MEDIATIZATION STUDIES 5/2021 DOI: 10.17951/ms.2021.5.59-76

FRANZISKA THIELE

University of Greifswald (Germany)
franziska.thiele@uni-greifswald.de
http://orcid.org/0000-0002-9035-8369

CORINNA LUETHJE

Federal Office for Radiation Protection (Germany)
CLuethje@bfs.de
https://orcid.org/0000-0002-4692-604X

Post or Perish? – Scholarly Communication Practices on Social Media in Times of Deep Mediatization

Abstract. The rise of the Internet and social media has introduced profound changes to (media-related) practices and communication strategies to accumulate power in the field of science. These are often described as the result of a (deep) mediatization of science with the COVID-19 pandemic accelerating the effects of (deep) mediatization further. The aim of this paper is to identify field-specific social media practices to accumulate capital in the field of science and analyze how they have been changed in the wake of (deep) mediatization processes. The paper does so by using the concept of field-specific mediatization as a theoretical basis. The empirical part of the study builds on 55 qualitative interviews with German-speaking scholars that were conducted in 2016. It compares their description of social media usage and communication strategies to accumulate power to scholarly practices currently conducted under the influence of the pandemic as described in the literature. The results of the analysis show that scholars accumulate capital by networking (social capital), accessing and sharing information and publications (cultural capital) and increasing their visibility (symbolic capital). Due to field-specific processes of mediatization of the field, external communication has become more important and internal communication has gained a more personal quality. Overall, formerly clear-cut boundaries of internal and external target groups as well as personal and professional spheres have become more blurred and pressure connected to visibility enhanced.

Keywords: deep mediatization; social media; scholarly communication; academia; Bourdieu; capital; pandemic

1. Introduction

Scholarly communication has undergone profound changes since the introduction of the Internet and especially social media. These are often described as a result of mediatization of science. Mediatization is defined as a complex, non-linear meta-process of social change, which is evoked by the availability of technical media, that transform communicative and cultural practices of society, which in turn shape how media are used (Krotz, 2017). Thus, "everyday life and everyday media life (…) hardly seem analytically separable anymore" (Wimmer, 2021, p. 28).

Andreas Hepp, Andreas Breiter and Uwe Hasebrink (2018b) discern three waves of mediatization. The first wave was initiated by the mechanization of media due to the invention of the printing press, creating the institutional basis of what would later be media organizations. The next wave came with the discovery of electricity, which paved the way for mass media such as radio and television. The third and current new wave was initiated by the process of digitalization, which has led to a "qualitative change occurring in the whole media environment: »New« digital media arose; and the »old« mechanical and electronic media also became digital" (p. 5). Hepp, Breiter and Hasebrink (2018b) claim that in the current wave we have now reached a stage of deep mediatization, which shows how deeply our everyday practices are interrelated with mediated practices. The effects of deep mediatization have been accelerated by the pandemic (Putta & Anderson, 2021). Due to the reduction of direct social contacts, we received most of our information via (digital) media and communication became further mediated in all fields of society where direct social contact was not relevant in order to keep the infrastructure critical for the sustainment of state and society going. This was only possible because of the already existing digital infrastructure and led to the rise of formerly less important digital media such as the podcast or the digital real-time communication platform Zoom (Beisch & Koch, 2021; McClain, Vogels, Perrin, Sechopoulos, & Rainie, 2021).

Although science is considered a field, where media-induced structural changes due to the mediatization take hold rather slowly (Rödder & Schäfer, 2010, p. 249), it has also been affected by the process of mediatization and its enhanced effects of the COVID-19 pandemic.

Historically, the field of science has aimed at independence from field-external influences, such as politics or religion, and scientific processes have long been obscured from the public eye (Rödder & Schäfer, 2010). Traditionally, its main audience is also not the field-external general public, as is the case in politics, religion or sports, but rather other scholars. In the German context this has changed since the 1970s due to the fact that prior research fraud, malpractice and ethically questionable research, became public. As science is funded by public money it was considered that the public should know what it was spent on, leading to democratization and opening of science and a stronger emphasis on the public engagement of science (Weingart,

2005; Weingart & Guenther, 2016). In the following years, research institutions started setting up press and public relations departments, linking the scholarly field more closely to the journalistic one. With the onset of social media, being present there in order to display results, but also attract students and their parents, has become more important, leading research institutions to increasingly encourage and reward scientific staff for sharing information with external target groups on social media (Marcinkowski, Kohring, Fürst, & Friedrichsmeier, 2014).

The French sociologist Pierre Bourdieu (1998) highly criticized the tendency of science to oblige to rules of the public and journalistic field in the 1990s. He felt that the scandalization and dramatization, from which the mass media derive a lot of their capital, attracted scholars, who would not be called experts by the margins of their own field. Yet, scholarly institutions would reward them for their presence in mass media just the same.

While many scholars used to share his critical view, positions on this have changed since Bourdieu made that statement (Peters et al., 2008). Furthermore, social media such as Facebook, ResearchGate, Academia.edu, LinkedIn, Xing or Twitter deconstruct the monopoly position of mass media and offer individual scholars new ways to communicate directly with the public and peers and to bypass traditional forms of communicating scientific findings. First results on scholars and their media usage changes during the pandemic indicate that especially online chat tools such as Zoom have been used intensively (Gruber, van Bavel, Lewis Jr, Neil, & Cunnigham, 2021). Tools such as this help when engaging in international and long distance collaborations as well as disseminating ideas and research results (Carrigan, 2019; Chugh, Grose, & Macht, 2020; Peters, Dunwoody, Allgaier, Lo, & Brossard, 2014; Schäfer, 2014). By now we know that this form of digital visibility and connectivity is desirable, as the ability to catch other people's attention and addressing the right target group online, cannot only increase people's citation rate, but also be helpful for career advancement (Huntington, Nicholas, & Warren, 2004; Ignatow & Robinson, 2017; Schäfer, 2014).

