

Competitive performativity of academic social networks: the subjectivation of competition on ResearchGate

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Abstract

This paper develops a better understanding of the explicit and implicit implications of the academic field's competitization, with a specific focus on the role that academic social networks and platforms (ASNP) play in this process. While ASNPs are embedded within a broad and complex ecology of academic competition we show that particularly ResearchGate offers a broad variety of tools for competitive subjectivation and thus can be seen as an important organizer and promoter of competition in academia. By applying a mixed-methods approach combining a structural analysis and a questionnaire study, we examine how and to what extent the platform ResearchGate contributes to the competitive subjectivation of its users. Therefore, we differentiate between suggested and enacted subjectivation. Concerning differences in age, gender and disciplinary background, our results show that ResearchGate is used more by younger and male researchers and especially younger researchers also perceive their work significantly more in a competitive context and thus also tend to act more competitively. While metric research evaluation is assessed as most important in the natural sciences and economics and rather unimportant in the humanities, subjectivation via the use of ResearchGate is perceived higher in the humanities, which are still less confronted with the competition ecology in academia.

Keywords: academic social networks; competition; subjectivation; ResearchGate; Austria.

1. Introduction

The last two decades have seen the advent of *academic* social networks and platforms (hereafter ASNPs) such as Academia.edu and ResearchGate. This is a result and a catalyst of three important developments the academic system has undergone in recent decades: The *internationalization* of the academic field, the *quantification* of academic research evaluation, both of which have promoted the *competitization* of social relations between academic actors such as universities and individual scholars. Through facilitating the international comparison of scholars, expanding the metric logic with new quantitative indicators and inducing new forms of competitive subjectivation, ASNPs have increasingly gained an important role in contemporary organization of academic social relations.

However, in order to gain a more detailed understanding of how ASNPs actually work, this paper examines the case of ResearchGate as a prime example of an ASNP. While we aim to develop a better understanding of the impact of competitization on the academic field from the perspective of competition research, the main contribution of this paper is empirical. Therefore, we *first* provide a detailed analysis of how the structural elements of ResearchGate encourage academic competition between individual scholars. *Second*, we conduct a questionnaire study with researchers from different academic disciplines in Austria to examine how active engagement on ResearchGate impacts on the self-perception, research practices and performance of researchers and provide a comparative account across disciplines. We have chosen biology, economics, sociology and historical science and assume that these disciplines represent different traditions of publication and research culture. Furthermore, they have

been exposed to varying degrees of competitization, where the use of metrics and quantitative methods of research evaluation is more common in the natural sciences and within the social sciences particularly in economics (Hammarfelt and Rushforth 2017).

The remainder of the paper is structured as follows: Section 2 provides an overview over the rise of competition in (Austrian) academia, introduces our theoretical approach for understanding competitization in academia and situates ASNPs within contemporary academic competition ecology. Section 3 provides our empirical approach and the methodological approach of our questionnaire study. In Section 4, we show the main results from our analysis of structural elements of ResearchGate and how they promote competition. In Section 5, we discuss the results from our questionnaire study on platform use and their implications for Austrian researchers, while Section 6 offers concluding remarks.

2. Research questions and theoretical approach

2.1 The rise of competition in (Austrian) academia

Competition in academia has recently become a much-researched field, not least due to the general expansion of competition research. Scholars from different disciplinary backgrounds postulate an era of competition since the 1980s, where many social fields and different aspects of life are increasingly organized and structured by competition (e.g. Jessop 2016; Davies 2017). In this regard, scholars focus on how competitive agency of universities is constructed (Hasse and Krücken 2013; Musselin 2018), the concepts of the entrepreneurial university and academic capitalism (Slaughter

and Rhoades 2004; Münch 2014), the role and impact of rankings (Espeland and Sauder 2016; Brankovic, Ringel and Werron 2018) and competitive research funding (Himanen and Puuska 2022; Osório and Bornmann 2022), different forms of evaluation practices across countries and disciplines (Hammarfelt 2017; Pühringer, Maesse and Rossier 2024), the performative impact that the quantification of impact and reputation has on the research practice of individual researchers (van Dalen and Henkens 2012) and the business model of academic publishers (Puehringer, Rath and Griesebner 2021). Especially relevant is the quantifying approach of valuation practices and devices in academia via metrics, which make the measured units, e.g. publications, scholars or universities comparable and evaluable (Peter 2017; Musselin 2018; Jordan 2019; Francke and Hammarfelt 2022: 4). Generally, the rise of the ‘metric tide’ (Wilsdon et al. 2015) in academia has led to a globally standardized stratification scheme for academic institutions and researchers alike. In this vein, impact factors, standardized bibliometric indices such as citation impacts or the h-index as well as university rankings enforce and institutionalize competition among universities and scholars (Carson, Bartneck and Voges 2013; Allmer 2024).

The development of Austria’s academic system reflects many of these developments, following the logic of new public management (Huisman 2009; Kreissl et al. 2018). At the organizational level, Austria introduced several reforms meant to improve the quality and productivity of universities and researchers over the last three decades. While the 1993 University Organization Act first increased the autonomy of universities from the Ministry of Science and Education, the later 2002 University Act (UG 2002) marked a particularly important and far-reaching reform of the Austrian higher education system (Winckler 2012; Gornitzka and Maassen 2017). Within the context of the Bologna Strategy, the UG 2002 strengthened university financial and organizational autonomy and modified the organizational framework of higher education management at the Ministry of Science and Education (BMBWF). Austria introduced several management tools of excellence orientation such as external quality assurance, audits and *knowledge balance sheets*, which continue to be used as a basis for triannual performance agreement negotiations between universities and the Ministry. Competitive formats are addressed directly by the BMBWF in its ‘three-tier-model’ of university funding. This model is based on indicators that measure the performance of universities in the areas of research, teaching and infrastructure, with ‘competitive indicators’ (‘Wettbewerbsindikatoren’) are used as one basis to allocate public funding in the areas of research and teaching (Altreiter, Pühringer and Völkl 2024; BMBWF 2024). While these reforms reflect an overall trend of the competitization of academic institutions, they have also intensified competition at the individual researcher level. Over the last two decades, the number of third-party funded researchers (‘Projektmitarbeiter: innen’) in Austria doubled from 5,700 (winter term 2005) to 11,500 (winter term 2020) (BMBWF 2023, 97). This expansion shows the increased impact of third-party funding, which is organized competitively by research funding organizations and has also exacerbated the precarious working conditions of (young) researchers in Austria. Hence, in 2021, ~80% of the scientific personnel at Austrian universities had fixed-term employment contracts, a percentage much higher than in almost any other European country (see Frölich et al. 2018; Aarnikoivu et al. 2019).

2.2 An analytical framework for understanding competition in academia

To grasp these different kinds and formats of competition in academia, we start from an understanding of competition as consisting of four basic elements (Simmel 1995 [1903]; Arora-Jonsson et al. 2021; Altreiter et al. 2023; Wolfmayr 2024): *First*, scarcity of a rival good. *Second*, a competitive allocation mechanism that rewards the party that best meets certain criteria. *Third*, at least two competitors who perceive the situation as a competition and who also understand themselves as competitors. *Fourth*, the ability to perform, such as control and decision-making power, ie competitive agency. Coming from constructivist competition research, we do not understand these four basic elements as naturally occurring but ask how they are constructed in different types and formats of competition. In this paper, we pay especially attention to the role of metrics for the construction of competition. Scholars from the growing field of valuation studies are increasingly interested in the practices and technologies of valuation of scientific work and in how metrics, rankings and scores can be used as ‘judgment devices’ or ‘calculative devices’ (Hammarfelt 2017; Callon 2021). A key finding relevant to this paper is that these valuation devices and practices do not measure the independent quality of social entities, but rather co-construct these measured entities by qualifying them (Callon 2021). Following this line of thought, this paper is not interested in how accurately valuation practices and devices measure scientific productivity, but rather examines them as essential elements in the construction and performativity of competition, i.e. as *competition devices*.

