Social Spaces

Ellersgaard, Christoph Houmann; Henriksen, Lasse Folke; Kristensen, Peter Marcus; Grau Larsen, Anton

Published in:
Routledge Handbook of International Political Sociology

Publication date:
2016

Citation for published version (APA):
Ellersgaard, C. H., Henriksen, L. F., Kristensen, P. M., & Grau Larsen, A. (2016). Social Spaces. In X. Guillaume, & P. Bilgin (Eds.), *Routledge Handbook of International Political Sociology* (pp. 338-352). London; N.Y.: Routledge. Routledge Handbooks

Social Spaces

Christoph Houman Ellersgaard, Lasse Folke Henriksen, Peter Marcus Kristensen and Anton Grau Larsen

The methodological imagination of social spaces

This chapter introduces methods for re-imagining international political sociology through social spaces of power, alliances and positions. The spatial methodologies introduced, Social Network Analysis (SNA) and Multiple Correspondence Analysis (MCA), build on a relational ontology that represents the social not in terms of individuals or organizational entities, but connections and interactions, spaces of positions and position-taking. One appeal of spatial methodologies like SNA and MCA, compared to other quantitative methods, is that by ”drawing things together” (Latour 1990) they enable us to *visualize* hitherto invisible social spaces in graphs and sociograms. As descriptive and explorative methods, they allow for complex relations of interdependence rather than pure one-way relations between independent and dependent forces (Emirbayer 1997). These methodologies are the backbone of the “descriptive assemblages” (Savage 2009) unifying different contemporary sociological traditions.

It should be emphasized that spatial methods not only render social spaces visible and thinkable, but also governable. The mapping of social spaces opens some political spaces and closes down, or makes invisible, others. By drawing things together, we also open for doing things together. As such, the methodological imagination of social spaces can be deployed for more or less critical purposes. So far, critical scholars within international political sociology and international relations have largely shied away from these quantitative methods, mostly because they were seen as a defining feature of its constitutive Other: the non-critical, problem-solving positivists who use quantitative methods to reproduce rather than disrupt political order. But criticality is not tied to the methods *per se*, we argue, which is not to say that the quantitative methods introduced here are apolitical, but, quite the contrary, that they construct political objects that can be deployed for *different* purposes.

Network analyses based on, for example, military alliances, diplomatic connections and co-membership in IGOs construct much more state-centric social spaces than those based on professionals and practices. Similarly, international security is often visualized through organized crime, trafficking and terrorist networks to be policed, but could also, for example, be envisioned as a field of security professionals and bureaucratic apparatuses, which opens a different space of governability. Or take the world of finance as seen through the transnational capitalist network of corporate elites or central bank directors, which represents a vastly different social space, than a network of country level financial flows. Global trade visualized as supply chain networks has different uses than if visualized through deadly logistical and production conditions, as do mappings of terrorist networks for counterinsurgency purposes compared to, say, accounting for terrorism through global inequalities (Aradau and Huysmans 2014:604).

To be sure, policy-oriented uses with implications for diplomacy, businesses, intelligence, counter-insurgency and policing are prevalent, and such modes of application risk reifying the object of study and directing the forces of action represented in social networks towards particular pre-defined aims. But the methods themselves allow for a

more imaginative use of spatial methodologies in international political sociology. Our aim in this chapter is to promote this agenda: we discuss what kinds of questions these methods allow us to ask. Specifically, the two main sections dedicated to SNA and MCA outline how these tools enable us to study social spaces in terms of relations of **power**, **alliances** and **positions**. Finally, we discuss issues of data collection and visualization before ending with some critical reflections.

Mapping Power, Alliances and Roles

A central feature of SNA and MCA lies in their potential to map the power structure of a social space - both globally, organizationally and in terms of individual power positions. Yet, they differ in what aspects of power they render visible. SNA is useful for representing relations of power in two-dimensional space and for drawing attention to questions of concentration and hierarchy through centrality analysis. MCA is better suited for revealing the complex interplay of attributes and status categories in a multidimensional space that represents the deployment of underlying power resources (such as forms of capital). However, the strength of both methodological approaches lies in the fact that positions of power are not determined *a priori*. For instance, the Bourdieusian approach used in MCA has "the distinctive advantage of not (pre-) defining elites in terms of their putative roles or functions but, instead, in terms of their field specific dominance" (Savage and Williams 2008:16)

Social Network Analysis

SNA triggers questions about how **power** is exercised by mobilizing relations in social space. One set of questions relates to how the overall structure of a network facilitates certain techniques for exercising power. Centralized networks with a dense core and sparse periphery offer core actors a clear strategy for reproducing hierarchies. Fragmented networks with competing fractions of actors can instead be detected through the identification of communities and structural holes.

SNA also directs the analyst's attention to particular actors who occupy spaces of potentiality. It is a particularly useful tool for exploring a relational-positional concept of power and *metrics of centrality*. Traditionally, attention has been on a local measure of centrality called *degree centrality,* which is a simple count of actors' direct ties. Actor positions with a high potential for exercising discrete influence on actors are made visible through the application of this metric. A different metric is *betweenness centrality*, which renders visible an actor's potential to control, and manipulate, the flow of things in the wider network. Betweenness relies on the analyst to meaningfully argue that actions carry effects across interconnected paths and hence travel the span of entire networks (Freeman 1979). Occupancy of a central position in an otherwise sparsely connected network spaces amplifies the overall connectivity in global network in terms, and for the individual actor generates the power of being in the 'midst of things'. For scholars of Actor-Network-Theory, betweenness centrality can be used to locate 'obligatory points of passage'.

Centrality analysis is widely used in studies of transnational corporate elites (Levine 1972, Heemskerk 2013), structures of ownership control (Vitali et al. 2011) and to locate professional competition in transnational networks of sustainability standard-setters (Henriksen and Seabrooke 2016). This, in turn, enables the researcher to study how the

network structure reflects relations of dominance and subordination and thus to describe key rivalries. This kind of analysis further stimulates questions of social change: what are the strategic points of intervention to inhibit the exercise of dominant powers and what might a more equitable network look like? Should positions of preponderance be wholly abandoned or occupied by actors with a more diverse set of attributes? By raising such questions, the identification of powerful positions through SNA enables researchers to de-naturalize prevailing power configurations and point to their contingency. Moreover, visualizing network structure can guide social movement organizing.

Furthermore, techniques for community detection and clique percolation algorithms can be applied to identify cohesive subgroups - and thus potential **alliances** - within networks. This is especially helpful for understanding social spaces that do not contain one uniform hierarchy but consists of several hierarchies nested within larger network structures. In network terms, actors can be seen as locally powerful within cohesive subgroups or communities even if they are not located at a global center of the network. This enables a more refined understanding of hierarchy, which can also render clear visualization of particularly dense 'regions' of a network. Another feature of visualizing subgroups is that it renders visible opportunities of bridging actions across subgroups. Situations of competition between communities can be exploited by brokers who capitalize on access to diverse flows of knowledge within and across separate subgroups. Brokers thrive from situations of conflict and may therefore be interested in sustaining structural holes. But alliances across subgroups are also rendered visible through this form of analysis by locating action from intergroup ties. These methods also open up new perspectives on what should be considered local and what should be considered non-local in order to move beyond methodological nationalism.

