# How to follow and Study Through the Sites and Situations of Expert Knowledge Diffusion in International Politics: Research Challenges and Methodological Responses

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**Abstract:** The central aim of this article is to consider tools and methods for studying expert knowledge (EK) diffusion in international politics. What we need are methodological devices to enable research of the object in motion and to study small or multiple sites, and even global scales in time, as well as the object of inquiry at different levels of analysis. Based on the marriage of network analysis and mobility research this article discusses the research potential of several methodological tools: bibliometrics, QHA, SNA techniques, topology, topography and biography. I conclude that despite these methods being imperfect, they 1) make possible the bridging of traditional IR dilemmas, such as the level-of-analysis problem, the micro-macro gap, and the agent-structure debate, 2) enable to collect and evaluate a much richer class of evidence and contextualization than methods usually used in IR offer, and 3) make possible to be much more ethnographically sensitive than IR research traditionally is.

Key words: expert knowledge, diffusion, international politics, methods

Information, innovation, and expert knowledge (EK) are parts of modern life; they are a prerequisite for the functioning of the state, business, and society. The diffusion of EK in international politics and whether actors engaged in this environment have or have not the EK influences their behavior, power, or agenda.

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The diffusion of specific EK has contributed, for example, to the inception of international agreements limiting the use of micro-plastics, banning the production and use of landmines, and banning the use of freons and halons. The ability to diffuse EK in international politics, manage the process, and understand it, is one of the pillars of working international politics and the lives of actors in this environment. States, international organizations and companies have set up special bodies to diffuse and communicate data, information, and EK. Bodies have also emerged which aim to stop, or at least slow down the diffusion of particular information, such as Facebook's fact-checkers. All this indicates that the diffusion of EK is not automatic or spontaneous, there are many different actors involved in the process which is also not simply a technical process based on a series of isolated events. It may be accelerated or slowed by various factors and instruments (Hall 1989; Hveem – Knutsen 2012).

While the research of EK diffusion is already well embedded in the research traditions of other disciplines<sup>2</sup>, for International Relations it is a relative novelty. To date, IR scholars paid attention to the actors of diffusion (e.g. Haas 1975; Ruggie 1975; Haas 1992; Stone 2013; Antoniades 2015) and to the instruments and mechanisms of diffusion (Checkel 2005; Schimmelfening 2008), and in recent years also to the influence of structures and networks on the diffusion (Khaler 2009; Maoz 2012). However, the process of diffusion itself has been in IR little analyzed. Several pioneering studies were published in last years (e.g. Bueger – Bethke 2014; Sending 2015; Waisová 2018), but they were mainly organized as in-depth theoretically informed analyses following the socio-genesis of specific EK and did not consider how to approach the issue methodologically. The main causes of this situation seem to be the fact that for IR, *it is not easy to grasp an object in motion which crosses levels and in which micro events and micro structures may have macro impacts*.

In this contribution, attention is given to the process of expert knowledge diffusion in international politics, particularly how to study the process. My aim is to consider how to follow the pathways of EK in international politics, how to study through the sites and situations of EK international diffusion, and to discuss methods of data collection and evaluation enabling to know more about the process, pathways, mechanisms and practices by which EK has been spreading and circulating in international politics. To discuss how to study EK diffusion in international politics is today more important than before. Today, the diffusion of EK often occurs quickly and globally, and the significance of time and place decreases.

<sup>2</sup> See e.g. Science and Technology Studies (see more in the section on ANT below), anthropology (e.g. Grannovetter 1973), management and organizational studies (e.g. Roger, 1983/2001; Amin and Cohende, 2004; Saxenian 2008); sociology (e.g. Jasanoff 2004; Knorr-Cetina 2007; Sheller – Urry 2006) and health studies (Christakic – Fowler 2007).

The article proceeds in three steps: 1) the objects of the research will be discussed and defined – particularly "expert knowledge" and "the diffusion process"; how *EK* and *diffusion* are defined influences the thinking into possible research methods and techniques, 2) the methodology which could frame the scrutiny will be debated and 3) based on this techniques which may be used in the process of collection and evaluation of data will be introduced, their application demonstrated, and their limits discussed. What we need are methodological devices enabling research of small sites, as well as instruments to study multiple sites and even global scales in time, along with the object of inquiry at different levels of analysis and in motion. A final discussion gives a critical appraisal of all the methods introduced and debated in the third section.

#### Placing expert knowledge and diffusion

Within the research two approaches to knowledge may be identified: the first sees knowledge as something which is possessed; the second sees knowledge as an action and something which is practiced.<sup>3</sup> In other words, the second approach works with the idea that knowledge is the product of habits of everyday interaction in which creation, thinking and acting are combined. Because in the real world, it is not possible to delineate a clear border between knowledge that is "possessed" and knowledge that is "practiced", in this article, I understand EK (which is inspired by the works of Cook – Brown 1999; Adler – Pouliot 2011; Sending 2015; Bueger - Gadinger 2018) as a hybrid entity which is a spatio--temporal arrangement including facts, information, professional codes and skills gained and generated through everyday actions, education and training, socialization and research (not necessarily done in the laboratory), and through the theoretical and practical understanding of the subject. To circulate and diffuse EK, it must be converted into a form (messages, artifacts, deeds) that allows it to circulate and diffuse (Amin - Cohendet 2004). The form alone depends mainly on the epistemic content of the knowledge and its generality.