As the examples of competitization in academia show, there are many different types of competition in academia at different scales and for different actors (Musselin 2018; Krücken 2021; Osório and Bornmann 2022). Competition occurs at individual (scholars compete for grants, jobs, positions in committees, positions in journals, scores, visibility), institutional (universities compete for students, grants, high positions in rankings, visibility) and national (nations compete for knowledge hubs) levels (see Fig. 1). Borrowing a term by Arora-Jonsson et al. (2021:224), we refer to this myriad of competitions in which contemporary scholars find themselves in as an ‘academic competition ecology.’

On the individual level, the competitions can be divided into those that are primarily concerned with financial aspects (jobs, grants) and those that are primarily concerned with questions of academic prestige (publications, prizes, grants, metrics, ranking positions, visibility). There is a complex relationship between the two types of competition: competitions for financial aspects are often decided on the basis of competitions for academic prestige, for example when the number of publications or high metrics are decisive for the appointment of high positions. However, studies analyzing the increasing importance of competitive third-party funding not least as an important evaluation indicator in university rankings such as THE also suggest that vice versa competitions for financial aspects can be the basis for decisions on academic prestige (e.g. Gornitzka and Maassen 2017; Söderlund 2020; Wiener, Maresch and Breiteneker 2020). Apart from the fact that high positions themselves go hand in hand with high academic prestige, this is the case when prizes and publication opportunities are primarily accessible to scholars with high

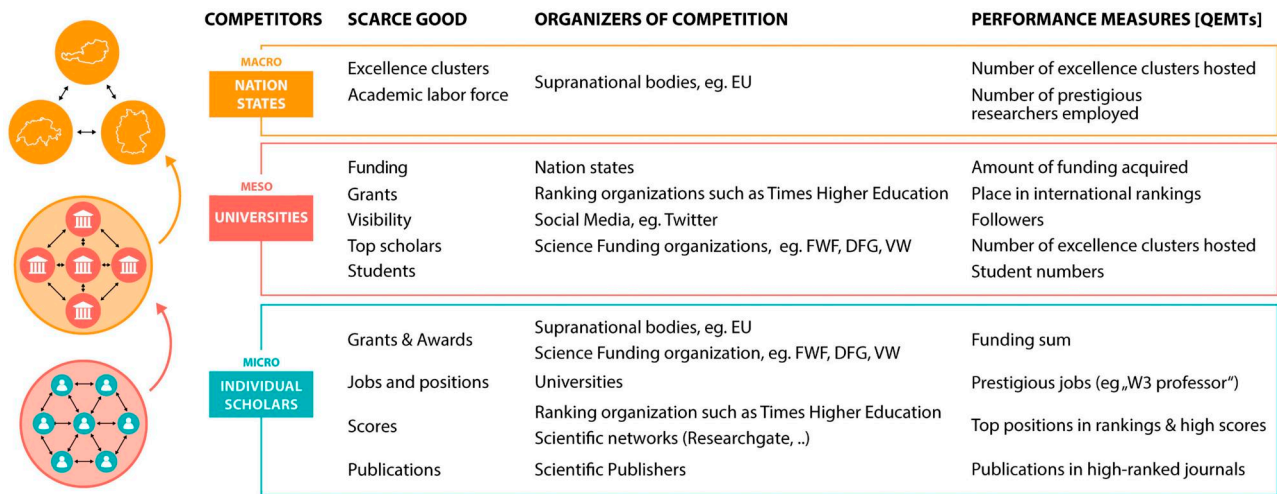


Figure 1. Academic competition ecology: Nested competitions and their connections in academia.

academic prestige. In this context, ASNs enable individual scholars to make their own academic prestige visible, foster it and pursue it more strategically, which in turn increases their chances on the job market.

Based on this framework, in this paper we are particularly interested in the individual level of competitization, specifically in how the four basic elements of competition (scarcity, competitive allocation mechanism, competitive self-understanding, competitive agency) are constructed on ASNs and in how competition is subjectivized by individual scholars through their use of these ASNs.

2.3 On the individual level: the subjectivation of competition on ASNs

In the last two decades, many scholars have been concerned with how competition gets subjectified on the individual level by the involved competitors, i.e. to what extent actors understand themselves and others as competitors and actually act competitively (Bröckling 2016; Reckwitz 2020). A few studies have addressed competitive subjectivation in the academic world: They are concerned with how scholars understand themselves as *academic entrepreneurs* (Peter 2017), practices of comparing oneself with colleagues (Hammarfelt, de Rijcke and Rushforth 2016), incorporating the principle of publish-or-perish (van Dalen and Henkens 2012; Carson, Bartneck and Voges 2013; Sigl, Felt and Fochler 2020), maximizing scientific output by splitting publications into least publishable units (Peter 2017), the narrowing of evaluative principles available to researchers to value their work (Fochler, Felt and Müller 2016) and also the subversion of competitive subjectivities (Sigl 2019).

We understand the emergence of specialized ASNs such as Google Scholar (2004), Academia.edu (2008), and ResearchGate (2008), as a further step in the dissemination of metrics, in making scientific work comparable, and in the diffusion of competitive relations between scholars. There has been increasing scholarly interest over the past decade in how and by whom these ASNs are used and what effects they have on their users (Muscanell and Utz 2017; Plantin et al. 2018; Utz and Muscanell 2018), although studies about academics' views on and interpretations of ASNs are still rare (Jordan 2019:12). However, only a few studies have explicitly researched *competitive* aspects of ASNs: Utz and

Muscanell (2018) studied feelings of envy and pride while using platforms, Hammarfelt, de Rijcke and Rushforth (2016) examined how neoliberal ideas about markets and competition shape the conception and enactment of research as a game on ASNs and how profiles are technologies of the professional self, Komljenovic (2019) studied how ASN metrics enhance competition and Duffy and Pooley (2017) examined how these networks lead to the self-branding of scholars. To complement this research, we examine how and to what extent scholars—being embedded in the academic competition ecology—experience competitive subjectivation on ASNs, specifically on ResearchGate.

The selection of ResearchGate as a research case was based on the platform's great popularity, the novel combination of its features and the fact that it provides its own research metric. Moreover, ResearchGate was also the most often mentioned ASN in our questionnaire survey with Austrian researchers; about two thirds of our respondents reported that they use ResearchGate in a professional context (see Section 4). ResearchGate was founded and launched in 2008 as one of the first academic social networks by German scholars Ijad Madisch, Sören Hofmayer and Horst Fickenscher. According to its own statements, money is made in particular with personalized advertising and subscription-based services as well as the selling of user data (Goldenfein and Griffin 2022). It has received funding from several venture capital firms. Since 2023, ResearchGate has been cooperating with the scientific publisher De Gruyter, which means that content from 437 journals is included in ResearchGate. According to its own data, today ResearchGate has 20 million users in over 190 countries.