In a recent paper, Heemskerk and Takes (2016) conceptualize local ties as those formed within network communities and non-local ties as those that connect an actor beyond their own community. Considering board networks of the 1,000,0000 largest corporations globally, they identify localities of global capitalist networks without incorporating any information about geographical locations and find several interesting dynamics including a peculiar community around Panama (notably prior to the leaking of the Panama papers). By mapping these inductively identified communities onto a geographical map, the geography of the actual social interactions of capitalists is displayed and triggers imaginaries of explanation: e.g. why is Portugal a distinct community (connected to its former colony Brazil), when Spain, France and Italy are part of the same community (along with Spanish Latin America)? What explains the fact that Israel is the only country in the North American community or the existence of two Asian communities (an East Asian and another comprising South Asia, Korea, Vietnam, Australia and New Zealand).

Figure 1: Board Networks in Europe

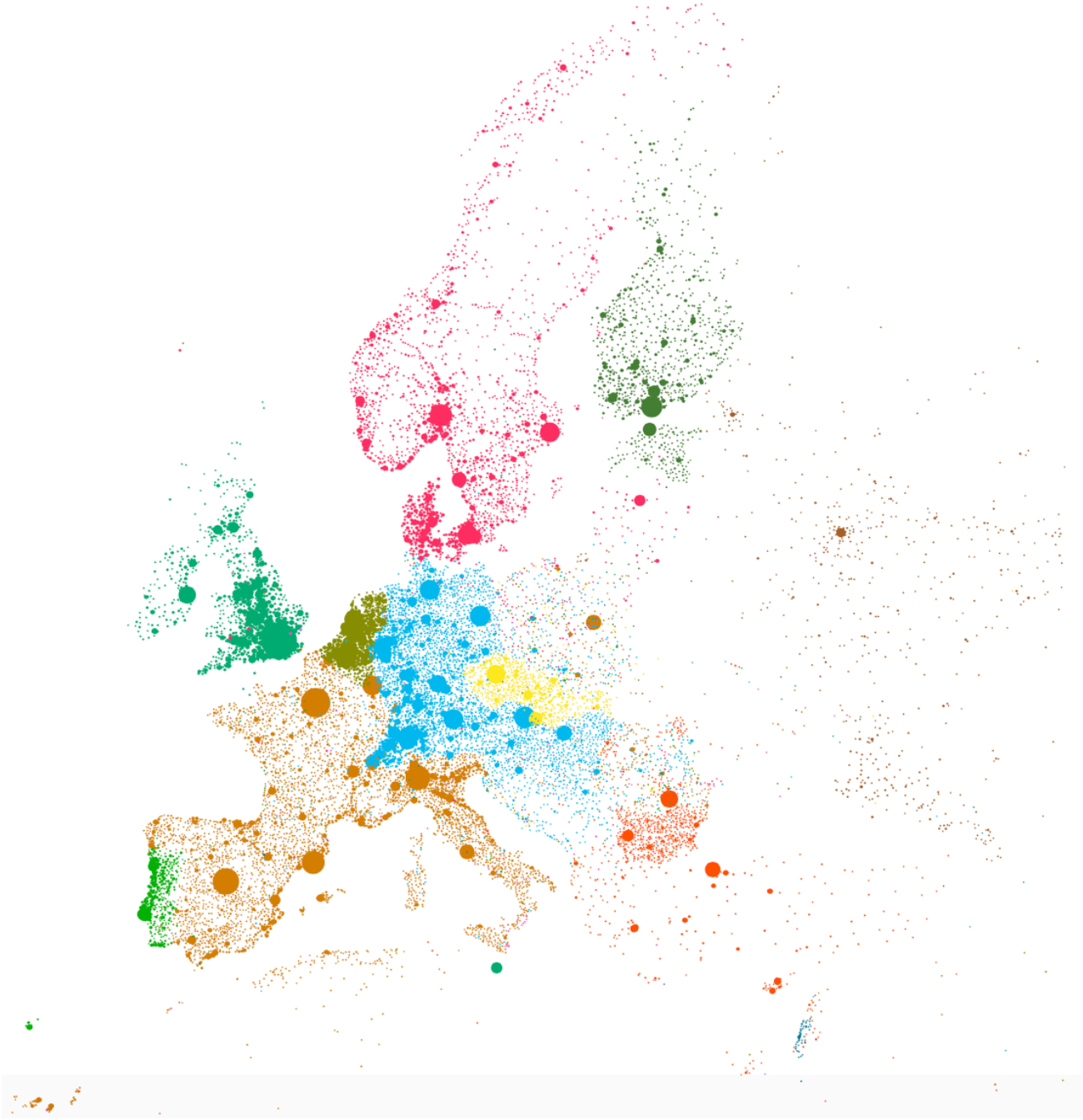
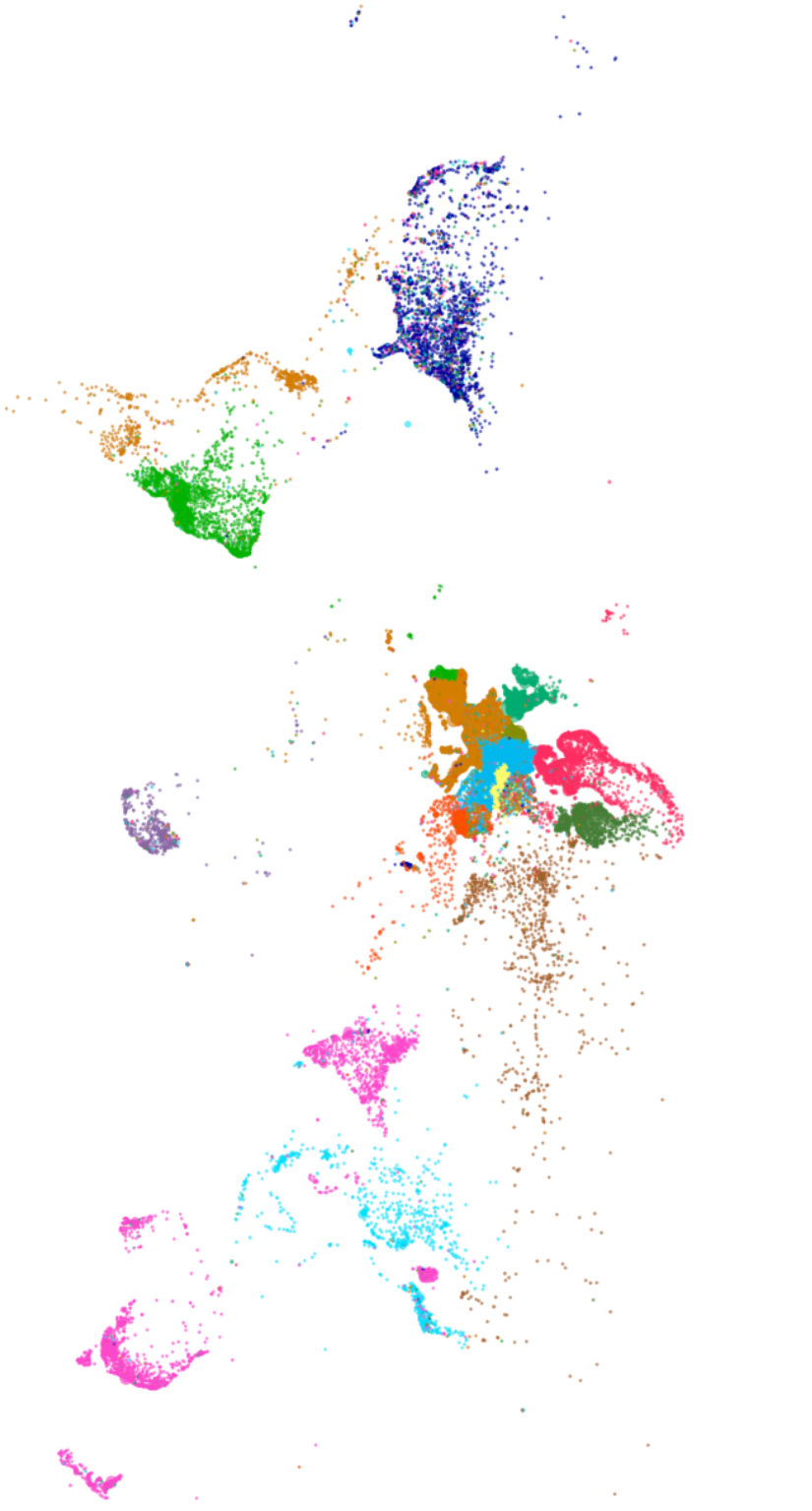