All this shows that the third wave of mediatization, digitalization, and the deep mediatization have altered not only the relation of the scientific and the journalistic field, but also external and internal scientific communication. This has consequences for scholarly practices, values, routine and power structures, as it strengthens the relevance of communication strategies to gain reputation in science, that are connected to media prominence and visibility.

In the understanding of Pierre Bourdieu's (1985) field theory agents can accumulate three basic capitals in order to gain symbolic capital, which translates into individual reputation and shows itself in titles acquired, as well as winning titles and awards. The current wave of mediatization of the field of science highlights not so much the classical basic cultural (acquired by writing publications or giving scientific presentations), social (gained by networking and communicating with colleagues, students

and field-external agents) or economical capital (gained by writing successful research proposals), but rather digital capital, which is an addition made by Sora Park (2017). Digital capital describes the ability to use online media. Its acquisition is always tied to the availability of digital media technologies and infrastructures as well as cultural capital in the form of knowledge on how to use it. Its most important trade is that it can be particularly easy transformed into all three basic capitals. With this bridging function it transfers the other basic capitals into the digital space and enables their increase in the offline world (Ragnedda, 2017). Although the digital capital's status as an independent capital is debatable, it allows us to analytically distinguish digitalized media practices connected to the accumulation of individual capital from the other capitals it helps accumulating. Digital capital related to cultural capital is gained by accessing and sharing information and publications online, to economic capital by writing research proposals online or raising research money via crowd-funding (Wheat, Wang, Byrnes, & Ranganathan, 2013). Social capital is gained by communicating with science internal and external groups online, e.g. on social media. Symbolic capital in its digitalized form is expressed in views, downloads and likes.

The aim of this paper is to look at these digitalized media practices especially on social media and analyze how they have imposed changes to the accumulation of field-specific capital. Thus, we can identify field-specific trends of (deep) mediatization in science. Studies looking at the usage of social media among scholars often highlight usage patterns in specific disciplines (Allgaier, Dunwoody, Brossard, Lo, & Peters, 2013; Schäfer, 2017, p. 278) or of one medium (Neuberger, 2014, p. 341), but put a lesser focus on the changes social media have induced on the field of science in general, its values and reputational system (Chugh, Grose, & Macht, 2020). A literature review by Mike Schäfer (2014) focusing on studies on the mediatization of science found that research indicating changes in relation to social media usage mostly remained anecdotal, as they often lacked empirical data and especially concerning social media usage among German scholars, there is hardly any empirical data. Hepp and the "Communicative Figurations" Research Network (2017) point out that these changes of the media environment have a "transnational and transcultural character" (p. 7). Therefore, deep mediatization has similar effects in different areas of the Western Hemisphere yet they slightly differ "nationally, regionally and locally" (p. 7), which is also shown in scholarly communication.

Empirical results show that scholars generally use social media tools rather unwillingly in the context of work as they often consider them to be a waste of time or distraction (Chugh & Ruhi, 2019; Manca & Ranieri, 2016). Yet, studies comparing usage patterns of scholars from different countries show that German scholars (also in comparison to the general public) are especially reluctant to use social media tools (Lo, 2016, p. 112; Peters et al., 2014; Pscheida, Minet, Herbst, Albrecht, & Köhler, 2014). Overall, the data base on German speakers using social media is quite thin, which makes it worthwhile to look at this case more closely. This paper does so by analyzing qualitative interviews with 55 German-speaking academics from different disciplines,

which were conducted in 2016. The interviews serve as an historical reference point as to how far the media practices in the scientific field have changed since then due to the accelerated deep mediatization during the pandemic. The theoretical basis of this work is the concept of field-specific mediatization (Luethje, 2017), which is built on Bourdieu's field theory and will be described in the next chapter.

2. Field-Specific Mediatization in Times of and in Relation to (Deep) Mediatization

According to Pierre Bourdieu, modern societies consist of different social fields, which are independent and have clear cut boundaries, but interact with each other. Each field has its own habitus, specific mixture of capitals and social practices. The habitus refers to "common schemes of perception, conception and action" (Bourdieu, 1993, p. 60), which people belonging to a social field have incorporated. It is the result of an acquired social instinct, which they do not reflect on. Therefore, it often remains invisible to those, who have acquired it, when performing habitual actions. The habitus is the basis of perceptions and (social and cultural) practices, such as media usage. The field-specific value systems and with it its power structures, habitus and practices can be altered, when new media appear and are incorporated in a field.

The concept of field-specific mediatization assumes that new media affect every social field, but each in a specific manner. Media innovations, such as social media, interact with the field-specific habitus of its members, thus, changing the logics of a field and its subfields in relation to others, leading to a field-specific mediatization.

The concept of mediatization is often used to either analyze developments on the micro-level, such as individual changes, or on the macro-level, such as systematic changes. The concept of field-specific mediatization focuses on the macro-level of the field, but via the habitus takes individual practices into account as well and allows us to look at both the micro- and macro-level. The habitus is "incorporated history" (Bourdieu, 2008, p. 60) and entails individual just as much as collective experience, which an agent acquires in the process of field-specific socialization and links the individual to its surrounding structures.

Using the concept of field-specific mediatization has three advantages for this work. First of all, changes in individual practices on the micro-level are always identified in relation to the field of science in this paper. By including the concept of habitus in the field-specific mediatization it allows an individual's actions and practices to be analyzed in connection to the habitus of the field, which is closely related to how capital is accumulated. Secondly, the field-specific mediatization allows for an easy integration of other aspects of Bourdieu's field theory, such as the capitals, which are at the core of this analysis. Finally, it offers a focus on processes of differentiation within and across a field that shows how mediatization differs in diverse social spheres of society.