Similar to platforms such as Academia.edu and Mendeley, ResearchGate provides features of more static academic databases such as Google Scholar, Scopus or Web of Science, as well as interactive communication tools and a job market tool. Thus, as different scholars have described, ASNs are a new, hybrid type of online platforms that combine publication databases with more profile-oriented social media sites (Hammarfelt, de Rijcke and Rushforth 2016; Komljenovic 2019; Francke and Hammarfelt 2022: 1). Regarding competitive subjectivation, we are particularly interested in specific structural elements of ResearchGate, namely *profiles*, *metrics/statistics* and *request/notifications*. Particularly, ASN metrics

make competition more visible by presenting comparative information to users, e.g. by reminding them of their colleagues' performance and their own relative position (Hammarfelt, de Rijcke and Rushforth 2016; Musselin 2018: 672; Utz and Muscanell 2018) in the 'indicator game' (Fochler and de Rijcke 2017). While bibliometrics play an essential role in the evaluation of scientific work in academia, it also encourages competitive subjectivation by enabling self-monitoring and self-surveillance (Komljenovic 2019), putting pressure on scientists to publish (Sigl, Felt and Fochler 2020; Francke and Hammarfelt 2022), influencing their affective state (Burrows 2012) and leading to entrepreneurial and self-promotional attitudes (Duffy and Pooley 2017) and the reduction of epistemic diversity (Müller and de Rijcke 2017). Now ResearchGate, which is increasingly part of the socio-material infrastructure of academic competition ecology, not only makes metrics visible, but also adds its own metric, the Research Interest Score, which can be used to compare the value of scientific work, thus stabilizing certain evaluation principles.¹

Following the useful differentiation of 'double empiricism' in recent studies on subjectivation (e.g. Bosančić, Pfahl and Traue 2019), we are interested in two sides of the competitive subjectivation on ResearchGate: (a) How the structural elements of ResearchGate offer and suggest modes of competitive subjectivity to scholars, especially notions of a 'competitive self', via the construction of the basic four elements of competition (Section 4), and (b) which subjectivities they actually adapt in their everyday academic life (Section 5). This differentiation considers the insight of constructivist competition research, which claims that the organization of competition does not necessarily lead to competitive behavior (Brankovic, Ringel and Werron 2018). Thus, even though scholars are addressed as competitors by ResearchGate, they may not accept this labelling or may even question it.

Thus, in sum, our paper's main inquiry is (1) how ResearchGate as a competition device constructs, through its structural elements of *profiles*, *metrics/statistics* and *requests/notifications*, the four basic elements of competition and suggests competitive subjectivities to its users, and (2) to what extent scholars who use ResearchGate actually understand themselves and other scholars as competitors and, thus, to what extent ResearchGate actually has a performative effect on the current state of the academic world.

3. Empirical approach

Our study rests on two methodological pillars: *First*, in order to study how ResearchGate as a competition device suggests competitive subjectivities, we conducted a detailed study of its structural elements, i.e. *profiles*, *metrics/statistics* and *requests/notifications*. The goal of this structural platform analysis was to develop a better understanding of the role that ResearchGate plays in the construction of competition and for the process of subjectivation of competition and thus its impact on constructing a 'competitive self'.

Second, in order to study to what extent, the users actually adopt these competitive subjectivities, we gathered primary data from a questionnaire study conducted among a full sample of Austrian scientists in four research fields: biology, economics, sociology and historical science. These four disciplines have been confronted with varying degrees of the ecologies of competition and thus represent a broad spectrum for a comparative analysis of competitive subjectivation. We collected primary

Table 1. Demographics of the respondents ($n = 379$).

Gender distribution [%], $n = 327$					
Female		Male		Divers	
48.93		49.55		1.52	
Academic Position [%], $n = 340$					
(Assoc)Prof	Post-Doc	Project Staff	Lecturer	PhD Student	Other
27.06	41.77	10.29	7.36	18.82	10.49
Discipline [%], $n = 368$					
Natural Science	Economics	Social Sciences		Humanities	Other
35.08	17.85	30.77		24.62	0.92
Age Distribution [%], $n = 333$					
<35	36–45	46–55	56–65	>65	n.a.
27.32	31.83	21.62	12.91	5.11	1.2

data by designing a questionnaire and forwarding it to all scientists (see the [Supplementary Appendix](#) for a full list of institutes) with Austrian affiliations starting from master-degree level. After an initial pre-test in April 2022, we collected data in June and July 2022. The link to the online anonymized questionnaire was connected to a serial number in order to exclude multiple participations per scientist. Scientists working at universities of applied sciences (Fachhochschulen) or comparable Austrian research institutes were excluded from the sample. In sum, we identified 2,809 scientists affiliated with Austrian universities in the four fields and invited them to join our survey. The gross response rate was 14.7% (413 respondents), while the net response rate was 13.5% (379 respondents). [Table 1](#) provides the demographics of the participating sample.

Compared to the overall demographic statistics of the Austrian University System, the group of Full and Associated Professors is overrepresented in our survey. The disciplinary background as well as the gender distribution is quite similar to the overall population of researchers in our sample as well as the overall population of researchers in the Austrian University System ([BMBWF 2023](#)). The questionnaire primarily focused on how individual researchers use ResearchGate in their everyday work (see the full questionnaire in [Supplementary Appendix S1](#)). We asked for personal assessments of the impact that these networks have on research practices and general stratification logics in academia. More specifically, we were interested in how and to what extent researchers interpret the role of ResearchGate in fostering individual competitive behavior. Therefore, we used rating scales as well as open questions and distinguished between active and non-active ResearchGate users. Furthermore, we asked the participants for their overall evaluation of metrics and rankings in science. Finally, we conducted comparative analyses of researchers with regard to different career phases, sociodemographics and academic disciplines.

4. Construction of competition and suggested subjectivation on ResearchGate

In order to examine how ResearchGate promotes competition among its users and encourages competitive subjectivation, we analyzed the central structural elements of the platforms and also provide some background information on the user interface

of ResearchGate for those who are not familiar with this ASNP. We identified three structural elements that contribute differently to how they construct competition and suggest competitive subjectivation: *profiles*, *metrics/statistics* and *requests/notifications*.

4.1 Profiles

On ResearchGate, the profile page allows the user to present their own work. Users can add a profile picture and describe their research in their own words. The descriptions often resemble short CVs, including current research projects, institutional affiliations and research interests (see Fig. 2). In addition, the users' activities on ResearchGate are summarized and they can use ready-made forms to provide information on education, institutional affiliations, journal positions, grants and awards and memberships. A summary of the user's attributes in the form of a 'business card' can be found at the top of the profile page, along with an indication of how often it has been viewed in the past week.

Thus, profile pages on ResearchGate allow users to present themselves to the academic community, promote their image and influence the perception of their research activities. However, this raises the question of how the user wants to appear and how the researcher avatar should be designed. Thus, users are addressed as active subjects who have to shape their own presentation and communicate themselves to a scientific public. Back to the four elements of competition, then, profiles co-produce users' competitive agency in the scholarly community by enhancing their options for self-presentation. Beyond these possibilities for shaping one's own profile, the logic of the individual profile also fundamentally reproduces the conception of scholarship that can also be found on university websites, in CVs, and in the idea of individual authorship, namely that scholarship and knowledge production is an individual matter (Fochler, Felt and Müller

2016)—a central requirement for understanding oneself and others as competitors, thus the third element of competition.

