

FULL PAPER

Communication floods – Emails in scholarly communication

Kommunikationsfluten – Die Email in der Wissenschaftskommunikation

Corinna Lüthje & Franziska Thiele

Corinna Lüthje (Dr.), University of Rostock, Institut für Medienforschung, August-Bebel-Straße 28, 18055 Rostock, Germany. Contact: [Corinna.luethje\(at\)uni-rostock.de](mailto:Corinna.luethje(at)uni-rostock.de)

Franziska Thiele (M.A.), University of Rostock, Institut für Medienforschung, August-Bebel-Straße 28, 18055 Rostock, Germany. [Franziska.thiele\(at\)uni-rostock.de](mailto:Franziska.thiele(at)uni-rostock.de). ORCID: <https://orcid.org/0000-0002-9035-8369>

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Abstract: The aim of this study is to display the current email usage among academics and the email's influence on the field of science by analyzing qualitative interviews and media diaries with 55 German-speaking academics. Emails pose a particular challenge for separating work and personal spheres. Mobile media such as tablets and smartphones reinforce the penetrating effects of emails. Our results show that scholars hardly engage in a temporal and spatial separation of the spheres when accessing work emails. This is one of the reasons why emails contribute to a perception of information overload and stress. While emails cause problems in many fields, we assume that it is particularly pronounced in the scientific field. In order to raise awareness for this topic and to facilitate the handling of emails in the scientific community, we recommend introducing email workshops and regulations at universities.

Keywords: Email; scholarly communication; organizational communication; mediatization; qualitative interviews.

Zusammenfassung: Ziel dieser Studie ist es, durch die Analyse qualitativer Interviews und von Medientagebüchern mit 55 deutschsprachigen Wissenschaftler*innen aufzuzeigen, wie sich die Nutzung der Email in der Wissenschaft aktuell darstellt und welchen Einfluss die Email auf das Wissenschaftsfeld hat. Die Email stellt für die Trennung der privaten und beruflichen Sphären eine besondere Herausforderung dar. Durchdringungs-Effekte des Mediums werden durch mobile Medien wie Tablets und Smartphones verstärkt. Unsere Ergebnisse zeigen, dass die interviewten Wissenschaftler*innen bei der Nutzung ihrer Arbeitsemails kaum eine zeitliche und örtliche Trennung der Sphären vornehmen. Unter anderem dadurch trägt die Email unter den Wissenschaftler*innen zu einer Wahrnehmung von Informationsüberlastung und Stress bei. Auch wenn diese Auswirkung der Email in vielen Arbeitsfeldern festzustellen ist, gehen wir davon aus, dass er in dem Bereich der Wissenschaft besonders ausgeprägt ist. Um das Bewusstsein der wissenschaftlichen Gemeinschaft für dieses Thema zu schärfen und den Umgang mit Emails zu erleichtern, halten wir die Einführung von Email-Workshops sowie von Emailregulierungen an Universitäten für notwendig.

Schlagwörter: Email; Wissenschaftskommunikation; Organisationskommunikation; Mediatisierung; qualitative Interviews.

1. Introduction

It is Monday, 5 a.m. Prof. Fink, a natural scientist, just got up, made herself a cup of coffee and sat down at her computer at home while her husband is still asleep. She does her email and structures her day before she goes to the office.

Two hours later, Anna, a PhD student in social sciences, wakes up, turns off the alarm and starts reading her emails on her phone while being half-asleep and still in bed. Every time she gets a new email throughout the day, she receives a push message on her phone and instantly checks her mailbox whether she is at work or waiting in line at the supermarket.

Lena, a postdoc in life sciences who is currently on holiday in Thailand, replies to her work-related messages in her hotel because she is afraid that her emails will pile up in her absence.

Since the first days of the internet emails have been the most pervasive form of online communication (Siegert, 2008; Statista, 2019). According to the Radicati group (2019), the number of emails sent and received on a daily basis will exceed 293 billion in 2019. Although the email itself is an asynchronous medium, it is very often used in a synchronous manner, as people tend to reply almost instantly. Renaud, Ramsay, and Hair (2006) dubbed the term “e-synchronous communication” for this. Sending an email is very easy and comes at almost no cost for the sender. The recipient, however, very often has to meet task demands which can contribute to a feeling of stress since new, unexpected assignments can arrive any minute and pile up in the recipient’s absence.

