with 7 authors inflates size and density of largest component
- ▶ All authors involved co-operation are empirical researchers, not theorists

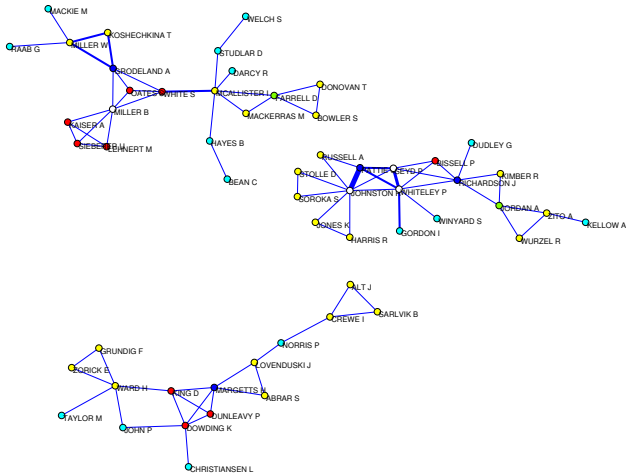
Close-up: co-operation in PVS



Co-publication in PS

- ▶ 439 scholars \Rightarrow 161 co-publication networks, (median size 2)
- ▶ 7 components \geq 6, 3 components with 16-21 members
- ▶ Sustained co-operation: 22 dyads co-operate at least twice
- ▶ At the centres of the larger components overlapping triads (up to 6)
- ▶ Johnston, Miller, Whiteley, Seyd (again, all empirical researchers)

Close-up: co-operation in PS



Co-publication in BJPS

- ▶ A different scale
- ▶ 607 scholars \Rightarrow 165 co-publication networks (median size 2)
- ▶ $17 \geq 6$, 7 with 15-48 members
- ▶ Within the larger components, again centres where triads overlap and co-operation is sustained (Johnston and Pattie published 11 joint articles in BJPS)
- ▶ (Articles with unusually large numbers of authors)
- ▶ Some central figures (re-appear): Johnston and Pattie, Heath, the Millers, Clarke, Budge, Laver ...
- ▶ Co-publication in BJPS *much* more important than in PVS or PS

What about co-publication in the UK (BJPS + PS)?

- ▶ 964 scholars \Rightarrow 257 co-publication networks
- ▶ 30 per cent in four large (21, 29, 77, 145) components
- ▶ Only 15 per cent part of the largest component (Johnston & Pattie)
- ▶ Average distance within largest component 9.2
- ▶ Many scholars (some of them not UK-based) could break largest component apart
- ▶ Very different from Newman's findings for the sciences

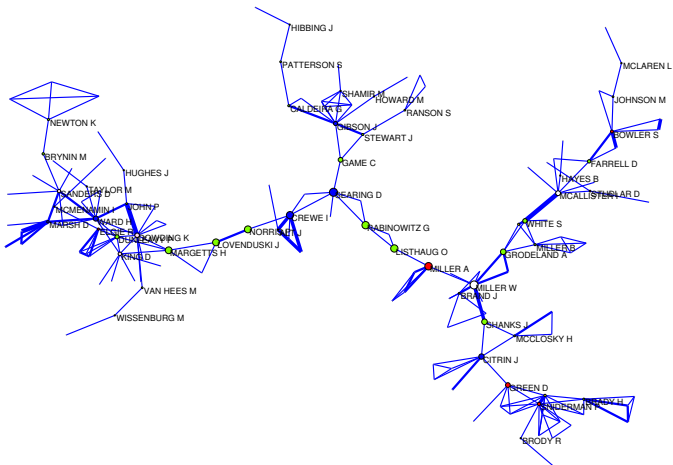
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Newman (2001)

- ▶ Physics, computer science, bio-medical research, other sciences
- ▶ Giant component includes 57-93 per cent of scholars
- ▶ Second largest component typically less than 0.5 the size of giant component
- ▶ Average degree of separation within giant component ≈ 6
- ▶ „Small world“

Close-up: Co-operation in BJPS+PS



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But...

