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Published in:
International Studies Review

DOI:
[10.1111/j.1468-2486.2012.01101.x](https://doi.org/10.1111/j.1468-2486.2012.01101.x)

Publication date:
2012

Citation for published version (APA):
Kristensen, P. M. (2012). Dividing Discipline: Structures of Communication in International Relations. *International Studies Review*, 14(1), 32-50. <https://doi.org/10.1111/j.1468-2486.2012.01101.x>

Dividing Discipline: Structures of Communication in International Relations

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International Relations (IR) has cultivated an image as a discipline with strong divisions along paradigmatic, methodological, metatheoretical, geographical and other lines. This article questions that image analyzing the latent structures of communication in IR. It uses citation data from more than 20,000 articles published in 59 IR journals to construct a network among IR journals and finds a discipline with a center consisting of pedigreed IR journals, albeit closely related to political science. Divisions are identifiable as specialty areas that form clusters of specialized journals along the periphery of the network—security studies and international political economy in particular—but communication is also divided along the lines of geography and policy/theory. The article concludes that divisions notwithstanding, IR communication remains centered around American, general and theoretical IR journals and that to practice this particular kind of communication is an important dimension of being an IR scholar.

Keywords: The IR discipline, scholarly communication practice, divides and debates, sociology of science, bibliometrics, citation analysis.

The discipline of International Relations has cultivated an image as a “dividing discipline” (Holsti 1985).¹ Its history is told as a divisive series of “great debates” between incommensurable theoretical, methodological and metatheoretical approaches in most textbooks (Carlsnaes, Risse, and Simmons 2002; Dunne, Kurki, and Smith 2010; Jackson and Sorensen 2006; Kahler 1997) and its current state is no more harmonious judging by state-of-the-discipline articles. It may be an occupational peculiarity, but International Relationists are exceptionally skillful at identifying ever-widening internal divisions and acrimonious lines of opposition that inhibit dialogue and peaceful resolution of scholarly

¹Research for this article was part of a sociology of science project financially supported by Carlsbergfondet. I would like to thank its participants Ole Wæver, Heine Andersen, Christian Knudsen and Kristoffer Kropp for their support and invaluable comments on several previous drafts. I am also grateful to Trine Villumsen and the three anonymous reviewers for their excellent suggestions. The usual disclaimer applies.

conflicts. Some stress, and often lament, how the proliferation of research specialties, incompatible theories and meta-theoretical camps has balkanized the discipline internally and created a range of insular coteries who rarely engage in dialogue (Hellmann 2009 and the subsequent forum; Hermann 1998; Holsti 1985; Jones and Holsti 2002; Kornprobst 2009; Mansbach 2002; Sylvester 2007; Wæver 2010). Others emphasize growing inside/outside gaps between the parochial IR discipline and bordering social sciences (Buzan and Little 2001), between the theoretical discipline and the outside world of policy-makers (George 1993; Jentleson 2002; Leggold 1998; Nye 2008; Walt 2005)(Palmer 1980) or geographically between the rationalist “American social science” produced in the core discipline and periphery perspectives produced elsewhere (Aydinli and Mathews 2000; Hoffmann 1977; Holsti 1985; Kahler 1993; Smith 2000; Tickner 2003; Tickner and Wæver 2009; Wæver 1998)(Neal and Hamlett 1969). Some scholars have started to challenge this self-perception through disciplinary historiography, predominantly by questioning the existence of the “first great” debate between realists and idealists (Ashworth 2002; Quirk and Vigneswaran 2005; Wilson 1998), or through empirical studies that find a discrepancy between the paradigm wars we present in classrooms and the mostly non-paradigmatic research we publish (Maliniak et al. 2011). But the majority seems to agree that the discipline is divided. They share the premise that divides restrain dialogue and thus lead us to ignore important developments at the other side of these gaps. Dividedness, in the sense of absent dialogue, thus seems to be a matter of how communication is structured.

This article argues that dividedness in the communication structure of IR should be subject to empirical analysis and that bibliometric methods and data provide largely unexplored ways to do so. It progresses from the premise that the bibliometric network of IR publications can help international relationists learn more about the communication patterns of their discipline; If IR is as divided as disciplinary narratives suggest, these lines of opposition should become evident when mapping how IR scholars communicate with each other in journals. Bibliometrically, one would expect segregated parts of a discipline to read and cite particular literatures relating to, say, security or economics, theory or policy, reflectivism or rationalism. If not fragmented into specialty, geographical or metatheoretical journal clusters, is IR communication then structured around a hard core of IR journals with discipline-wide impact? Citation analysis with its formalistic focus on communication flows provides a way to map division and integration in the IR discipline.

A Bibliometric Approach to IR Communication

The communication patterns of academic journals are interesting because journal data provides a direct indicator of the discipline (Wæver 1998:697). Journals play a gatekeeping role for the communication of scientific knowledge because their editors and reviewers decide what kind of research to reward and disseminate in the IR network (Goldmann 1995:247). Journals are important institutions in modern science not only because they disseminate accredited knowledge but also because their accreditation affects material payoffs and promotions. Knowing where to publish is key to communicating one’s research to relevant peers, and peer accreditation in turn is important to make a career in research. Both scholars who accept this and those who lament it are aware of the importance attached

to journal publications (Breuning 2010). The monograph is still an attractive format for both publication and citation but scholars increasingly present their ideas in journal articles before launching them in books (Breuning, Bredehoff, and Walton 2005:448).²

Several IR scholars have therefore started using IR journals as a mirror to study what “kind of international relations research gets published in the field’s most recognized journals” (Breuning et al. 2005:447). Contents of article samples have been analyzed in terms of subject matter, methodology, meta-theoretical commitments or a combination of these (Breuning et al. 2005; Goldmann 1995; Wæver 1998; Maliniak et al. 2011). Others have focused on formal characteristics such as the gender (Breuning 2010; Maliniak et al. 2008) or geographical affiliations of authors (Aydinli and Mathews 2000). Studies of the content and form of IR publications are valuable contributions to the sociology of IR—particularly *what kind* of knowledge passes through the disciplinary power of peer reviewers and editors. If the *content* of IR journals is “the most direct measure of the discipline itself” (Wæver 1998:697), it is reasonable to assume that their citation patterns give an indication of the organization of the discipline too. Yet, citation analysis has until recently been the province of political scientists who rank journals (Garand and Giles 2003; Giles and Garand 2007; Norris and Crewe 1993) or librarians who conduct “citation analysis for collection development” (Zhang 2007). Librarians have studied the type, age and discipline of sources used in IR journals “in order to help librarians more effectively working with international relations scholars” (Zhang 2007:196; see also Brill 1990; von Isenburg 2009). But this type of information may also contribute to IR’s knowledge about its organization into specialties, its debates about great debates and its theoretical imports from other disciplines (the so-called ‘turns’ to culture, linguistics, aesthetics, history, sociology, economics). There is room for a citation analysis that speaks to IR and contributes to the much sought after reflexivity in the discipline.