4.2 Metrics and statistics

Metrics and statistics are another key structural element of ResearchGate and appear in many different places on the platform. Upon visiting the ResearchGate homepage, users are immediately confronted with their own metrics: A text box titled 'Stats on your research' shows the changes from last week and links to the *stats page*, where statistical values for publications such as reads, citations, recommendations, mentions and research interests are displayed and can be differentiated: Which aspects of my research interest score have changed? This page also shows the metric and visual representation that most strongly establishes a comparative relationship to other scientists: the comparison of the user's own research interest with that of other researchers and the user's competitive position in this comparison (see Fig. 3). The user's research interest score can be compared with different categories of users. In each case, the page indicates one's relative position, which also implicitly promotes a hierarchical order of science. A separate page is dedicated to these comparisons: 'How your Research interest compares. See how much interest your research items are getting compared to the work of other researchers on ResearchGate.' Moreover, similar to platforms like Facebook or Instagram—and particularly similar to the target group logic in marketing—detailed information on readers can be displayed and broken down by country, discipline, academic position or institution. A statistical history visually displays the development of the user's scores with graphs. This makes it possible to identify patterns and directions of development over the course of weeks, months and years, to assign them to individual publications and to differentiate divergent developments; for example, if a rising research interest curve is not reflected in a rising citation curve, which allows for analyzing one's own scientific

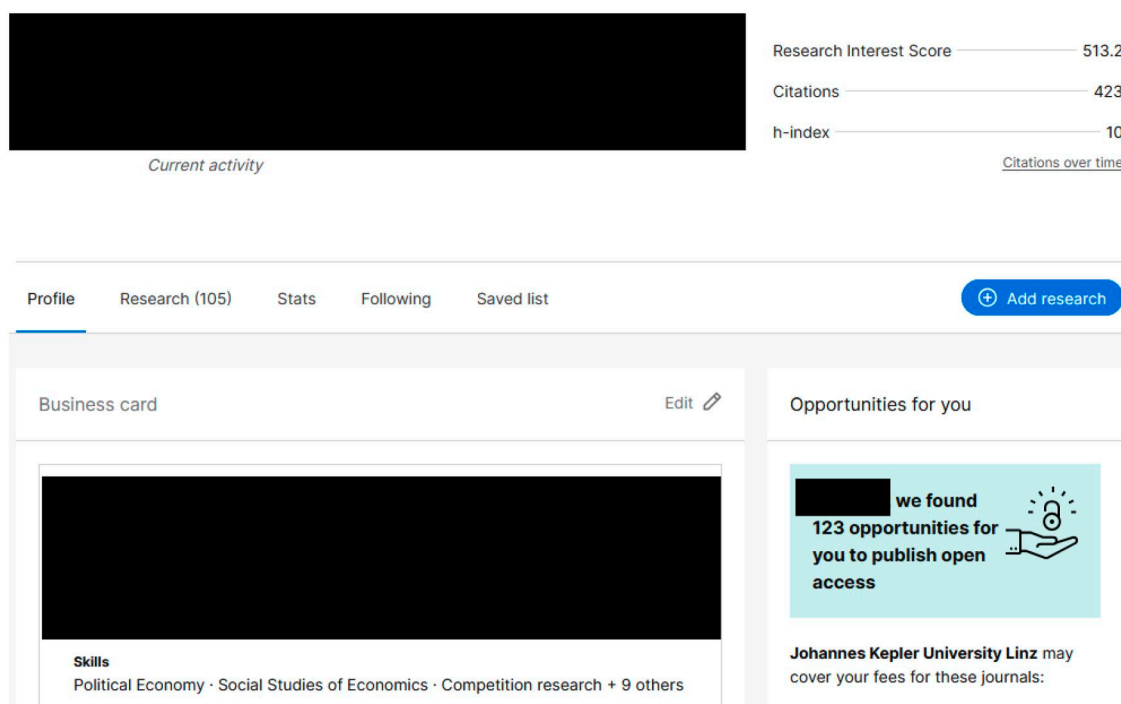


Figure 2. Anonymized ResearchGate profile.

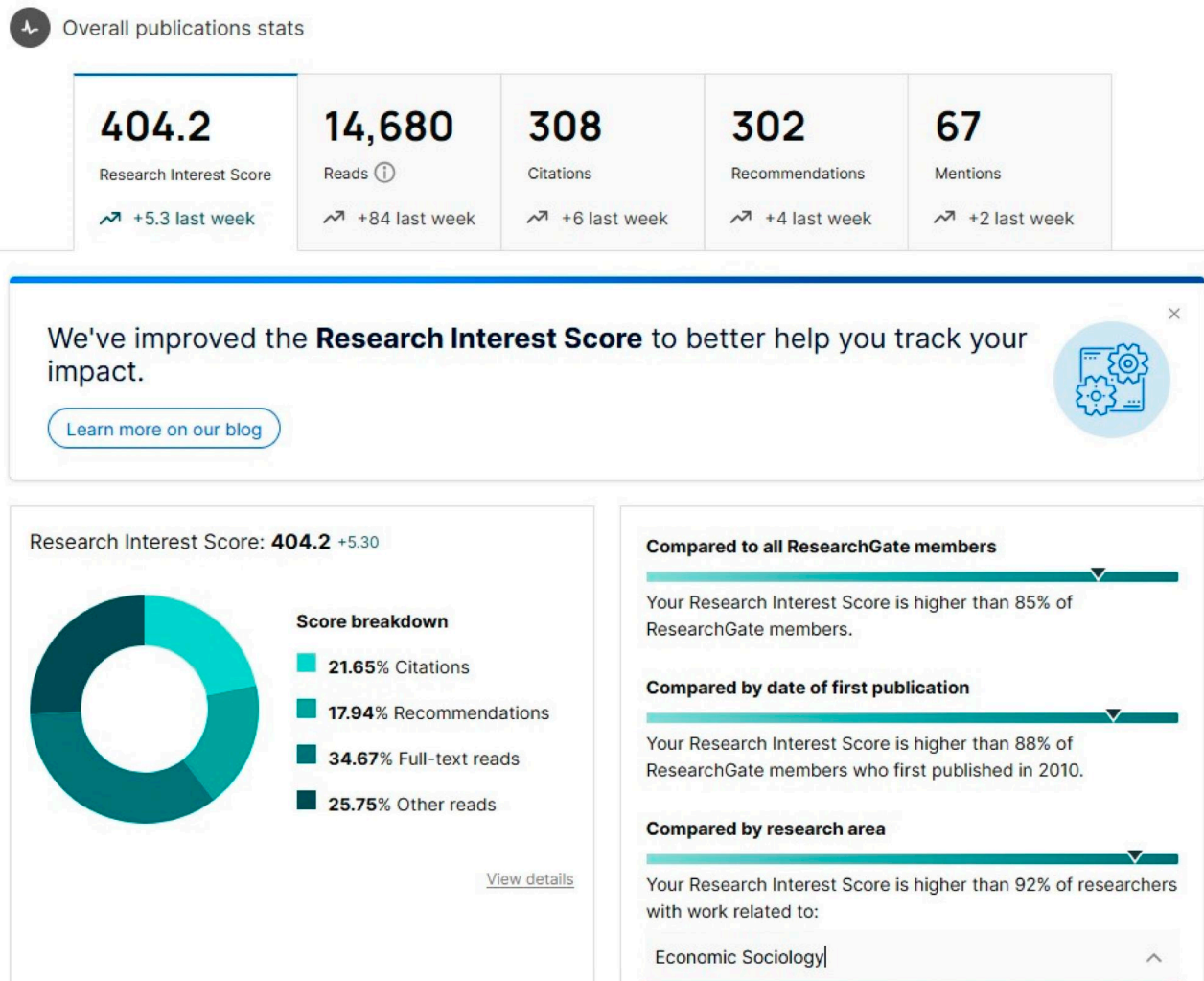


Figure 3. Differentiated comparison with the scientific community.

output by means of self-tracking. While these metrics on the stats page can only be viewed by oneself, the metrics on the *scores page* and the *profile page*, i.e. research interests, h-index and citations, are also accessible to other users, who can thus check the scientific impact and ‘value’ of other scholars.