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- ▶ Co-publication network of ≈ 160 political science journals covered by the SSCI, 2000-2008
- ▶ 13,538 authors (first initial criterion), 38 per cent (5,134) within giant component
- ▶ Second largest component with 41 members
- ▶ Largest component not a „small world“
 - ▶ Average distance is 10
 - ▶ Few hubs
 - ▶ Number of collaborators low (median 3, mean 4, maximum 80, 43, 39, 36)
 - ▶ k -cores: 9 10-31 cores, but none with more than 40 members

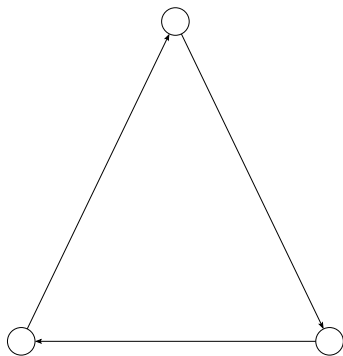
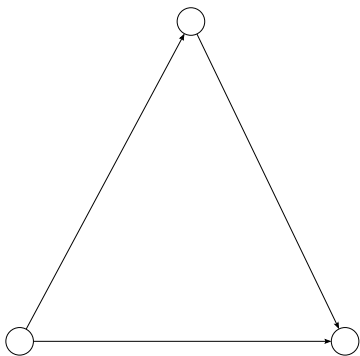
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- ▶ In terms of co-publication, political science is rather fragmented

What are we looking at?

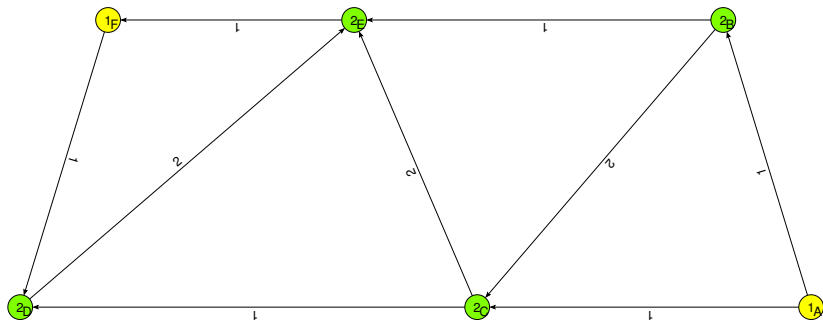
- ▶ Problems and ambiguities, but citations signify authority, standing, prestige, and (unidirectional) communication paths
- ▶ A journal's citation network: authors who publish at least one article in the journal that
 1. Cites other work from the journal **or**
 2. Is cited in the journal **or**
 3. Both 1+2
- ▶ (Hidden self-citations as a consequence of joint work in the past)
- ▶ Our main measure of importance: *indegree*, i.e. the number of other scholars **B, C, D** who cite **A**'s work in the journal
- ▶ Mutual citations a very restrictive criterion for cliques/circles, 3-ring census/islands more inclusive

3-rings & islands



- ▶ Cyclic and transitive 3-rings

3-rings & islands



- ▶ Line value = number of 3-rings of which line is part
- ▶ Island:
 - ▶ Assign maximum line value to vertex
 - ▶ Find clusters (of min/max size) so that
 - ▶ Values inside cluster larger than values in neighbourhood

Citation in PVS

- ▶ 240 (40 per cent) of the 594 authors part of the journal's citation network, 26 cite their own work
- ▶ Very skewed distribution:
 - ▶ 46 per cent not cited at all, 22 per cent by a single other scholar
 - ▶ 16 per cent cited by 5-21 other authors, top five: Scharpf, Klein, Klingemann, Kaase, Pappi
- ▶ Little evidence of „citation circles“; mutual citations in the journal very rare
- ▶ One component of 12 authors linked by mutual citations, most of them (formerly) based at the university of Mannheim