Journal citations constitute a complex network and the citation network approach has recently been applied to subfields of IR such as conflict studies (Sillanpää and Koivula 2010), security studies (Russett and Arnold 2010) or approaches such as feminism (Soreanu and Hudson 2008) but not to the IR discipline itself. Indeed, IR communication may be too fragmented to be studied in total, yet such fragmentation, specialization and division should be subject to empirical investigation, not assumed a priori. It may seem commonsensical to IR scholars that they are divided into subfields—some work in security studies, others in international political economy—but the fact that there is only commonsensical knowledge about the degree of specialization and centralization in IR communication makes it all the more relevant to study the entire discipline, not only its subfields. The network made up by journal citations can shed light on the structural properties of IR communication, including its degree of dividedness or integration, because network analysis can show whether reflectivist journals tend to be used together with other reflectivist journals or if policy magazines constitute an isolated cluster far from theoretical journals in the IR communication network.

²It is possible that research presented in books differs from the same research presented in journals in terms of citation practice, not to speak of methodological, metatheoretical and policy orientation. The differences between the two genres is beyond the scope of this article but further research can only be encouraged.

Methodology

Quantitative sociologists of science have long proposed journals and the aggregated citation structures among them for mapping the intellectual structure of scientific disciplines (Price 1965; Leydesdorff and Rafols 2009). Citation networks can be analyzed at several levels of aggregation, however, and there is no consensus about a single best way for doing so (Leydesdorff 2005). Data collection, inclusion thresholds, parameter choices, clustering algorithms and other factors all make an imprint on the final map.

One citation analysis of conflict research constructed a hierarchical network from the *most cited articles* in this specific research field (Sillanpää and Koivula 2010). This level of analysis has the advantage that articles are the actual currency of scientific communication. To map an entire discipline, not only a specialized research field, by its articles would produce a very complex network, however. Moreover, articles tend to have a short citation life and then disappear into oblivion, journals tend to remain. Others have looked at the aggregate citations sent and received by a defined set of journals (Russett and Arnold 2010)—the level of analysis proposed by quantitative sociologists of science. However, focusing only on the citations sent and received between IR journal A and IR journal B, also known as *directed* citation analysis, is problematic because it ignores that IR scholars communicate through non-journal and non-IR sources. IR's preference for citing document types like newspapers, policy magazines and books has been documented by librarians (Zhang 2007) but is ignored when IR scholars study themselves (Russett and Arnold 2010; Sillanpää and Koivula 2010). So is the use of journals from other disciplines in IR communication. To increase sensitivity towards the possibility that IR scholars communicate through non-journal and non-IR sources, I investigate the entire bibliographies of journal articles using bibliographic coupling.

Bibliographic coupling diverges from ordinary citation analysis by focusing on relations among the sources in a bibliography, not the relation between sending and receiving journal. Whereas *directed* citation analysis focuses on citations from journal A to journal B, bibliographic coupling studies how often source A and source B co-occur in a bibliography in journal C. That is, what sources tend to be cited together. It assumes that if two journals often occur in the same bibliography, they have a higher degree of similarity than if they rarely occur in the same bibliography. In the language of bibliometrics, it studies the *similarity*, not *distance*, between A and B, which provides an alternative perspective on communication 'gaps' and divides. This way, sources that are *used similarly*, for instance by reflectivists and not rationalists, are clustered closely together in the network visualization.

An important caveat to the use of citation analysis is necessary: To study the bibliographic coupling of IR references is not necessarily to study 'knowledge base' of IR. Some authors do not cite everything they use and others may cite works that have not been consulted (Price 1986:70). The IR citation network tells us something about the way IR scholars communicate with each other and should be interpreted as a communicative rather than intellectual structure. With this caveat in mind, it is more interesting to assume that authors do not construct their bibliographies randomly and that if two journals often co-

occur in a large sample of bibliographies they are likely to have some similarity.

Data

Bibliographic data is imported from the 59 journals categorized as IR in the Web of Science (WoS) database, henceforth referred to as *seed journals*.³ The WoS database is chosen over its main competitors, Scopus and Google Scholar, because it has the longest coverage of cited references over time (Meho and Yang 2007), which allows for a potential extension of the present study with time series data. The data used is also derived from the same database as, and thus compatible with, the much used and debated science indicator Impact Factor (published in the WoS Journal Citation Report).

Seeding journals from the WoS database is not unproblematic, however, as it has an Anglophone and US bias and a far from transparent categorization of IR journals. Its IR category comprises neither all IR journals nor only pure IR journals. The criteria for categorization are not publicly available but supposedly based on the journal's title, citation patterns and other criteria (Leydesdorff and Rafols 2009).⁴ Some journals are multidisciplinary and also cover bordering disciplines such as international law or international economics, which could be criticized of introducing unnecessary interdisciplinarity into the network.⁵ Others might conversely accuse the list of being too mainstreamed by including primarily security and economic journals and excluding

³The IR category 2009 comprises the following journals in alphabetical order: *Alternatives*, *American Journal of International Law*, *Asian Journal of WTO & International Health Law and Policy*, *Australian Journal of International Affairs*, *Biosecurity and Bioterrorism*, *Bulletin of the Atomic Scientists*, *Columbia Journal of Transnational Law*, *Common Market Law Review*, *Communist and Post-Communist Studies*, *Conflict Management and Peace Science*, *Cooperation and Conflict*, *Cornell International Law Journal*, *Current History*, *Emerging Markets Finance and Trade*, *European Journal of International Law*, *European Journal of International Relations*, *Foreign Affairs*, *Global Governance*, *International Affairs*, *International Interactions*, *International Organization*, *International Politikk – Oslo*, *International Relations of the Asia-Pacific*, *International Security*, *International Studies Quarterly*, *Internationale Politik*, *Issues and Studies*, *Journal of Common Market Studies*, *Journal of Conflict Resolution*, *Journal of International Relations and Development*, *Journal of Japanese International Economy*, *Journal of Maritime Law and Commerce*, *Journal of Peace Research*, *Journal of Strategic Studies*, *Korea Observer*, *Korean Journal of Defence Analysis*, *Latin American Politics and Society*, *Marine Policy*, *Middle East Policy*, *Millennium – Journal of International Studies*, *Ocean Development and International Law*, *Pacific Focus*, *Pacific Review*, *Review of International Political Economy*, *Review of International Studies*, *Review of World Economy*, *Revista de Derecho Comunitario Europeo*, *Security Dialogue*, *Security Studies*, *Space Policy*, *Studies in Comparative International Development*, *Studies in Conflict & Terrorism*, *Survival*, *Terrorism and Political Violence*, *War in History*, *Washington Quarterly*, *World Economy*, *World Policy Journal*, *World Politics*.

