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INDICATORS AND METRICS IN SSH RESEARCH:

HOW SCHOLARS VALUE PUBLICATION PRACTICES IN THE FACE OF EPISTEMIC CAPITALISM

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ABSTRACT

Situated at the level of individual researchers, this paper extends empirical research on indicators, metrics and other forms of quantification in everyday (research) practice to the social sciences and humanities (SSH). I draw on 46 qualitative in-depth interviews with senior researchers and early career researchers in history, political science and area studies to trace how SSH scholars value publication practices and outputs. Building on approaches from valuation studies (Helgesson & Muniesa, 2013) three registers of valuing (Heuts & Mol, 2013) are identified: an epistemic, a reputational and an institutional register of valuing publication practices. By exploring overlaps and relations between the three registers, folded valuations (Helgesson, 2016) and their mobilization in different valuation constellations (Waibel et al., 2021), I investigate the role of indicators, metrics and other forms of quantification. Results show that epistemic practice in SSH fields is permeated with indicator use. On the one hand indicators and metrics are a means to denote relevance across the three registers in everyday practice. On the other hand, output-oriented research cultures rely on socio-technical practices of quantification to promote "research quality" and "research excellence", as such practices are closely related to the epistemic and organizational practices that constitute epistemic capitalism (Fochler, 2016). The paper concludes with implications for reforms of research assessment (CoARA, 2022) and how this relates to reforming contemporary research cultures more generally.

Keywords: indicator use, social sciences and humanities (SSH), valuation studies, research quality, CoARA, epistemic capitalism

INTRODUCTION

For more than two decades, scholars have observed and scrutinized auditing and evaluation practices in Western societies (Power, 1997; Dahler-Larsen, 2012), including their role in the governance of scientific systems and the resulting implications for academic subjectivities (Strathern, 2000; Shore, 2008). The rise of evaluation and assessment procedures in science has been accompanied by the definition of performance targets and benchmarks as well as an increasing output orientation of funding systems (Hicks, 2012; Gläser & Laudel, 2016) and the emergence of new methods and practices of quantification. While the quantification of scientific output with a special focus on scholarly communication originates in the late 1950s and early 1960s (Garfield, 1955, 1964), bibliometric indicators and metrics gained momentum in scientific management around the year 2000, when computerized information and communication technologies (ICTs) allowed for their increasing dispersal and application (Burrows, 2012). In the meantime, growing concerns about the use of quantitative indicators to evaluate scientific performance have been voiced repeatedly, calling for the assessment of *"research on its own merits rather than on the basis of the journal in which the research is published"* (American Society for Cell Biology (ASCB), 2012), for more responsible use of publication-based metrics in assessment procedures (Hicks et al., 2015; Wilsdon et al., 2015) as well as for more general reforms of research assessment with a focus on qualitative assessment, supported by the responsible use of quantitative indicators (CoARA, 2022). At the same time scholarship has started to empirically investigate the role of indicators and metrics in research practice, observing their use in and effects on epistemic practices at the level of research groups and individual researchers (de Rijcke et al., 2016).

This paper contributes to these lines of work by presenting empirical results on the role of indicators and metrics in the social sciences and humanities (SSH). Situated at the level of individual researchers, I explore how SSH scholars perceive and reflect the conduct of research and its outputs in everyday practice. Developing an empirical approach based on valuation studies (Helgesson & Muniesa, 2013) I draw on qualitative in-depth interviews with senior researchers and early career researchers in history, political science and area studies to analyze how SSH researchers value publication practices and outputs in everyday practice and investigate the role of indicators, metrics and other forms of quantification in this regard.

The resulting empirical observations help to unpack opaque notions such

as “research quality” and “research excellence”, offer new insights for ongoing debates and efforts to reform research assessment (CoARA, 2022), and contribute to the analysis and critique of output-oriented, competitive academic research cultures in terms of epistemic capitalism, namely a cultural configuration of organizing and practicing research based on the entrepreneurial management of careers, publications and grant portfolios (Fochler, 2016).

EMPIRICAL APPROACH, METHODS AND ANALYSIS

Building on empirical work conducted as part of a Ph.D. project in science & technology studies (STS), this paper extends empirical research on indicators and metrics in (research) practice (de Rijcke et al., 2016) to SSH fields. Situated at the level of individual researchers, I aim at identifying how SSH scholars mobilize indicators, metrics and other forms of quantification in everyday (research) practice based on a case study at the University of Vienna.

Throughout the last years Austrian science policy has increased the utilization of performance-based indicators in funding universities, assigning 20 percent of the budget in teaching and research based on at least one competitive indicator in each domain.[1] Within this framework research performance is addressed based on grant income and the number of employed PhD students per academic year.[2] In resulting budget negotiations with the Federal Ministry for Education, Science and Research universities commit to meet benchmarks for revenues from R&D projects and for employing Ph.D. students. The national funding model is reflected within universities, e.g. in funding its different faculties, the University of Vienna is calculating a portion of their budgets based on these performance-based indicators. However, scholars with management experience report that the University of Vienna is not defining, assessing and economically incentivizing quantified benchmarks at the level

1 Bundesgesetz, mit dem das Universitätsgesetz 2002 geändert wird, Bundesgesetzblatt, BGBl. I Nr. 8/2018, published 4 April 2018. URL: https://www.ris.bka.gv.at/eli/bgbl/I/2018/8 (Accessed 07.03.2025).