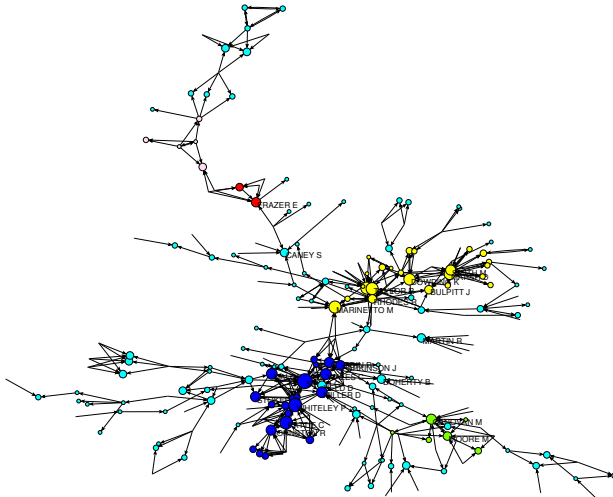
„Citation Cliques“ in PVS?

- ▶ Some small weak components, but 171 (70 per cent) within one large weak component
- ▶ 3-ring census/islands yield three relatively dense clusters
 - ▶ 7 IR scholars grouped around Zürn interested in the EU and (multi-level) governance
 - ▶ 11 scholars grouped around Plümper (who published in three different genres)
 - ▶ 47 scholars working in empirical political sociology, broadly defined
 - ▶ Scharpf

Citation in PS

- ▶ 359 authors, mutual citation even rarer than in PVS
- ▶ 250 (70 per cent) within weak large component
- ▶ Like in Germany, clear hierarchy:
 - ▶ 40 per cent w/o citations, 22 with a single citation
 - ▶ 10 per cent cited by 5-15 other scholars
- ▶ Two large clusters
 1. Rational choice (Dowding, Marsh etc.; yellow)
 2. Empirical political sociology + empirical political theory (Whiteley, Johnston, Pattie; blue)
- ▶ Plus electoral institutions (red/pink) and liberal political theory (Canovan, Moore; green)

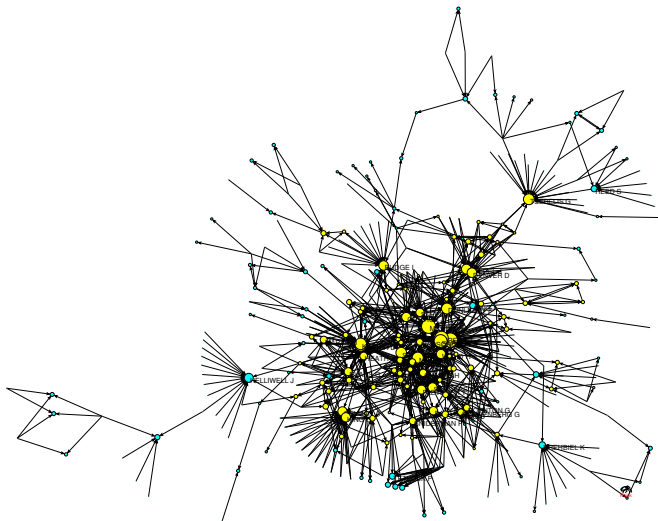
Close-up: citation in PS



Citation in BJPS

- ▶ 422 authors, mutual citation is rare
- ▶ 368 (87 per cent) within large component, more internal citations (up to 5 per cent)
- ▶ Hierarchy
 - ▶ 52 per cent not cited by anyone, 12 per cent cited by on other scholar
 - ▶ 17 per cent cited by 5-38 other scholars
- ▶ 3-ring census \Rightarrow large island (164 authors / 45 per cent)
- ▶ Some oft-cited authors (Krehbiel, Helliwell, A. King) outside the cluster
- ▶ At least three prominent Americans (Gelman, G. King, Tsebelis) do not cite anyone in the network
- ▶ Island dominated by political sociology but combines major subfields
- ▶ Citation network less fragmented than in PS and PVS