The characteristics of deep mediatization are that it is a reflexive (users and creators have certain intentions and expectations concerning the tool, which influence its usage and further development) and multifaceted process which takes place across different media (Hepp & "Communicative…, 2017). The multifaceted feature of deep mediatization shows that it can take on various forms and has to be analyzed in context. This makes it important to look at the field, where media-related change is identified, in relation to others, as well as each medium and its distinguishing features. Due to this, the concept of field-specific mediatization makes a great addition when working with the concept of deep mediatization. As the process takes place across media it is also important not only to identify the role of one new medium or "new media logic" (Altheide & Snow, 1979), as it was first introduced, but to take into consideration the entanglement and convergence of old and media as well as the digitalization that drives this change as a whole (Hepp, Breiter, & Hasebrink, 2018a, p. 13 f).

While the characteristics of deep mediatization change with the field and medium in question, there are certain overall trends that can be identified in changing media environments across the board:

1) a further differentiation of the number of media and their functionalities, which is closely connected to

2) an accelerated pace of innovation. This can lead to an enhanced experience of pressure to adapt to the changes it brings and might result in processes of exclusion and inequalities.

3) There is an increasing connectivity, that bridges space and time, leads to a blurring of boundaries, as well as

4) an omnipresence of media.

5) Finally, we find more and more processes of datafication, in which we are being tracked or track ourselves with a software, which opens the floor for new forms of participation as well as wanted and unwanted surveillance (Hepp & "Communicative…, 2017, pp. 17–20).

As these five are overall trends, they are also visible in the field of science, but – due to field-specific mediatization – might play out differently than in other fields. These will be referred to again in the empirical part of the paper.

3. Method and Sample

The data for this study was collected from February till December 2016 as part of a larger project on mediatized scholarly communication called "Mediated Scholarly Communication in post-normal and traditional science", which was funded by the German Research Foundation (DFG). The aim of the project was to learn about the effects of mediatization on scholarly communication by conducting qualitative media

biographical interviews, focusing on the changes of media usage that scholars had experienced throughout their career.

Media biographical interviews are a form of biographical interviews focusing on the interrelations of everyday life and media usage. They help to assess the relevance media have for individual biographical (re)construction and how patterns of media use and media appropriation develop and change. As individual and field-related media practices are often habitualized and no longer reflected upon, we used guideline questions in our interviews that pre-structured the narration of the interview partners around media usage (Röttger, 1994, p. 96). Our interviews started off with an introductory narrative-generating question, in which the participants were asked to describe how their media usage had changed since they first started studying at university using milestones of their career as an orientation. The narrative was followed by questions about their media usage and professional background, focusing on social media usage.

After the interview the participants were requested to keep a semi-standardized media diary for a week, which is not part of this paper, because it did not address the research question. Once it was completed, we carried out a second reconstructive interview with each person asking follow-up questions about the media diary and current media usage. The media biographical interview was transcribed literally following the rules by Udo Kuckartz (2012, p. 136 f.), while the reconstructive interview was synoptically transcribed. The parts of the interviews used in this article were translated by the authors.

For analysis, we randomly chose two of the conducted interviews for a so-called summarizing content analysis (Mayring, 2014) to inductively identify general structures. Based on this detailed close-up examination, we developed categories for a code book, which was used to analyze all the other interviews. We first coded every medium that the scholars mentioned in the interviews as well as whether they were using it or not, what for and how frequently as well as whether changes in their usage had occurred and for what reason. We furthermore took a close look at the parts of the interviews, where the scholars mentioned conducting communication strategies to accumulate capital, like writing publications. The text passages that we identified were then compiled and their content reduced again using Philipp Mayring's (2014) summarizing content analysis.

In total, 55 German-speaking scholars working in Germany, Austria and Switzerland were interviewed. They were doctoral students, postdocs and professors in social sciences and the humanities as well as natural sciences, life sciences and engineering (see Table 1). The scholars, who took part in the interviews were contacted via mailing lists, on conferences and by using the snowball system. For the aim of the project, it was important to include people of different age groups, disciplines and career stages, who had experience with varying stages of mediatization and media products, as we wanted to get a good overview over the field and its media usage in general. While we tried to create an even division between the different disciplines, this was a sample where

sociologists (and in this case especially communication scientists and natural scientists) were very well represented, while engineers and life sciences scientists accounted for a smaller proportion of the respondents because they were more reluctant to participate in the study. We therefore do not make disciplinary based comparisons of the smaller groups in the results section.

Table 1. Overview of the interviewees' disciplines, gender (m = male, f = female) and status group

Subject area	PhD Students	Postdocs	Professors	Total
Social Sciences and Humanities	7 (2 m/5 f)	7 (4 m/3 f)	6 (6 m/1 f)	21 (12 m/9 f)
Natural Sciences	3 (2 m/1 f)	10 (7 m/3 f)	6 (4 m/2 f)	19 (13 m/6 f)
Life Sciences	1 (1 f)	3 (2 m/1 f)	5 (4 m/1 f)	9 (6 m/3 f)
Engineering	4 (4 m)	1 (1 m)	1 (1 m)	6 (6 m)
Total	15 (8 m/7 f)	21 (14 m/7 f)	19 (15 m/4 f)	55 (37 m/18 f)

Source: Authors' own study.

4. Discussion of Results: Capitals and Field-Specific Changes in Their Accumulation

The following part of the paper will be structured along the different capitals and communicative practices associated with their accumulation. In order to display how their accumulation has changed in the process of mediatization, the alteration of practices from offline to online as well as their accumulation on social media using the data from 2016 will be described. An outlook on how the practices of capital accumulation were further changed during with the pandemic will be given.