In sum, ResearchGate provides a plurality of metrics and statistics that allow self-tracking as well as the statistical categorization of other scholars. Crucially, this enables and encourages comparison between oneself and the scholarly community. Unlike profiles, then, metrics level out personal differences and replace them with comparable, universal and context-free scores. The massive visibility of metrics and rankings on ResearchGate co-constructs competitive relations between its users by creating universal comparability and equivalence of scholarly work, situating the user's values in relation to all other users. Metrics and the way they are presented on ResearchGate, thus, simultaneously reinforce all four basic elements of competition. First, the evaluation and metrication of research output can be interpreted similarly to rankings as an important driver of scarcity by defining and enhancing the desirability of exclusive high positions such as being in the top percentiles of researchers (Espeland and Sauder 2016; Brankovic, Ringel and Werron 2018; Brankovic, Ringel and Werron 2022). Secondly, this invites users to compare and compete with each other,

turning them into subjects who see themselves and others as competitors. Third, the ability to monitor the development of one's own metrics and values strengthens self-reflection as an essential prerequisite for competitive agency and, thus, the ability and awareness to also influence this development. Fourth, also similarly to rankings, ResearchGate's competitive positioning of users can be interpreted as a mechanism allocating desirable high ranks to the users who achieve the highest scores.

4.3 Requests and notifications

The first two structural elements are amplified by a third element: the requests and notifications which pop up via different channels of ResearchGate. The first thing that stands out is the large number of emails with requests and notifications that this platform sends to its users; for example, about achievements, publications by other scientists, new research from one's own network and, notably, the aforementioned weekly statistical reports. This *report of the week* lets users track weekly changes to their metrics, making the growth of their ResearchGate scores regularly visible. Moreover, users are asked to contribute to this growth with prompts: ‘Increase your impact.’ Suggestions are provided, including adding full texts or linking to the user's own ResearchGate profile from an external site. This option for improving one's

own visibility is detailed in the platform's *Help Center* under the title 'How to use SEO [Search Engine Optimization] to improve the visibility of your research.' Noting that 'it is becoming more and more important for researchers to improve the visibility of their work,' the site recommends linking from other websites which 'can get up to 5 times more publication reads,' adding a profile photo because 'publications on profiles with photos get 50% more reads,' completing the profile because 'publications on profiles with complete About sections get up to 150% more reads,' confirming authorship of one's publications and adding full-texts, abstracts and other data. Notifications and a notification feed are another platform feature: The notifications page continuously informs the user about news, including the new 'report of the week,' when a milestone in reads or citations is reached ('Your research items reached 1,500 reads') or when other scientists follow the user's own updates. However, outstanding 'achievements' are also mentioned: 'With xxx new reads, your research items were the most read research items from your department.' Upon achieving these milestones, the user is awarded a graphic medal with the words 'Way to go, XXX!' and can also share these achievements on social media (see Fig. 4).

Overall, these requests and notifications encourage an active subject by constantly reminding users how they can increase their visibility, while introducing elements of gamification. In a similar vein, Fochler and de Rijcke (2017) as well as Hammarfelt, de Rijcke and Rushforth (2016) have argued that against the background of the highly individualized competition ecology in academia with few reward mechanisms, these incentives for profile maintenance can become a self-chosen strategy to achieve social recognition. Thus, by making quantitative relations between users a constant theme, the platform further encourages—as an essential element of competition—a competitive imaginary in which users understand themselves and others as competitors.

Thus, in sum, ResearchGate can be understood as organizing an own format of competition. While the three competitive

elements of the platform (*profiles, metrics/statistics and requests/notifications*) promote pre-existing competitive relations among scholars, they also organize them: by defining and enhancing the desirability of scarce high ranks in the academic community; by encouraging self-presenting, active, and individual subjects who constantly compare themselves with other scholars and strive for greater visibility, ie competitive subjects; by strengthening users' competitive agency through the possibility of self-presentation and self-monitoring; and finally, by allocating desirable high ranks in a competitive positioning of users. In the following section, we examine whether and to what extent this construction of competition and suggestion of competitive subjectivity is actually embraced by scholars.

5. Competition and ResearchGate usage among academics

Our questionnaire study's objective was to develop a better understanding of ResearchGate use in order to examine to what extent users actually understand themselves and other scholars as competitors. Therefore, our *first* step was to generally ask about using or not using specific ASNPs, as well as users' specific interactions, practices and routines along with the overall evaluation of the role that metrics and rankings play in academia. In a *second* step, we specifically examined competitive subjectivation on ResearchGate and used five questions to measure the level of competitive behavior associated with its use. Finally, we also checked whether competitive behavior differed between academic disciplines, gender, age and academic status.

5.1 The use and importance of ASNPs

Our sample displayed an uneven distribution in the use of ASNPs but was quite high for ResearchGate with ~65%. For comparison 31% of respondents reported using Academia.edu and only 4% Loop, while the rather static academic platform Google Scholar was used by 46% (see Fig. 5). The usage rates were higher than in similar previous studies (Muscanell and Utz 2017), which provides some evidence for the increasing importance and popularity of ASNPs over the last few years. However, we also found significant differences concerning ResearchGate use between disciplines. While it was particularly high in the natural sciences (74%) and also among social scientists (71%) and economists (69%), it was much lower in the humanities (38%). Age and gender differences did not seem to play a significant role for usage rates, with slightly more men than women (67% and 63%, respectively) and more younger (<35 years) than older (>50 years) researchers (67% and 64%, respectively) using ResearchGate.

While ResearchGate is already widespread among our sample of Austrian academics, a lack of time resources was seen as the most important restriction (47%) for an even higher level of engagement. In this context, it is also telling that 50% of all ResearchGate users agreed or strongly agreed with the statement that their engagement meant that 'unevaluated aspects of my scientific work, such as teaching, academic self-administration, peer reviews, lose importance'.