⁴Eugene Garfield, founder of the WoS database, recently admitted that “journals are assigned to categories by subjective, heuristic methods” (Pudovkin and Garfield 2002, 1113). The categories have been developed manually for 40 years and was also based upon relevant citation data and the Hayne-Coulson algorithm (unpublished). Others argue that the categorization “represents a human judgment that can be considered as a high-quality, if outdated and imperfect, standard of comparison” and conclude that although ISI categories do not reflect journals groupings in many cases, there are many more cases where it does reflect groupings (Boyack, Klavans, and Börner 2005, 354).

⁵Only 18 of the 59 journals listed under IR are categorized exclusively as IR.

journals like *Antipode*, *New Left Review*, *Signs* or those related to area studies, human rights, history or geography. The WoS is indeed a conservative database, compared to Google Scholar, which makes the final network more conventional. But compiling any such list is a delicate balancing act and probably no one list will do justice to all.

A more fundamental methodological issue is the predominance of Anglophone journals based in the US and UK.⁶ Some European, and even less non-Western, journals are included but most of these are published in English too. There is no obvious reason to exclude non-Western journals, except that most of them do not publish in the English lingua franca. It is not that non-Western IR journals do not exist. China, for example, has several IR journals and has even developed a *Chinese Social Science Citation Index* (CSSCI) to cater domestic needs for science management, rankings and bonus schemes—partly a consequence of being excluded from the WoS database (Su, Xinming Han, and Xinning Han 2001). If it is true that American journals publish different research than non-American journals (cf. Wæver 1998), one should be aware that the Anglo-American entry point will primarily produce a picture of the Anglo-American discipline. In its defense, although the WoS database comprises only a fraction of the journal universe, it tends to include the most important journals in each discipline. In IR these are—whether we like it or not—published in the United States. The US bias is problematic in many ways, but may not be a methodological problem because, as Wæver argues (2007:10), “if we want to get an idea of what is characteristic of IR as such, we should first deal with the American/global discipline.” IR is still an “American social science” (Hoffmann 1977; Smith 2000; Crawford and Jarvis 2001) and in that sense *reality*, not the WoS database, has a US bias. Limiting the analysis to references in these 59 journals does indeed produce a more ‘mainstreamed’ image of the discipline, but not necessarily a less interesting one.

A more pertinent issue in the data collection is whether IR can be treated as a separate discipline because the WoS database does so.⁷ If IR is treated instead as a subdiscipline to political science, a strong argument could be made to seed political science journals to the document set. *American Political Science Review*, in particular, could be included as seed journal because part of it publishes IR articles. If journals such as *American Political Science Review* are included, however, the referencing patterns of American politics, comparative politics and political theory are also included and the network ends up comprising more than IR as such. It is indisputable that IR is related to political science, not least in departmental organization, but a strong argument can be made that it nonetheless behaves like a separate discipline with its own PhD degrees, conferences and journals (Wæver 2010). Whether IR behaves like a discipline and how it relates to others is exactly what bibliographic coupling aims to study. It provides a workable solution to the dilemma of disciplinary delineation because journals from political science, as well as economics or

⁶43 of the 59 journals are registered in the United States or England and only 3 are not Anglophone.

⁷ Whether IR is a discipline, a multidisciplinary field (international studies), an interdiscipline (Dougherty and Pfaltzgraff 1981), a subdiscipline to political science (international politics) has been debated since its very founding, see (Kaplan 1961). Manning, Morgenthau. The subsumption under political science was arguably part of the realist gambit, a strategic mistake not get separate departments (Olson 1972, 5).

law, will show up in the network if they are central to the referencing patterns of the seeded 59 IR journals. Therefore, it is reasonable to limit the analysis to these 59 IR journals.

Articles are harvested from the five most recent complete volumes of these 59 journals (2005-2009) to smooth out yearly fluctuations and to secure sufficient data material.⁸ The document set does not discriminate between research articles and other documents but includes all documents with references. This produces a total set of 20534 documents containing 438505 references, 136204 of which are unique. Most source names are already standardized but due to different abbreviations the references were imported to Microsoft Access where cited sources that occur under several abbreviations are homogenized. In order to convert this extensive data material into a network matrix, and avoid the time-consuming computation of a full 136204 by 136204 matrix, only the most frequent sources are included in the network visualization. The processing software BibJourn is used to limit the analysis to sources that account for a certain percentage of the total references in the seeded document set (Leydesdorff 2007a). In practice, my approach in the initial data processing was to vary the threshold levels to see how the data behaved at different thresholds in order to produce a network that is neither too visually complex nor too parsimonious. The following visualization uses a threshold of 0.1%, that is, sources that account for minimum 438 (0.1% of 438505) references are included. This produces a matrix of 79 units, whereas a 0.2% threshold results in only 35 sources. Next step in the network analysis is to visualize the relations between these units.

Network Visualization

A network consists of units and relations, or nodes and edges. The units are references and their relations are similarities. In order to observe the latent similarity structures in the data, the number of co-occurrences must be normalized. For this purpose Ahlgren, Jarneving and Rousseau (2003) proposed the cosine as similarity criterion, and there is increasing consensus among scientometricians that cosine normalization is preferable (Leydesdorff 2007b:1305). Cosine normalization transforms all values to a 0-1 scale, ranging from the weakest to the strongest similarity. The network map is then drawn using the cosine similarity values among sources in the total IR environment. The visualization may be somewhat disappointing at first because relations between journals almost never are equal to zero, which means all units are connected (Leydesdorff 2007:1305). To enhance the visualization, I have chosen a threshold of cosine larger than 0.1 because it removes the weakest links and shows only the strongest relations ranging from cosine 0.1 to 1.