2 Erläuterungen, Regierungsvorlage: Bundesgesetz, mit dem das Universitätsgesetz 2002 geändert wird, 31.01.2018. URL: https://www.parlament.gv.at/dokument/XXVI/I/10/fname_679289.pdf (Accessed: 07.03.2025); Verordnung des Bundesministers für Bildung, Wissenschaft und Forschung über die Umsetzung der kapazitätsorientierten, studierendenbezogenen Universitätsfinanzierung, BGBl. II Nr. 202/2018, published 4 August 2018. URL: https://www.ris.bka.gv.at/eli/bgbl/II/2018/202 (Accessed 07.03.2025).

of departments, research groups or individual scholars. Instead, publication output and grant income are simply discussed on a regular basis between the rectorate and faculties and are thoroughly assessed in a seven-year evaluation cycle of faculties. Furthermore, publication output and grant income play a central role in qualification agreements for tenure track positions and in the evaluation of newly hired professors, typically after five years. In relation to international examples such as Poland, Australia or the UK, the degree of institutional metricization and economization (Kulczycki, 2023) can therefore be described as low.

Indicator-related incentives have been observed to trickle down to institutional practices targeting individual SSH scholars in the Norwegian case, which is also characterized by loose coupling (Aagaard, 2015). Since Aagaard observed a high degree of informal indicator use in the SSH, especially in career-related governance practices such as salary negotiations, it seemed promising to empirically study indicator use in relation to career trajectories more generally. More recently scholarship on the impact of quantification on the social sciences in the United Kingdom (Pardo-Guerra, 2022) as well as research on strategic decision making in relation to the academic labor market in general (Gläser & Laudel, 2015; Laudel & Bielick, 2018, 2019) has convincingly utilized a concept of academic careers based on the works of the Chicago School of Sociology.[3] Such a conceptual focus on career trajectories enables us to empirically trace how SSH scholars negotiate and navigate the nexus between individual and collective research practices, between the academic self and the community it is embedded in, as well as between individual action and structural requirements and expectations.

Mobilizing disciplinary differences as a comparative lens, the study was confined to one research institution. With about 10,700 employees and more than 85,200 students, organized in 20 faculties and centers, the University of Vienna is Austria's biggest institution for education and research, where SSH fields are well represented.[4] The fields history, political science and area studies were chosen for empirical analysis, because each of them is

3 Transcending earlier narrow conceptualizations of careers as a sequence of jobs or professional statuses, by more broadly and firmly grounding the concept in various social settings, authors like Hughes and Goffmann had stressed the capacity of this notion to conceptualize the nexus between the personal and the collective, individual action and social structure (Hughes cf. Barley, 1989, p. 46; Goffman, 1961, pp. 127–128).

4 Universität Wien, Zahlen, Daten & Broschüren. URL: https://www.univie.ac.at/ueber-uns/auf-einen-blick/zahlen-daten-broschueren/ (Accessed: 07.03.2025).

institutionalized in a different faculty. History and political science are both traditional disciplines, usually represented at universities covering the SSH. Both have strong disciplinary traditions and institutions within Austria and at a global level. Area studies is an explicitly interdisciplinary research field, bringing together different perspectives and traditions – ranging from social and cultural anthropology, economics, political science to cultural studies, linguistics and literary studies – based on a regional focus, e.g. japanese studies or chinese studies.

Qualitative in-depth interviews with senior researchers (SR) were conducted to explore the characteristics of these research fields by obtaining the perspectives of scholars, who have led and shaped departments, who have experience in different types of hiring processes, and who have experience in leading and mentoring pre- and postdoctoral researchers. The next step was to focus the interviews on early career researchers (ECR) at different stages of their careers, starting with late predoctoral researchers who had had their first experiences with academic publishing, researchers in postdoctoral positions, as well as more advanced and established scholars, who were about to receive or had recently received tenure.

In total 46 interviews were conducted with 44 researchers (23 male, 21 female) between September 2018 and December 2023. Starting with historians in the first wave (9/2018 – 4/2019), I moved on to interview SR across the three research fields in a second wave (11/2019 – 2/2020). Building on the results of waves 1 and 2, I conducted a third wave of interviews (1/2023 – 12/2023) with ECRs in all three fields. All interviewees gave written and oral consent. Conversations – ranging from one hour up to three hours, 40 in German language, 6 in English – were recorded, transcribed and imported to Atlas.ti.

The first round of coding was conducted in parallel with data collection, following the principles of Grounded Theory (Strauss & Corbin, 1998; Bryant & Charmaz, 2010), so that emerging categories and themes could inform ongoing sampling and data collection based on a zig-zag approach (Rivas, 2018). The coding process was restarted and restructured several times during data collection waves 1 and 2. These repeated iterations and adaptations were related to moving away from traditional Grounded Theory towards Abductive Analysis (Timmermans & Tavory, 2012; Tavory & Timmermans, 2014), which offered a good way into structuring the material and developing a coding scheme based on the process of alternative casing (Tavory & Timmermans, 2014, pp. 58–61).