Figure 2: Global Board Networks



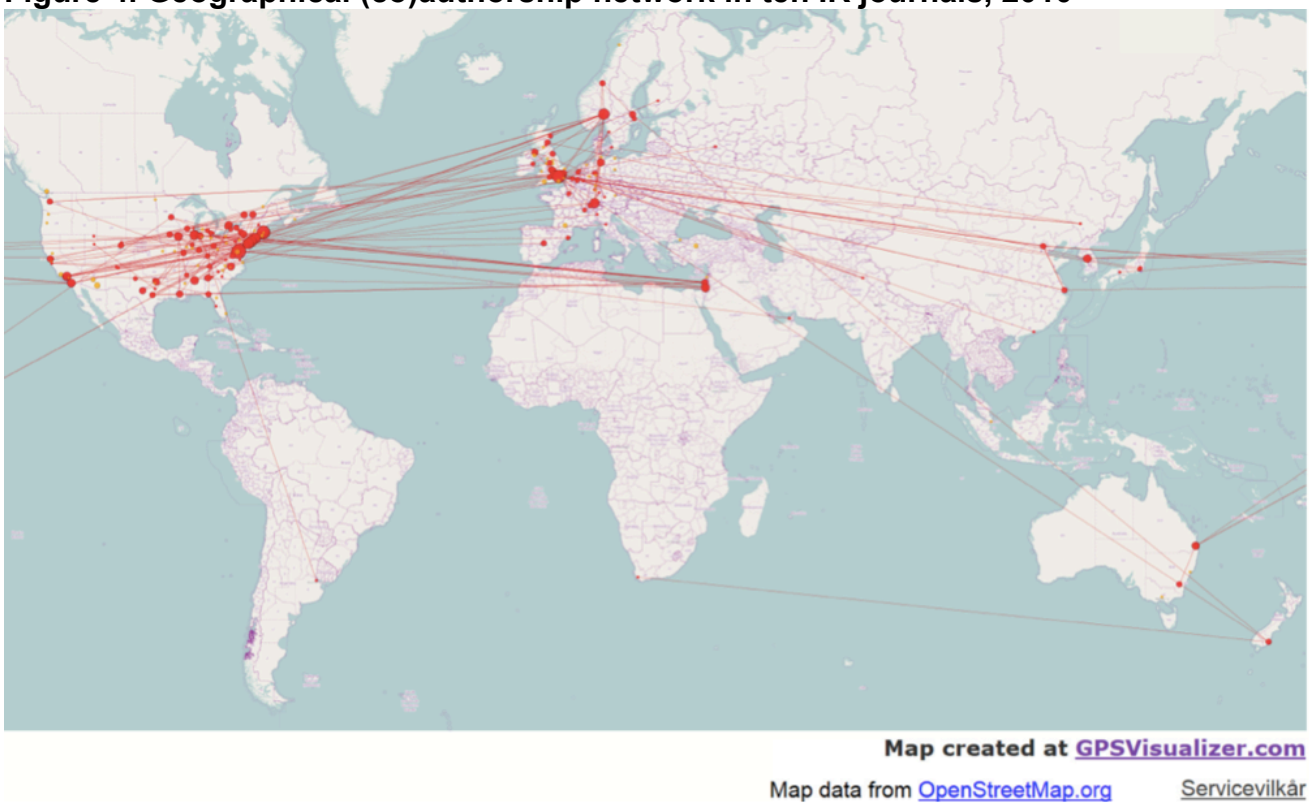
Source: Heemskerk and Takes 2016

Social action does not necessarily emerge from cohesion or lack thereof, but sometimes from particular social **roles** within a system. Structural equivalence is an alternative way of identifying groups in a network, not based on social cohesion but on the profile similarity of

actors within a network: the idea being that the cognitive worldview of an actor can be equally important for explaining what strategies of action are actualized. The subtle but important difference in locating groups of structural equivalence, in contrast to an idea of social cohesion as the constitutive mechanism of groupness, is that structurally equivalent actors are by definition unconnected. By way of being connected to the same actors, they have similar 'network worldviews' and are, the assumption goes, influenced in similar ways and deploy similar strategies of action. Structural equivalence is a different way of envisioning social space as consisting of positions embedded in certain network topologies that engender specific social roles within the system (Lorrain and White 1971). In a more general formulation of structural equivalence, roles can be seen as only tied to the form of the network topology and not the specific actors that surround the position. The idea of the broker as an actor that occupies a structural hole, here understood as a topologically peculiar network position, is perhaps the most famous example (Burt 1992).

