

## The use of bibliometrics in adult educational research - an introduction

*To be, say, a formidable club player, I must be recognized as such by those I recognize as such. My cognitive attitudes can define a virtual community, but only the reciprocal recognition by those I recognize can make me actually a member of it, accord me the status for which I have implicitly petitioned by recognizing them. (Brandom 2008)*

### Introduction

The aim of this chapter is to introduce a methodological approach that can be used in order to analyse how the adult education research field is shaped through research practices, measurement standards and indexation. More specifically, we focus on three formative dimensions that we argue play a significant role in constructing “the rules of the game” in contemporary academia: (i) indexation, (ii) publications and (iii) citations. Our account is nowhere close to exhaustive but could be considered an introduction to the use of bibliographic data and bibliometric methodology in adult education research. Hence, to build our argument we draw on the research traditions of bibliometrics which, in the last few decades, has been placed in the middle of a highly controversial subject. Namely, how the reward system of the modern university should function. What will be the basis of ‘quality’ assessments of universities? How will merit be fought about and money distributed across different universities and disciplines?

The emergence of large-scale statistics in Western societies has always had a close connection to the state and the role it has in steering and governing a given population (Desrosières, 2008). Since the early ground-breaking work of bibliometricians such as de Solla Price’s (1965) and Merton (1973), citations and publication patterns of scholars has been used to understand how researchers behave and relate to one another's work. In the heyday of bibliometrics the measurement of citations could, quite rightly we think, be treated as signs of internal collegial recognition. However, since then citations and publications within higher education has been dragged into a standardized evaluation regime that differs considerably from the situation studied by the forerunners of contemporary bibliometrics. Apparently lacking any other comparative measurements governments and management boards across a wide range of countries have begun to turn towards the standardized output variables found in the acknowledged data-bases. As with all economic incentives orchestrated by the state, standardized evaluations can have “perverse effects” as soon as agents start to adjust their behaviour to fit what is currently being measured and evaluated (Hoskin, 1996).

However, the degree to which higher education policies have incorporated bibliometric performance indicators varies across countries and tend to change over time. For example, the Research Excellence Framework (REF) in the UK drew on citation analyses as part of the research assessment (Martin, 2011; Brown, 2014). Another, arguably even more aggressive version of this assessment praxis, is currently and has for many years been enacted in Sweden where the government divides a substantial share of its research funding to higher education institutions purely based on the basis of a small number of performance indicators related to the publication and citation rate in journals listed in Web of Science (Ministry of Education, 2007). A third version, combining collegial assessment and production matrixes, is the so called “Norwegian list”, in which both articles and books are counted, but differently so depending on where it's published and how evaluators assess its general impact (Larsson, 2009).

It is tempting and, indeed appropriate, to critique these policy developments for the highly reductionistic and futile ways it deals with the complex issue of quality assessment and collegial recognition in higher education (Gingras, 2016; Karpik, 2011; Larsson, 2009). Yet the research tradition that once gave rise to the convention of studying research practices and scholarly acknowledgement through publications and citations still provide a series of important lessons for those interested in understanding the construction and formation of research traditions and the way scholars recognize and assign value to each other's work.

This chapter builds on previous research conducted on the field of adult educational research and aim to provide a short introduction to the use of bibliometrics (Nylander et al, 2018; Fejes & Nylander, 2014, 2015, 2018, forthcoming). To be sure, bibliometric research has evolved greatly since the foundational contributions of de Solla Price and Merton. This contribution can be seen as an effort to provide a “descriptive cartography” of the field of adult educational research (Gingras, 2016, 75).<sup>1</sup> Throughout the chapter we will highlight the importance of geographical and linguistic boundaries in assessing what is given scholarly recognition within the (adult) educational research field. We conclude that bibliometric methods remain a powerful tool to map out localized research communities and their publication and citation practices. By conducting these kinds of analysis, we believe it is possible to give a panoramic view of what kind of research that is being published and cited by colleagues as well as to foster reflexivity on the fundamental questions posed in any given scientific subfield (Bourdieu & Wacquant, 2004).