Results from a study by Gillespie, Walsh, Winefield, Dua, and Stough (2001) show that stress for academic staff has increased over the years. This is mostly due to factors like “insufficient funding and resources; work overload; poor management practice; job insecurity; and insufficient recognition and reward”, (ibid: 53) but also to “information overload due to an increasing amount of electronic mail, coupled with the expectation to respond immediately” (ibid: 63). Emails are commonly used among scholars (Bader, Fritz, & Gloning, 2012, p. 97) and mailing lists and groups play a very important role in the German community (Bons, Fritz, & Gloning, 2011; Pscheida, Albrecht, Herbst, Minet, & Köhler, 2013) and beyond (Koku, Nazer, & Wellman, 2001; Matzat, 2009). Furthermore, scholars – like all knowledge workers – need to cope with an ubiquitous access to email and work-related issues via the internet and mobile as well as wireless devices. Yet, there is little research on email usage among scholars and even fewer studies take into account the mobile aspect of email usage (Barley, Meyerson, & Grodal, 2011; Capra, Khanova, & Ramdeen, 2013).

Current studies mostly focus on social media usage among academics (Bader et al., 2012; Cardon & Marshall, 2015) which still plays a marginal role in scholarly communication. Research in international companies implies that users from different countries tend to use email differently (Tang et al., 2009). Also, the use

of communication technology varies across fields of work, organizations and job types (Olson-Buchanan & Boswell, 2005). Therefore, it is very likely that usage patterns and copying strategies applied by German academics differ from those in other countries, the non-academic field and among doctoral students, postdocs and professors.

Prior studies looking at email usage and the blurring of boundaries in academia have taken little interest in the characteristics of email usage in the field of science as well as usage patterns among scholars in different stages of their career. This study contributes to closing the research gap by looking at the current use of the email as well as the changes it has induced by analyzing qualitative interviews and media diaries of 55 German-speaking academics. It identifies the development of email usage as a social process in the context of field-specific mediatization (Lüthje, 2017) and takes influencing factors such as social norms and field-specific email usage rules into account (compare Barley et al., 2011, p. 902).

2. Theoretical background: Field-specific mediatization

The theory of this paper draws on the hypothesis of field-specific mediatization (Lüthje, 2017). It assumes that media innovations, such as the email, interact with the logic of a field and its subfields in relation to individual habitus, other fields and social space, thus leading to a field-specific mediatization (Figure 1).

Mediatization is understood as an historically-induced, permanently progressing meta-process (similar to and connected to globalization or commercialization), in which more and more media emerge and become institutionalized (Krotz, 2007). The basic assumption of the concept of mediatization is that new media modify communication. It draws on an extended understanding of media as (1) technologies, (2) social institutions, (3) organizing machines that help to produce content and (4) recipients' realms of experience (Krotz, 2009, p. 23). The starting point for mediatization processes is direct communication as a basic human practice (face-to-face, nonverbal and language-based). Mediatization influences media change (Krotz, 2007), human communication and interaction (compare: Hjavard, 2008, p. 108) as well as social and cultural reality (Krotz, 2009, p. 24).

According to Pierre Bourdieu, modern societies consist of different social fields. The social fields are relatively independent and have clear-cut boundaries, yet they are connected systematically and interact with each other. Each field has its own field logic, which means that it has a specific mixture of capitals (economic, cultural, social and symbolic), specific rules and social practices (Bourdieu, 1995).

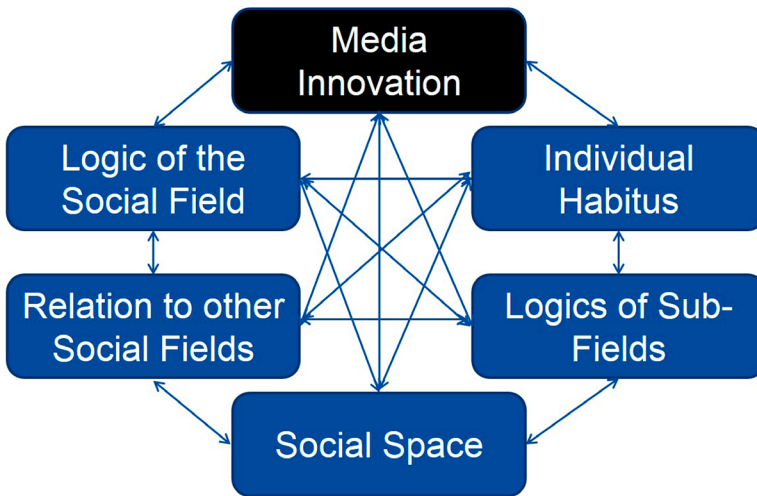
Media usage is a social and cultural practice. It encompasses (1) field-specific media repertoires (2) and how they are used (duration, frequency and application) by members of the field. Media change alters (media) practices and field-specific habitus. The term "habitus" refers to "common schemes of perception, conception and action" (Bourdieu, 1993, p. 60) of social agents in social fields. They function as the basis for the creation of practices and perceptions.