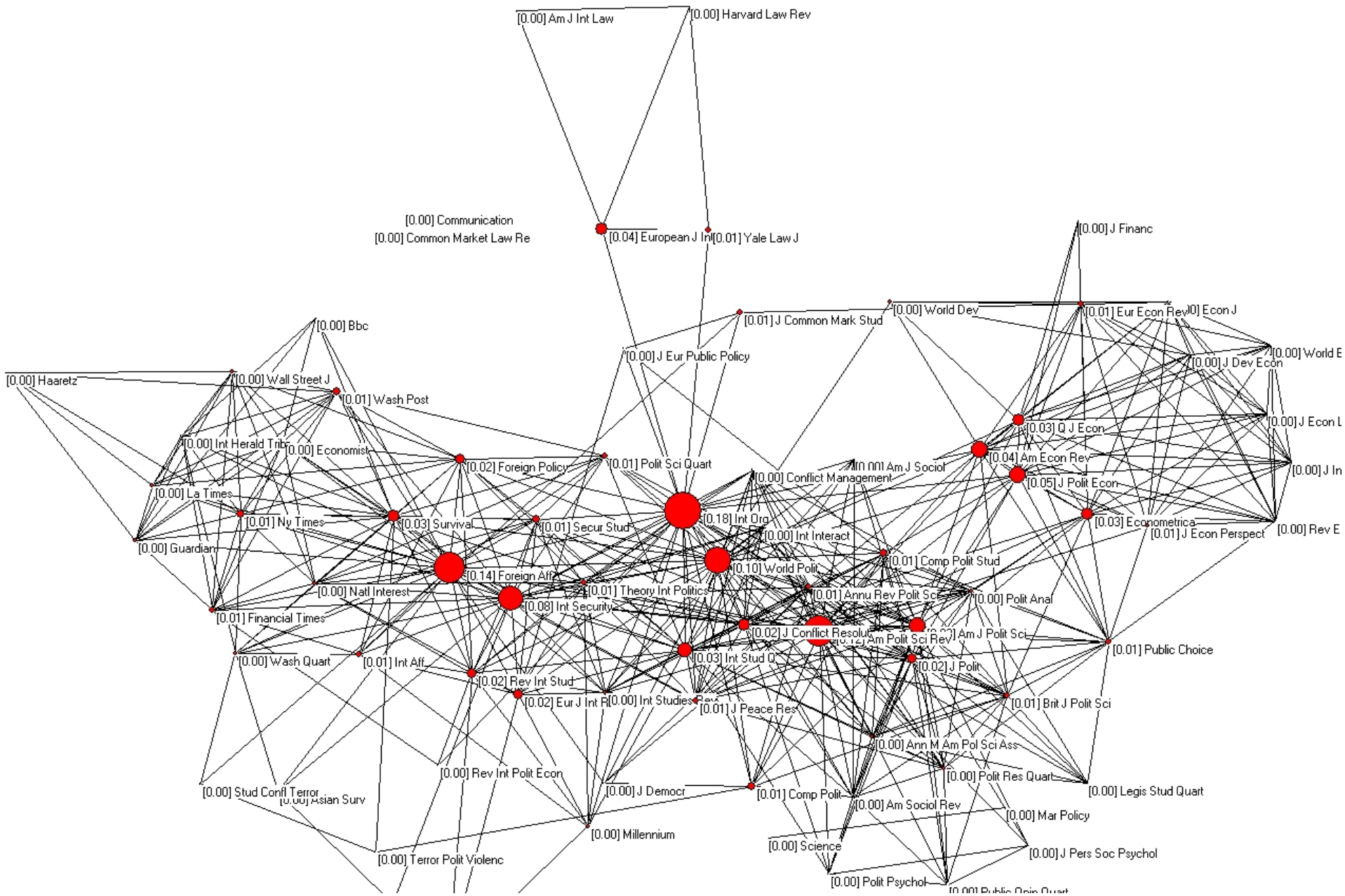
Next the units must be visualized according to their relational position. The following visualization was generated using the algorithm of Kamada & Kawai (1989) in Pajek. Kamada-Kawai is a force-directed layout algorithm that calculates the force between any two nodes. The idea is to minimize the energy of the total system by an iterative process in

⁸One could limit the analysis to only one volume without significant changes. I have visualized the IR environment for both a set consisting of 2005-2009 articles and another set consisting only of 2009 articles, and the results are robust.

which the maximum value is moved until the total energy is minimized and the equilibrium with least tension is reached. In other words, this bibliometric procedure groups references so that most similar references (journals) are arranged closest to each other.

Finally, the units are sized according to their centrality for the communication flow. For this purpose, I use betweenness centrality, a measure often used for communication networks. Network analytic Linton Freeman (1977, 1979) distinguished between three types of centrality: degree, closeness and betweenness. A journal is the most central either if (i) it has the highest *degree* of citations; (ii) it is maximally *close* to all other units; or (iii) it lies on the shortest paths *between* the largest number of other units. *Degree centrality* is a simple absolute indicator of size but can be misleading because it neglects who and how many others send citations; if an IR journal receives a sufficiently large amount of citations from *Pacific Review* it can become most central journal in the discipline. Freeman thus proposed closeness and betweenness as *relative* measures of centrality. *Closeness centrality* indicates the length of the shortest path between units x and y. The idea behind betweenness centrality is that if communication always passes through the shortest available path, then a unit that lies on several shortest paths among other pairs of units is central because it controls the communication flow between the pairs (Freeman 1979:224). An example is the star-shaped network where all nodes have to pass through the center to reach each other, as opposed to a circle-shaped network.

To study journal size and centrality is inevitably to take part in the controversial journal ranking game. However, my focus here is on journal divisions and I have saved a discussion of betweenness centrality vis-à-vis Impact Factor and other traditional science indicators for another study.