Analyzing SSH scholars' reflections on research and publication practices when reporting about their personal experiences throughout their careers –

e.g. in applying for academic positions, the ways they had (not) planned or prepared for certain career steps and the role they attribute to different research and publication practices in their everyday working routines – I turned to valuation studies to make sense of the material. In particular, Heuts and Mol's (2013) approach to valuation as a practice enabled me to further sensitize quality judgments as a central aspect of research practice. Moving away from looking into certain qualities of things, they are *"foregrounding 'valuing'"* as an activity by identifying and closely looking into different *"registers of valuing"*. These registers *"indicate a shared relevance, while what is or isn't good in relation to this relevance may differ from one situation to another"* (Heuts & Mol, 2013, p. 129). Speaking of "*valuing"* also highlights how assessment, judgment, valuation, evaluation, improvement are practices that "*slide over into each other"* (p. 130). Coding the material of waves 1 and 2, three registers of valuing publication practices emerged, transposing Gläser & Laudel's (2015) model of the simultaneous pursuit of three different careers in academia: an epistemic register, a reputational register, and an institutional register. Throughout the coding process emerging codes and categories were grouped along research and publication practices and the three registers alike.

For the final wave of interviews with ECRs, a new interview guideline was developed based on insights from previous waves. ECRs were invited to report and reflect their academic career so far, before they were asked to choose the five most important research outputs on their CV and recall their practical histories from the very beginning. The guideline was accompanied by a set of cards to actively confront the interviewees with quotes and insights from previous interviews along the emerging codes and categories of the coding process. The cards were used to jump-start reflections, to mobilize disciplinary differences, and to offer orientation on what aspects and levels of abstraction to focus on, enabling the interviewees to relate and position their own sense-making and experiences to that of others.[5]

5 Card-based methods have been used to render non-debatable issues debatable in focus group discussions on nano-technologies (Felt et al., 2019), and to enable researchers to reflexively discuss matters of responsible research and innovation (Felt et al., 2018) and research integrity (Felt & Frantz, 2022).

VALUING PUBLICATION PRACTICES IN THE SSH

This empirical approach based on valuation studies enables a new perspective on how SSH scholars value publication practices in everyday contexts. Due to the output orientation of contemporary academia, publications are no longer just a means of scholarly communication. They have become essential for signaling "research quality" or "research excellence" in a variety of settings and contexts. As a result, all sorts of considerations in epistemic practice are related to publication practices. The analysis and description of the registers of valuing publication practices provide sensitivity and orientation in this regard. Heuts and Mol (2013, p. 129) emphasize how valuation practices are messy and complex. The registers of valuing drawn upon overlap and are sometimes in tension with each other. In a similar vein, Helgesson (2016) has suggested investigating the ways in which multiple valuations and different valuation practices are folded into each other:

> *"Looking into the nooks and crannies of a conglomeration of interrelated valuation practices further provides a glimpse of a politics beyond the singular valuation practice; this is the politics of how valuation practices are folded on to one another, and how these folds are characterized"* (Helgesson, 2016, pp. 100–101)

Other scholars highlight that not only the multiplicity of valuing as a practice as such needs to be accounted for, but also the multiple contexts in which valuations take place. Waibel and colleagues speak of valuation constellations to reflect the positions and relations between the valuee, the valuator, and the audience, and to include the role of valuation rules and infrastructures (Waibel et al., 2021).

The results presented and discussed here are based on the analysis of interview material concerned with research outputs from the perspective of their production process. As indicated above, this focus originates in an interview design focusing on relations between publication practices and career trajectories. Instead of studying moments of assessment or asking researchers what constitutes a good monograph or journal article, scholars were encouraged to recall the practical histories of their own publications: e.g. starting with the context of the respective research, the associated research agenda, project idea or research questions, to reflect the research process, to recall initial ideas for manuscripts, up to the drafting of the manuscript

and the review and production process of publications. Analyzing how SSH scholars value research and publication practices from this perspective reflects overlaps and relations between the identified registers of valuing publication practices, considers specific foldings of different kinds of valuations, and how they are related to experienced, imagined, and anticipated valuation constellations.

THREE REGISTERS OF VALUING PUBLICATION PRACTICES

In a first step empirical analysis uncovered how SSH scholars draw on three registers of valuing publication practices: an epistemic register denoting qualities in relation to processes of knowledge creation and production; a reputational register expressing relevance based on the capacity to contribute to reputation building in the scientific community; and an institutional register denoting quality in relation to meeting demands and expectations from institutional settings and contexts. Throughout this section I will present these registers in more detail by showcasing how SSH scholars value publishing as a research practice in general terms; then I will move on to illustrate the mobilization of the three registers with regard to monographs and journal articles, which are described as the two most relevant output types in relation to career trajectories.

The three registers of valuing publication practices are accessible not only in relation to individual research outputs or types of outputs, but also in relation to publishing as a research practice itself. Scholars' reflections on their most important research achievements and outputs often came along with valuing publishing in general. Across the three research fields there was no clear difference between producing research results and communicating them through publication practices. In many instances scholars describe the writing process as an integral part of "doing research".