Mediatization as a meta-process affects social space and all social fields within it, but each in a specific manner. Field-specific mediatization targets the interaction of media innovations with the logic of a social field and its relation to other

fields. It is not monocausal, but the result of a complex and dynamic interaction of media change, social fields and agents, which mutually influence each other. Therefore, usage and integration of media innovations like the email vary within fields and within those among people on different career levels or from different generations. The academic field, like all social space, is mediatized, which means that mediated communication takes place.

According to Roth-Ebner, economic demands for flexible and mobile action influence the development and use of mobile technologies in a work-related context, while the existence of mobile communication technologies enables a more flexible and mobile working context (2015, p. 42). This becomes especially visible in fields where work mostly consists of information and communication. This development enhances global communication and networking (*ibid.*: pp. 50–56), but also leads to a dissolution of boundaries (*ibid.*: S. 68–73), due to flexibility and mobility being expected of the “prototype of the new labour force” (Flick, 2013, p. 17). The so-called “manpower entrepreneur” (Voß & Pongratz, 1998) constantly has to negotiate boundaries of work and non-work domains. The boundary work usually takes place in form of “boundary placement” and “boundary transcendence (or transition)” (Nippert-Eng, 1996, p. 569). Borders with low permeability and flexibility are strong, while high permeability and flexibility can lead to a “blending” of different domains (*ibid.*). The email is a medium which is especially challenging for boundary management and its permeating effects are increased by mobile media such as tablets and smart phones (Capra et al., 2013, p. 1030).

Instant messaging services such as WhatsApp and video or teleconferencing services such as Skype satisfy similar communicative needs as emails and create similar problems on mobile devices. But instant messaging services are rather used for non-work-related or informal communication and whenever documentation is not important (Cameron & Webster, 2005; Schmidt, 2018b, p. 15). Video or teleconferencing services often include an instant messaging option, but are mostly used to enable real-time conversations, adding the video function to the traditional phone call (Schmidt, 2018a, p. 15). While workers in a study by Cardon and Marshall (2015) rated the effectiveness of face-to-face communication higher than email, the latter was still most frequently applied and both surpassed instant messaging as well as texting. Therefore, services such as instant messaging, video or teleconferencing supplement email usage, but do not replace it (Bader et al., 2012).

Figure 1. Field-specific mediatization

Source: Lüthje, 2017, p. 61.

3. Literature review: The email as an established innovation

The email has been developed in the academic field. In 1982 it emancipated itself with its own protocol as an independent service. In Germany, the first email was received at the University of Karlsruhe in 1984. From the scientific field onwards, the email conquered almost all areas of society with the liberalization of the internet in the beginning of the 1990s. Its success is mostly based on the fact that it sped up communication and enabled communicative asynchrony, which allowed more flexibility (Höflich, 2016).

In their literature review, Watts and Ducheneaut (2005) discovered that research mainly focused on email as a file cabinet, “meaning the cognitive aspects of information organization and retrieval in email” (2005, p. 5). As such it was employed since the very beginning, when people working in the Advanced Research Projects Agency Network wrote and sent notes via email and scientists in the project used it for electronic publishing (Siegert, 2008). The email is also described as a production facility “concerned with the efficiency and effectiveness of organizational communication” (Watts & Ducheneaut, 2005, p. 5).