### **The ramifications of Indexation: what is included in the dominant databases?**

In the current landscape of higher education, the role of databases such as Web of Science and Scopus is paramount in “setting the rules” of which journals that “count” (cf. Archambault et al, 2006; Bonitz et al, 1997; Larsson, 2009). Or put in another way, by introducing certain measurements, based on certain databases, politicians and university managers steer academics work towards certain publication outputs. This means that Web of Science and Scopus are assigned the role of rulers of the rules of contemporary academia and that journals indexed in these databases, their editors and reviewers function as gatekeepers of what is deemed as ‘high quality’ research. In effect the journals are also deciding on which researchers that should be deemed worthy of contributing to the field and which ones that is not. Thus, questions such as what kinds of journals that are indexed in these databases becomes pivotal to explore. In what language are these indexed journals published? Who can publish in their first language in the journals that “count”? Where are the journals published, or rather, are there a “bias” in terms of geography of journals? Even though, many of these indexed journals have not asked to become gatekeepers in the various national contexts they have nevertheless increasingly been awarded this role.

First thing we need to look closer at is what kinds of journals these databases include in the first place. Turning to the database that is assigned the highest status in many locations, the Web of Science (WoS), we can begin to look at in what countries that are represented in the journals that are indexed, and in what language their articles are written. Here, we focus on those journals indexed in the category “education” and “educational research” as per the listing for 2016. We also compare 2016 to the listing of 2011, in order to see how the database have developed over time.

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<sup>1</sup> In the quest to map out the relations between scholars, bibliometrics contains alternatives to the methods used in this paper, see for instance the analysis of “co-citation networks” provided by Persson and colleagues (Person, 1994; Åström et al, 2009).

In total there are 235 articles indexed in the category of education and educational research for the year 2016, whereas a total 216 journals were included for 2011. Country of publisher origin, as listed in the database, is distributed in the following way.

**Table 1. Publishers indexed in the categories Education and Educational research included in Web of Science 2011 and 2016 by Country, Frequency and Percentages.**

Country of publisher	Freq. 2016	Percentage 2016	Freq. 2011	Percentage 2011
UK	92	39%	81	38%
USA	87	37%	80	37%
Netherlands:	18	8%	15	7%
Australia:	8	3%	7	3%
Spain:	6	3%	8	4%
Germany:	5	2%	4	2%
New Zealand:	4	2%	4	2%
Turkey:	3	1%	3	1%
South Africa:	2	1%	2	1%
South Korea:	2	1%	2	1%
Mexico:	1	0%	1	0%
Philippines:	1	0%	1	0%
Lithuania:	1	0%	1	0%
Belgium:	1	0%	1	0%
Brazil:	1	0%	1	0%
Croatia:	1	0%	2	1%
Italy:	1	0%	1	0%
Canada:	1	0%	1	0%
Poland:	0	0	1	0%
<b>Total</b>	<b>235</b>	<b>100%</b>	<b>216</b>	<b>100%</b>

The numbers illustrate that there is a clear dominance of two countries in terms of publication locations, the US and the UK. Altogether, 76% of all journals in the category education and educational research is published in any of these two countries. If including all those journals published in a location where English is the first language (New Zealand, Australia, Canada and South Africa), we end up with a total percentage of 82% of all journals indexed in WoS. We can

also see how there has been a slight *increase* of indexed journals in this category, from 216 to 235 between 2011 and 2016. In relative terms the Anglophone dominance is stable and the idea that these databases has become more ‘international’ over time does not seem warranted based on the available data on the location of the publishers.<sup>2</sup>

However, we also need to consider that the editorial work is not necessarily conducted in the same country as where the publisher is located. Thus, there might be a wider regional distribution of the journals as indicated above. But when we look at what language these journals are published in, the Anglophone dominance becomes even more prominent. Below is the language of publication as of 2016 and 2011.

**Table 2. Indexed journals in the categories Education and Educational research included in Web of Science 2011 and 2016 by language in frequency and percentage.**

Language of journal	Freq. 2016	Percent 2016	Freq. 2011	Percent 2011
English	219	93%	194	90%
Spanish:	5	2%	7	3%
German:	3	1%	3	1%
Multi-lingual:	3	1%	3	1%
Turkish:	1	0%	4	2%
Portuguese:	1	0%	1	0%
Dutch:	1	0%	1	0%
Croatian:	1	0%	2	1%
Italian:	1	0%	1	0%
<b>Total</b>	<b>235</b>	<b>100%</b>	<b>216</b>	<b>100%</b>

As these results indicate, English is, not surprisingly, the hegemonic language of publication in the education research field as represented through journals indexed in the Web of Science (WoS). Perhaps more surprisingly, this position as the modern-day Latin or *lingua franca* of educational research has been strengthened over the course of recent years, as the share of multi-lingual and non-English journals has decreased further. Interesting to note, as well, is how several of the journals published in locations where is English is not the first language, also publish their journals in English.