Moreover, SNA methods are useful for analyzing the global structure of social space. In the following, we illustrate how SNA can help visualize core-periphery structures in the sociology of knowledge. We map the global network among producers of knowledge using data from ten top journals of International Relations in the Web of Science and a GPS geocoder to produce geographical coordinates for each (following the procedure of Leydesdorff and Persson 2010; for data specifications, see Kristensen 2015). In figure 4, we visualize all cities that produce publications (sized by output) and use coauthorships to construct network relations among them:

Figure 4. Geographical (co)authorship network in ten IR journals, 2010



The geographical network mapping illustrates that elite knowledge producers are based in the U.S. and Europe and that most collaborative links occur within these two regions or across the Atlantic—thus confirming a longstanding argument that International Relations is an American/Western dominated discipline organized in a core-periphery structure. The

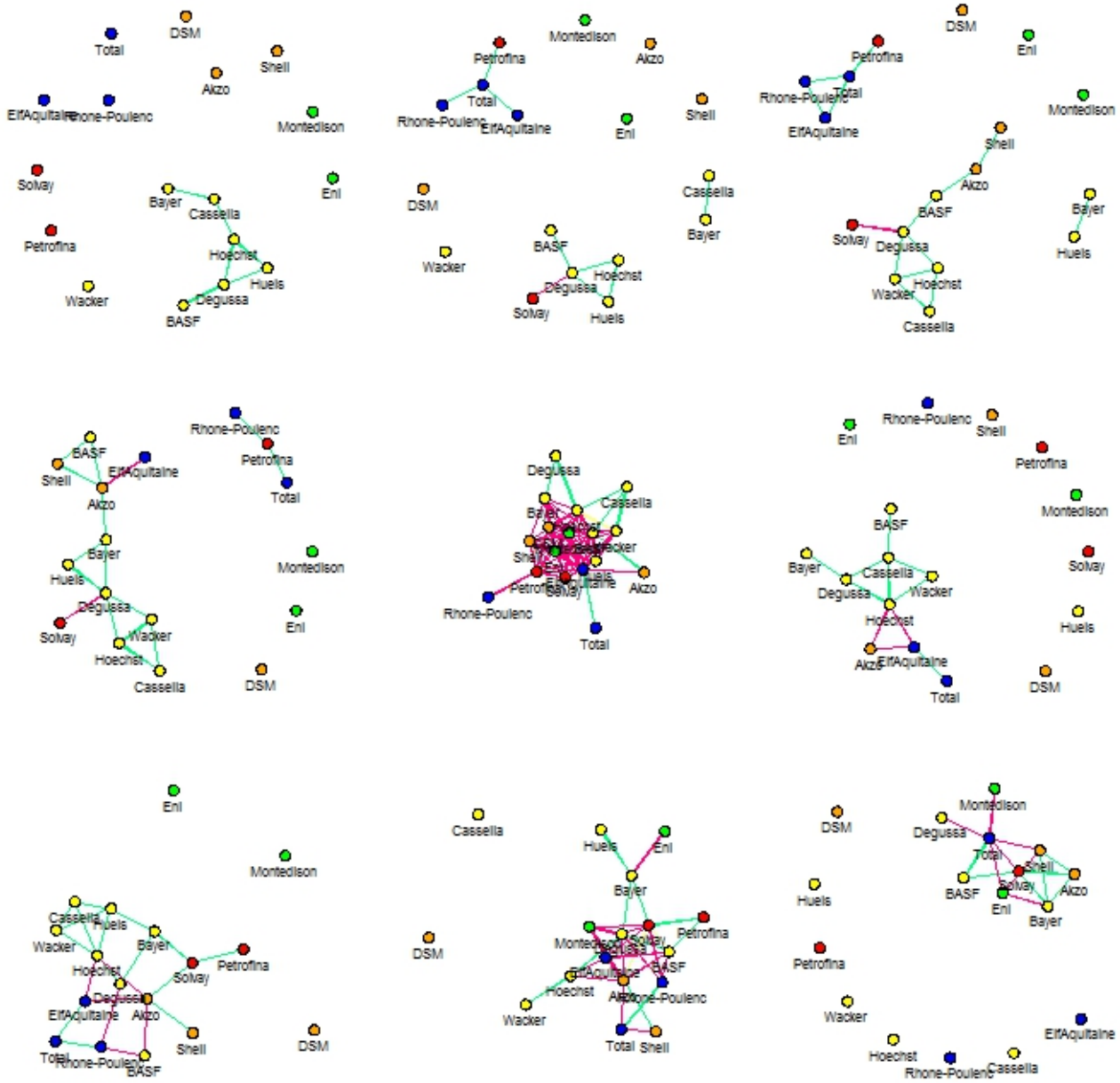
rest of the world is barely present in the top ten journals and also rarely co-authors articles with authors from North America and Europe. As an alternative to this territorialized geomapping exercise, we can also visualize co-location in a social rather than geographical space where nodes are rearranged based on collaborative networks:

Figure 5. Social networks (coauthorships) in ten IR journals, 2010

The deterritorialized map shows how a number of elite cities constitute central nodes in the collaborative knowledge network—as defined by coauthorship links. The network is organized around a core of nodes like Washington, Cambridge MA, New York, Los Angeles, New Haven, Princeton—but also Zurich and Oslo who are part of the core, even if geographically outside the Anglo-American sphere. Further towards the periphery, we find a number of other U.S. cities but also non-U.S. cities like Jerusalem, Haifa, Trondheim and Geneva while a range of other cities are so peripheral that they are disconnected or entirely absent from the network.

Finally, beyond the static mapping of networked social spaces, SNA also allows us to study the dynamic features of network: how their structure is contingent, has evolved over time, how far they spread and diffuse. Questions about the limits over these social spaces, e.g. the actors that have at least historically been outside the knowledge network above, are as important as those that concern the centrality of actors within it. Analyzing and visualizing the temporal evolution of social networks can bring to the fore fundamental changes in social relations underpinning power, alliances and roles. Figure 6 visualizes cartel and interlock ties between European chemical companies from 1960-2000 (represented in 5-year interval time slices):

Figure 6: Networks among European chemical companies, 1960-2000



Source: Data from the authors

The analysis of the network over time shows that legitimate relations of social coordination between companies mainly took place between same-country firms prior to the oil crises in the 1970s, but also that a major trans-European cluster of cartels formed in the latter half of the 1970s and triggered social relations to reify in the form of interlock in the late 1980 and 1990s after much stricter regulation of collusive activities had been introduced by the EC.