Close-up: citation in BJPS



Citations in the UK (BJPS+PS)

- ▶ 847 authors
- ▶ More mutual citations, one larger (24) component of mutual citations
- ▶ 87 per cent of all authors within giant component
 - ▶ 47 per cent not cited at all, 15 per cent with a single citation
 - ▶ 16 per cent cited by 5-51 other scholars, Alt, Crewe, Warren Miller, Sarlvik and Marsh at the top
- ▶ 3-ring census/islands ⇒ large island of 299 authors + separate liberal political theory island (8)

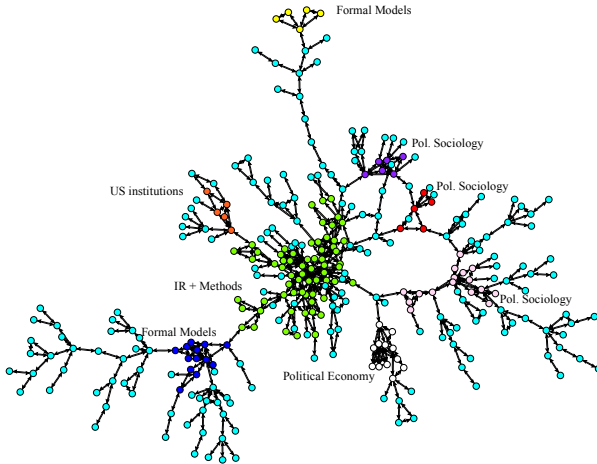
The Global Perspective

- ▶ 10,388 authors, giant component encompasses 93 per cent of them
 - ▶ 45 per cent w/o citations, 13 per cent cited by a single other person
 - ▶ 22 per cent cited by 5-161 scholars
 - ▶ Top five: Wallensteen and Sollenberg (joint producers of a oft-cited dataset in IR), D. Bennet (IR), Risse (IR) and Stam (IR)
- ▶ 1,112 pairs of mutually citing authors; one large component with 320 authors
 - ▶ Very dense centre with 64 authors, many of them prominent scholars with an interest in IR and methods
 - ▶ Linked by a ring-like structure and bridges to other dense regions
 - ▶ Some rather conspicuous gaps between scholars working in the same subfields

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- ▶ 3-ring census \Rightarrow one giant (5,196) and 15 small (5-13) islands
- ▶ \approx 93 per cent of the authors part of global citation network, but 50 per cent in its periphery

Close-up: Mutual Citations



What Have We Learned about Countries/Journals?

- ▶ All networks very sparse in Germany – a data problem?
- ▶ BJPS more integrated than PS, UK as a whole (two top journals) fairly integrated
- ▶ UK/BJPS network dependent on US scholars, BJPS both British and international journal
- ▶ Sub-disciplinary islands (PS, PVS)
- ▶ Authors of any given journal no close-knitted community (what about more specialised journals?)

What Have We Learned about the Discipline?

- ▶ Co-publication levels much lower than in the sciences
- ▶ Co-publication mostly restricted to empirical applications
- ▶ Not a small world, rather centre/periphery
- ▶ Some sub-fields better connected than others

Where Do We Go from Here?

- ▶ Improve the way we extract data from SSCI
- ▶ Use additional information (institutions, countries, language) for global perspective
- ▶ Own data collection on national journals, monographs, chapters?

Want to know more?

- ▶ Project outline
- ▶ More graphs
- ▶ Working paper (soon)
- ▶ Replication data (soon)

`http://www.politik.uni-mainz.de/kai.arzheimer/
social-networks-in-political-science.html`

or

`http://tinyurl.com/pol-sci-networks`