Apart from its enabling features and new opportunities it creates, research has also found that emails contribute to a feeling of information overload (Bellotti, Ducheneaut, Howard, Smith, & Grinter, 2005; Eppler & Mengis, 2004; Ishii, 2005; van den Hooff & Jackson, 2006). Information overload is defined as “receiving too much information” and occurs “when the supply exceeds the capacity” (Eppler & Mengis, 2004, p. 326). It may cause individuals to experience stress, confusion, pressure, anxiety and low motivation (Eppler & Mengis, 2004, p. 328). The email has been identified as a major cause for information overload (ibid.) because it

- a) comes in high volume (Barley et al., 2011),
- b) interrupts tasks (Jackson, Dawson, & Wilson, 2001; Mark, Volda, & Cardello, 2012)
- c) creates tasks that were not anticipated at the beginning of the workday (Barley et al., 2011; Thomas et al., 2006),
- d) is being checked (too) often (especially on mobile devices) (Kushlev & Dunn, 2014; Mark et al., 2012; Thomas et al., 2006) and
- e) contributes to a blurring of boundaries (Capra et al., 2013; Duxbury, Higgins, Smart, & Stevenson, 2014).

A study on information overload in the context of online news exposure found that there was a positive correlation between push notifications users received and their experience of information overload. The researchers attributed it to the fact that users had no control over the time and situation in which they received them (Schmitt, Debbelt, & Schneider, 2018), which is also the case with emails. Therefore, it is very likely that the findings are applicable for it as well.

Most studies on email usage have been conducted in the context of companies, but only few have taken a closer look at email in the context of academia, although it is the place of its origin. Research in that area has been concerned with email communication with students (Duran, Kelly, & Keaten, 2005; Kuehl, Rebecca, A., Westwick, Joshua, N., & Hunter, Karla, M., 2014; Lam, 2014; Lam, 2016) and the blurring of boundaries (Agarwal & Rodhain, 2002; Boswell & Olson-Buchanan, 2007; Ishii, 2005; Olson-Buchanan & Boswell, 2005). As the latter is also a concern of this paper, the blurring of boundaries in the work-related context will be described in more detail. At first, the email was perceived as a medium

“[...] with well defined [sic!] properties [...] [b]ut research progressively recognized the malleability of email and this medium is now described more in terms of its local meaning, contingent on how users appropriate it and renegotiate the value of its features in the context of their organization” (Watts & Ducheneaut, 2005, p. 19).

A study from 2018 found that almost 70 percent of the surveyed German employees checked and replied to their emails on weekends and after work (Markgraf, 2018, p.15). About two third of employees also state that they are following non-work-related interests like replying to personal mails account while at work (Schneider 2017). Especially among knowledge workers, physical and temporal boundaries of work and non-work seem to no longer exist, which is enhanced by mobile media tools (Duxbury et al., 2014; McCloskey, 2018). When people were asked, why they were crossing these boundaries, they mentioned convenience and dealing with work-life constraints as the most important reasons (Duxbury et al., 2014; Eddy, D’Abate, & Thurston, 2010).

In the academic context, a survey – looking at work and personal email account use of nearly 600 university employee’s – found that users put more effort into storing their work emails (like getting bigger inbox sizes) than their personal emails. Mobile devices like smartphones were used for personal and work-related issues (Capra et al., 2013). The researchers assumed that the use of multiple email

accounts (84 % of the participants had at least one for work and one for personal issues) could be a sign of a “work-personal boundary placement strategy” (2013, p. 1029). Still, 16 percent of the participants just had one account for both, which Capra et al. (2013) attributed to their strong job role identification.

The role, which people inhabit at work, influences their email management practices. Those, who are more ambitious and identify strongly with their job, care less about blurring boundaries of the place and time of their work, yet they also report higher work-life conflicts. The lack of separation of different spheres is common among managerial and professional employees (Boswell & Olson-Buchanan, 2007; Glavin & Schieman, 2012; Olson-Buchanan & Boswell, 2005).

We assume that the blurring of boundaries is very strong in the academic field and might even exceed that of other fields. This is due to the academic freedom to choose the time and place of work. The fact that scholarly research (especially in the social sciences and humanities) is strongly shaped by intrinsic motivation (Enders, 2008, p. 90) also contributes to the problem. A high individual commitment is necessary to fulfil the variety of tasks and expectations towards an academic position, which also means that people need to be able to prioritize and select foci (Höhle & Teichler, 2013, p. 125). Renaud et al. noted that the academic environment “requires long periods of reflection and concentration” (2006, p. 13), which are difficult to maintain when incoming emails keep interrupting this process.

Furthermore, traveling is often part of the academic life. Therefore, academics often access emails on mobile devices, increasing the likelihood that email coping strategies applied in the scientific field will differ from those in the non-academic companies examined above.