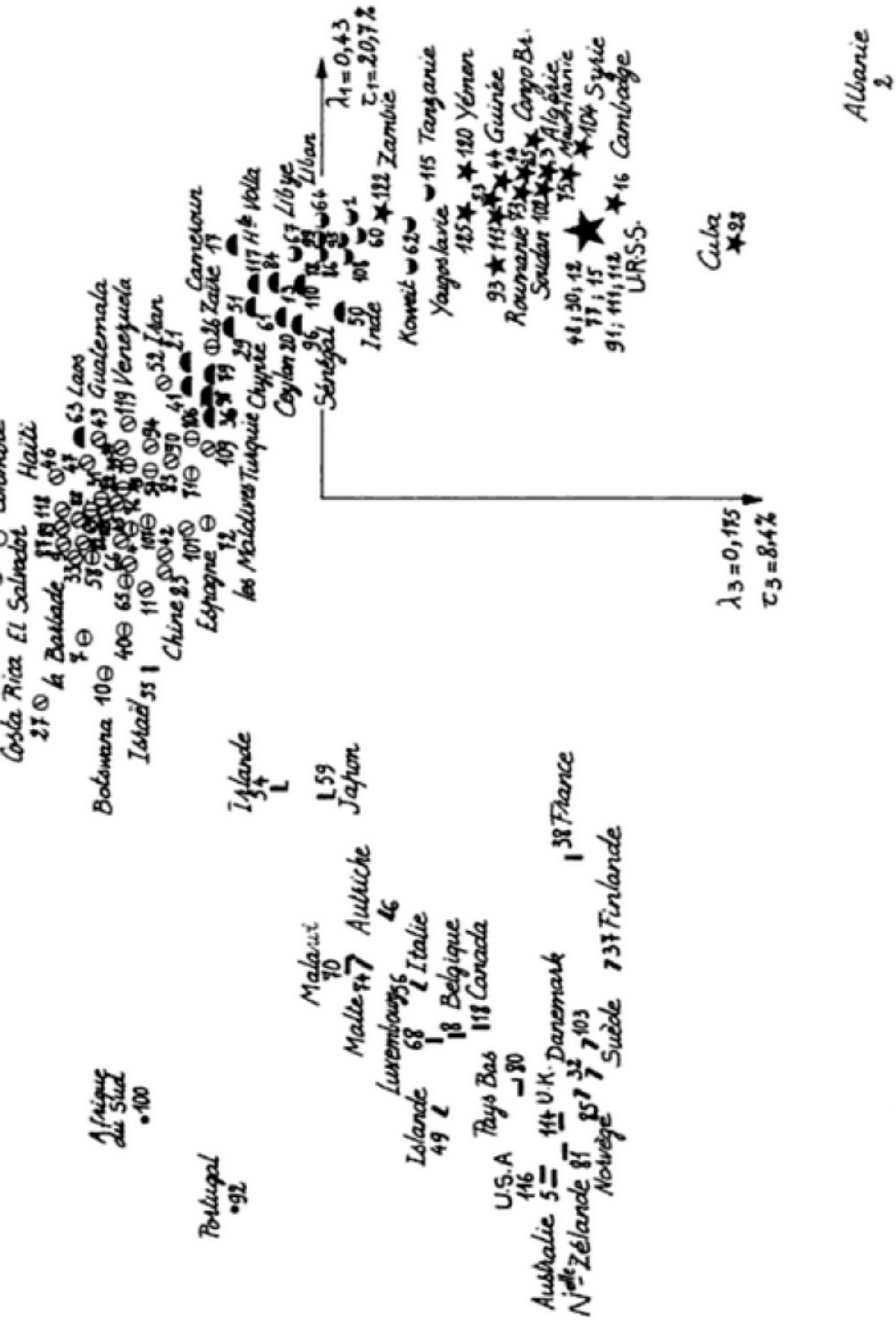
Multiple Correspondence Analysis

Where SNA is useful for mapping the global structures of a network and identifying central actors in it, it gives us little information on the specific power attributes of these groups and

actors. MCA is a useful supplement because it has a more multidimensional perspective on power positions, comprising several forms of power, and allows the researcher to focus simultaneously on attributes and standpoints. In MCA the structural mapping of social spaces relies on identifying groups, or rather clouds of individuals, that possess common attributes (Le Roux and Rouanet 2010). These might have no direct social interaction or connection with each other, like those resulting from network connections. Rather, MCA is useful for analyzing the structure of, and positions in, a 'field' or 'social space' in the terminology of Pierre Bourdieu through quantitative data (Bourdieu and Wacquant 1992, Lebaron 2009).

The founding father of the tradition of geometrical data analysis, Jean-Paul Benzécri (1992: 485-93) used simple correspondence analysis to understand the relationship between nations and voting patterns in the UN in 1967. As figure 7 illustrates, it found two primary oppositions: the first between the West and the Soviet Bloc and the second between The North and the Global South.

Figure 6: Simple Correspondence Analysis of nations and UN voting patterns



Analysis of 62 ballots at the UNO, 1967:
122 Countries × 186 voting attitudes (Yes, No, Abstension); the absences are coded as (0, 0, 0). In the graph, each country is represented by a symbol of one of the classes constructed by agglomeration according to the variance. We have given length one to the half-axes.

Source: Benzécri 1992: 490

The social space within the MCA framework is a multidimensional space where each actor has a position and a distance to all other actors along a set of dimensions (Le Roux and Rouanet 2004). The distance between two individuals or actors is found by the similarity or dissimilarity of their attributes. Individuals with similar profiles will be close to each other and vice versa. By looking at which attributes that are often or rarely found together, MCA

enables the researcher to analyze the oppositions and dimensions within the space and measure their relative importance.

For example, when the researcher looks at the main dimension of a space made up by variables such as income, position in the organizational hierarchy and academic credentials, she is likely to find a social space with three substantial dimensions. The most prominent dimension, which accounts for the largest part of the variation among the variables, is likely to be the opposition between those who have and those who have less: e.g. those with prestigious academic titles, high net worth and positions at the top of the organizational hierarchies on one side and those with lower positions, less prestigious titles and lower income on the other. The researcher could then interpret this opposition as a volume of resources or capital. The second dimension might then differentiate between those with high organizational positions and high income but without prestigious academic credentials on the one hand and those with high positions low income but prestigious academic credentials on the other. This opposition might be interpreted as the opposition between cultural and economic capital and corresponds to the composition of capital or resources.

Actors in positions associated with high volumes of capital occupy the dominant positions within the field (Bourdieu 1996). As such, MCA allows us to identify the positions of **power**. However, due to the multidimensional approach, power is tied to different forms of capital that differ in their relative conversion rate towards each other. As a result, the researcher can also discuss the relative hierarchy of these forms of capital, or the relationship of dominance within the dominant group of actors. For instance, Beauvallet and Michon (2013) show the space of the Members of the European Parliament is structured by the distribution of both volume of “European capital” and of capital tied to national fields of power.