In a next step, we asked respondents about their experiences with the relevance of research metrics in their professional careers in general. More specifically, we asked: 'Where do you think metrics like impact factors, Hirsch index, RG score, citations have played a role in your scientific career?' Overall, we found that metrics especially played a role in job

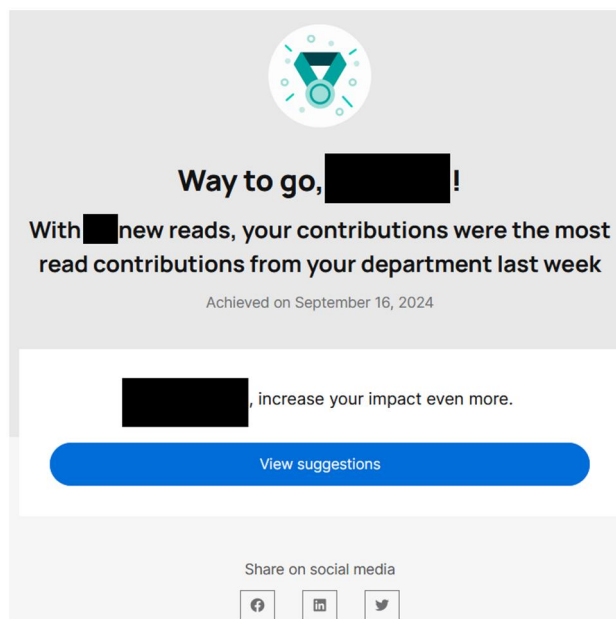


Figure 4. Notification of a personal achievement on ResearchGate.

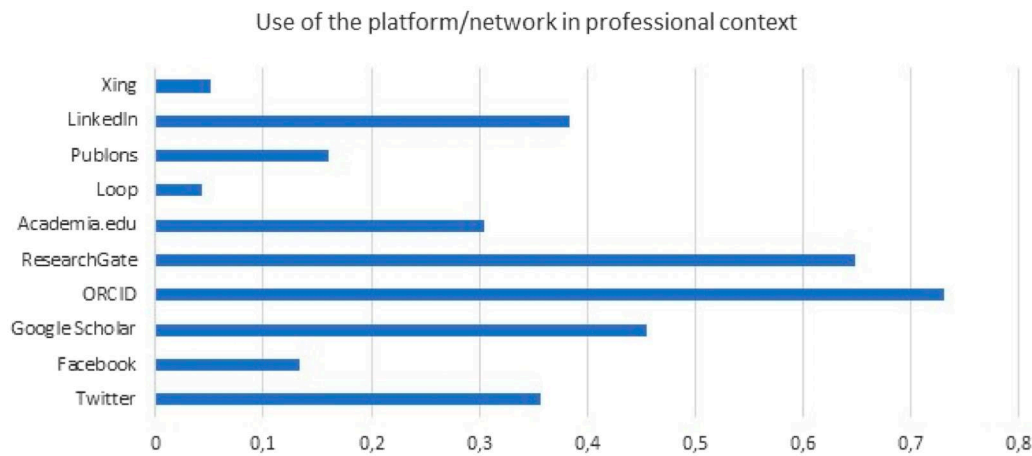


Figure 5. Use of ASNP in professional context.

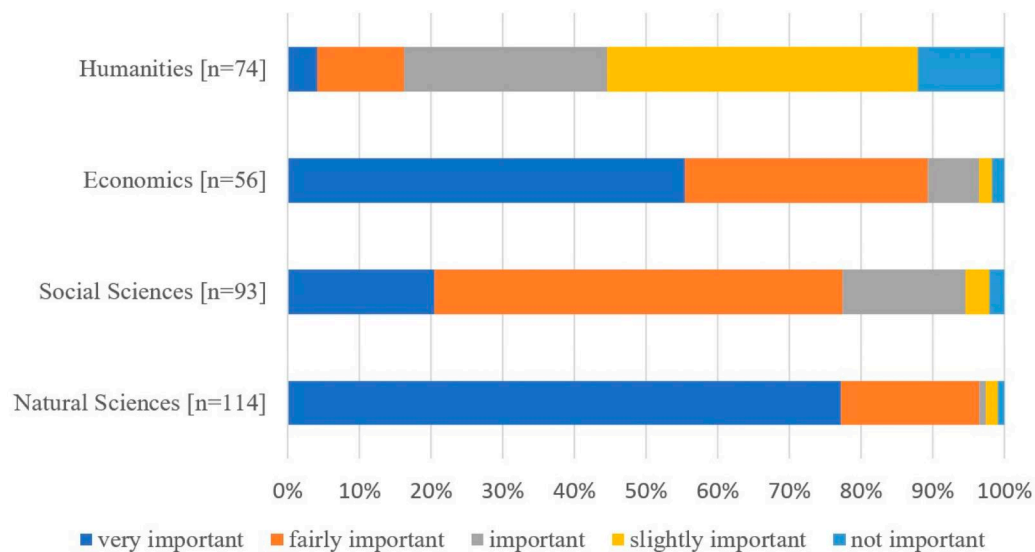


Figure 6. Importance of research metrics in different disciplines.

applications (58%) and for research proposals (49%). Moreover, 36% also reported that research metrics impacted ‘internal university evaluations’ and 31% ‘for external evaluations of my position/job.’ Again, metrics seemed to be more important for natural scientists (61%), followed by social scientists (49%) and economists (41%) and less important for scholars in the humanities (22%, each for the case of job applications). While younger scholars reported a comparably lower relevance of metrics in job applications (24%) compared to older scholars (40%), which might be due to their career status. There was also a statistically insignificant small gender difference: 50% of the male, but only 42% of the female respondents reported that metrics had been relevant for past job applications.

In a last step, we also looked at the overall relevance of metrics in different disciplines and asked respondents to evaluate the importance of research metrics for their own disciplines. The results were quite striking: 96% (very or fairly) agreed that metrics were important in the natural sciences, followed by economics (89%), social sciences (77%) and the humanities (16%) (see Fig. 6). These results provide further

evidence for disciplinary differences concerning the extent to which research metrics and quantitative stratification logics have been successfully scientifically adopted.

These different levels of the relevance of metrics provide interesting empirical findings in the light of recent studies showing that the use of bibliometrics and quantitative evaluation indicators in general leads to competitive subjectivation (Sigl, Felt and Fochler 2020; Francke and Hammarfelt 2022). Müller and de Rijcke (2017) have also reported that that it could lead to a reduction in epistemic diversity. In line with this claim, especially for economics, it has been consistently reported that bibliometric indices induce a path-dependent mainstreaming of research and thus a marginalization of heterodox economic research (Aistleitner, Kapeller and Steinerberger 2018; Stockhammer, Dammerer and Kapur 2021). Due to the central role of quantitative evaluation indices and especially rankings in economics (Fourcade, Ollion and Algan 2015; Hylmö, Reymert and Hammarfelt 2024), Buehling (2021) has even reported a change in research topic trends as an effect of the very popular Handelsblatt-Ranking in Germany. Moreover, metrics co-produce the notion that they represent actual achievements and

that scientists can be hierarchized according to them—that science is meritocratic (Peter 2017; Gallas 2018). Against this background in the following section we provide a detailed analysis of our survey results with regard to levels of competitive subjectivation.

5.2 Competitive subjectivation on ResearchGate

Based on this overall evaluation of ASNP use and the role of research metrics for researchers of different ages and genders and from different disciplines, we aimed to evaluate to what extent scholars who use ResearchGate understand themselves and other scholars as competitors. Therefore, we used the following set of six statements indicating an increase of competitive behavior associated with the use and active engagement on ResearchGate. The initial question for all statements was: ‘Due to my use of ResearchGate, I...’:

- I increase my own visibility.
- I find it easier to assess the quality of individual researchers/research results.
- It seems more important for me to get cited
- I compare myself more often with other researchers
- I see my work more in a competitive context
- I perceive other researchers as competitors

While all six questions are related to competitive subjectivation, the last three address the competitive self more directly. We generally found that direct impact of ResearchGate use on competitive subjectivity was reported by a considerable share, but hardly the majority of our respondents. However, the results from our questionnaire concerning main causes of ASNP use and the fact that, about two thirds of respondents had a ResearchGate account (see Section 5.1) indicate that many researchers chose or felt obliged to confront themselves with the competitive logic of ResearchGate to a certain extent. Table 2 provides an overall overview of approval rates to questions that evaluate competitive subjectivation on ResearchGate.