When explaining their motivations and aims for publishing, researchers indicate epistemic relevance of publishing as a research practice with regard to several dimensions: Time spent on publishing is described as valuable, if it enables the development or pursuit of research interests embedded in or relating to an overall research agenda. Another central motivation for publishing is contributing to certain debates/bodies of knowledge. Along this dimension, publishing is not an end in itself. Rather it requires to have something substantial to say to begin with: *"[…] it is not very meaningful to simply publish boring stuff or more of the same"* (I23-1, P97). In the words of a SR: *"You have to go for the questions where you can actually make a contribution."* (I16, P77).

Even though the focus is on academic debates, relevance for the public and societal concerns are also mobilized to denote epistemic relevance. Finally, there is also an individual dimension in the epistemic register: publishing is denoted as "good" when enabling personal learning in epistemic terms: *"*[With regard to publishing] *you also have to understand: you are not the same person at the beginning and at the end of the predoc phase* [...] *over the years your experience grows, your competencies expand"* (I25, P216).

In the reputational register, publishing is denoted as an important research practice based on its capacity to contribute to reputation building. In most general terms this means that scholars think publishing is important because it enables and facilitates the recognition of the self as an academic, researcher, and scholar in the first place. A SR recalling career advice by their own mentor expresses this dimension most vividly: *"... because* [mentor] *had told me: That's not possible, not publishing during your Ph.D. That is terrible, then you are not a person"* (I17, P33). Similarly, publishing is denoted as relevant, when it contributes to the development of a scholarly profile and to the shaping and formation of one's academic personality. Publishing practices are constructed as "good" or "bad" based on the different kinds of positioning work they enable, including the signaling of academic maturity or facilitating topic-name recognition.

The institutional register allows researchers to frame the relevance of publishing in relation to demands and expectations originating from institutions. In scholars' narrations on the relevance of publishing as a research practice, they reflect institutional settings, contexts and practices as mediators for the important role attributed to publishing. Scholars refer to, draw on and mobilize regulations, policies and practices at the level of departments, faculties or the university (e.g. regulations for paper-based dissertations or qualification agreements for tenure track positions), funding institutions (from application guidelines to hearsay on review processes and decision making), and the academic job market (from experiences with applications, job talks to participation on hiring committees) in order to express the importance of publishing. This way institutional settings, contexts and practices do not only exert pressure on scholars by articulating and enacting demands and expectations; at the same time all of these moments can be used as argumentative resources to denote publishing as an important, if not *the* most important research practice.

The institutional register also offers a whole repertoire of motivations and goals for publishing, that scholars can draw on to denote relevance. The most

dominant one would be the overall goal of developing a publication portfolio that ticks the relevant boxes in institutional settings and contexts. In the words of an ECR:

> *"I really do not know for sure if say like the-, for the department when they hire a new professor if they like, tick boxes how many or in what category it's published. But I feel that these are all altogether to be considered. Yeah (..) and I think for the younger scholars, it's perhaps also an effective way of like presenting yourself publicly or to the universities, of course."* (I28, P108)

Other dimensions in the institutional register comprise the capacity to demonstrate experience, performance, and productivity through publishing, while publishing itself is also described as the core task of being an academic.

VALUING MONOGRAPHS

When recalling the practical histories of individual publications, interviewees repeatedly describe publishing monographs as enabling specific forms of thought and research processes, due to the relative absence of limitations in form and space. In contrast to other formats, monographs offer the most freedom for authors to choose the structure and form of presentation, usually there is also no word limit. For this reason, researchers value the publication of monographs because of the freedom to present their research as they see fit and as appropriate with respect to the object of their research, instead of following editorial guidelines. In these valuations the writing process is described as an integral part of the research process. The practice of publishing a monograph is valued as an act of doing research rather than an act of communicating research results produced in an earlier, separate phase of the research process. In these terms publishing monographs is denoted as good, because it enables specific epistemic practices, such as thoroughly discussing and appropriating theories, or working with and integrating multiple approaches. As an ECR in history recalls one mentor explaining: *"Well you can somehow argue anything in an article, but you can only see whether an argument really works in a book"* (I45, P167).

Drawing on the reputational register, scholars value publishing monographs as the traditional format or research output that comes with high status gains and prestige. Scholars in history and area studies repeatedly argue that monographs are still important in their fields. So even though the status of the monograph is seen as challenged, it is at the same time described as the gold standard. This resonates in ECRs' reflections on how doing a paper-based dissertation was only a theoretical option, which many of them

did not even know about, while others were explicitly advised against it by their supervisors. In area studies the status of the monograph is challenged based on researchers' multiple, transdisciplinary identities. Scholars with backgrounds in the social sciences tend to value publishing monographs as less important or as challenged, while scholars working in the tradition of the humanities emphasize its prestige. In political science the importance of the monograph is described differently depending on subfields and empirical orientation. Scholars with a focus on theory and qualitative research tend to value monographs as traditionally prestigious, while political scientists with a quantitative empirical orientation see a declining role of the monograph in reputation building.