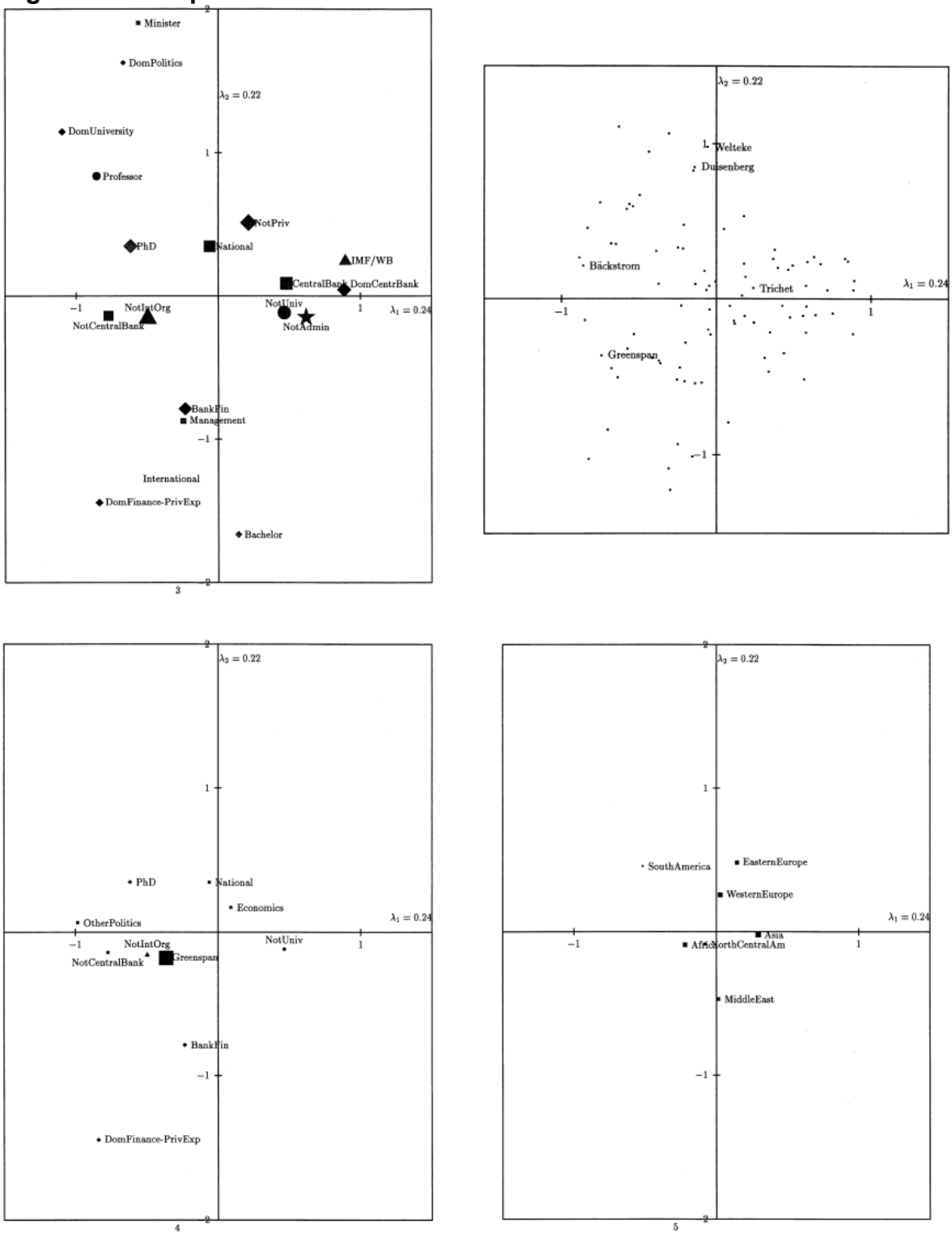
Within the Bourdieusian framework, a shared position in the social space is a result of similar compositions and volumes of capital and thus the basis for potential **alliances**. Those with similar forms of power share a common interest in maintaining a high value and exchange rate for their forms of power vis-a-vis other forms. For instance, holders of high volumes of cultural capital obtained from elite universities share an interest in upholding the symbolic value and scarcity of their credentials. Even if the competition within the prominent group is strong, they are united in the common cause of keeping the dominated in their subordinated positions. Hence similar positions result in common interests that may lead to political alliances and mobilization.

Dissimilarity, on the other hand, is thought to hinder alliances and increase the potential for conflict. In this way conflict and hierarchy is often visible within the social space giving us the characteristics and positions of the dominant and the dominated within the social spaces, while also allowing us to identify the internal conflict lines among the dominant group based on the differences in their composition of capital. Since the space identified by MCA is empirically sensitive to the changing values of particular forms of capital over time, it can also be used identify how the opportunity structure of potential alliances have changed. For instance Bühlmann, David and Mach (2013) show how strong ties to the national political elite became less important among Swiss CEOs between 1980-2010, whereas foreign CEOs and holders of “cosmopolitan capital” in general, located far from the dominant form of capital in 1980, had now risen through this space, although still tied to the productive sector rather than the domestically more dominated financial sector. Furthermore, *concentration ellipses* - the position of individuals or actors with a particular shared attribute in the cloud of individuals - can be used to identify the

homogeneity of a group on several dimensions. A group of actors occupying a small and rare area within the entire space share forms of capital, while the shape of the group of actors within the space suggests which identified dimensions matter in the internal hierarchy within this particular subgroup (for an example on sectors within the Norwegian field of power, see Hjellbrekke and Korsnes 2009; Denord et al 2011).

In the identified social space, MCA also enables the researcher to inspect how different **roles**, in the form of identified position-taking or based on criteria not directly tied to the capital of an actor, is related to the particular space. For this purpose, the researcher can use *supplementary variables* - variables not active in the construction of the space, but projected upon it. In a study of central bankers, Lebaron (2008) projects their geographical origin onto the identified space. The space is structured on the horizontal axis, by an opposition between insiders in central banking versus outsiders, and on the vertical axis, private finance versus political and academic capital (figure 7). Furthermore, one may also inspect which attributes that lead to a particular position in the cloud of individuals, such as the one held by Alan Greenspan.

Figure 7: The Space of Central Bankers



Source: Lebaron (2008:128-31)The spaces of Central Bankers identied by Lebaron (2008). In the top left corner, the active variables construct the space of central bankers. In the top right corner, the central bankers are projected onto this space in the cloud of individuals. The bottom left corner show which particular attributes contribute to the position of Alan Greenspan and the bottom right shows the average position of central bankers from different regions

While MCA can identify specific *alliances* and *power* hierarchies, SNA offers a more compelling toolkit to understand how the social connections of an actor shape their strategic opportunities and access to information and thus the particular *roles* an actor may play. Meanwhile, MCA takes into account how people, though not interacting directly, nevertheless take one another into account, thus allowing for a social space to span across actors with no formal relation (cf. Bourdieu 1996). Furthermore, the multidimensional approach of MCA allows the researcher to see how actors may advance their overall volume of capital, or position in the vertical hierarchy, but retain their composition of capital, i.e. their horizontal position and thus also map the most likely historical trajectories of an actor in the social space.