4. Sample and method

The data for this study was collected from February to 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 participants were recruited via email distribution lists of different universities, personal email, face-to-face conversations and by applying a snowball sampling method. 55 German-speaking scholars in Germany, Austria and Switzerland were interviewed. They were on all three career levels (doctoral student, postdoc, professor) and worked in humanities, social sciences, life sciences, natural sciences and engineering (see Table 1). The aim of the project was to learn more about the effects of mediatization on the interviewees’ work-related communication. For the purpose of anonymization, a consecutive number from 29 to 83 (earlier interviews having lower numbers) was assigned to each of the interviewees. For informational purposes, we added a letter denoting the discipline (H = Humanities, S = Social Sciences, L = Life Sciences, N = Natural Sciences, E = Engineering), a number for the career level (1 = PhD Student, 2 = Postdoc, 3 = Professor) and a letter signifying the sex of the participant (m = male, f = female).

Table 1. Overview of the interviewees' disciplines, gender and career level

	PhD Students	Postdocs	Professors	Total
Humanities	2 (1 m/1 f)	0	1 (1 m)	3 (2 m/1 f)
Social Sciences	5 (1 m/4 f)	7 (4 m/3 f)	6 (5 m/1 f)	18 (10 m/8 f)
Life Sciences	1 (1 f)	3 (2 m/1 f)	5 (4 m/1 f)	9 (6 m/3 f)
Natural Sciences	3 (2 m/1 f)	10 (7 m/3 f)	6 (4 m/2 f)	19 (13 m/6 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)

With each of the participants we first conducted a biographical narrative interview (Misoch, 2015). In the introductory question, we asked the interviewees to tell us more about milestones of their career and how their work-related media usage had changed since they first entered university. Afterwards we had follow-up questions about their media usage and professional background.

The interview notes for the biographical narrative interview did not include a question on their email usage. Nevertheless, the interviewees were usually talking about their email usage when they were asked how their communication with other scientists had changed. After conducting the first interviews, it became clear that the email played a very important role in the scholars' lives. Very frequently, it was among the first media they mentioned or the medium they described most intensively.

Once the interview was completed, the participants were asked to keep a semi-standardized media diary for a week. They were given seven sheets where they documented their current work-related media usage in 30-minute intervals throughout the whole day. If they did not work on a given day, we asked them to leave the sheet blank.

We decided to use 30-minute intervals because we knew that our study was very time-consuming for our interview partners. We did not want our participants to quit due to a too complex media diary. We are aware that 30-minute intervals are not ideal to measure email usage, as email activities are usually much shorter. As the aim of the study was not just to document email usage but work-related media usage in general, this method seemed more feasible. Therefore, we decided to settle for 30-minute periods and asked the interviewees about shorter activities in a reconstructive interview.

During the biographical interview as well as in the media diary, we asked the interviewees about different places of their work-related media usage (at the office which included the office, laboratories and university grounds in general; in transit which included cars, planes, public transportation, but also conferences; at home for which we will later use the term "home office").

In total, we received 51 media diaries which we used for our analysis. The participants filled out the diary during the semester (39 participants) as well as during the semester break (12 participants). The media diaries were analyzed using SPSS and correspondence analysis (Blasius, 2001).

A second reconstructive interview was carried out with each interviewee after the media diary was completed. It included follow up questions about the media diary and about the interviewees' current media usage. The biographical interviews had an average length of 1 hour and 14 minutes, the reconstructive interviews 44 minutes. The biographical narrative interview was transcribed literally, but slightly smoothed following the rules by Kuckartz (2012, pp. 136–137) while the reconstructive interview was synoptically transcribed. The German-language interview excerpts found in chapter five were translated to English by the authors.

We randomly chose two of the conducted interviews for a detailed content analysis (Mayring, 2015) in order to identify general structures of the interviews. On the basis of this analysis, we developed a code book which put a focus on the different media the interviewees described (not) to use as well as how (long), when and why they (or others) used it, whether changes in their usage had occurred and if so for what reason.

The coders read the interviews in order to identify all media mentioned by the interviewees and then coded them. The procedure enabled us to filter the data by medium, the interviewee's career level and discipline in order to get a better overview of the data and identify user groups and usage patterns more easily.

Concerning the email usage of our interviewees, we had the following research questions:

RQ 1: When did the interviewees start using email?