The network includes 79 nodes, ranging from quarterly and bi-monthly academic journals over weekly magazines to daily newspapers and even a book. Inclusion *per se* speaks to their importance for the knowledge base of IR, yet their position and size suggests that some are more important for the communication flow than others. Position is an indicator of centrality because the spring embedding algorithm causes central nodes to be located in the center and marginal nodes in the periphery. Clusterings of certain source types in both center and periphery indicate that they share a similarity with each other, although the criteria of demarcation between clusters may differ. In order to answer the puzzle about the dividedness of IR, I ask three questions of the network (i) what are the main journal clusters, (ii) how are they demarcated and (iii) which nodes are most important for the communication flow? I focus first on disciplinary demarcations and then how differences in source type, country of publication and methodological or theoretical approach may—or may not—structure lines of division in IR communication.

Structures of Division and Integration in IR Communication

Disciplinary Divides

The most obvious lines of demarcation and clustering are disciplinary. Included in the center and center-left of the network are mainstream IR journals such as *International Organization*, *World Politics*, *Journal of Conflict Resolution*, *International Studies Quarterly*, *International Security*, *Foreign Affairs* and several others. Their location in the network center and their size shows that they are key journals and that they share a high level of similarity. This part of the network visualization largely confirms existing results; for example, it includes 22 of the top 25 IR journals found most prominent in a recent survey (Maliniak et al. 2009) and locates the most prominent ones in the center. The most central journals in terms of betweenness centrality are, to a large extent, the ones usually ranked as top journals by traditional science indicators such as the WoS Impact Factor.

In terms of Total Cites received from the entire WoS database in a given year, *International Organization* (3465) was clearly the most cited of the 59 IR journals in 2009, followed by *Foreign Affairs* (2598), *Journal of Conflict Resolution* (2410), *World Politics* (2134) and *International Security* (2075). Impact Factor, originally proposed by Eugene Garfield (1955), measures average cites per published item over a two-year time span. In this respect *International Security* (3.243) ranks first, followed by *Foreign Affairs* (3.155), *Journal of Peace Research* (2.468), *World Politics* (2.114) and *International Organization* (2.000). Below, I will discuss how these indicators miss that some of these journals have a more specialized role within IR communication because they measure how many cites a journal receives from the entire WoS database and not their importance in IR communication (Giles and Garand 2007:744-5; Nisonger 1994:448).

The network may look conventional, but it should be noted that only 25 of the 59 seeded IR journals are included and that there is a pattern of inclusion: the visualization

excludes 13 of the 16 seeded journals based outside the US and UK.⁹ Seeded journals with a regional focus, at least in their titles, are excluded (e.g. *Korean Journal of Defence Analysis* or *Latin American Political Science*)—unless, of course, the region is America (e.g. *American Journal of Sociology, Economics, Political Science* and *International Law*).¹⁰ In terms of inclusion, some unseeded IR journals such as *International Studies Review* appear despite exclusion from the WoS IR category. So do unseeded policy journals *Foreign Policy* and *National Interest* while the seeded *Bulletin of the Atomic Scientists, Space Policy* and *World Policy Journal* do not. This attests to their relative bibliometric importance in academic IR. Apart from journals, Kenneth Waltz's (1979) *Theory of International Politics* is included as the only monograph cited above the 0.1% threshold. The fact that a 25-30 year old book occupies such a central position in the network confirms its classical status in the discipline. It is most closely related to (co-cited with) *International Security*, however, which can be taken as an indication of their shared realist orientation.

Apart from conventional IR sources, the center-right also contains a range of political science journals that are not wholly separated from the IR core. This raises the question of disciplinary status and the boundary relation to Political Science. Although it was excluded from the seeded set, the *American Political Science Review* has the third highest betweenness centrality and is among the most centrally located journals in the IR network. This attests to its prominence in the seeded IR bibliographies and for IR communication at large. In the specific case of the *Review*, one explanation is that it publishes articles on international relations alongside comparative politics, political theory and American politics and thus organizes IR as a subfield to political science.

It is unlikely, however, that all political science journals in this cluster are included only because they publish articles that are 'actually' IR. They are also included because the two intellectual fields are interconnected intellectually and thus political science publications are relevant to IR research. IR has closely monitored and followed theoretical and methodological trends in political science, for example the turn to rational choice and formal modeling. The interconnection is also related to social organization: IR is often a subdiscipline to political science located at political science departments, its practitioners often possess political science degrees, attend political science conferences and are thus likely to be exposed to political science journals.

Although political science journals, the *Review* in particular, are located in a central position for IR communication, they do not play an exclusively integrating role. Firstly,

⁹*Asian Journal of WTO and International Health* (Taiwan), *Australian Journal of International Affairs* (Australia), *Cooperation and Conflict* (Norway), *International Politikk* (Norway), *Internationale Politik* (Germany), *International Relations of the Asia-Pacific* (categorized under England but published on behalf of the Japan Association of International Relations), *Issues and Studies* (Taiwan), *Journal of International Relations and Development* (Slovenia), *Korea Observer* (South Korea), *Korean Journal of Defence Analysis* (South Korea), *Pacific Focus* (South Korea), *Revista Derecho Comunitario* (Spain), *Review of World Economy* (Germany).

¹⁰In addition to the abovementioned, journals based in the US and UK but with a regional focus are mostly excluded (e.g. *Communist and Post-Communist Studies, Journal of Japanese International Economy, Latin American Political Science, Pacific Focus, Middle East Policy*).

they are located in a dense cluster because IR articles tend not only to cite political science journals but also to cite them *together*. Secondly, not all IR journals are directly connected to political science journals. The fact that it is *International Organization*, *World Politics* and *International Studies Quarterly*—not *International Security* and *Foreign Affairs*—that are most closely related to the political science cluster suggests that their content is more similar to that of general political science journals.

Moreover, it is the political science cluster that links the economics journals to the IR core. This is not to say that political science is closely related to economics but rather that the two are central resources to IR and often are cited together in IR publications. Bibliometrically, the link to economics is constituted mainly by comprehensive and prestigious journals like *American Economic Review* and *Quarterly Journal of Economics* that are neither purely empirical nor theoretical. The multidisciplinary *Public Choice* also plays a mediating role. Although the linkage between IR and economics is well known, particularly in American IR, it is remarkable that there are 14 journals in the economics cluster, of which only *World Economy* was included in the seeded set. Other seeded journals relating to economics are either located elsewhere (*Review of International Political Economy*) or excluded from the network (*Review of World Economy*, *Journal of Japanese International Economy*, *Emerging Markets Finance and Trade*).