Beyond being valued as the traditional format for reputation building, the monograph is valued for its capacity to represent a scholar's academic personality. Drawing on the reputational register, scholars denote publishing monographs as "good", because doing so forms researchers, as writing a research monograph shapes one's personality as an academic. Scholars do not only express pride in having written books themselves. They also express admiration and respect for others who did so. In this sense, a mythical dimension is ascribed to the monograph:

> *"*[...] *it's difficult to write a book* [...]*, therefore it's part of a maturing process and so on.* [...] *I think it's a lot symbolic and not necessarily broken down into individual criteria as to why monographs and books are so important."* (I22, P77)

Finally, scholars also draw on the institutional register to denote publishing monographs as relevant and important. Field specific differences in these valuations correspond to those in the reputational register: While historians describe the publication of monographs as a necessity in the competition for academic jobs, political scientists with a quantitative empirical orientation argue this is not the case at all. These valuations in the institutional register also find an expression with regard to tenure: A typical academic career trajectory in history is reported to require the publication of two research monographs, one being the Ph.D. thesis and the second one for a tenured position. Scholars in area studies express the need to plan for at least one monograph in the long run to maintain a competitive profile ticking all the relevant boxes. Political scientists with a quantitative empirical orientation argue that monographs are no longer a prerequisite for tenure in their field. However, in certain sections of the academic job market, especially in the German speaking context, not having published a monograph at all might become an obstacle in the competition for full professorships.

VALUING JOURNAL ARTICLES

Valuations of publishing journal articles drawing on the epistemic register relate to the research and the writing process. In their most basic form such valuations revolve around the content, topic, argument or the empirical material or substance of the respective manuscript or article. Likewise, journal articles are denoted as good, by relating the aforementioned aspects to ongoing debates in the respective discipline, (sub)field or community. Regarding the writing process, the journal article is repeatedly described as a specific form or craft. Scholars express how writing and presenting results in the form of journal articles is very much shaped by formal guidelines, established or expected structures and the more general style and form of the journal, including the need to meet the imagined, anticipated, or in due course clearly expressed expectations of editors and reviewers. Learning and mastering the craft of conceptualizing, drafting, and getting journal articles accepted for publication is described as a key personal learning. Across the board, scholars vividly recounted and recalled how publishing their first article was an intense and exciting epistemic experience in exchange with mentors, editors and reviewers.

Valuations of individual journal articles drawing on the epistemic register typically go hand in hand with epistemic valuations of the journal the article was published in. Similar to individual articles, journals are valued in the epistemic register in terms of the discipline, (sub)field or community they are addressing. Correspondingly, the epistemic relevance of journals is expressed in terms of the debates, topics, and works published in them. Also, individual experiences with the editorial and review process are mobilized in the epistemic register of valuing journals. Even though scholars repeatedly express how astonishingly contingent review processes are, past experiences are mobilized as an argumentative resource to assess and express the quality of journals in epistemic terms.

With regard to reputation building, the folding of valuations concerning individual journal articles and their journals turns upside down, as reputational valuations mostly revolve around the outlets, rather than the individual articles themselves. This means that an individual journal article contributes to reputation building based on the status the outlet is ascribed in the discipline, (sub)field or community. In these terms the prestige of the journal is related to its audience: the most prestigious journals are described as broad and general flagship journals of disciplines and research fields (requiring also contributions of general and broad importance in epistemic terms). In contrast, contributions

to more specialized subfield journals are ascribed less relevance, hence they contribute less to reputation building. Successfully publishing an article in a respective journal is not only part of positioning work with regard to the academic profile, it also comes with being recognized as a scholar in the field: *"With a text like the one I wrote* […] *you are accepted as a participant in the debate, so to speak, or you can at least suggest that you want to have a say, let's put it that way, right?"* (I45, P59).

In the institutional register, the relevance of publishing journal articles is predominantly denoted by emphasizing the role of articles in getting jobs in academia. Journal articles are described as the decisive element on CVs when it comes to pursuing an academic career trajectory. Articles are valued as "good" because they enable scholars to distinguish themselves and to make it to the next round of hiring procedures for postdoctoral and tenure track positions, as well as full professorships. Also in the institutional register, the valuation of individual articles is folded into valuations of the publication venue. Across all three research fields, interviewees emphasize how publishing articles in internationally recognized, peer reviewed journals is key in pursuing an academic career. As a political scientist recalls the first accepted manuscript:

> *"How do I remember that? Well, of course with a lot of sweat and fear about what would come out of it, because I thought that would be ideal if it worked out.* […] *I had submitted it somewhere else before and it was closely rejected* […] *and it was also submitted very high.* […] *I really, I think, revised it very, very fundamentally, changed very fundamental things* […] *the paper itself is certainly one of the most polished and well thought-out things I have ever done, simply because so much time went into it.* […] *I think it was simply because of the high stakes, that was the first publication where I thought to myself, this will really help me now for my future career. And I want to do anything but mess the whole thing up."* (I32, P197)

Publishing journal articles is also denoted as important with regard to funding applications, or expectations at the level of departments, faculties or the university. In the most general terms, the practice of producing peer reviewed journal articles is valued as important by describing it as the core task of being an academic.