RQ 2: How is the email currently used in scholarly communication and do people on different levels of their career use it differently?

RQ 3: What changes has the email induced and how do people on different levels of their career cope with them?

The first research question identified whether the email was used among German scientists from the very beginning and at what point the process of mediatization in different disciplines began. With the second and third question, we assessed the status quo of the process of field-specific mediatization and changes it has induced on people in different career levels, thus also covering the blurring of boundaries between work and personal life.

5. Results

5.1. Beginning of email usage

39 of our interviewees, those who had started studying no earlier than 1990, described that they had used email since their student days and therefore have been using email throughout their whole academic career. 16 interviewees had started studying between 1968 and 1988 and experienced the changes that came with the introduction of the (then) new media.

The earliest email usage was described by 69N3m who sent his first email in the mid-80s. He was introduced to it while he was working in an internationally operating company. He was part of a community of developers that exchanged data via computer and remote-controlled other computers.

The first of our participants to use email in the context of academia was 53L3m. He claimed that it was shortly after the university network had been created around 1989–1991. He wanted to send data from his doctoral thesis to a colleague in the US,

“[...] because I knew that it was possible. No more fax, I was tired of fax. Anyway, I managed to send it with a lot of effort and the help of our computer scientist. It took us, I think, six hours or five hours to get the system running. And the colleague in the USA was not happy because he had to go to another building to receive it, but it worked, and it was slow, slow. I think it took half an hour (interviewer and interviewee laughing) until the data arrived on the other side.”

From the mid until the end of the 90s, eight of our interviewees, who were mostly postdocs and professors in natural sciences, described the emails to be more commonly used due to an institutionalization of email accounts at universities. Two of them described discipline-specific differences in the diffusion of email, with students in natural and computer sciences being the early adopters. 61S2m, a social scientist who was already an active member of the “modem scene” as a pupil, asked for a personal email account as soon as he arrived at his first university in 1993: “And like I said, in ’93 it was not possible to get this at enrollment, it was only possible via application. It was, I think, rather unusual that students did this, mostly students of computer sciences, who were quite powerful at our university.”

42S3m, who studied German and physics, mentioned that he first used emails exclusively during his studies of physics and exchanged emails with a friend.

“And it took years until they had emails, email accounts for German studies students. This happened at least two years later or maybe even later ... In physics it were the students, the student association and not the professors who introduced it. It must have been around 1994 or 95.” (42S3m)

56S3f, who studied cultural sciences, described that the email started to “kick off” when she started studying in 1998.

Those who enrolled around 2000 already had personal email accounts prior to the one they got from university. The latter was used for communication with university lecturers (37S2f) and mailing lists (62S2m, 80N2f). 37S2f and 80N2f preferred using their personal email address and 58S2m only began using his institutional email account when he started working at university “because my personal mail is actually a bit weird”.

For those who began their studies in 2007 and 2008, using the institutionalized account from the very beginning was normal (46S1f, 77L2m).

Interviewees from every career level in social sciences and a doctoral student in engineering described that their email usage first intensified during the course of

their studies and once more when they started working in academia, which shows the importance of email in the context of professionalization and academia.

Several interviewees mentioned that once they used email on mobile devices, which two of them date back to 2011 (36S1f, 53L3m), their email usage changed again (more in chapter 5.3.2).

5.2. Current email use

All of our interviewees talked about their email usage in the interviews (even though there was no question asking specifically about it) and all of them used email during the week documented in the media diary. 74N3m, who had been working outside of academia before, said that he communicated a lot less via email then and that face-to-face conversations were more common:

“If you have managerial responsibility in a company, you cannot write an email to your foreman ... you usually have a one-on-one. That’s very different here. When you have highly qualified scientific staff, you can of course communicate in written words – and have to communicate in written words – a lot more.” (74N3m)

5.2.1 Multifunctional communication tool for multitasking

Although only 30-minute intervals were documented, the email accounted for 35,41 percent (900 episodes of email use in total) of the work-related activities recorded in the media diaries and even surpassed face-to-face communication (12,67 %, 322 episodes of face-to-face communication). While the number of email activities is very high, most of them only lasted between half an hour to two hours, while face-to-face episodes more often than email communication lasted between five and a half to ten and a half hours.