Viewing knowledge as an action determines the idea of the process of diffusion. Diffusion is approached as a set of non-isolated activities which result from social structures, embedded practices, technical processes, absorptive capacities of recipients, and from the institutions and forms in which they take place, develop and are maintained (Amin – Cohendet 2004; McCann and Ward 2011). Practiced knowledge is distributed because it is collectively enacted through relations between and mediated by the intersubjective meanings that are invested in the artefacts they produce (Amin – Cohendet 2004: xiv). My view here is that the diffusion of EK in international politics is a non-random,

<sup>3</sup> The difference could be summarized in a short question, "Is knowledge best understood as a thing or a relationship?" A more nuanced view is offered by Bueger (2014).

not necessarily linear multidimensional socially complex process consisting of global, international, transnational, domestic and inter-organizational social interactions which occur among different entities such as state agencies, scientists, experts, and international organizations, and interconnects and constitutes actors, institutions and territories.

Regarding the understanding of EK diffusion, it is clear that we need a tool-box which enables to trace and observe the object (being it artefact or action) across time, space, and scales, and in which actors (authors, users and diffusers), practices, relations, materiality, and structures interact and build connections, all being constantly in motion and assembled and reassembled in changing configurations in hardly predictable ways.

## How to think through the EK diffusion: network analysis, mobility research and Following the Policy

The challenge for IR is to marry a commitment to follow a trans-local hybrid entity in motion in the environment of international politics, its associated network-communities, and connections between micro-practices and macro-forces. To face the challenge, I offer marrying network analysis and mobility research, namely Actor-Network Theory (ANT), Social Network Analysis (SNA), and the "Following the Policy" approach. They, as approaches to inquiry, offer inspiration and instruments on how to grasp dynamic, unstructured, non-centralized and non-hierarchic heterogeneous and, in fact, autonomous entities and their collections, both in permanent motion, and make no specific claims about how the world operates, but instead suggest ways and analytical tools to trace the activities and relations of particular entities to reveal how worlds are made.

Since neither ANT, SNA, nor "Following the Policy" are embedded in IR, they will be briefly introduced. However, while they represent approaches to wider social world, the attention will be paid mainly to those aspects which may enrich the scrutiny of EK diffusion in international politics and IR as a discipline.

Even with the word "theory" in its title, *Actor-Network Theory* is not a theory as such; it developed as a holistic way to understand the social construction of science and knowledge and as a set of methods to trace and understand this process. The research inspired by ANT originally aimed to analyze small spaces such as laboratories; later it was used to research the market (Law 1987) and overseas discoveries (Callon 1986). As a novelty, it was used to scrutinize the diffusion of particular concept in international politics (Bueger – Bethke 2014). According to ANT, nothing in the social and natural worlds exists separately and everything is rather constantly being generated and transformed by the mutual relations between actors within the network. All-important innovations and human enterprise are the function of the interactions of mutually constituting heterogeneous elements assimilated into networks (Law 1987). ANT believes that networks

develop organically during the process of the active participation of actors. For researchers it means that networks do not have predetermined borders and researchers can even not pre-draw borders. ANT scholars follow the relations and actors and map the networks as they emerge. Actors and networks are viewed as interdependent entities in the making when actors fill networks with sense and enable them to exist and survive and networks determine the actors' roles and functions. Latour (2005: 107) summarizes it as follows: although we do not know how actors are connected, the connections are assumed and we also assume that these connections transform the actors' world. Activities are not understood as the product of any independent selection or decision, but rather as the product of influences of relations, linkages, and networks. ANT's goal is to trace routes, relations and activities linking actors and actants<sup>4</sup> and how associations between actors create networks, and to understand how actors and actants enable and mediate organized activities. The acting must be mapped as a network, where the movement of links and relations and the circulation of information is traced (Elder--Vass 2019). Concerning the EK, ANT adherents understand it as embedded and carried by social arrangements in which the value of EK is negotiated. Through the ANT lenses, to study EK means to study social arrangements and their insides.