THE ROLE OF INDICATORS, METRICS AND QUANTIFICATION

By delving into overlaps and relations of the three registers of valuing publication practices, we can disassemble vague singulars like "research quality" and "research excellence" into a broad variety of dimensions, notions and their context-specific mobilization. We can strip notions like "quality" of their opaqueness, by breaking them down into different kinds of qualities, namely the multiple and heterogeneous characteristics of publication practices and outputs. In doing so we can also trace how citation-based indicators and metrics are mobilized together with other forms of quantification in valuing publication practices.

First, the empirical analysis presented illustrates how SSH scholars make sense of their own publication practices and outputs in relation to varying concrete, imagined, and anticipated valuation constellations (Waibel et al., 2021): Publications are a means of producing, presenting and communicating research and its results, they are a means for recognition in the community, and they are a means in the competition for institutional reward. We can observe how multiple aspects and dimensions are conflated in practice, by studying overlaps and relations between the three registers in different valuation constellations. Usually, we assume these to be neatly separated, following a linear process of abstraction: research quality is based on solid and careful epistemic practice, which is consequently recognized, criticized and acknowledged through peer review and finally rewarded by institutions. Analyzing how SSH researchers value publication practices clearly indicates that the situation is more complex, as all of these dimensions come to matter already in the research process, very often simultaneously.

This also applies to the mobilization of indicators and metrics, which become relevant not only through institutional assessment procedures and evaluations. Indicator use is spread across all three registers of valuing as well as all sorts of practices and contexts, as is exemplified by an ECR elaborating on the role of citation-based information in literature research:

> *"Generally speaking, citation numbers. This is one of the easiest ways I can look at whether or not this is a good journal. It doesn't (.) it's this peer review, DOI number kind of thing. Yeah, that's great. That's the very basic that you want to have but then you need to look at citation numbers. How often has this been cited? And then you start looking at that.* […] *I look at certain articles and then*

> *it tells me these are journal articles that are constantly being used.* […] *This tells me this is an important and incredibly important journal in* [subfield] *that has to be used. I had to look at it, not just at this issue. So, I actually go into the database of that journal and then look at other issues they have come up with and then see what they're doing."* (I29, P47)

Reflections of this kind demonstrate how citation-based indicators and metrics have permeated epistemic practice. Scholars use and mobilize them as one piece of information among others in finding, assessing and appropriating the work of other scholars, as much as in decision-making about their own publication practices. They are mobilized to denote relevance in the epistemic register, in the reputational register and in the institutional register alike. By reflecting relations between the three registers of valuing we can trace how different aspects and dimensions are folded into one another (Helgesson, 2016) to construct meaning and relevance. This kind of analysis clearly indicates, how status and prestige – often combined with citation-based indicators and metrics – are not only mobilized in institutional assessment procedures, but play a crucial role in making sense of, strategically planning and carrying out epistemic practice. This has important implications: The use of indicators in epistemic practice must not itself be conceptualized as necessarily inappropriate, nor as the result of external pressures exerted by evaluation procedures. Rather, these observations suggest that *"thinking with indicators* […] *inform*[s] *research* a*s it is being conceived and conducted"* (Müller & de Rijcke, 2017, p. 161). Following Dahler-Larsen (2014), we might speak of constitutive effects of indicator use in epistemic practice.

Second, the empirical analysis of how the three different registers are folded into one another facilitates a better understanding of how SSH scholars plan, structure and carry out epistemic practice in output-oriented academic research cultures. Doing so enables the observation and articulation of specific dynamics that are brought about or mediated by competition. In everyday practice SSH scholars anticipate competitive editorial and review processes for limited publication space with journals and publishers. Similarly, they anticipate how their publication output will be valued by hiring committees, which are assessing large numbers of applicants trying to identify the best candidates that deserve a closer look in the second round. This kind of competition fosters abstractions to enable the comparison of candidates, e.g. by focusing on a limited spectrum of publication venues. As a SR points out in relation to hiring for postdoctoral positions:

> *"I can't read the entire oeuvre of 60 people* […] *on the assumption that there are golden nuggets in some papers, yes. So, you need criteria to go by and, of course, ranked journals are an important indicator. They've managed to jump over this hurdle, yes, that's no guarantee that it's* […] *great research* […] *in the sense that it revolutionizes the world or really brings something fundamentally new to the discipline or reorganizes the subfield or anything, but it is the criterion that there is at least solid, solid work that is good enough to get into the respective journal."* (I16, P117)

For individual scholars the strong emphasis on output orientation and competition in contemporary research cultures implies that pursuing a career in academia resembles a quest for return on investment by managing publication portfolios (Fochler, 2016; Rushforth et al., 2019). This is reflected in scholars' strategic decision-making on what publication practices to spend time on. An ECR recalling their strategy for developing a competitive portfolio illustrates how the different registers are mobilized in anticipation of future hiring committees:

> *"I knew at that time, and I know now that publishing in Q1 journals, it's valued much more than publishing in lower-ranked journals. And especially respected journals, sometimes even if it's not Q1, but it's a respected journal. I don't know whether it is true, to be honest with you, but this is also something that my supervisor had told me at that time. I think it's more important to have one good publication in a very good journal rather than having many in low-ranked journals or not respected journals, because the committee will not look at them anyway. It will be a bit of a waste of time. It's also good to show that you can publish on different outlets and talk to different audiences. But for me, the respect of the journal and the Q tire was among the most important decisions besides the topic fitting."* (I35, P57)