### **Publications and citations: the bibliographic content of indexed journals**

There are currently very few journals in the adult education and learning research field indexed in the Web of Science. In the 2016 listing these journals in the field are indexed: *Adult Education Quarterly* (AEQ), *Australian journal of Adult Learning*, *Studies in Continuing Education* and *Vocations and*

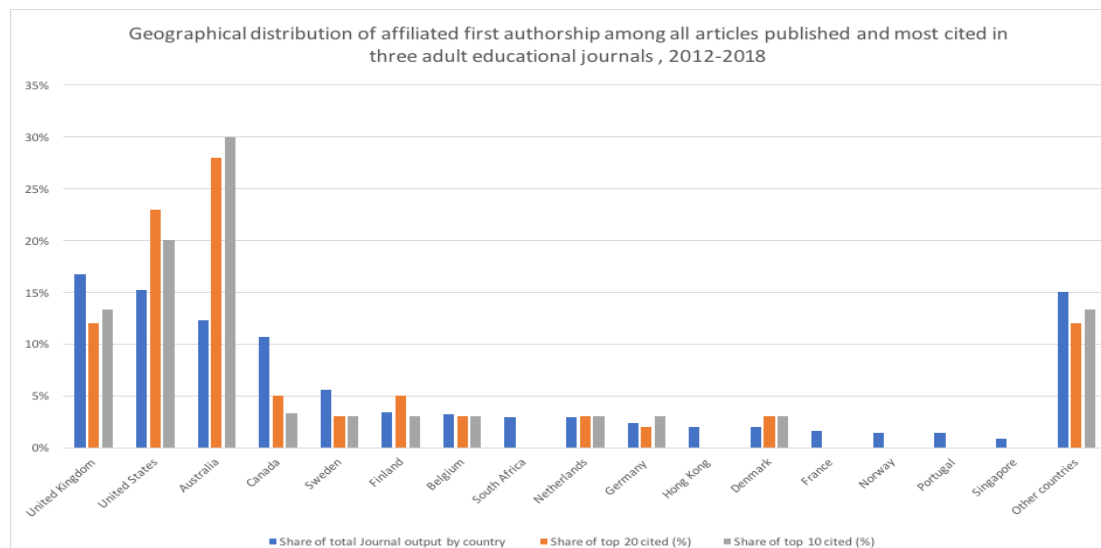
<sup>2</sup> Please note that the editorial work and the country of the publisher does not necessary match. This is partly due to the big publishing houses being located to a specific country for non-academic reasons such as taxation, accounting etc. For instance, this help to explain the rather elevated position of the Netherlands which host a series of international publishers that has editorial teams active elsewhere.

*Learning*. Furthermore, most of these journals, have only been indexed in the Web of Science for a few years. If we turn to the rival database, Scopus, a few more journals in the field are included, e.g. *European Journal for Research on the Education and Learning of Adults*, *International Journal of Lifelong Education* and *Journal of Education and Work*. Thus, if the aim of the bibliometric analysis is to map out the content of research in adult education and lifelong learning, more specifically, it could be an idea to start from Scopus rather than WoS, as that database seem to include more relevant content.

So far, we have argued that the way research quality is assessed today, is very much based on metrics in terms of individual scholars' publication in indexed databases and in terms of citations. We have also illustrated how journals indexed in the main databases, such as the Web of Science, is assigned a key role in defining quality, and how there is a substantial bias in this database in terms of where the journals are published and in which language research is published. The question then is, can we identify a similar pattern in what is being published in key journals in the adult educational and learning research field? Or rather, does it matter if journals are published in English speaking countries with English as the publication language? In order build empirical evidence on such questions, we will here, firstly, conduct an analysis of the geographical distribution of first authorship of articles published within three journals in the field of adult education and learning, and secondly, outline the location of authorship for those articles that receive the highest share of citations. Thus, we can on the one hand, identify potential bias in terms of representation of authors from different parts of the world, and secondly, identify potential bias in terms of which authors in terms of citations are assign greater value than others.