Social Network Analysis has been evaluated as an inter-disciplinary research program aiming to analyze and predict the structure of relations between social entities and the impact of this structure on other social phenomena (Borgatti et al 2009; Mützel 2009). It believes that "structure matters", in other words in the importance of relations between mutually influencing entities. Relational linkages between actors in the social structure are seen as being prior to actors' attributes, such as individual characteristics or qualities. However, the connections - as opposed to attributive data – are not the individual qualities of specific agents, but the quality of the conglomerate of agents who produce the social network. The social network is defined as a limited set of at least two actors, each of them having at least one link to another actor (Wasserman - Faust 1994). Network analysis was not used in IR until recently. However, since the late 1990s, Maoz (2009, 2012) has tried to adapt it to the study of international phenomena. He argues that SNA enables to analyse the formation, structure, and effects of indirect relations, and offers a bridge to connect levels of analysis and link micro and macro. Maoz pioneering studies demonstrate that the benefit of using SNA in IR resides in its ability to combine relations, attributes, and structure and simultaneously treat relations as units, their attributes, and the emergent structure as part of the same logical and analytical package. For the debate on methods, the value of SNA lies in the opportunity to offer tools for studying the complex social interactions between individuals and organizations, the constraints and opportunities that result

<sup>4</sup> ANT ascribes the agency to human, as well as non-human entities. This idea is often the object of criticism.

from the patterned relationships between them, and the impact of the structural environment on their behavior and actions (Emirbayer –Goodwin 1994).

As demonstrated, both, ANT and SNA are network approaches; however, what differentiates one from the other is that SNA pays attention to the partial, clearly limited systems and assigns the agency only to human entities, i.e. can only map relations between actors; whereas, ANT is interested in how to map routes and techniques through which actors define and distribute roles and mobilize and support others to play these roles, it analysis the chains of relations, the range of the analyzed network is not predetermined, and the agency (ability to act and determine the activities of others) is also assigned to non-human objects (Law – Callon 1988). Despite such differences, both approaches also share some elements: they both 1) approach reality ex-post and "process its imprint" (the same position is shared by the Following the Process approach – see below), 2) are interested in the production of meaning, in the activities of actors and their definitions of situations, in tracing their stories and their connections and disconnections with others, 3) perceive reality as dynamic and changing in a chaotic random world, 4) perceive networks as results of a culturally constituted process and of discursive practices, 5) combine relations, attributes, and structure within one package, 6) are symmetrical, while both give equal status to scientists and other actors and focus on how different actors together weave textures of the world, and 7) share ethnographic sensibilities.

Here, the value of combining ANT and SNA is seen in the opportunity to bridge the level-of-analysis, to take the heterogeneity of actors, time, and the micro-macro link into consideration, to analyze direct and indirect relations and their implications and to be ethnographically attentive. The combination of SNA and ANT enables us to trace connections, to discover a central point of the network, bridges between nodes, the existence of partial networks, how they form a new whole, how the new whole influences the distribution of knowledge and how it structures international politics. For IR and the scrutiny of EK diffusion in international politics, the integration of both approaches is a way to connect structural and interpretative analyses and trace actors and routes through which they (re)constitute categories, relations and networks, instead of a prior definition of categories and relations.

The *Following the Policy Approach* was introduced by Peck and Theodore (2015) when they were thinking about how to research the processes of policy formation, reproduction and circulation, and flows and connections between actors and issues, however within one political system. FPA has been built as an exploratory approach using a rich tradition of multi-sited ethnography<sup>5</sup> and

<sup>5</sup> Multi-sited ethnography emerged as a methodological reaction to the failure of traditional ethnography to "work" globally and in more locations simultaneously respectively. More see (Marcus 1995; Burawoy 2000; Desmond 2014; Stepputat – Larsen, 2015).

progress in mobility research in sociology (Sheller and Urry 2006) and geography (Prince 2016, 2017). To follow the policies Peck and Theodore (2015: xxvi, 31–33) involved the research of local socio-institutional context and actors, and situated and connected investigations across a variety of sites along various channels which take account of frictions and backwash effects in addition to dominant currents and tides. They stressed that scholars must always consider the individuality of each object and process, particularly where it is traced and where it takes place. To collect data Peck and Theodore advise to use the so--called extended case method, which has been used within so-called multi-sited ethnography. Extended case method aims to enable to "to be in more locations simultaneously"; it replaced observation and presence at the place with a complex combination of methods enabling to follow even when the scholar is not there. Burawoy (1998) defined it as an extended ethnographic practice across space and time based on the ideas that the observer is extended to the participant<sup>6</sup>, the study of context of context is also important, and that the research is not replicable because "history is not a laboratory experiment that can be replicated again and again under the same conditions" (Burawoy 1998: 11). The ethnographic approach – no matter how unusual for IR – is important for "studying through" EK diffusion in international politics because we cannot only consider the idea that there are relations within and between places, objects and people, but interrogate what precisely holds these networks together, and ethnographic methods open the door to explanations from Inside Out. Inclusion of ethnography into network approach may immensely enrich IR because unlike IR it tends to see network structure as flowing from transactions rather than vice versa and focuses on the networks themselves as object and subject of enquiry and attention.7

By this methodology exposé, I wanted to emphasize that to scrutinize the EK diffusion in international politics IR scholars shall be open and reflexive otherwise we will not be able to trace objects in motion, to map inter-scalar relations, to collect data ex-post taking socially distributed activity systems and various types of social arrangements, as well as material dimension into consideration, enabling the reconstruction of the history of the object in motion and the motion itself, and the discovery and description of how different entities were related and ordered to each other, and a whole web of reality thereby created. The next section develops a toolbox of specific techniques for the collection and evaluation of data on EK diffusion in international politics.