The analysis focuses on those social media the interviewees claimed to use most frequently. ResearchGate was most popular among them, followed by Facebook, Twitter, Academia, and LinkedIn. The order of popularity is similar to that among scholars worldwide, with the only difference that LinkedIn usually comes in second place (Jordan & Weller, 2018; Muscanell & Utz, 2017; van Noorden, 2014).

The different platforms catered to different scholarly needs. The interviewees used them to network (social capital), get and disseminate work-related information and publications (cultural capital) and to do self-marketing (symbolic capital) (Hennig & Kohler, 2020; Jordan & Weller, 2018; Manca & Ranieri, 2017). As they did not mention that the online media also helped them to increase their economic capital, this basic capital has not been included in the analysis.

Acquisition of social capital: Networking

Before the Internet institutes and conferences were the major places, where informal scholarly communication took place. Debates, which used to take months or years via peer-reviewed journals can now be conducted swiftly via online and social media. The social media most frequently used for networking and to acquire social capital was Facebook followed by Xing and LinkedIn. The scholars applied them for personal exchange with colleagues from other countries and finding out what they did outside of work. This is similar to what studies on scholarly social media usage in other countries have shown (Chugh & Ruhi, 2018; Kjellberg, Haider, & Sundin, 2016).

A reason for Facebook's popularity seemed to be that most of the academics first started using it in a personal context as a means to stay in contact with close friends. After a few years they began to add more work-related contacts to their network. Due to this, Facebook provided them with a lot more personal information on their colleagues than they used to have. A social sciences professor illustrated that this quality of the network had brought the academic world closer together, because it stimulated a new kind of friendship:

> Especially Facebook, a little less LinkedIn, enables a deeper connection with international colleagues. Because you used to email each other twice a year and meet at some conferences and now you get a lot of information on Facebook about what people do (…). When you follow them, you know, if someone has a new car or another kid or whatever and you have a communicative resource, when you meet them and a starting point and that used to be different.

Facebook has had a profound effect on the academics' digitalized social capital by adding a new aspect to their relationship in particular with scholars from abroad. Being able to show an international network is often seen as a plus in appointment processes for a professorship in Germany, which is a result of the Bologna Reform that has greatly contributed to the internationalization and globalization of European higher teaching institutions (Cañibano, D'Este, Otamendi, & Woolley, 2020). On Facebook these contacts can be maintained or even created, without ever having been abroad for more than an international conference.

On the other hand, personal and work-related usage were described to become intertwined. One of the social science professors illustrated that he always had to have "a clear handle on who gets to see what", while another had three different accounts to keep the spheres apart. This (risk of a) blurring of boundaries is a possible result of the heightened connectivity in times of deep mediatization (see Chapter 2). It has further progressed during the pandemic, when people had to work from home and would mostly connect with their colleagues and students on video conferencing tools. Through these videos others could peek into their homes. The most frequently used

app Zoom only introduced a function to blur the background by February 2021, which was almost a year after online teaching was introduced widely at Universities (Singh, 2021). Also, the home sphere became a workplace, kindergarten and school for those with kids, which made it even harder to keep the personal and professional spheres apart or focus on work at all (Kim & Patterson, 2022).

Some of the interviewed scholars used social media to address external publics on social media, promote their topics to be found by journalists and communicate with their students, but most of their activities were directed at other colleagues. This is similar to results in a study by Kimberley Collins, David Shiffman, and Jenny Rock (2016), who found that scientists used microblogs to do outreach, but preferred fellow scientists as their audience. Considering that field-specific scientific reputation in the form of symbolic capital is awarded by members within the scientific field this is not surprising (Bourdieu, 1985).

During the pandemic the demand for scientific expertise increased. According to Holger Wormer (2020), the borders between science journalism and self-communication of science became more blurred and pressure on scientists to communicate with the general public for example by the German Federal Ministry of Research was heightened. Scientific results indicate that during this time scholars have become more active in science external communication, particularly when their research involved pandemic-related issues (Ambrasat & Fabian, 2021). Also, a female professor in social sciences in our sample described that "as a potential applicant I have noticed during my career that it has become increasingly important for the institutions (…) to actively promote this external presentation". During the pandemic a lot of scholars also seem to have directed their energy to creating tools for online education, YouTube channels or writing for the public on different media outlets (Gruber et al., 2021). This points to social capital, acquired via contacts outside the field of science, becoming increasingly relevant for a scientific career, through processes of mediatization in recent years.

Acquisition of cultural capital: accessing and disseminating information and publications

Before online media scholars would inform themselves on work-related issues via personal networks, on conferences, field-related outlets and visit the library to access publications. While academics still follow these practices, they also inform themselves on social media with Twitter being the most important channel for many of them to get information on (non-)work-related issues.

In terms of changes induced to informational practices, the interviewees put forth that social media – like the Internet in general – enhanced the speed at which information was spread and made it more accessible. For one professor in communication science social media had become so important as a tool for information, that "at this point a lot of relevant content – including scientific content – reaches me (…) via social media and actually almost exclusively. So, people don't email it and I don't see it because

I flip through journals or the like, but it reaches me via social media". Another professor in the same field illustrated that this was starting to be a problem, as it made it harder to identify the original source of information. He described an exchange with American colleagues, who only informed themselves via Twitter, but were no longer able to tell him, what the original source of a piece of information on Twitter was.

In crisis situations such as the pandemic the demand for information is very high and what we know today about the pandemic is communicated to us through media (Putta & Anderson, 2021). Yet, in the wake of the pandemic, identifying the source of information became more important again, due to the spreading of misleading information, conspiracy theories, and fake news, that were spread (among others) by alternative news media. While the usage of traditional mass media increased a lot more than that of social media during the pandemic, channels such as Twitter are still very important tools to inform oneself and spread (science-related) information (Beisch & Koch, 2021).