We draw on the database *Scopus* analysing three journals where the editorial work is located in three different continents, for further analysis: *Adult Education Quarterly* (US), *International Journal of Lifelong Education* (UK), and *Studies in Continuing Education* (Australia - however, the publisher is located in the UK). We have conducted an analysis of these journals during the period 2012-2018, to identify the location of the first author of each article in each journal (affiliation). To assess the articles that have been picked up and cited within the field we select the articles with the highest citation rates during the period, and identify the first author, and compare this to the full sample of published articles. For the period 2012-2018 we identified the share of the top 10, and top 20 highest cited articles for the period. Below, we present the results in figure 1.

**Figure 1. The share of published and cited content of all articles published in three adult educational journals 2012-2018**



During the period 2012-2018 we can see how authors from the UK, US, Australia and Canada, together represent a total of 56% of all articles published. In terms of share of the 20 most cited articles, the four countries represent 67% of all articles and 66% in terms of the 10 highest cited articles. Such results indicate that a substantial dominance of authors from these four anglophone countries. However, there are differences among the four countries. UK and Canadian authors have a relatively low number of highly cited articles as compared to Australian and US authors. This is interesting, not the least as the former have a higher share in terms of published articles. Compared to previous findings (Fejes & Nylander, 2014), the dominance of Anglophone scholars also seems to be declining slowly in terms of both contribution to the journals and the “conversion rates” as measured through the difference between “output” and number of articles included among the “top-cited” percentages. In one way this can be taken as an indication that the role of these journals as international outlets for academics all around the world has been strengthened over time. However, since the sample size is rather small, particularly when it comes to the top-cited contributions, it might be wise not to read too much into the current data.

### Following the citations flows: Who is citing whom?

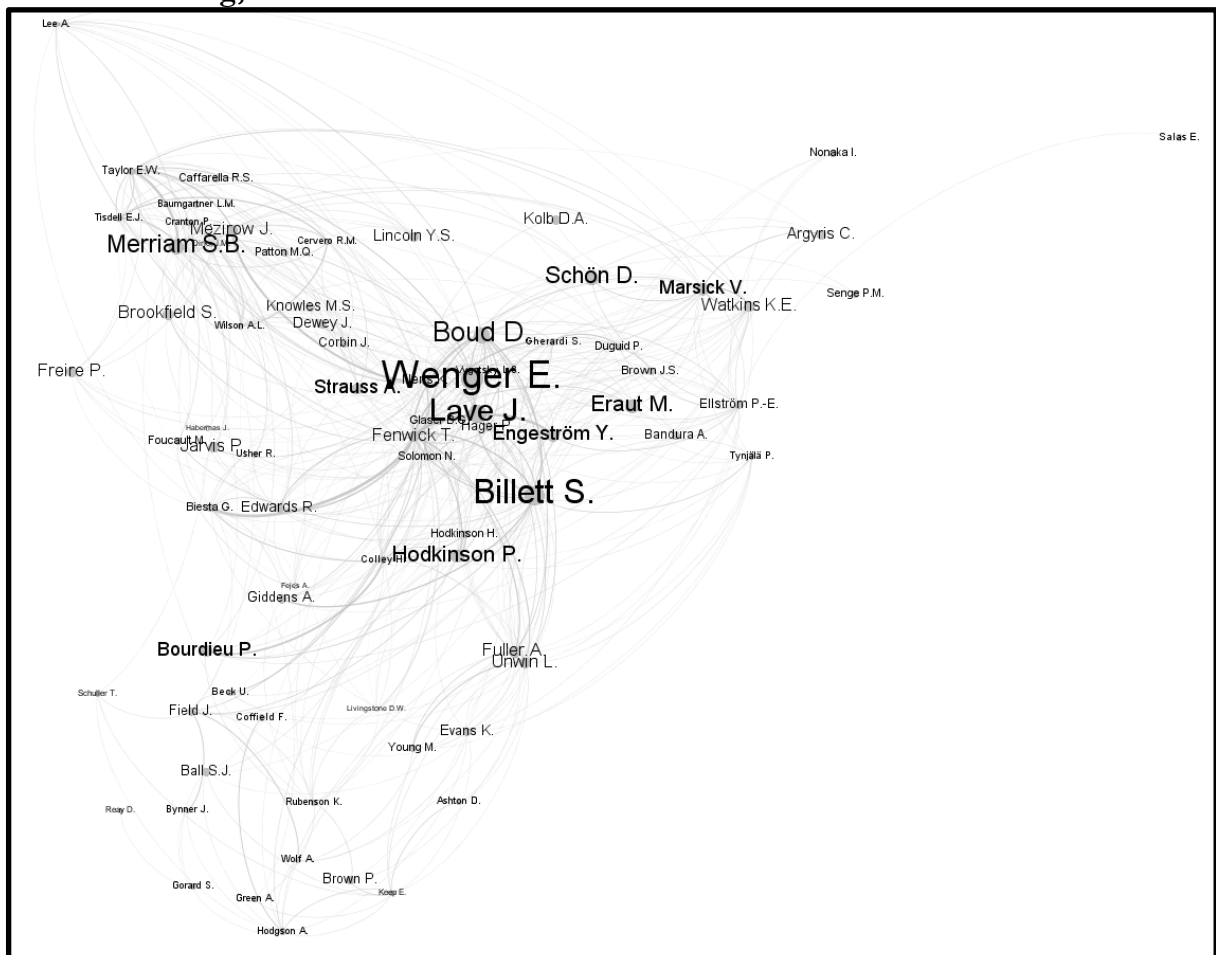
The third and final dimension of the bibliometric tradition that can be considered useful is to use citations to explore and dissect who is given recognition in the research field (Nylander et al, 2018; Larsson et al., forthcoming). Whereas indexation could be seen as key in shaping *where* researchers direct their publications and the gatekeeping-function of editors and reviewers hold an important role in filtering out *what* is deemed “publishable” in the first place, that is hardly enough for understanding “who counts” in any given research field. Just as the quote by Brandom (2008) in the beginning of this chapter illustrates, one is not fully a member of a community until one is recognized as such by the members of that particular community.