<sup>6</sup> This idea is also shared by ANT and SNA. Optimally, the scholar traces the process of everyday social transactions "face to face" and is part of the processes (Latour 2005).

<sup>7</sup> An inspiration for the combination of network analysis with ethnography offers the previous work of Ball – Junemann (2012). They used ethnography in network analysis to map the network evolution, the form and content of policy relations in a particular field, and a particular form of relationships and interactions, with an emphasis on understanding the contents, transactions and meanings.

### How to follow the pathways of EK in international politics: a research toolbox

This part concentrates on tools enabling the reconstruction of the history of the object in motion and the motion itself. The attention is paid to methods enabling the collection of data on EK diffusion as well as to the analysis and visualization of data on EK diffusion. In the following sections, it is not to provide empirical evidence of EK diffusion, however, empirical evidence is used to demonstrate the application and eventual weaknesses of a concrete method. The following section introduces the potential of bibliometrics, Qualitative Historical Analysis, biography, SNA tools, topography and topology. While bibliometric and OHA are not entirely new for IR scholars, biography, SNA techniques, topology, and topography have been rarely used. Biography has been typically used in ethnography, sociology, or anthropology, usually for the analysis of the life cycle of a particular individual and, in IR, the individual is rather ignored as a relevant actor. SNA is at home in anthropology and sociology and is used for the study of small groups of individuals; the study of extensive communities and global relations is typically beyond its interest. Topography was originally used in geography; however, it gradually turned into an interdisciplinary approach emphasizing fixity, space and proximity, and observing the socio-spatial distribution of phenomena. Topology originated in mathematics to research the relations, spatiality, and architecture of connections. It was first used in IR a decade ago to study networks, power, and technology (Hafner-Burton, Kahler - Montgomery, 2009; Martin - Secor 2014). The research toolbox introduced here is by no means complete; it is presumable that based on changes in international politics and the content or form of EK and diffusion processes researchers will also test and use other methods.

### Bibliometrics: who with whom writes about whom and what, how often and from what resources

Bibliometric analysis has become a generic term for a whole range of specific measurements and indicators; its original purpose was to measure the output of scientific and technological research through data derived from scientific literature and from patents (Wallin 2005). Today, bibliometrics has universal application in different fields of knowledge. It is used as a statistical tool to map the state of the art in a given area of scientific knowledge and the identification of essential information. It is applied to a wide variety of fields: for measuring, monitoring, studying and mapping the expansion of knowledge about a particular area of research; evidencing connections between main publications, authors, institutions, themes, and other characteristics of the field under study, be it academic production or policy documents (de Oliveira et al 2019). Biblio-

metric techniques include keyword analysis, co-citation relationships analysis, cluster analysis, analysis of interactions, and timeline overview. All of these techniques combine to give more detailed and more effective measurements. Results are presented in various forms to depict relationships between participants and expand the means for analysis (Wallin 2005).

In political science and IR bibliometrics is instrumental; it was used for example to uncover the patterns and trajectory of policy development through the analysis of documents on policies, or in the field of science policy, such as the study of environmental change or public health (English – Pourbohloul 2017). In research of the EK diffusion process, bibliometric tools help discover when specific EK was published for the first time, how publication counts develop over time, when and how a particular EK penetrates internationally spread documents, who the authors are and where they reside, where the EK originated (e.g. through the timeline of citations and their localization), and in what context, time and intensity. Publication data may be also used to identify how EK is shared in time and space, to whom, and what the most cited texts are. In epitome, bibliometrics provides insight into the scope of EK and how its circulation intensifies.

Bibliometric analysis of academic production today is rather easy, because scientific articles, their metrics and citation indexes, including the necessary software for analysis, are readily accessible via science platforms such as JSTOR and WoS. However, when researching EK diffusion in international politics, the analysis of academic production does not give the full picture of the issue. The analysis of policy documents is also necessary, and scientific platforms do not usually include documents and policy publications, not even those prepared exclusively by scholars. It should also be kept in mind that not all books are contained in academic databases.

The problem of the absence of publications in scientific databases is demonstrated by knowledge on environmental peacebuilding. One of the formative publications of the environmental peacebuilding movement is the academic book "Environmental Peacemaking", edited by G. Dabelko and K. Conca (2002). The book is not covered by SCOPUS, JSTOR, nor WoS. There are three reviews published in JSTOR, and the Cited Reference Index indicates that the book and its chapters are cited in four WoS records (as of May 4, 2021). This would indicate that the book is rather insignificant. But when a wider corpus of policy papers and documents is collected, the story is different. A Google scholar search, which also takes some policy documents into consideration, indicates 348 citations (as of May 4, 2021). UNEP official documents published between 2002 and 2018 in excess of 500 citations (Waisová 2020). Similarly misleading may be to only consult scientific platforms to research authors. One more example from environmental peacebuilding: David Jensen<sup>8</sup>, Head of