First, the responses again show that increasing one’s visibility is not only one of the main motivations behind ASNP use in general, but that ResearchGate also seem quite capable of fulfilling this task. In fact, the mean value for agreement with this statement was 3.56 for ResearchGate users, or in other words 66% agreed or strongly agreed with this statement.² Overall, active participation on ResearchGate was seen as an important way to gain visibility, which in turn increases the competitive position of researchers in contemporary academia. The mean value for using ResearchGate as an assessment tool for ‘quality of researchers’ was 2.37 and the impact

of ResearchGate on the importance of getting cited was positively reported by 39% of the respondents (mean value 2.85).

To further investigate the level and extent of competitive subjectivation on ResearchGate, we asked three more direct questions, namely about comparing oneself with others, seeing one’s work in a competitive context and perceiving other researchers as competitors. Again, we deliberately decided to frame the questions rather provocatively and thus assumed that there was a substantial social desirability bias favoring disagreement to these statements. Overall, we found that a substantial share agreed with these very explicit aspects of competitive subjectivation, however the levels of agreement vary between the different statements. The approvals were higher for comparing (mean value 2.9) and seeing one’s work in a competitive context (mean value 2.91) than perceiving other researchers as competitors (2.36) (see Table 2). In other words, 41% of ResearchGate users (strongly) agreed that they compared themselves with others more often and 44% saw their work in a more competitive context. In turn, only 25% reported that they perceived others as competitors, while 59% (strongly) opposed to this statement.

Interestingly, disciplinary background impacted the questions on competitive subjectivation on ResearchGate differently (see Table 3). While the usage rates of ResearchGate was lowest among humanities scholars and they also reported by far the lowest numbers with regards to the relevance of research metrics in their discipline (see Section 5.1), the agreement levels to statements on competitive subjectivation was above the average for all six statements. Although due to the low number of users this result has to be interpreted cautiously, we would argue that the competitive exposure on ASNPs seems to be particularly strong for those scholars, who might be less confronted with a competitive research culture and quantitative evaluation criteria. Beside this rather superficial interpretation, our results yield hardly noteworthy differences between disciplines, which might also underline that competition and quantification of research evaluation is really a global trend in academia.

Concerning age and gender, our results are rather clear for most statements related to competitive subjectivation (Table 3). First, age really seems to play an important role. With the exception of quality assessment,³ junior researchers (we used the two age groups ‘younger than 35 years’ and ‘older than 50 years’) report a higher level of competitive subjectivation than senior researchers. These differences are even highly significant (>0.01) for all the five remaining questions regarding visibility, being cited, comparing oneself, seeing oneself in a competitive context and perceiving others as competitors. The agreement levels were not only above the overall average of respondents but some forms of competitive subjectivation—particularly comparing and seeing one’s work in a competitive context—have been reported by a majority of younger researchers. In other words, ResearchGate is contributing to the competitive pressures in modern academia, which are affecting a substantial share of particularly young researchers. In this respect, typical open responses read like the following: ‘I also think it is hypocritical to pretend that one is not encouraged to see oneself in a competitive environment in all academic matters (project acquisition, job advertisements etc etc). Competition is promoted by all those responsible and often contradicts or prevents cooperative behavior.’ The negative implications of increased exposure to competitive pressures have been reported recently in several

Table 2. Evaluations of competitive subjectivation on ResearchGate.

Because of my use of ResearchGate ...	Mean values ^a [n]
... I increase my own visibility.	3.56 [209]
... I find it easier to assess the quality of individual researchers/research results.	2.37 [208]
... it seems more important for me to get cited	2.85 [214]
... I compare myself more often with other researchers.	2.9 [216]
... I see my work more in a competitive context.	2.91 [211]
... I perceive other researchers as competitors.	2.36 [212]

^a The mean values represent the level of agreement from 1 = strongly disagree to 5 = strongly agree.

Table 3. Disciplinary, age and gender differences between enacted competitive subjectivation on ResearchGate.

	Disciplines			Age		Gender		
	Economics	Natural Sciences	Social Sciences	Humanities	<35 years	>50 years	male	female
<i>I increase my own visibility.</i>	3.51 [41]	3.56 [73]	3.51 [55]	3.63 [24]	3.2 ^a [50] (0.002)	2.52 ^a [61]	3.65 [98] (0.17)	3.51 [89]
<i>I find it easier to assess the quality of individual researchers/research results.</i>	2.48 [42]	2.51 [72]	2.07 [55]	2.52 [25]	2.4 [47] (0.23)	2.57 [60]	2.46 [99] (0.081)	2.23 [88]
<i>It seems more important for me to get cited</i>	2.93 [42]	2.74 [73]	2.79 [57]	3.16 [25]	3.2 ^a [50] (0.002)	2.51 ^a [61]	2.88 [100] (0.35)	2.81 [93]
<i>I compare myself more often with other researchers</i>	2.93 [41]	2.86 [77]	2.91 [57]	2.92 [24]	3.31 ^a [52] (0.0005)	2.49 ^a [59]	3.08 [100] (0.06)	2.78 [94]
<i>I see my work more in a competitive context</i>	2.78 [41]	2.85 [73]	3.01 [57]	3.00 [24]	3.45 ^a [51] (0.0002)	2.55 ^a [55]	3.00 [97] (0.27)	2.88 [92]
<i>I perceive other researchers as competitors</i>	2.36 [42]	2.41 [75]	2.35 [55]	2.42 [24]	2.68 ^a [50] (0.006)	2.03 ^a [60]	2.51 [99] (0.18)	2.33 [91]

The mean values represent the level of agreement from 1 = strongly disagree to 5 = strongly agree, [number of observations], (*P*-value).

^a Highly significant (*P*-value < 0.01).

studies warning of psychological stress overload (Woolston 2020) and a mental health crisis in academia (Hall 2023).

6. Discussion and conclusion

Our analysis of how ResearchGate constructs competition and suggests competitive subjectivities to its users, and the extent to which scholars who use ResearchGate actually perceive themselves and other scholars as competitors, shows some revealing results.

First, while the structural elements of the platform (profiles, metrics/statistics, and requests/notifications) promote pre-existing competitive relations among scholars, they also organize them: by defining and enhancing the desirability of scarce high ranks in the academic community; by encouraging self-presenting, active, and individual subjects who compare themselves with other scholars; and by strengthening users' competitive agency through the possibility of self-presentation and self-monitoring; and finally by allocating desirable high ranks in a competitive positioning of users. Thus, ResearchGate encourages competitive relations between its users.

Second, the high share of researchers using ResearchGate indicates that ASNPs play an important role in contemporary academia, with the humanities being an exception. This finding is in line with previous similar studies (e.g. Ortega 2015; Muscanell and Utz 2017). It is therefore telling that younger researchers tend to engage more on ASNPs and that 'gaining visibility'—or as one respondent shyly stated, 'gaining at least a bit of visibility'—is reported as one of the major reasons for ASPN use in general. By contrast, many users are well aware that their ASPN engagement depreciates other 'unevaluated' aspects of their academic work such as teaching, academic self-administration and science communication. Thus, our study shows that the need for self-presentation on ASNPs to attract attention and visibility and the deliberative exposure to competition on ASNPs has a formative impact on the everyday academic practices of many researchers. However, interpretations concerning differences in competitive subjectivation have to be interpreted cautiously since we lack information on increases in competitive behavior as such, but rather measure the individual perception of competitive subjectivation.