The striking presence of economics can be interpreted as both theoretical and empirical import. Economics supplies a substantial part of the knowledge base of IR partly because some economics journals study the same empirical topics as IR journals, international development, trade and institutions. The use of empirical and applied journals such as *World Economy* or *Journal of Development Economics* suggests empirical overlap. But economics journals are cited also because IR imports theories and methodologies from economics: for example, game-theoretical models, bargaining theory, neoliberal institutionalism or statistical methods. Bibliometrically, references to theoretical-mathematical journals like *Econometrica* or *Journal of Finance* suggests theoretical import rather than empirical overlap.

Despite constituting a significant part of IR communication, economic journals play a less central role in the IR network than political science journals. As the clustering algorithm shows, economics journals constitute a separate island in the periphery of the IR network, and a relatively dense one. Dense, yet loosely connected, clustering indicates that these journals appear frequently in IR references but tend to appear together. Their high co-occurrence and isolation from the remainder of the network indicates *specialization*. Bibliographic references to economics tend to cluster and are less likely to co-occur with journals relating to, for example, security studies or international law. Instead, they occur in articles that *specialize* in economics or the interdisciplinary field International Political Economy (IPE) that can be considered a subfield to both IR, political science and economics.

Apart from IR and its ‘own’ journals, economics and political science are the two disciplines whose journals are most obviously present in the network. Four journals relating to law constitute a separate cluster, albeit a less dense one. Journals in psychology and sociology are found in the periphery of the Political Science center, but they are too few to make up a separate cluster.

Policy/Theory Divides

An alternative interpretation looks at source types and, somewhat related, policy/theory demarcations. Newspapers and weekly magazines make up the left part of the network, ranging from the Israeli *Haaretz* and British *BBC* in the periphery through the more influential US and UK dailies *Wall Street Journal*, *International Herald Tribune*, *LA Times*, *The Guardian*, *Financial Times*, *New York Times*, *Washington Post*, foreign policy magazines such as *Washington Quarterly*, *National Interest*, *Economist*, and closer to the center one finds *Foreign Policy*, *Survival*, *International Affairs* and *Foreign Affairs*. The most ephemeral sources are located in the periphery and do not perform an integrative function for IR communication. It could be argued that this section of the network is a continuum ranging theoretical to policy related sources. The center contains theoretical and academic sources published quarterly or bi-monthly while the left periphery contains policy related sources published at a weekly or even daily rate. This is not to imply a hierarchy, newspapers, magazines and journals all provide knowledge relevant to IR research, otherwise they would not show up in the network, but they do so for different uses due to different editing practices and speeds of publication.

The conventional wisdom, in the simplified version, is that IR scholars come in two types: those who engage in policy relevant questions and policymaking and those who are unattached and critical academics. It would be obvious to deduce that these two types write, read and cite policy-related and theoretical literature, respectively. But there is reason to be skeptical about such a policy/theory divide. Or, to put it in bibliometric terms, that IR communication is divided between journals like *Foreign Affairs* that cite only policy-related and empirical sources and journals like *International Organization* that cite only academic and theoretical sources. It is tempting to conclude that the presence of a ‘policy cluster’ is the product of including policy magazines like *Foreign Affairs* and *Survival* in the seeded document set, but one should remember that such policy magazines contribute with little, if any, references. The policy cluster arises because academic journal articles too cite these non-academic and policy-related sources. To take an example, *International Security* cited *The New York Times* more than any other source apart from itself in 2009. It is true that most top academic IR journals are theoretical, not policy-relevant, journals (Hellmann and Müller 2003:382) controlled by theorists, but they do not exclusively publish theoretical work (Wæver 1998:718). A wide range of journals in the discipline cite newspapers and policy sources. This practice may even be more outspoken in IR than in other social sciences. *The New York Times*, to continue the example, was the fourth most cited source in the entire IR category in WoS in 2009, whereas it ranked 10th in political science, 26th in sociology and 123rd in economics. If anything, IR seems to be characterized more by its propensity to communicate through policy-related non-journal sources than its policy/theory gap.

Divides Between a General-Theoretical and a Specialized Tier

Another reading is that IR is a “two-tiered discipline” segregated into an upper core tier of all-round theorists who publish in general journals and a lower tier of specialists who are accepted only in their respective subfields (Wæver 1998:718). These two tiers to a large

extent correspond to a core-periphery reading of the bibliometric IR network; the core is made up by pure and general IR journals while specialization enters at the periphery. While the idea of tiers seems to imply super/subordination, I use the core-periphery dichotomy not to imply an exploitative relationship between dominant core and dominated periphery but to characterize a type of organization "where the core has greater density of connections within itself than with the periphery [and] where peripheral elements are only loosely connected to one another." (Fowler, Grofman, and Masuoka 2007:736).

Not only is IR communication divided into a theoretical core and a specialized periphery, there are also indications that it is divided into separated specialties; most notably security studies and IPE and the two main clusters of sources related to economics and policy/security, respectively. At the outermost periphery one finds less central journals related to subfields such as International Law (*European Journal of International Law*, *Yale Law Journal*, *American Journal of International Law*, *Harvard Law Review*), European/EU studies (*Journal of European Public Policy* and *Journal of Common Market Studies*), Asia-Pacific studies (*Asian Survey* and *Pacific Review*), development studies (*World Development* and *Journal of Development Economy*), terror studies (*Studies in Conflict and Terrorism* and *Terrorism and Political Violence*).

The journals in these clusters tend to be highly co-cited, an indication that they are similar, and have only few connections to the center, an indication that they are specialized. *Journal of Common Market Studies*, for example, has only four connections, the strongest has a similarity value of cosine 0.63 (*Journal of European Public Policy*) while the second-strongest is only 0.13 (*International Organization*). In other words, IR scholars tend to cite these specialized journals together and not along with a wide array of other journals, which results in very narrowly distributed connections. The same can be said about Asia-Pacific or terrorism journals that have no centrally integrating function for the entire network and thus have a low betweenness centrality; if *Pacific Review* is removed, the network will not disintegrate the same way as if *International Organization* is removed.