Another field-specific change in the process of getting and sharing information concerned conferences, at which in his discipline, as a professor in social sciences explained, it became more common to have a Twitter feed connected to the event creating a parallel "live coverage" communication about "who just said something important". This highlighted topics, yet, it also diverted the attention of those attending, as he mentioned "50% of the people [at conferences – Authors' note] have technology in front of them while they're consuming [presentations – Authors' note]. My impression is that the overall attention level in the audience has decreased". Research shows that on digital conferences, which have become a lot more common during the pandemic, people attending via video conferencing tools have an even harder time keeping their attention focused, as there is no social control by other people and one can zoom out physically even more, by turning of the camera and doing something else entirely (Fauville, Luo, Queiroz, Bailenson, & Hancock, 2021).

Cited publications are one of the most important sources of scholarly reputation. When publishing in a journal, that other academics have limited access to, this effect can be diminished. Therefore, is not surprising that the overwhelming majority of the interviewed scholars, who used ResearchGate and Academia.edu, did it, as a professor in natural sciences said, "to make your own work available" as well as to "find good articles". A postdoc in oceanography figured that one of the biggest changes he experienced in the last years was that more and more people in his discipline were starting to use ResearchGate and were "successively uploading old papers dating back till the 70s and uploading old data sets". Because of that a professor in social sciences came to the conclusion that ResearchGate was "building an archive".

Before and during the pandemic, publications were still the most important outlet to gain scholarly reputation. But while our interviews showed that especially in the social sciences, publishing journal articles became more important than publishing book (chapters), research during the pandemic shows that preprints, particularly on

COVID-19 topics, are now more heavily spread, cited, reported on mass media and shared on social media platforms (Fraser et al., 2021; Patel, Li, Acharya, Lerner, & Rajamohan, 2021). This indicates a decreased relevance of the peer-review process, which is a core scientific practice to ensure the quality of scientific work, as a result of the deep mediatization during the pandemic. So particularly during the pandemic, we see more opportunities to increase one's publication-based cultural capital before different target groups online. Yet, literature shows that especially women as well as people with children in academia have published significantly less during the pandemic and were less present in the online discourse. Due to this, they are likely to have a disadvantage when being considered for promotion, tenure or funding in the following years (Kim & Patterson, 2022; Radtke & Burian, 2021).

Acquisition of symbolic capital: Doing (self-)marketing

Two social scientists illustrated that, when they published a new paper, they would present a preview of their work on Twitter and Facebook and then add a link to ResearchGate, Academia.edu or a homepage, where the whole full article could be found. These forms of self-marketing are actually new communication strategies that did not exist before the invention of the Internet. In this case, scholars are given new possibilities to become visible in their community, which especially the social and natural scientists in our study made use of. For this they employed Twitter, Facebook, ResearchGate and Academia. The most profound and professional forms of self-marketing the scholars described, took place on Twitter. They would tweet results (doctoral student, natural sciences), promote articles (postdoc, social sciences), hint at interesting literature (professor, social sciences) or simply inform other "colleagues, that something is happening" (doctoral student, social sciences). The academic social networking sites ResearchGate and Academia.edu were described as helpful to become more "visible and present" (postdoc, social sciences) in the community, which also was the main reason to have an account there, besides accessing and sharing publications. But a postdoc in social sciences mentioned that in order to be visible, it was important to regularly post content "because otherwise people don't notice you". Like the saying "publish or perish", which expresses that people need to regularly write publications to be visible in the scientific community, we can conclude that scholars have to "post or perish" on social media to promote and draw attention to themselves and their work by constantly contributing to the stream in order to not be overlooked or forgotten in the feed.

According to a female professor in social sciences being present on these sites was particularly advantageous at a career stage, postdocs often find themselves in, at which you have to "communicate, who you are, what you have done and where you might want to go". In our study it were the postdocs, who were the most active and used the biggest variety of social media. In Germany, scholars are mostly employed

on temporary posts for a maximum of 12 years, afterwards they have to get one of the very few permanent positions or leave the scientific field.[1] This puts postdocs under high performance pressure and makes them most likely to be active on social media in order to be visible and position themselves in the field.

This pressure is an inherent part of the German scientific field, but social media also perform pressure to regularly contribute. Some platforms have even created ratings such as the ResearchGate score to compare people or whole institutes. While this might give higher visibility, assigning a score to individuals also enhances social comparison practices and is a result of the mediatization process in the form of datafication. It is therefore not surprising when Hjarvard (2013) argues that the recent mediatization has led to an on-going monitoring of the peers. A postdoc in natural sciences described how he would log in to ResearchGate in order to see what others were doing and then automatically start comparing himself, which he disliked. Especially, among emerging scholars, it might contribute to a feeling of peer pressure which according to a professor in social sciences "is a lot higher than it used to be". Another professor explained that universities were checking out "how you present yourself as a scientist" online and that it mattered not just to them, but also to external funding institutions.

Scholars – like everyone else – were experiencing high levels of uncertainty, loneliness and stress during the pandemic. Not being able to connect personally with peers leads to an intensified usage of online (social) media where content mostly focuses on people's successes, which increases the risk of negative social comparison. We do not know, if this is necessarily connected, but overall issues with mental health became more common during the pandemic, especially among female and early career scientists (Michalegko, Welch, Feeney, & Johnson, 2021). So, while mediatization processes have added a new quality to the acquisition of symbolic capital, by doing self-marketing online, it does at the same time increase peer pressure.

5. Conclusions

The aim of this paper was to identify digitalized social media practices to accumulate field-specific digital capital and how they might have changed due to field-specific trends of (deep) mediatization of science. The results show that the accumulation of digital capital on social media amplifies social, cultural and symbolic capital, but not so much economic capital. As digital capital enables the formerly offline capitals to be transferred into digital space, they become mediatized. In the wake of this, the accumulation of the capitals becomes more intertwined and interdependent as the

[1] See: §2 para. 1, WissZeitVG. Retrieved from https://www.gesetze-im-internet.de/wisszeitvg/__2.html

same medium can be used to communicate with others, inform oneself, share publications and to do self-marketing.