<sup>8</sup> Author ID: 37861639500.

the Environmental Peacebuilding Programme at UN Environment since 2008, actively publishes on environmental peacebuilding. Jensen has no entry in WoS and one co-author entry in JSTOR, but 18 documents and 47 citations in SCOPUS. His public CV, accessible via UNEP's webpages, indicates that Jensen has coordinated and co-authored six UNEP flagship policy reports on risks and opportunities from natural resources and was a series co-editor of a six-volume set of books on post-conflict peacebuilding and natural resource management, with 150 chapters published by Routledge.<sup>9</sup>

Both empirical cases demonstrate the value of bibliometrics but also the importance of sensitive and reflexive data collection. Researcher equipped with adequate software tools (e.g. wordle.net and VOSviewer.com) is able to go beyond the Cited Reference Index, make more complete data available and get maximum from bibliometrics.

## Qualitative Historical Analysis: obtain basic information and know where to start and finish the investigation

QHA employs qualitative, not quantitative measurement, and the use of primary historical documents, or a historian's interpretation, usually in the service of theory development or testing (Thies 2002). Its goal is to examine the presence or absence of certain qualities or attributes in some phenomenon of interest. Because QHA is not for IR scholars a novelty, I will concentrate only on why and how EK diffusion research may benefit from OHA.

For the study of EK diffusion in international politics, QHA may be used to obtain "basic information" (Topolski 1999) on manifest and latent events which help us to construct a chronology of events, to discover the socio-genesis of specific EK, and the development and context of diffusion processes. To study context is for IR unusual but would bring an enormous benefit for the discipline (Goodin - Tilly 2006). Context might be thought of as a bundle of historical/ cultural or material/political facts and perceptions informing the interests of any given actor, and it enables us to explain the ways in which actors negotiate. EK diffusion research also benefits from QHA when it comes to determine key agents and key events. Key agents are those who drive the process of diffusion and who keep EK in motion, key events are milestones in the diffusion process. When the object is in motion to know key agents and key events is necessary for the decision on "when and where to start and finish the research". In research of EK diffusion in international politics, the key event must verifiably demonstrate the presence of specific EK in international politics and its actionability. Once the initial event is known, the researcher then traces "the connections and networks... and actors who do something", observes how they assemble

<sup>9</sup> UNEP: https://www.unenvironment.org/people/david-jensen.

from that point (Latour 2005: 98, 128), and tries to discover how the initial event emerged. QHA may also help to find where the EK was embodied in the event origins and how it was translated into the initial event. The rhizomatic logic of the diffusion process and its planetary-wide potential bring us to the question of how long and how widely to trace the process. As noted by Latour (2005), if a researcher does not predetermine their research space and the set of actors and connections analyzed, it is then the pragmatic decision of each scholar based on the relevance of the event to a specific research question. The research shall be finished when enough empirical evidence has been gathered to enable the consideration and analysis of the problem. It is like in biology: to understand how a plant and its roots work, it is not necessary to study all plants of the same species, only a representative part. Tilly (1992: 36) put it well when he wrote that the goal is "not to give a 'complete' account (whatever that might be) but to get the main connections right."

However, the employment of QHA is not without problems. It is based on access to a wide resource pool and extensive sources. But we live in a time when the problem is not a lack of resources, but quite the opposite: an enormous amount. Therefore, the use of OHA needs time and enthusiasm to filter resources and triangulate the information. On the other hand, despite the quantity of information, it is often brief and general, only rarely indicating any personal relations and the roles actors played. To illustrate: how does one explain the cooperative and working relationship between UN Secretary General K. Annan and UNHCR Director S. Ogata in setting up human security in the UN agenda in the 1990s; and how did D. Jensen, the Director of UNEP Swiss branch, find EK about environmental peacebuilding and why does he promote it globally? Without personal communication with the people involved, the answer is practically inaccessible. The information deficiency is strengthened by the interpretation of international politics as high-level impersonal interactions. We may read anthropomorphized statements such as "Germany said," or "the US Department of State decided," but it does not help us to know who really "said" or "did", and we know nothing about the flow of information and knowledge to "Germany" before it "said", or to the "Department of State" before it "decided".

To conclude, it can be stated that detailed, reflexive, and sensitive QHA is a fundamental step in any scrutiny of the EK diffusion process in international politics. It helps us, among other things, to overcome the problems of where to begin and end research when scrutinizing objects in motion and processes, and enables the collection of data for other methods, such as a set of so-called key agents when using SNA. However, both examples show that it is more than appropriate to also use other methods and techniques to obtain and triangulate data and information.