The presence of journals from other disciplines such as economics and law can be interpreted as an indication of interdisciplinarity, and their clustering along the periphery as an indication of specialization. In fact, interdisciplinarity and specialization are often two sides of the same coin; "as a new specialty emerges, it may draw heavily on its mother disciplines/specialties, but as it matures a set of potentially new journals can be expected to cite one another increasingly, and this to develop a type of closure that is typical of 'disciplinarity'" (Leydesdorff and Rafols 2011:3). All the clusters mentioned above can be interpreted as clusters of specialization, but if there is a trace of scissiparity in IR it points towards a split into the specialties security studies and IPE. International political economy is a specialty area that happens to be very much related to what another discipline studies. It forms a bibliometrical cluster because articles that are essentially located at the nexus of two disciplines co-cite both IR journals and economics journals. This type of specialization works as IR scholars 'borrow' from other disciplines and combine with IR. Not all specialties rely on import and interdisciplinarity, however. Security (policy) studies can be considered a homegrown specialty that relies mostly on IR and policy related sources.

Betweenness centrality can also be used to study whether a journal has a general or

specialized role for the disciplinary network. The marginal role for IR communication played by the specialized journals just mentioned results in a low betweenness centrality. Even among seemingly general IR journals, some are more generally important for the dissemination of communication in the discipline than others. As mentioned above, traditional science indicators neglect how a journal may have a very local impact, for example in security studies, without affecting the entire IR network. This is where betweenness centrality provides a much-needed supplement because it shows a journal's centrality in a disciplinary network and how its impact may be structured around patterns of subdisciplinary specialization.

International Organization and *International Security* are both important journals. In the 2009 Web of Science category for IR, *International Organization* is largest in terms of citations while Impact Factor suggests that *International Security* has the largest impact on the field.¹¹ Yet, other researchers of IR journals have argued that *International Security* is on a more specialized mission than *International Organization* (Breuning et al. 2005:450). If one looks at betweenness centrality in the network, *International Organization* ranks first (0.18) followed by *Foreign Affairs* (0.14), *American Political Science Review* (0.12), *World Politics* (0.10) and *International Security* (0.08%). In words, among the 79 journals and books in the network, *International Organization* is on the shortest path between two of them in 18% of the possible cases. *International Security*, on the other hand, is mostly cited together with particular journals, i.e. in security studies, and thus scores lower on betweenness centrality. Its distribution is more concentrated than that of *International Organization*, which more often co-occurs with a broader range of journals and thus plays a more general and integrating role for communication flows in IR. Note how *Journal of Conflict Resolution*, *Journal of Peace Research* and *International Studies Quarterly* that rank highly on Total Cites and Impact Factor all score relatively low on betweenness centrality and thus are less central for the overall communication flow. These patterns of generality-specialization are supported by the results of a survey of general political science journals that ranks *American Political Science Review* 1st, *World Politics* 4th and *International Organization* 5th among all political science journals (Garand and Giles 2003:296). A high ranking by political scientists can be taken as an indication of their usefulness for broader political science and thus as a strong indicator of their generality. In comparison, the survey ranks *International Studies Quarterly* 14th, *Journal of Conflict Resolution* 18th, *International Security* 19th and *Journal of Peace Research* 52nd. Other surveys conducted among both political scientists and IR scholars support this pattern (Norris and Crewe 1993; Giles, Mizell, and Patterson 1989; Maliniak et al. 2009). The network diagram shows this same pattern of generality-specialization in a more visual way. *International Organization* and *World Politics* are more geographically central to core IR and political science journals than *International Security*, and more central in terms of size than *International Studies Quarterly* and *Journal of Conflict Resolution* (as measured by betweenness centrality). Both position and size indicate what journals perform a more general organizing function for the entire field.

¹¹*International Organization* received 3465 cites, *International Security* received 2075. Meanwhile, *International Security* scored an Impact Factor of 3.243, *International Organization* scored only 2.000.

Betweenness centrality thus supplements the analysis of centre-periphery structures and general-specialized profiles by providing a quantitative indicator to measure what IR journals constitute central nodes with wide interactions. It should be noted that *International Security* and *Foreign Affairs*, despite their specialized profile, still score relatively high on betweenness centrality because they are a frequent path to and from policy oriented sources. They are important nodal points in the sense that they link peripheral policy sources to the core of the IR network.

Methodological, Theoretical, and Metatheoretical Divides

A related mode of dividing the discipline goes beyond empirically based subfields and operates instead within the theoretical-general core, as methodological, theoretical and metatheoretical divides. There is some bibliometric evidence of methodological and metatheoretical clusters. For example, journals that are typically regarded as quantitative and positivist in orientation cluster together. Several content analyses have identified a preference for quantitative methods and large-n data in *International Studies Quarterly* and *Journal of Conflict Resolution* (Goldmann 1995:250; Wæver 1998:720; Breuning et al. 2005:454). The bibliometric data support these findings as *International Studies Quarterly*, *Journal of Conflict Resolution* and *Journal of Peace Research* are cited mostly with each other. These quantitatively oriented IR journals are also located close to a range of political science journals with a quantitative profile. This is supported by another journal survey showing that quantitatively oriented political scientists regard *International Studies Quarterly*, *Journal of Conflict Resolution*, *American Political Science Review*, *Journal of Politics* and *American Journal of Political Science* more highly than qualitatively oriented political scientists do (Garand and Giles 2003:304). The same survey finds that scholars favoring qualitative approaches are more likely to prefer *World Politics*, *International Organization* and *International Security*. This methodological preference is not clearly visible in the network visualization, presumably because other delineations such as theoretical orientation distinguish *International Organization* and *International Security*.

A related mode of organization, maybe the most commonsensical, is that of theoretical approaches. This line of reasoning suggests that IR journals are organized by theoretical approach rather than the subject their name may suggest, namely that “neoliberals gravitate to *International Organization*, realists to *International Security*, quantitative researchers to the *International Studies Quarterly*, constructivists and critical theorists to *Millennium*.” (Lebow 2007:19). This simple and persuasive story is often decried because “people from one tradition will be less likely to read the work of researchers from other traditions.” (Lebow 2007:19). If theoretical clustering is the norm, however, we would not expect IR scholars to read and cite these journals together. On this point, the bibliometric results are inconclusive at best. The marginal position of *International Security* near the policy cluster may be explained by its realist profile. Similarly, *Millennium* is located among other European journals with a more reflectivist orientation (Wæver 1998). With regards to *International Organization* and *International Studies Quarterly*, however, the picture is less clear. *International Organization* is the dominion of not only neoliberal institutionalists but also soft constructivists. At least the editorship of Adler and Pauly seems to encourage both rationalist and constructivist

contribution ranging from “agent-based modeling to disciplined discourse analysis” (Adler and Pauly 2007:4). The central network location of *International Organization*, *World Politics and International Studies Quarterly* indicates that they are not read along with particular journals but with a variety of other journals. This speaks to generality rather than a specialized profile.