A major challenge of identifying social spaces, whether through SNA or MCA, is boundary specification (cf. Emirbayer 1997; Laumann et al. 1983) or identification of "effective agents" (Bourdieu 2005: 99): Which actors belong to the space? Both methods actually allow us to start with broader defined groups and then use the empirically constructed social spaces to identify subspaces of particular interest. Here the two methods could complement one another to allow a specification of the social space that is both theoretically grounded and empirically sensitive.

The potential of using both methods simultaneously appears very promising. Bühlmann et al. (2013), for instance, uses centrality measures in their construction of the space of Swiss CEOs. Adding to this, Denord (2015) use several other methodological strategies to combine SNA and MCA, such as using the variance of positions of the connections of an actor to access their social capital in a space, using membership of certain affiliations as supplementary variables or simply projecting the network tied to the geometric space constructed through MCA. Using the methods iteratively seems a promising avenue. SNA can be used to identify transnational networks, or communities, directed towards specific fields of action in international relations. It can be used to locate actors of relational prominence but then falls short in understanding what resources and attributes these actors draw on to exercise power in specific situations. Analyzing centrality, for instance, guides our thinking towards power as a space of opportunity to exercise power. Whether this power is exercised and what resources and attributes are mobilized is a different structural question, which requires the tool of MCA. In sum, the two methods provides underexploited tools for studying complex forms of power in international social spaces and should be taught to future students of international political sociology.

Data and Visualization

One of the strong appeals of both SNA and MCA are the attractive and informative visualizations. By plotting social spaces in detail, the analysis opens up for multiple interpretations and invites the reader to explore the different positions within space. The visualizations correspond to the theoretical metaphors that guide the analysis and are at the same time theoretical, analytical and empirical representations. The distances in an MCA plot are like metric distances on a road map, while distances in a SNA plot are like the jumps and links on a subway map (Denord 2015: 64).

MCA is often presented in three different types of plots, sometimes referred to as biplots; the plot of the cloud of individuals or actors, the cloud of active categories and the cloud of supplementary categories. When analyzing the cloud of individuals, the researcher can look at named individuals or actors and the general shape of the cloud.

She might also use concentration ellipses to show where the actors with a certain characteristic is positioned in the cloud. The cloud of active categories, sometimes referred to as the cloud of modalities, tells us the mean points of the categories and lets us analyze the dimension. The cloud of supplementary categories is for showing the relationship between the dimensions and variables that are not active in the construction of the dimensions themselves. These categories could be illustrative, rare or from variables with a high proportion of missing values.

We have given several examples of how social networks can be viewed. Most of these plots are readily interpretable, but some caution is advised when interpreting large networks. The coordinates and the position of the points in an MCA plot have a strict hierarchy and interpretation. But this is not the case for SNA. The position in most plots with dots and links holds a vague information. While most layout algorithms try to position the nodes relatively close to the mean point of those who they are connected to, this position is not entirely fixed and there is a large element of randomness in the position. Most layouts of large and relatively dense networks end out with a core/periphery like structure, and the distance to core is interpretable but the distance between two periphery points is not.

The amount and variety of available data sources has grown considerably in recent decades. Researchers can now piece together large datasets from a wide set of sources that are increasingly transnational. Citation network data can be constructed using databases such as Web of Science (for an introduction, software and tutorials, see Leydesdorff.net). Data on corporate interlocks can be found in Orbis. Web services such as Facebook, Twitter, LinkedIn, Google, Wikipedia and The Internet Archive all have more or less open public APIs. An API is an interface that lets the researcher access parts of the websites' databases by programming small database calls. Programming database calls might seem a daunting task for most social scientists, but there are tools available that ease the process. While many of these data sources are impressive in their size and detail it is important to be aware of the hazards of errors and missing data. SNA is particularly vulnerable to missing data and because of the dynamics of social networks the adverse effects of missing data rises exponentially (Smith and Moody 2013). A missing tie between a relatively isolated and a highly connected node would result in very different results when it comes to studies of brokerage and structural holes. These types of studies require an excellent data quality, especially for the best connected parts of the network.

In comparison, MCA is incredibly resilient. The fields and the individual positions within it are the result of several variables and measurement errors or missing values on a single variable are unlikely to change results dramatically. Furthermore, the variety of MCA called specific multiple correspondence analysis allows for the researcher to set missing values as passive. Thus even actors for whom not all information used in the analysis is available can still be part of the analysis. Individuals or actors with several passive categories will then be drawn towards the center of the field (Le Roux and Rouanet 2010). This method is an essential necessity when doing prosopographical studies of small groups where every data point counts.

The data structures that can be analyzed as networks are diverse. The most common form is the adjacency matrix, which is a matrix with nodes on both rows and columns. Each cell indicates whether there is a connection or not. If the network contains both actors and affiliations it is often stored in a incidence matrix, where rows are actors and columns are affiliations. The adjacency and the incidence matrix are useful for calculations and analysis, but they are cumbersome for both data storage and data

collection. Adjacency matrices grow exponentially in size and networks with more than 5.000 nodes are likely to become unwieldy or outright impossible to analyze unless the are converted to a sparse matrix. Large adjacency matrices is almost entirely made up of “white space” or zeroes because links are rare, and by converting the matrix to a sparse matrix you only store the location and value of the actual links and not the “white space” in the matrix. In R this is a simple procedure when you use the Matrix package.

The edge list is a superior format for data collection, especially by hand. The edge list for a one-mode network is typically two columns; “Ego” and “Alter”. Each row then contains the name of ego and alter. For affiliation networks the edge list has the columns; “Name” and “Affiliation”. Each row then contains the name of the person and the affiliation they are a member of. Extra columns can then contain other variables that are tied to the connection such as duration, tie strength, role or type of connection.

When working with network data you often need to switch between formats and it helps having some basic coding skills. Especially when using the APIs of different websites. Here the tools and packages developed by the open source community around the statistical programming language R is a very valuable resource. R has several high quality packages for SNA; Igraph and statnet in particular. There are also packages that ease the use of API’s, such as the TwitteR package. There are modules for MCA in all major statistical software suites, such as SPSS, STATA and SAS, but these modules are not always at the methodological forefront and none of them can do specific correspondence analysis. For this you need specialized programs such as SPAD or the R packages FactoMineR, ca or soc.ca. Both MCA and SNA are methods that are in a tremendous development as a result of strong scientific communities and much is still to be gained by a increased collaboration between the methods.

Methods for or against the powerful?

Our attempt here has been to emphasize SNA and MCA as tools for rendering visible power structures in the international realm. Two important questions emerge here: First, how can we ensure that these tools of analysis are used denaturalize and open, rather reify and shut down, social spaces of action? Second, how can we deal with the challenge that these methods developed by social scientists, often with a critical aim, are adopted by those exercising power in the interest of sustaining status quo power structures. In other words, both tools can be directed against those in power as well as used by them.