While opportunities for scholars to become visible have increased, the overall attention has been diminished, as it gets harder to be noticed in the more fragmented (in comparison to former disciplinary outlets), but continuous social media stream. It also makes the competition more visible and can heighten experiencing peer pressure.

Boundaries of different spheres also start dissolving and have become even thinner with the increased usage of video conferencing tools during the pandemic. Due to the trend of higher connectivity internal as well as external target groups can be addressed at the same time and work as well as personal spheres overlap. Sara Kjellberg, Jutta Haider, and Olof Sundin (2016) mention that the usage of social media in the field of science has resulted in new forms of scholarly communication, which are "in-between" (p. 3) external and internal communication. Based on the findings of this paper, we would like to add that there are forms "in-between" personal and professional communication.

While writing publications is still the most important communication strategy to increase cultural capital, publishing preprints, in order to get the results out faster, is becoming more common, due to the trend of acceleration. Also, not so much because of social media and the rather deep mediatization of science during the pandemic, peer review, which is the core form of quality management in science, loses its relevance as it is being bypassed via preprints that let the general public and no longer just scholars decide, if they are good or not. Thus, the field of sciences also opens its once obscured processes (Rödder & Schäfer, 2010) and becomes more intertwined with other fields, while its main audience is becoming a public one.

This also shows how much the digital acquisition of social capital and the ongoing orientation of academic institutions towards the public has altered this capital. The value of external communication in the field-specific mediatization is continuously increasing, which is massively enhanced by social media, as information need no longer go through the journalistic system. Communicating with the public is playing a more important role in distributing positions and funding, which changes the scholarly reward system and with it the field-specific habitus. As a result, people's practices are altered and being visible on (social) and mass media, which Bourdieu (1998) had highly criticized, has become accepted, if not encouraged.

Using the frame of field-specific mediatization, we can see that social media have inflicted changes on the accumulation of field-specific capital and the habitus of the field of science. Still, as the mediatization of different fields is a multifaceted process, not just social media, but changes to media usage in general need to be taken into account in order to paint a complete picture.

6. Limitations

Our data is limited on several accounts. Out of our 19 social scientists, 16 were communication scholars, who are likely to be more inclined to use social media, thus creating a bias. Also, we only had six engineers and nine life scientists in the sample, which made it difficult to compare these groups to others. Furthermore, this research focuses on changes to the scientific field in Germany and even though deep mediatization processes are found to be similar in the Western Hemisphere (Hepp & "Communicative…, 2017), the results of this study might not be applicable to other countries. As the empirical data is based on an explorative qualitative study further research is necessary to validate the preliminary findings. Still, as one of the few studies that look at social media usage among German-speaking scholars, our results give insights into the interplay of the process of (deep) mediatization within the field of science' as well as "changes" inflicted by social media to the accumulation of field-specific capital.

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the German Research Foundation under the project no: 251947167.

References

Allgaier, J., Dunwoody, S., Brossard, D., Lo, Y.-Y., & Peters, H.P. (2013). Journalism and Social Media as Means of Observing the Contexts of Science. *BioScience*, *63*(4), 284–287. https://doi.org/10.1525/bio.2013.63.4.8

Altheide, D.L., & Snow, R.P. (1979). *Media Logic*. Beverly Hills: SAGE.

Ambrasat, J., & Fabian, G. (2021). *One year after the Outbreak – Involvement of Scientists in the Covid-19 Pandemic Findings from a Germany-Wide Study*. Center for Open Science. https://doi.org/10.31235/osf.io/56r3u

Beisch, N., & Koch, W. (2021). Aktuelle Aspekte der Internetnutzung in Deutschland: 25 Jahre ARD/ZDF-Onlinestudie: Unterwegsnutzung steigt wieder und Streaming / Mediatheken sind weiterhin Treiber des medialen Internets. *Media Perspektiven*, *10*, 486–503.

Bourdieu, P. (1985). *Sozialer Raum und »Klassen«: Leçon sur la leçon. Zwei Vorlesungen*. Frankfurt am Main: Suhrkamp.

Bourdieu, P. (1993). *Sozialer Sinn. Kritik der theoretischen Vernunft*. Frankfurt am Main: Suhrkamp.

Bourdieu, P. (1998). *On Television*. New York: The New Press.

Bourdieu, P. (2008). *The Logic of Practice* (reprinted). Stanford: Stanford University Press.

Cañibano, C., D'Este, P., Otamendi, F.J., & Woolley, R. (2020). Scientific Careers and the Mobility of European Researchers: An Analysis of International Mobility by Career Stage. *Higher Education*, *80*(6), 1175–1193. https://doi.org/10.1007/s10734-020-00536-z

Carrigan, M. (2019). *Social Media for Academics*. London: SAGE.