In research, this dimension of scholarly recognition can also be analysed by means of more detailed bibliographic maps based on citation data (cf. Gingras, 2016). One of the advantages of the indexation and standardization of knowledge production in databases such as WoS and Scopus is that they enable us to make use of large-scale data for exploring *who* is given recognition through citations.

In this final example of bibliometrics we make use of a visualization of the citations from five journals between 2006-2014 within the wider field of adult learning; adult education, continuing education, lifelong education, and workplace learning (Nylander et al, 2018). To derive the map presented on the dominating scholars in this field we have used a visualization tool called Gephi (Bastian et al., 2009). To model the relationships of the top-cited scholars we used the default algorithm to explore social networks in Gephi, ForceAtlas2 (Jacomy et. al, 2014).

All the selected journals (*Adult Education Quarterly*, *International Journal of Lifelong Education*, *Journal of Education and Work*, *Journal of Workplace Learning*, *Studies in Continuing Education*) has acquired an indexation status in Scopus, and is thus categorised as “international” in contexts where international publication is encouraged through different methods of measuring quality in research. All in all, the sample covers 1219 publications, 151 261 citation links and more than 33 000 different authors.<sup>3</sup>

**Figure 2. The space of citations based on accumulated number of citations in five journals on adult learning, 2006-2014.**



<sup>3</sup> Self-citations were excluded from the sample as was other document types than articles or reviews (that often do not include reference lists in Scopus). For more on the method used see e.g. Nylander et al (2018) and Fejes & Nylander (Forthcoming).

Figure 2 illustrates how the entire research field on adult learning looks like if one takes into consideration all the citations found in these five journals between the years 2006-2014. Several central sub-clusters of authorship nodes can be observed. The most central cluster, and arguably the strongest one at the time, is created by the citation bibliographies in the tradition of sociocultural theory (in its various branches). Authors such as Etienne Wenger, Jean Lave, Stephen Billett, Yrjö Engeström, David Boud and Phil Hodkinson, represent key bibliographies in this citation cluster. It is worth noting that two bibliographies, that of Wenger and that of Lave, do not themselves contribute to the building of the field by publishing in the selected journals, even though they occupy such central position. Instead these names represent what is conceived of as ‘standard referencing’, and is called upon as external authorities by the many researchers contributing to these journals.

Aside from references to quite a few scholars from social science in general (Bourdieu, Foucault, Beck, Giddens, Lave and Wenger) one can also trace the dominance of Anglophone scholars as most prominent names (by size). These scholars either work in or originate from countries where English is the main language spoken. One might assume that this finding is directly linked to the sample of journals chosen as these are edited in the UK, Australia, and the US. However, as we saw in the previous section, one third to almost half of the content produced in journals such as *Adult Education Quarterly*, *International Journal of Lifelong Education*, and *Studies in Continuing Education* did come from scholars affiliated to universities outside of the UK, US, Australia and Canada. Following the citation of individual scholars thus strengthens the image of a research field where linguistic and geographical boundaries have considerable power of shaping *who* is given recognition even if, as we saw from the previous figure (1), this is far from guaranteed.