As for the first question, SNA must work in tandem with other critical methods in order to avoid producing overly static pictures of the powerful and powerless where ‘flat actors’ on the network image are stripped of their visions to move beyond the realm of opportunity given to them in that particular network context. Rather, visualizing networks should be used to open for strategies of intervention and active attempts to disconnect with the powerful. Showing processes of network change holds a great potential for informing the strategies of social movements and can lead to important insights about how to scale up political resistance.

As for the second question, two examples comes to mind. First, the use of SNA techniques by the US military in their attempts to destroy terrorist networks is a clear case in point. One of the authors of this chapter participated in the International Network for Social Network Analysis’ annual meeting in 2016 which was, as openly communicated on page 2 in the program, “generously supported” with a grant from the US Army Research Office. We also know that more prominent SNA scholars work on long-term grants from

the US Army. This indicates a clear interest on behalf of the military to import SNA research strategies and to influence its direction. Second, the use of SNA and MCA-like techniques and machine learning to make sense of 'big data' is being deployed extensively for surveillance purposes around the world. Most recently, such data has been used to map and control the movement of people in the current political crisis in Europe regarding refugees. It is important to critically interrogate such uses of spatial methodologies, but rather than simply disavowing the use of quantitative methodologies, we argue that an underexploited counter-strategy is to deploy them for critical purposes in line with the aims of a more public international political sociology. This requires us to raise questions of resources for independent and critical research and to push for more symmetry on access to data for research and the general public.

References

Aradau, Claudia, and Jef Huysmans (2014). Critical Methods in International Relations: The Politics of Techniques, Devices and Acts. *European Journal of International Relations* 20: 596–619.

Beauvallet, Willy, and Sébastien Michon (2013). "MEPs: Towards a Specialization of European Political Work?" In *The Field of Eurocracy*, eds. Didier Georgakakis and Jay Rowell, 16–34. Palgrave Macmillan.

Benzécri, Jean-Paul (1992). *Correspondence Analysis Handbook*. New York: Marcel Dekker.

Borgatti, Stephen P, and Martin G Everett (2000). "Models of Core/periphery Structures." *Social Networks* 21(4): 375–95.

Bourdieu, Pierre (1996). *State Nobility - Elite Schools in the Field of Power*. Cambridge: Polity Press.

Bourdieu, Pierre (2005). *The Social Structures of the Economy*. Cambridge: Polity Press.

Bourdieu, Pierre, and Loïc J. D. Wacquant (1992). *An Invitation to Reflexive Sociology*. Chicago: University of Chicago Press.

Burt, Ronald S. (1992) *Structural holes: The social structure of competition*. Boston: Harvard University Press.

Bühlmann, Felix, Thomas David, and André Mach (2013). "Cosmopolitan Capital and the Internationalization of the Field of Business Elites: Evidence from the Swiss Case." *Cultural Sociology* 7(2): 211–29.

Denord, Francois (2015). "Géométrie Des Réseaux Sociaux." in *La Méthodologie de Pierre Bourdieu En Action*, ed. Frédéric Lebaron and Brigitte Le Roux, 59–78. Paris: Dunod.

Denord, François, Johs. Hjellbrekke, Olav Korsnes, Frédéric Lebaron, and Brigitte Le Roux (2011). "Social Capital in the Field of Power: The Case of Norway." *The Sociological Review* 59(1): 86–108.

Emirbayer, Mustafa (1997). "Manifesto for a relational sociology," *American Journal of Sociology* 103(2): 281-317.

Freeman, Linton C (1979). “Centrality in Social Networks Conceptual Clarification.” *Social Networks* 1(3): 215–39.

Hafner-Burton, Emilie, Miles Kahler, and Alexander Montgomery. (2009) Network Analysis for International Relations. *International Organization* 63: 559.

Heemskerk, Eelke M (2013). “The rise of the European corporate elite: evidence from the network of interlocking directorates in 2005 and 2010”. *Economy and Society* 42(1): 74–101.

Heemskerk and Takes (2016)

Henriksen, Lasse F., and Leonard Seabrooke (2016). "Transnational organizing: Issue professionals in environmental sustainability networks," *Organization*: 1350508415609140.

Hjellbrekke, Johs., and Olav Korsnes (2009). “Quantifying the Field of Power in Norway.” In *Quantifying Theory: Pierre Bourdieu*, ed. Karen Robson and Chris Sanders, 31–45. Dordrecht: Springer.

Kristensen, Peter Marcus. (2015) “Revisiting the “American Social Science” - Mapping the Geography of International Relations,” *International Studies Perspectives* 16(3): 246-269.

Latour, Bruno. (1990) Drawing Things Together. The Map Reader: Theories of Mapping Practice and Cartographic Representation: 65–72.

Laumann, Edward O., Peter V. Marsden, and David Prensky (1983). “The Boundary Specification Problem in Network Analysis.” In *Applied Network Analysis: A Methodological Introduction*, ed. Ronald S. Burt and Michael J. Minor, 18–34. Beverly Hills: Sage.

Lebaron, Frédéric (2008). “Central Bankers in the Contemporary Global Field of Power: A ‘Social Space’ Approach.” *The Sociological Review* 56: 121–44.

Lebaron, Frédéric (2009). “How Bourdieu ‘Quantified’ Bourdieu: The Geometric Modelling of Data.” In *Quantifying Theory: Pierre Bourdieu*, ed. Chris Sanders and Karen Robson, 11–29. Dordrecht: Springer.

Levine, Joel H. (1972) “The sphere of influence”. *American Sociological Review*, 14–27.

Leydesdorff, Loet, and Olle Persson (2010). Mapping the Geography of Science: Distribution Patterns and Networks of Relations among Cities and Institutes. *Journal of the American Society for Information Science and Technology* 61: 1622–1634.

Lorrain, Francois, and Harrison C. White (1971). "Structural equivalence of individuals in social networks." *The Journal of Mathematical Sociology* 1(1): 49-80.

Mizruchi, Mark S. (2013) *The Fracturing of the American Corporate Elite*. Cambridge: Harvard University Press.

Le Roux, Brigitte, and Henry Rouanet (2004). *Geometric Data Analysis from Correspondence Analysis to Structured Data Analysis*. Dordrecht: Kluwer.

Le Roux, Brigitte, and Henry Rouanet (2010). *Multiple Correspondence Analysis*. Thousand Oaks: Sage.

Savage, M., and K. Williams (2008). “Elites: Remembered in Capitalism and Forgotten by Social Sciences.” *The Sociological Review* 56: 1–24.

Savage, Mike (2009). “Contemporary Sociology and the Challenge of Descriptive Assemblage.” *European Journal of Social Theory* 12(1): 155–74.

Smith, Jeffrey A., and James Moody (2013). “Structural Effects of Network Sampling Coverage I: Nodes Missing at Random.” *Social Networks* 35(4): 652–68.

Vitali, Stefania, James B. Glattfelder, and Stefano Battiston (2011). “The Network of Global Corporate Control”. *PLoS ONE* 6(10): e25995.