Third, while our results suggest that ASNPs and particularly ResearchGate seem to contribute to an overall trend of competition in academia, we found a discrepancy between being aware of competitive pressures in general and reflecting and acting according to competitive principles on a very personal level. We found that the agreement with more explicit aspects of competitive subjectivation on ResearchGate was lower and not usually held by a majority, again young researchers being an exception in this respect. Since our sample has a 'seniority bias', ie older professors are overrepresented, our results on competitive subjectivation due to the use of ResearchGate tend to underestimate its impact for the total population of Austrian researchers.

Nevertheless, while the group of researchers that consciously perceives, reflects upon and thus enacts competitive subjectivation might be in the minority, still a substantial share of ResearchGate users (strongly) agreed that they compared themselves more regularly, saw their work more in a competitive context and even perceived other researchers as competitors. However, as some of our open responses suggest, competitive pressures are often simply interpreted as 'rules of the game' in contemporary academia and that

adhering to these rules is not interpreted as a competitive act by many researchers. The primary focus of our analysis was the self-perception of scholars and their reflections on their engagement ASNPs. Consequently, institutional policies shaping the academic competition ecology and defining the 'rules of the game' were only indirectly addressed. The proliferation of ASNPs could also be understood as a consequence of an increasingly competitive academic environment and the growing emphasis on the metrification of science. While institutional policies might have paved the way to the competition of science on a meso and macro level, our methodological approach allows a better understanding of various aspects of competitive subjectivation on the micro level of researchers engaged on ASNPs.

Fourth, we found some illuminating patterns in competitive subjectivation concerning gender, age and disciplinary background. Although the results are not statistically significant, it is telling that for all our statements related to competitive behavior male respondents deliberately expose themselves more to competition, interpret academia more competitively, act more competitively on ResearchGate and also see and perceive their work more strongly in a competitive context than female researchers, which is again in line with recent findings about gender biases in competitive behavior (e.g. Carpenter, Frank and Huet-Vaughn 2018; Saccardo, Pietrasz and Gneezy 2018). These findings have nontrivial implications given the rise of competitive formats in academia (e.g. new excellence programs, Harroche 2022) and are thus particularly alarming for science policies aiming at gender balances in academia. While competitive formats are often presented as objective allocation mechanisms, its gendered organization and the gendered differences in the willingness to engage in them, could well aggravate the success of anti-discrimination policies (van Staveren 2013; Flory, Leibbrandt and List 2015; Hager and Pühringer 2024).

Even more striking and statistically highly significant are our results concerning competitive subjectivation and age: Younger researchers tend to engage more on ASNPs, perceive a stronger competitive pressure and also show higher levels of competitive subjectivation than their older colleagues. On the one hand, this could indicate tendencies of competition in academia and thus suggest that the 'competitive self' could gain further ground among researchers. On the other hand, our results also reflect recent reforms in Austria's organization of the university system. These reforms were accompanied by a sharp increase in rates of short- and fixed-term-contracts as well as the increase of inherently more precarious third-party funding (see Section 2.1), and also reflect strong hierarchies in academia (see also Papatsiba and Cohen 2020 for the UK). Given the various implicit and explicit negative implications of a high degree of competitive behavior in an academic environment, which is strongly organized according to quantitative research evaluation tools, young researchers seem to be particularly responsive to this 'publish or perish' culture in academia. While the negative implications of increased exposure to competitive pressures have been reported recently in several studies warning of psychological stress overload (Woolston 2020; Albayrak-Aydemir and Gleibs 2023) and a mental health crisis in academia (Hall 2023), our results also raise concerns about the future development of the Austrian academic system.

Fifth, concerning the disciplinary background of researchers, our results show that ASNPs hold much less importance

in the humanities than in economics, the social sciences and especially natural sciences. However, while humanities scholars stress the low relevance of metrics and also report experiences with metrics in their academic careers to a lesser extent, competitive pressure and competitive subjectivation due to ASNP use was interestingly reported most strongly by humanities scholars engaged on ResearchGate. Hence, our results suggest that engagement on ResearchGate has a much stronger competitization-effect for humanities scholars than for others, who already perceive the role of individual comparison via metrics and quantitative research indicators as very important in their respective disciplines. This reflects different research and publication cultures across academic disciplines, which impact on the behavior and self-perception of researchers; allegedly more than their engagement on ASNPs.

Our findings show that contemporary scholars are confronted with platforms and metrics that encourage competition-oriented subjects. Thus, even though institutional policies of the last decades have powerfully contributed to a far-reaching academic competition ecology, ASNPs are not merely neutral technologies that simply measure and visualize scientific work for better or worse. Consequently, their flaws cannot simply be fixed with better measurement tools in the sense of a critique *in concurrentia* (Ergen and Kohl 2022). Rather, our survey results show that ASNPs shape social relations between scholars toward competition [which may also have the effect of isolating and making scientists less self-organized, see (Ullrich 2019)]. Hence, our results also raise *ad concurrentia* concerns about the far-reaching implicit and explicit consequences of the competitization of science in general. This intensification of the quantitative assessment of one's own work and its immediate visibility and universal comparability represents a broader societal trend, as evidenced by the increasingly important role of metrics in other social fields and professions such as docfinder, www.ratemyprofessors.com or Uber. However, in order to understand the relevance of ASNPs, it is important to also think about the context and the institutional policies in which the platforms and metrics are used: Competition does not only take place in terms of scientific output, as found on ASNPs such as ResearchGate, but is linked to an increasingly tense academic job competition, the rise of third-party funding and the introduction of 'competitive indicators' at the level of public university funding by the Ministry in Austria. Against the background of this academic competition ecology on a macro and meso level, ASNPs are not the main cause of competitization of science, but rather a main promoter and organizer of competition on a micro level. Given the unstable professional situation of many scientists, who are confronted with multiple competitions (Krücken 2021), platforms and metrics take on a special weight. Recent developments at the EU level, such as the Coalition for Advancing Research Assessment (CoARA), reflect growing concerns among science policy actors regarding the direct and indirect effects of an intense focus on competitive quantitative evaluation measures on research, teaching, and science communication.

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Supplementary data

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Notes

1. Like other social platforms, academic ones are constantly subject to changes, which also means that the suggested forms of subjectivation are often slightly modified. Interestingly, a fundamental change in the metrics displayed on ResearchGate took place in July 2022. The *RG Score*, introduced in 2012 and a key metric since then, was abolished and replaced by the already existing *Research Interest Score*. The company justified the change with a stronger responsibility in the use of research metrics, a more holistic approach to the evaluation of research output and the non-transparency of the *RG Score* (RG email, April 2022 'Why we're removing the RG Score').
2. The mean values represent the level of agreement from 1 = strongly disagree to 5 = strongly agree.
3. The result that quality assessment was reported more often by senior researchers can also be found for GoogleScholar and might simply be caused by the fact that assessing other researchers and evaluating their research profiles is typically done by senior researchers for instance during job hearings. We thank an anonymous reviewer for this valuable hint.

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