Geographical Divides

Journals have thus far been treated as indicative of cognitive or intellectual divides in IR. Sociologist of science Richard Whitley (1984) emphasized that disciplines are characterized by both intellectual and social organization. The social organization of disciplines includes the non-intellectual institutions such as university institutions, promotion schemes, funding sources, peer review systems, geographical organization and so on. In the bibliometric vein followed so far in this article, journals are often considered a part of the intellectual dimension, which supports treating “the intellectual organization of knowledge in terms of texts (journals) as different from the social organization of the sciences in terms of institutions” (Leydesdorff 2007a:25). But the two are interconnected and social patterns do show up in the journal network.

It is no coincidence that the network consists mainly of American journals; the American seed journals tend to cite American journals in their bibliographies. Although partly a product of seeding primarily Anglophone journals based in the US and UK, this provides bibliometric evidence that IR is still an American social science. Moreover, Europe-based journals *European Journal of International Relations*, *Review of International Studies*, *Security Dialogue*, *Millennium* and, to a lesser extent, *Journal of Peace Research* display a high level of similarity in their close relation, although they do not form a separate cluster. Of course, the geographical publishing locations of these journals do not explain why European journals are mostly cited in one set of bibliographies and American journals in another. In a world of online access to journals, publications are widely disseminated and geographical distances are becoming smaller obstacles yet. Besides, the location of the editorial team is probably more important than the location of the printing house.¹² Rather, geographical diversity between European and American journals is more likely to arise from the fact that Americans publish in, and dominate, American journals, while Europeans tend to publish in European journals (Goldmann 1995:252; Wæver 1998:698). And European authors produce a different kind of scholarship than American scholars, argues Wæver (1998), because of differences in foreign policy, sociopolitical organization, disciplinary patterning and intellectual traditions of IR in Europe. Geographical divides and intellectual divides are thus connected; European journals are often co-cited because they publish more articles authored by Europeans which, according to Wæver (1998), are generally more constructivist, postmodernist and ‘other’ compared to the American rational choice and quantitative approach.

¹²I would like to thank one of the anonymous reviewers for this point.

Overall, however, my analysis at this level of aggregation does not provide strong support for the common view that IR journals are divided into methodological, theoretical or metatheoretical clusters. This is not to rebut that such clusterings exist but merely that this requires a more qualitative approach to the data. A content analysis based on the coding of individual articles is a task for further research.

Drawing Conclusions

This article has visualized how IR communication is structured along lines of integration and division by analyzing the bibliographic coupling of references in more than 20,000 articles published in IR journals between 2005 and 2009. To summarize its results, the IR communication network is centralized around its own journals and this supports the view that IR is a discipline, at least bibliometrically. The IR network is held together by a center of key nodal points we would typically characterize as ‘pedigreed IR’ journals, with the important exception of *American Political Science Review*. Depending on the indicator of centrality used, *International Organization*, *American Political Science Review*, *World Politics*, *Foreign Affairs* and *International Security* are the most central journals that knit together the peripheral parts of the network and enable communication to flow from one specialized corner of the discipline to another. Because of their level of generality for discipline-wide communication, these journals integrate less cited sources and disciplines in the periphery; or, in other words, make sure specialties areas like security studies and international political economy are part of the same disciplinary network.

The network analysis also provides some support to the argument that IR is a divided discipline. The IR network is most obviously divided along specialty lines; the two most prevalent being IPE and security studies, but one also finds clusters related to international law, EU, Asia-Pacific, development and terror studies. Some specialty clusters consist of journals from other disciplines (IPE), others are homegrown (security studies), but common to them all is that they are located at the margins of the communication network. This supports the two-tiered reading of the discipline in the sense that general-theoretical sources are central for the way the discipline communicates while policy- or area-specific sources play a marginal role. There are also geographical divisions, albeit with American journals dominating most of the network and European journals clustering together while non-Western journals are conspicuously absent. With regard to theoretical, metatheoretical and methodological divisions, however, the results are far from conclusive. And it should be stressed that citation analysis ignores the content of journals and has its methodological strength as a formalistic and structural tool.

The network among journals shows that IR communication is divided along several lines, to be sure, but it is not pure cacophony. In social network terms, a highly centralized network is one where few units have a much higher centrality than the rest—the star as opposed to the circle—and IR as a whole is centrally organized around few key journals. Centralization has several explanations; one is that most IR scholars read and cite these key journals because their general character allows them to be combined with various subfields in the periphery of the network. Moreover, these homegrown journals are institutions—on a par with IR departments and ISA conferences—that give international relationists a distinct

identity in the social sciences. Being an IR scholar entails communicating in a certain manner. In bibliometric terms, to cite these journals is to be part of the trans-departmental and trans-national IR community. It is possible that very few IR scholars actually *read* these journals but cite them nonetheless. This may in fact be the very point: to practice IR is also to speak the right language and an important part of this is to cite correctly. The structural dimensions produced by such communicative behavior are seldom manifest to participating agents but sets limits to their capacity to understand signals and participate in further communication nonetheless.

With these conclusions in mind, there is obviously room for further bibliometric studies on the dividedness of the discipline. The narrative of a dividing discipline usually relies on the myth that IR was more integrated back in the days, but today we are factionalized and neither read, cite nor respect each other. A longitudinal analysis of the discipline's communication structures over time would be an interesting way to test this myth. Equally interesting for a future research agenda of quantitative sociological studies of IR would be a synchronic analysis of IR compared to other disciplines to assess whether IR is in fact more divided than is normal in other social sciences. In that setup a directional citation analysis could investigate who is learning from whom, both within IR and in relation to neighboring disciplines. The journal is an interesting unit of analysis, but articles, authors, countries and even (key)words are also connected in latent networks that structure our discipline. To grasp the changing nature of IR communication and its dividedness, it is important to further investigate the geographical distribution of scientific output and what networks that author and coauthor the discipline. To assess the divide between Western and non-Western IR and the future challenges to Western scholarly hegemony, one has to move beyond the study of Western journals. The debate about the development of a Chinese IR theory is a good example of counter-hegemonic moves that have largely been ignored by mainstream journals and instead take place at conferences and symposia in Beijing and Shanghai, in working papers and articles in Chinese journals. There is an expanding landscape here that must be addressed to truly comprehend the dividedness of our discipline.

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