Two further points worth raising here. Firstly, there are remarkably few female authors among those top cited as illustrated in figure 2. Such results are the same as those reported by Larsson et al (Forthcoming). However, in their more elaborated analysis on the issue of gender, they illustrate how this gender imbalance in citations, is not so much an effect of internal gender discrimination within the articles produced in the field but rather an effect of the highly gendered referencing that is targeting external social scientific authorities. As the adult educational research field is rather “weak” and direct a large part of its citations to elevated scholars from outside the field, the gender imbalance here is to a large part “imported” from the patriarchal structure of the social scientific canon writ large. Secondly, we can also note that many of these authors currently hold, or have held, positions as editors and advisories to the examined journals, which raises the age old “chicken and egg”-discussion of what comes first? Is it that citations come from taking on the gatekeeping function of editor within the field or is it the recognition of peers that lies behind the assignment of editor for these journals?

West/Southwest in the space of citations we find an aggregation of more philosophically and sociologically-oriented scholars of education, whereas on the opposite side of the figure (East/Northeast) scholars are more oriented to studying workplace learning and human resource development informed by organizational perspectives or more psychologically oriented learning theories. As previously argued by Nylander et. al (2018), the dominating role that socio-cultural theory has occupied in the field can be attributed to its “mediating” role in the field, equally adopted by scholars interested in education and workplace learning and having the power of transgressing institutional and geographical boundaries to some extent.



A surprising finding worth recognizing from this citation map is that position rendered to scholars from North American universities are not as central as one might have expected. Unlike many other social scientific fields, the assigned value of research from the US does not occupy any hegemonic position in the field of adult education and learning research, although they are still clearly visible on the map of the dominating scholars (see also, Heilbron & Gingras, 2018). Though it is beyond the scope of our chapter to investigate what, more closely, lies behind this finding it seems warranted to claim that a few adult educational researchers in Australia has possessed more prominent positions within this field in terms of citations during this period than has the scholars from North American and British universities. One hypothesis that has been launched for explaining this is that the Australian scholars are forced to be more mobile and international in how they relate to other researchers and their research in the field, as they might not have the same incentives of playing a “domestic game” as one might assume is the case in US and UK (Nylander et. al, 2018).

### **Summary and some ideas for future research**

In this chapter, we have introduced three formative dimensions that we argue play a significant role in constructing “the rules of the game” in contemporary academia as well as for adult educational research, more specifically: (i) indexation, (ii) publications and (iii) citations. Bibliometric methods have come to be hijacked by politicians and policy makers in order to assess the quality of research. However, in this chapter we propose that we as researchers, instead of only critiquing such measurements, should use bibliometrics ourselves in order to create knowledge on our own “localized” publication and citation practices. By doing so, we believe it is possible to give a synthetic and panoramic overview of what kind of research that is being published and cited by colleagues and to foster reflexivity on the fundamental questions posed in any given scientific field (Bourdieu & Wacquant, 2004). To make the rules of current publication game more transparent could hopefully lead to a well-grounded discussion on what kind of evaluation systems that are being implemented across different countries, as well as discussions on how our publication and citation practices could become more balanced in terms of who is publishing, who and what is cited, and what should be deemed to be “quality” in our own specific research fields.

Another important aspect of the shaping of a research field is the gatekeeping function of journal editors and reviewers (cf. Pontille & Tornø 2015; Hirschauer 2015; Lamont & Huutoniemi 2011). The peer-review processes and journal publications can represent an important space of possibility for contemporary scholars as well as exercise substantial scholarly constrain. As journals are governed by editorial decisions it is obviously part of the job-description of editors and peer-reviewers to act as intermediary gatekeepers, controlling the discursive influx to the particular scholarly field (Lewin, 1947a; 1947b). To provide the full story of scholarly recognition, it would be interesting to extend the analysis to include research in other publication formats than journal articles (books, handbooks, educational policy, etc) as well as to assess, more closely, the gatekeeping work that goes on in the blind peer-view processes. Another aspect of dynamic of scholarly publication and recognition that has not yet been explored extensively is the temporal aspect of the relative impact that individual scholars and research traditions exercised on the field over time. One final bibliometric idea that could be worth pursuing is, therefore, to arrange the bibliographic data in time-series and to take into consideration the emergence and perseverance of the dominating research traditions in a longer time horizon.

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