Both examples demonstrate how output-oriented, competitive valuation constellations for positions or resources depend on abstractions in order to compare profiles and portfolios of individual scholars, even if procedures are based on peer review and are carried out with rigor and dedication to the highest standards. In other words, competition based on publication portfolios takes part in bringing about abstract goals and criteria, emphasizing the reputational and institutional register rather than the epistemic register. Also in this regard indicators and metrics serve as means to denote relevance. In assessing publication portfolios indicators are frequently mobilized to value publication venues, which is not necessarily inappropriate, as they are not used to signify immediate epistemic relevance for individual articles. In many cases

they serve as a means in venue-related reputational valuations. Scrutinizing overlaps and relations between the different registers of valuing illustrates that indicators and metrics play a crucial role in such valuation constellations, but the overall dynamics originate in the orchestration of output-oriented competition. Criticizing the presence and use of quantitative indicators might not be enough, because the phenomena at hand are dynamics resulting from output-oriented, competitive production and valuation.

This leads to a third observation. Studying overlaps and relations of the three registers of valuing publication practices enables more fine-grained and detailed investigations into the role of indicators, metrics and other sociotechnical practices of quantification in contemporary academic cultures. Fochler (2016) has conceptualized the entrepreneurial management of careers, publications and grant portfolios in terms of the more general cultural configuration of epistemic capitalism. Epistemic capitalism denotes *"a particular cultural dynamic in knowledge production"*, that is based on *"the accumulation of capital as worth made durable, through the act of doing research"* (p. 924). In this perspective, the examples above illustrate how SSH research is practiced and organized in specific forms and thereby subjected to this very particular dynamic. Indicators and metrics play a central role in enacting markets *"based* […] *on the strategic competition for the best asset position in relation to others."* (p. 927). In that sense ECRs' strategic reflections on developing their publication portfolios illustrate how they are *"concerned with accumulating indicators of their own worth in terms of their future employability"* (p. 934).

By delving into the different registers of valuing publication practices in SSH research, we can better understand how markets are enacted and how scholars are compared to each other based on publication output. Again, indicators and metrics are not necessarily used in naive or inappropriate ways in these processes. Many SSH scholars have profound knowledge of indicators, metrics, and their problems. Consequently, they are also hesitant and careful in mobilizing them to assess and compare individual scholars based on publication portfolios. A good example is the following quote by a SR, specifying how it's not simply about more publications being better:

> *"I don't mean it like that.* […] *(sighs) it's rather, averages* […]*, if I have two, three, four people and keep all other factors stable, which is of course difficult, then, under these conditions, the person who has a higher-ranked publication or a longer list of publications would prevail."* (I22, P169)

Drawing on the reputational and the epistemic register, the interviewee goes on emphasizing how assessing the overall profile of the respective scholars

and the content of the publications in relation to the job announcement are more important. Even though these "other factors" are given priority and point to the high relevance that is attributed to epistemic valuations, this kind of reflection demonstrates how output-oriented competition is enacted based on rather abstract comparisons. Through competitively assessing publication portfolios individual publications are related to each other in an abstract, commensurable from that requires quantitative terms to express difference. In other instances, quantitative comparisons are a means to construct equivalencies. E.g. a SR reflecting the role of habilitations in book form for full professorships: *"So when it comes to someone with ten peer-reviewed journals and someone with four plus habilitation, I would say: that's seven. That's also my argument, explicitly"* (I19, P167).

Both examples demonstrate how competition based on publication portfolios is enabling and facilitating quantitative reasoning in valuing publication practices, and that this kind of quantitative reasoning is not external or opposed to peer review. Of course, this does not imply that such kinds of valuations do not involve qualitative aspects or content at all. On the contrary, qualitative aspects usually precede or accompany these kinds of valuations, as researchers draw on the three registers of valuing publication practices to denote what kind of outputs are to be considered and to what extent in negotiating equivalencies and differences, i.e. to argue what should count at all and how much.

The three registers of valuing publication practices have offered an analytical perspective to scrutinize in more detail how scholars make use of citation-based quantitative infrastructures, also in contexts relying on peer review. This has also highlighted how abstraction and quantification do not only originate in indicator-related performance goals or assessment but are brought about by and deeply inscribed in epistemic and organizational practices of contemporary research cultures. Empirically studying the three registers of valuing publication practices, the folding of respective valuations, and their mobilization with regard to multiple valuation constellations illustrates how planning, doing and presenting research – also in SSH fields – need to take very specific forms in order to enable the production and accumulation of epistemic capital (Fochler, 2016).