# Biography: who those are diffusing EK and where their relations originated

Biography encourages the understanding and interpretation of experience across national, cultural, and other boundaries to better understand individual actions and engagements in society. Biography helps to discover relations, affiliations, identities, and values and enables to trace the circulation of relevant people across jobs and personal and institutional connections. Biography assumes that the link between social context and individual could be best analyzed by single cases and their individual experiences. Biography involves gathering data about a specific individual and interpreting these data to create a representation or portrayal of particular aspects of the subject's life. A biographical case reconstruction includes (objective) biographical data analysis, text and thematic field analyses (structure of self-presentation; reconstruction of the life story), a life history reconstruction (lived life as experienced), individual text segment microanalysis (e.g. letters, publications), and semi-structured interview-strategies, to name but a few.

In studying EK diffusion in international politics, biographical research is especially promising in bridging the traditional "micro-macro" gap, to understand the relationships between individuals and organizations, and to obtain more evidence on individuals identified as key agents. Even when the IR mainstream marginalizes the role of individuals, as demonstrated by e.g. Foreign Policy Analysis, their role is immense in international politics. As Granovetter (1973) discovered, to diffuse information quickly, weak interpersonal connections (defined as connections with people other than family members, friends, and colleagues) and diversity in communication channels is necessary. Those paying attention to knowledge diffusion across the market (Henry – Pinch 2000; Saxenian 2008) found that one of the main diffusion mechanisms is the regular movement of staff between companies. In international politics, individuals circulate across policy-making, academic and bureaucratic positions domestically and internationally, and tie others together. It may be expected that these people, like businesspeople, take their values, interests, and knowledge with them. Only when we know their professional and personal lives, for example that S. Ogata and K. Annan worked for UNHCR in the 1980s, shared an office and were friends (interview with S. Ogata, November 3, 2014), can we understand their special relationship in support of human security in the 1990s when Ogata was UNHCR Director and K. Annan UN Secretary General. Biography helps to trace the global pathways of individuals and the development of their relations going beyond borders and continents, as well as the micro-structures these people work and live in, an important context highlighting individual connections, relations, affiliations, identities, and values.

In the research of EK diffusion in international politics, biography may also be used for the collection of data for other methods, such as prosopography and topology. It enables us to look inside institutions and behind official high-positioned representatives of institutions and, with interviews and other techniques, to discover who the real driving forces behind ideas and policies were (Wedel et al 2005).

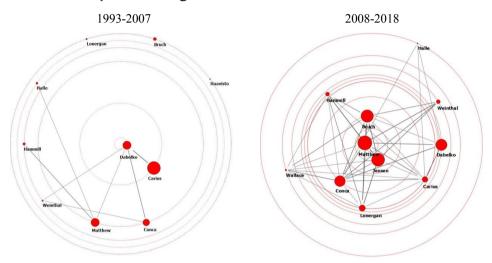
#### Social Network Analysis: who with whom and what roles of actors in the network

SNA as a methodology was introduced above. In this subsection, specific metrics, methods of relation structure systematic analysis, connections between *set of agents* and appropriate and tractable strategies for studying nodes, changes in networks over time, and symmetries or asymmetries in relations will be discussed. SNA is not interested in the architecture of connections (like topology), but rather in the network (quality and density of relations) and the positions of agents ('nodes') within the network. The decision on metrics, strategies and methods of data collection depends on the goal of the analysis. Data can be derived from interviews, CVs, academic and non-academic databases and archives, or from on-line repositories and knowledge hubs (Bender et al 2015; Maoz 2009, 2012).

Since SNA goes beyond territoriality and working positions to identify the importance of a specific person within a network, it offers a number of opportunities in the research of EK diffusion in international politics. For example, it enables a network analysis of (co)authors (academicians as well as non--academicians) writing about specific EK showing links between a set of people and the position of a specific individual within the network. The measurement and analysis of a co-authorship network may be used when analyzing the role of specific people in the diffusion of EK about environmental peacebuilding in international politics. We can measure the betweenness centrality within the co-authorship network. This metric indicates how many times a node (a specific author) within a network must be passed by; i.e. the betweenness centrality of node X can be interpreted as how many times node X becomes the pathway when other nodes connect with each other within the network. Nodes with a high betweenness centrality often connect components of a network that would be disconnected if the node were removed. A high betweenness centrality in co-authorship networks indicates that an author is frequently identified if other authors within the co-authorship network need to be connected with one another, and they lie "between" them as an intermediary (Bender et al 2015). Based on QHA, it can be identified a group of key persons writing about environmental peacebuilding, collected data on all their publications (co/authorship, editorship), and, using SNA, showed that there are significant relations between

people from this group and the position of some people from the set was more important than that of the others, regardless of their professional position or where they lived and worked. The results may be visualized (Picture 1) based on a radial model. The robustness of the line indicated how often specific people published together, the size of the node how often the person was an editor. When the set of people is mapped in time, it shows how relations and nodes changed or developed respectively.

Picture 1: Betweenness centrality within a network of people writing about environmental peacebuilding



# Topography: where EK really occurred and which localities it really reached

Topography was originally used by geographers when studying terrain and possibilities of its representation. It was, among other things, used to produce topographical maps. These maps, within the limits of scale, show as accurately as possible the location and shape of both natural and man-made features. Today, topography is an interdisciplinary approach. This is because most things that circulate across distances can be tracked, associations can be traced, and connections and networks mapped in a conventional cartographical manner (Allen 2011, 2016).