Chugh, R., Grose, R., & Macht, S.A. (2020). Social Media Usage by Higher Education Academics: A Scoping Review of the Literature. In A. Tatnall (Ed.), *Encyclopedia of Education and Infor-*

mation Technologies (vol. 26, pp. 983–999). Cham: Springer Nature. https://doi.org/10.1007/s10639-020-10288-z

Chugh, R., & Ruhi, U. (2018). Social Media in Higher Education: A Literature Review of Facebook. *Education and Information Technologies*, *23*(2), 605–616. https://doi.org/10.1007/s10639-017-9621-2

Chugh, R., & Ruhi, U. (2019). Social Media for Tertiary Education. In A. Tatnall (Ed.), *Encyclopedia of Education and Information Technologies* (pp. 1–6). Cham: Springer Nature. https://doi.org/10.1007/s10639-020-10288-z

Collins, K., Shiffman, D., & Rock, J. (2016). How Are Scientists Using Social Media in the Workplace? *PloS One*, *11*(10), e0162680. https://doi.org/10.1371/journal.pone.0162680

Fauville, G., Luo, M., Queiroz, A., Bailenson, J.N., & Hancock, J. (2021). Zoom Exhaustion & Fatigue Scale. *Computers in Human Behavior Reports*, *4*, 100119. https://doi.org/10.1016/j.chbr.2021.100119

Fraser, N., Brierley, L., Dey, G., Polka, J.K., Pálfy, M., Nanni, F., & Coates, J.A. (2021). The Evolving Role of Preprints in the Dissemination of COVID-19 Research and Their Impact on the Science Communication Landscape. *PLOS Biology*, *19*(4), e3000959. https://doi.org/10.1371/journal.pbio.3000959

Gruber, J., van Bavel, J.J., Lewis Jr, Neil A., & Cunnigham, W.A. (2021, July 6). Why the COVID-19 Pandemic Could Lead to Overdue Change in Academia. Retrieved from https://www.science.org/content/article/why-covid-19-pandemic-could-lead-overdue-change-academia

Hennig, A., & Kohler, S. (2020). Einflussfaktoren bei der Social-Media-Nutzung in der Wissenschaftskommunikation. *Publizistik*, *65*(4), 593–615. https://doi.org/10.1007/s11616-020-00618-z

Hepp, A., & "Communicative Figurations" Research Network. (2017). Transforming Communications. Media-related Changes in Times of Deep Mediatization. *Communicative Figurations. Working Paper, 16*. Retrieved from https://media.suub.uni-bremen.de/handle/elib/3345

Hepp, A., Breiter, A., & Hasebrink, U. (Eds.) (2018a). *Communicative Figurations: Transforming Communications in Times of Deep Mediatization*. Cham: Springer Nature.

Hepp, A., Breiter, A., & Hasebrink, U. (2018b). Rethinking Transforming Communications: An Introduction. In A. Hepp, A. Breiter, & U. Hasebrink (Eds.), *Communicative Figurations: Transforming Communications in Times of Deep Mediatization* (pp. 3–13). Cham: Springer Nature. https://doi.org/10.1007/978-3-319-65584-0_1

Hjarvard, S. (2013). *The Mediatization of Culture and Society*. London: Routledge. https://doi.org/10.4324/9780203155363

Huntington, P., Nicholas, D., & Warren, D. (2004). Digital Visibility and Its Impact upon Online Usage: Case Study of a Health Web Site. *Libri*, *54*(4), 211–220.

Ignatow, G., & Robinson, L. (2017). Pierre Bourdieu: Theorizing the Digital. *Information, Communication & Society*, *20*(7), 950–966.

Jordan, K., & Weller, M. (2018). Communication, Collaboration and Identity: Factor Analysis of Academics' Perceptions of Online Networking. *Research in Learning Technology*, *26*(0). https://doi.org/10.25304/rlt.v26.2013

Kim, E., & Patterson, S. (2022). The Pandemic and Gender Inequality in Academia. *PS: Political Science & Politics*, *55*(1), 109–116. https://doi.org/10.1017/s1049096521001049

Kjellberg, S., Haider, J., & Sundin, O. (2016). Researchers' Use of Social Network Sites: A Scoping Review. *Library & Information Science Research*, *38*(3), 224–234. https://doi.org/10.1016/j.lisr.2016.08.008

Krotz, F. (2017). Explaining the Mediatisation Approach. *Javnost – the Public*, *24*(2), 103–118. https://doi.org/10.1080/13183222.2017.1298556

Kuckartz, U. (2012). *Qualitative Inhaltsanalyse: Methoden, Praxis, Computerunterstützung*. Weinheim – Basel: Beltz Juventa.

Lo, Y.-Y. (2016).*Online Communication Beyond the Scientific Community: Scientists' Use of New Media in Germany, Taiwan and the United States to Address the Public*. Retrieved from https://refubium.fu-berlin.de/bitstream/handle/fub188/7426/Diss_Lo_2016.pdf?sequence=1&isAllowed=y

Luethje, C. (2017). Field-Specific Mediatization: Testing the Combination of Social Theory and Mediatization Theory Using the Example of Scientific Communication. *Mediatization Studies*, *1*, 45–67.

Manca, S., & Ranieri, M. (2016). Facebook and the Others. Potentials and Obstacles of Social Media for Teaching in Higher Education. *Computers & Education*, *95*, 216–230. https://doi.org/10.1016/j.compedu.2016.01.012

Manca, S., & Ranieri, M. (2017). Exploring Digital Scholarship. A Study on Use of Social Media for Scholarly Communication among Italian Academics. In A. Esposito (Ed.), *Advances in Knowledge Acquisition, Transfer, and Management (AKATM) Book Series. Research 2.0 and the Impact of Digital Technologies on Scholarly Inquiry* (pp. 116–141). Hershey: Information Science Reference. https://doi.org/10.4018/978-1-5225-0830-4

Marcinkowski, F., Kohring, M., Fürst, S., & Friedrichsmeier, A. (2014). Organizational Influence on Scientists' Efforts to Go Public. *Science Communication*, *36*(1), 56–80. https://doi.org/10.1177/1075547013494022

Mayring, P. (2014). *Qualitative Content Analysis: Theoretical Foundation, Basic Procedures and Software Solution*. Klagenfurt. Retrieved from https://nbn-resolving.org/urn:nbn:de:0168-ssoar-395173

McClain, C., Vogels, E.A., Perrin, A., Sechopoulos, S., & Rainie, L. (2021, September 1). *The Internet and the Pandemic*. Retrieved from https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2021/09/PI_2021.09.01_COVID-19-and-Tech_FINAL.pdf