CONCLUSION

Empirical analysis of how SSH scholars value publication practices and outputs in everyday practice has highlighted the diversity and multiplicity of how publishing and publication outputs are valued in different contexts and settings. The inquiry differentiated three registers of valuing publication practices and outputs, namely an epistemic, a reputational and an institutional register. Looking into these registers and their relations not only enabled a more detailed articulation and understanding of publication practices in SSH research. Doing so, helped to unpack valuations behind notoriously vague notions like "research quality" and "research excellence" in the context of output-oriented academic research cultures. We have observed how epistemic practice is imbued with all sorts of valuations regarding publication practices, which includes the mobilization of indicators and metrics across the different registers. We should be hesitant to deplore valuations of this kind in advocating for purely epistemic valuation and judgment. Because research and scholarship are social practices organized based on recognition and reward (Stephan, 2012, pp. 17–34), epistemic practice cannot be imagined as a sphere prior to or isolated from these issues. Since *"thinking with indicators"* (Müller & de Rijcke, 2017) has also permeated epistemic practices in SSH fields, we need to examine in which cases, at which moments, and to what extent this is the case, rather than assuming that it is the result of assessment and evaluation procedures alone. We can do so by empirically tracing how valuations mobilizing the identified registers are folded into one another in specific settings and contexts, and how different valuation constellations and their anticipation shape epistemic practices.

However, the results presented also have implications for ongoing efforts to reform research assessment. For instance, the Coalition for the Advancement of Research Assessment is calling for more responsible assessment by focusing procedures "*primarily on qualitative evaluation for which peer review is central, supported by responsible use of quantitative indicators"* (CoARA, 2022, p. 5). The agreement suggests to *"move towards research assessment criteria that focus primarily on quality, while recognizing that responsible use of quantitative indicators can support assessment"* (ibid.). This recommendation implicitly juxtaposes peer review as a procedure to assess quality and the use of quantitative indicators, neglecting the role of the latter in valuations constructing and defining "research quality" in everyday practice. The empirical results presented in this paper show how researchers make context-specific use of quantitative indicators in valuing publication practices across

the three identified registers of valuing. In other words, quantitative indicators have become one means among many for constructing and articulating "research quality" in everyday research practice as well as in peer review. In light of this observation, it seems important to emphasize that the focus on quality through peer review does not in itself contradict the use of quantitative indicators to construct and assess "research quality".

This is closely related to a second implication regarding CoARA's core commitment #3, which is calling to abandon inappropriate forms of indicator use such as *"assessing outputs based on metrics relating to publication venue, format or language"* (p. 6) Again, the empirical results show how publication venues are an important means of valuing individual journal articles in many settings and contexts. Looking at these valuations in more detail, we have explored how the mobilization of indicators and metrics, as well as status and prestige, are not necessarily considered inappropriate either. Scholars express awareness of the limits of such valuations and are carefully folding the valuation of articles and outlets into each other. If the complexities and multiplicities of such valuations are not adequately addressed and acknowledged, efforts to reform assessment procedures risk failing, as actors with different positions are unlikely to find common ground to discuss what is considered (in)appropriate or (il)legitimate and why. Empirically scrutinizing how publication outputs are valued based on the three registers of valuing publication practices offered clarity and orientation in this regard. Thus, the implementation of CoARA requires to create spaces for collective deliberations on what should constitute "research quality" and why, taking the observed complexity and multiplicities of valuations into account.

Finally, these observations also reflect how debates for reforms of research assessment are not only a central arena to discuss assessment and evaluation procedures. They are at the same time normative negotiations on what should constitute "research quality", "research excellence", and how research cultures should be organized. This way questioning indicator use in research assessment is implicitly tied to more general ideas and assumptions about whether and how research should be driven by recognition, reward and competition. The empirical results presented suggest, that indicator use is a central element in the construction and evaluation of "research quality", because contemporary research cultures are characterized by output-oriented competition and the entrepreneurial management of publication and grant portfolios (Rushforth et al., 2019). Doing research in the face of epistemic capitalism (Fochler, 2016) implies that the products of research have to take specific social forms to produce value, which in turn needs to be

accumulated as epistemic capital, e.g. through successful career accumulation. Under these circumstances producing research results "of high quality" is not confined to carrying out and conducting research with rigor and based on the highest standards. Because of the overall output-orientation of research the production and accumulation of epistemic capital is dependent on repeated communication in proper form. I.e. publication outputs need to address the requirements of multiple valuation constellations by drawing on the epistemic, reputational and institutional register of valuing publication practices alike, in order to facilitate the production and accumulation of epistemic capital.

Considering this, the results presented above suggest that the role of quantification in valuing and assessing research outputs does not merely originate in the presence and use of bibliometric indicators. Rather, the organization of research in the form of epistemic capitalism implies to treat publications in abstract terms to negotiate "quality" and "excellence" in competitive settings. Comparing publication output in abstract forms requires expressing differences (and equivalences) in quantitative terms. As a result "more" is usually better, but only in the context of negotiating what counts as "excellent" or "high quality" and how much. Further inquiry along these lines can help us understand how this feeds into dynamics that are central to any capitalist configuration: *"an orientation towards attaining ever more capital* [...] *as an end in itself"* (Fochler, 2016, p. 929) and how this contradicts moving towards more heterodox and diverse economies of value and worth in academia (Fochler, forthcoming). The observations presented in this paper echo calls to question the organization of contemporary academia in the form of individualized competition (Kulczycki, 2023, pp. 188–191). Because abstraction and quantification originate in epistemic and organizational practices related to epistemic capitalism, actively challenging these phenomena would require establishing alternatives to output-oriented competition by seeking a new nexus between the production of individual researchers and the overall, collective achievements that constitute scholarship.

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