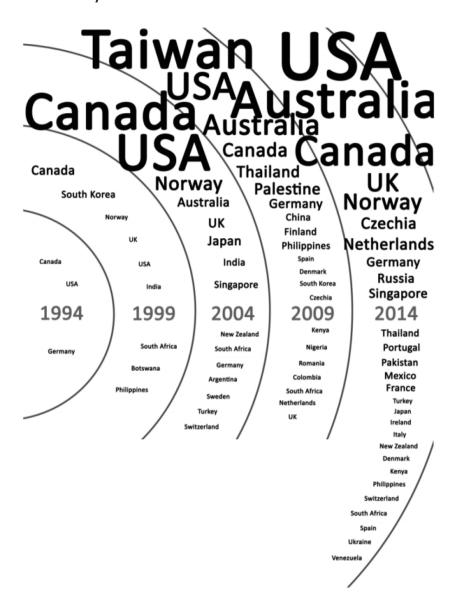
In IR, topography has been used to study the (geographical) environment and the behavior of nations<sup>10</sup> (Gottmann 1951), to analyze the expression

<sup>10</sup> The effects of locational, geomorphological and topographical conditions for national expansion and national power were regarded as being essential.

of power and authority in a physical space (including the discipline itself; Kristensen 2015), to find out senses of place and space for politics and how a particular spatiality of power is produced (Agnew 2007; Agnew –Livingstone 2011). The importance of topography for IR was well formulated by Easterling (2014: 15), when he wrote that in the contemporary world, "some of the most radical changes to the globalizing world are being written, not in the language of law and diplomacy, but rather in the spatial formation of infrastructure." Topography may be used to chart the outcomes-so-far of these struggles, displaying where place shapes status and how legitimate practices legitimate space.

IR research of EK diffusion in international politics may also well benefit from topography; EK, like other phenomena, has 'location and extension' and even in a time of rapid technological development, EK diffusion must inevitably be situated "somewhere", and places remain "fundamental to understand knowledge production and dissemination... provide both the social settings or venues in which new ideas develop (and to which they diffuse) and the claims to authority that rest on having been somewhere (doing fieldwork, hanging around, etc.)" (Agnew - Livingstone 2011). Scholars, research institutions and epistemic communities may be understood as nodes of infrastructure and parts of a social arrangement which serve as pertinent empirical sites through which we can learn more about the territoriality of EK. A topography of EK, for instance, can place research authors on a traditional, metric map, or trace the territorial expansion of EK in time, where it concentrates territorially, and where it already is, and where it still is not. Topography need not be used for the production of cartographical maps, but also for visualizations, being the spatial metaphors, which enable us to analyze space as an assemblage of social relations and identify proximity/distance, upper/lower, or intermediate, not as accurate representations, but as expressions of a spatial concept of social structure, particularly the localization of agents, their proximity and hierarchy. When the factor of time is added, the flows of EK in space may be traced. Topography (in combination with bibliometrics) was used, for example, by Waisová (2018) to study the diffusion of the human security concept. She traced the geographical locations of scholars (institutions they were affiliated to) writing on human security since the 1990s. Picture 2 visualizes the territorial spread of the human security concept and its popularity in a particular country (the size of the country's name indicates how many articles were published by scholars from that country). Place and time are important contexts, and contextual changes and their configuration can have an immense impact (Agnew -Livingstone 2011).

Picture 2: The development of the geographic distribution of authors writing on human security



Resource: Waisová 2018

## Topology: who relates to whom and what the architecture of connection is

The goal of topology is to study the characteristics of space and the architecture of connections. In topology, space is no longer a medium where an object with a certain shape is found. Relationality is more important than proximity; for most of us, our children, even when thousands of miles away, are closer and more intimate than other children from the neighborhood. In other words, "elements can be topologically close, even if they are topographically distant" (Prince 2017: 337–338). What counts is not metric distance, but exchanges and interactions. Such a view is becoming increasingly relevant with the emergence of technologies that mediate long metric distances. Based on the idea that the architecture of network matters, topological studies describe the attributes of space by means of connections and their characteristics. Several types of architecture of connections have already been described (see Sosinsky 2009) and scholars have discovered that the architecture of connections influences, for example, the cost of the creation and maintenance of a network, the speed of transfer, and the flexibility of the network.

Work on political topology stresses how relations make up and endlessly reconstitute space and emphasizes who and which ideas extend the influence, unrelated to physical closeness (Loughlan, Olsson and Schouten 2014; Allen 2016). Indeed, who creates and shapes space is often independent of proximity and distance. For research of EK diffusion in international politics, topology offers a way to bridge the problem of scalarity and observe the architecture of connections. Following interactions and studying properties of structures is not limited by "level of analysis thinking", and relations and objects are traced and mapped in social space across scales without prejudice. Following interactions and discovering the architecture of connections may show how interactive and socially embedded a diffusion process is, how the relational character of the space is produced through social practice, and how microstructural mechanisms are combined with global reach. In IR, topology data may be collected from the web pages and documents of institutions; project reports; interviews, introductions and acknowledgments in publications; newsletters and biographies, to name but a few. As demonstrated for example by Wedel et al (2005) the best way to present topological data and the architecture of connections is the visualization of the topological space.