Michalegko, L., Welch, E., Feeney, M.K., & Johnson, T.P. (2021). *COVID-19 Survey II (2021): Personal Impacts*. Retrieved from: https://www.sci-ops.org/surveys/covid-19-survey-ii-2021-personal-impacts

Muscanell, N., & Utz, S. (2017). Social Networking for Scientists: An Analysis on How and Why Academics Use ResearchGate. *Online Information Review*, *41*(5), 744–759. https://doi.org/10.1108/OIR-07-2016-0185

Neuberger, C. (2014). Social Media in der Wissenschaftsöffentlichkeit. Forschungsstand und Empfehlungen. In P. Weingart & P. Schulz (Eds.), *Wissen – Nachricht – Sensation: Zur Kommunikation zwischen Wissenschaft, Öffentlichkeit und Medien* (pp. 315–368). Weilerswist: Velbrück Wissenschaft.

Park, S. (2017). *Digital Capital*. London: Palgrave Macmillan.

Patel, V., Li, C.H., Acharya, J., Lerner, A., & Rajamohan, A.G. (2021). Changes in Social Media Impact of the Radiological Literature during the Covid-19 Pandemic. *Academic Radiology*, *28*(2), 151–157. https://doi.org/10.1016/j.acra.2020.11.002

Peters, H.P., Brossard, D., Cheveigné, S. de, Dunwoody, S., Kallfass, M., Miller, S., & Tsuchida, S. (2008). Science-Media Interface. *Science Communication*, *30*(2), 266–276. https://doi.org/10.1177/1075547008324809

Peters, H.P., Dunwoody, S., Allgaier, J., Lo, Y.-Y., & Brossard, D. (2014). Public Communication of Science 2.0: Is the Communication of Science via the "New Media" Online a Genuine Transformation or Old Wine in New Bottles? *EMBO Reports*, *15*(7), 749–753. https://doi.org/10.15252/embr.201438979

Pscheida, D., Minet, C., Herbst, S., Albrecht, S., & Köhler, T. (2014). *Nutzung von Social Media und onlinebasierten Anwendungen in der Wissenschaft: Ergebnisse des Science 2.0 – Survey 2014*. Datenreport Hochschulen.

Putta, S.K., & Anderson, B. (2021). Deep Mediatization during COVID-19: An Interview with Professor Andreas Hepp, University of Bremen. *Networking Knowledge: Journal of the MeCCSA Postgraduate Network*, *14*(1), 125–130. https://doi.org/10.31165/nk.2021.141.662

Radtke, J.S., & Burian, J. (2021). Der Arbeitsplatz Hochschule in Zeiten von Corona: Arbeitsbedingungen und Gesundheit in Wissenschaft und Verwaltung. In B. Badura, A. Ducki, H. Schröder, & M. Meyer (Eds.), *Fehlzeiten-Report 2021: Betriebliche Prävention stärken – Lehren aus der Pandemie* (pp. 123–148). Berlin – Heidelberg: Springer. https://doi.org/10.1007/978-3-662-63722-7_7

Ragnedda, M. (2017). *The Third Digital Divide: A Weberian Approach to Digital Inequalities*. New York: Routledge. https://doi.org/10.4324/9781315606002

Rödder, S., & Schäfer, M.S. (2010). Repercussion and Resistance: An Empirical Study on the Interrelation Between Science and Mass Media. *Communications*, *35*(3), 249–267. https://doi.org/10.1515/comm.2010.014

Röttger, U. (1994). *Medienbiographien von jungen Frauen*. Münster – Hamburg: Lit Verlag.

Schäfer, M.S. (2014). The Media in the Labs, and the Labs in the Media: What We Know about the Mediatization of Science. In K. Lundby (Ed.), *Mediatization of Communication* (pp. 571–593). Berlin: De Gruyter Mouton. https://doi.org/10.1515/9783110272215.571

Schäfer, M.S. (2017). Wissenschaftskommunikation Online. In H. Bonfadelli, B. Fähnrich, C. Lüthje, J. Milde, M. Rhomberg, & M.S. Schäfer (Eds.), *Forschungsfeld Wissenschaftskommunikation* (pp. 275–293). Wiesbaden: Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-12898-2_15

Singh, R. (2021). *How to Blur Your Background in Zoom Meeting*. Retrieved from https://gadgetstouse.com/blog/2021/03/01/blur-background-in-zoom-meeting/

Van Noorden, R. (2014). Online Collaboration: Scientists and the Social Network. *Nature News*, *512*(7513), 126. Retrieved from https://www.nature.com/news/online-collaboration-scientists-and-the-social-network-1.15711

Weingart, P. (2005). *Die Stunde der Wahrheit? Zum Verhältnis der Wissenschaft zu Politik, Wirtschaft und Medien in der Wissensgesellschaft*. Weilerswist: Velbrück Wissenschaft.

Weingart, P., & Guenther, L. (2016). Science Communication and the Issue of Trust. *Journal of Science Communication*, *15*(05), C01: 1–11. https://doi.org/10.22323/2.15050301

Wheat, R.E., Wang, Y., Byrnes, J.E., & Ranganathan, J. (2013). Raising Money for Scientific Research Through Crowdfunding. *Trends in Ecology & Evolution*, *28*(2), 71–72. https://doi.org/10.1016/j.tree.2012.11.001

Wimmer, J. (2021). The Subject in Times of Media and Social Change. The Analytic Potential of the Mediatization Approach Using the Case of Retro Gaming. *Mediatization Studies*, *4*, 25–40. https://doi.org/10.17951/ms.2020.4.25-40

Wormer, H. (2020). German Media and Coronavirus: Exceptional Communication – or Just a Catalyst for Existing Tendencies? *Media and Communication*, *8*(2), 467–470. https://doi.org/10.17645/mac.v8i2.3242