#### Conclusion

EK is part of modern life. As experienced, the diffusion of specific EK in international politics may contribute to the inception of international agreements, sanction mechanisms, or simply change. To study the process of EK diffusion

in international politics, needs a toolbox of relevant methods. The central aim of this article has been to consider instruments for studying EK diffusion in international politics. Distinct methodological mapping tools are offered based on the marriage of network analysis and mobility research, namely ANT, SNA, and the "Following the Policy" approach. As approaches to inquiry, they have been the inspiration to find instruments to grasp a dynamic, unstructured, non-centralized and non-hierarchic heterogeneous object in permanent motion and suggest ways and tools to trace the global pathways of EK, to study through the sites and situations of EK diffusion. However, the selection of methods and techniques has not been random, but resulted from the definitions of "expert knowledge" and "diffusion".

When debating methods and techniques, in the interests of space, I will limit the discussion to critical appraisal of the toolbox and its specific tools. From the analysis and discussion above it has emerged that: - To study EK diffusion in international politics, a mixed method and reflexive approach is necessary. Today, the production of EK is enormous and there are many different types of EK with different characteristics (general/specific, from techno-science, social sciences, and humanities) which diffuse in international politics. Moreover, international politics itself has profoundly changed. The focus on EK mobility and its global pathways has, since its inception, been an open, inventive, and reflexive, rather than prescriptive approach. The content and form of EK and changes in international politics may alter the process of diffusion, which will in turn alter the methodology; - The application of felicitous methods (and their mix) will enable us to scrutinize an object in motion and – albeit imperfectly – bridge some traditional IR dilemmas: the level-of-analysis problem (process as a unit of analysis going through levels), the micro-macro gap (e.g. the inclusion of individuals and international organizations into one framework and the idea of micro-structures having an impact on macro-level), and the agent-structure debate (relations are prior, not agents or structures). Methods enabling triumph over traditional IR dilemmas include topology and SNA techniques. However, this issue must be discussed further and the application of these tools tested; – The application of methods presented here is not without difficulties; e.g. "putting individuals and organizations into one sack", and using levels of analysis as a methodological tool rather than ontological postulates (for deeper discussion on this issue see Temby 2015). However, even when they are not perfect that does not mean that we should abandon them. Even when it is difficult or risky to use them in IR research, they could be innovative and enrich our discipline immensely. They enable the "hunting and gathering" of data and information, offering a much richer class of evidence and contextualization than traditional IR approaches and are endowed with various metrics and are able to utilize special analytical software, producing both new information and knowledge that allows us to widen our learning and understanding of the working of international politics; - The use of aforementioned methods to EK diffusion research in IR also produce practical problems. Some of these methods are not part of conventional IR repertoire; to use them means to learn them, i.e. they take time, need an open mind, enthusiasm and material resources, and bring with them several risks, as demanding and highly professional issues almost always do for beginners. As demonstrated by Montison (2018), the fact that IR scholars are not familiar with disciplines such as anthropology and ethnography and their methods led to reductionism within IR. Such reductionism itself is not without academic risk; - From the debate on methods it clearly emerged that all the collection and analysis of data on EK diffusion across international politics and its interpretation must be ethnographically sensitive, no matter how far ethnography is outside typical IR. This is particularly challenging because ethnographers themselves intensively debate how to approach events and situations which do not meet the traditional one-location engagement (Marcus 1995; Gusterson 1997; Desmond 2014; Stepputat - Larsen 2015); - The methods presented here assume in many respects the immense role of materialism, taking relations, networks, material capacities, and human resources for granted. Methods such as topology, topography and SNA are based on the idea that we live in a world in which material 'stuff' creates places, and such stuff is always in motion, being assembled and reassembled in changing configurations. The sum of relations and the networks which emerge in the process of diffusion represent new forms of social arrangement and assemblage. However, IR today is so ideational that such a material view could be rejected. I do not deny the role of ideas in IR, nor in international politics; however, the material elements of the EK diffusion process are so important that we should not be blind to them; - Finally, using the methods I have presented for researching the EK diffusion process in international politics may help open new issues to be debated in the IR discipline: the possibility that structure and non-humans may have agency; that the agent-structure debate has been translated into a new form the agency-structure-relations dilemma; and that level-of-analysis can be used as a methodological tool, not only as an ontological postulate. I have shown that the methodological issue of which level of analysis a researcher employs is insignificant; it is more important to find the tools that enable research across various levels. IR scholars should also return to the debate on the role of the individual and of the "micro" in international politics. We should consider the relationship between individuals' activities and the existence of micro-structures on the one hand, and macro-transformations and changes on the other. However, these debates are already beyond this article.

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