Emails were very often written and read parallel to other activities, for example while being on the telephone, listening to presentations, being in meetings or during face-to-face conversations with students to send them articles or information.

Interviewees across all disciplines and career levels described that the email was the most frequently used medium for internal scientific communication with colleagues and students. Seven pointed out that it facilitated international cooperation and four mentioned that they used it for external communication with interview or project partners.

Across disciplines and career level the interviewees used emails to arrange appointments, attach files, share/forward papers/information, write papers, as well as for documentation, journal publications and to contact people. Six participants expressed that it was useful for short, precise, uncomplicated messages. Its advantages are furthermore that it can be used in an asynchronous manner and is very easy to handle.

5.2.2 File cabinet and organizer

We found that our interviewees used the email as a file cabinet and an organizer.

38E2m deleted his emails once he finished a task connected to them or saved them in another file, if he wanted to keep the email. He said that emails were a major resource of his work as he used them to track his conversations, but also as a “to-do-list” (38E2m). 62S2m similarly mentioned that he had about two gigabytes of emails on his computer, so he could keep track of conversations. He dreaded losing this documentation in case he should change institutions.

Many email programs have a built-in calendar, which several of the interviewees made use of. “You can send an email with [...] an appointment request and the counterpart has to, can confirm it and then it is automatically in my calendar as a confirmed contact, a confirmed date.” (60N2m, similarly answered by three doctoral students in social, natural science and engineering and a professor in engineering)

71N1m reported to make notes and create reminders on paper, which he would then enter into his email account to create calendar entries and save them on his phone. 43S3m explained that he would make handwritten notes when conceptualizing or write an email to himself because he could access them everywhere.

5.2.3 Email interrupts and structures the workday

By means of the media diary we could see that emails were used all day. However the highest activity (26,67 %) was documented between 8–11 o'clock in the morning. This is consistent with what many of the interviewees (from all career levels and across disciplines) mentioned about starting their workday with checking emails. 35L3f even said that her working hours were structured by emails. Only 82N3f specifically stated that she tried not to check her emails first thing in the morning as those were the most productive hours of the day and “boring tasks” should be handled in the afternoon, when people tend to get tired and inattentive.

After checking their emails in the morning, 16 of the informants (four doctoral students, nine postdocs, three professors) stated that they kept their email program running in the background, while working on other tasks. Although several of the doctoral students said that they tried to check their email only twice a day, solely one of the postdocs and none of the professors mentioned setting such a limitation. The doctoral students on the other hand did not mention turning off their email completely in order to not be distracted (for example when working on an article), however, three of the postdocs did: “I take a look [at his email account] whenever it suits me and if it takes me three days, it takes three days.” (70N2m). Also, none of the professors in our sample said that they would turn off their email programs.¹ Some of them told us that they worked from home, if they did not want to be disturbed by people bursting into their office during the

1 We did not ask the interviewees specifically to tell us, when, where and how long they had their email programs running. Therefore, it is possible that some of the professors turned it off and simply did not mention it to us.

week, but 63N3m was still available via email. In order to not be interrupted by emails or other issues 44S3m and 82N3f worked at home, on weekends or holidays. 44S3m said that he would not find the time to write articles otherwise.

Quite a few of the participants expressed that incoming messages interrupted them during other tasks. 45S2f, a postdoc, described that she was in charge of a project, where data had to be coded. Once an error occurred, a coder could not continue until she had fixed it.

“And for that kind of purpose it [emailing] is good, but it is terribly annoying. In these cases, it is helpful, when I am online all the time, but it distracts me massively. So once the whole project is over, I don’t know, I have to consider turning the email program off for a while ...because it completely sucks for writing if you keep getting emails.” (45S2f)

Not all interviewees considered the arrival of new messages to be problematic. 72N2f, who is a postdoc, said she simply answered to important emails and ignored the others, when she was busy, and it would not make her feel stressed. But she was an exception (see chapter 5.3.3).

5.3. Email induced changes

In this chapter, we have collected the interviewees’ statements on major changes the email has induced. These were very often connected to metaprocesses such as mediatization, digitalization and acceleration.

5.3.1 More opportunities

People who did not use email throughout their whole academic career often described opportunities that emails offered. For them, email has improved communication because it made it faster, more extensive (32N3m) and less complicated (53L3m). For 53L3m it was a positive change, but he also felt that more trivia was being sent (53L3m). 56S3f described that she had profited from mailing lists concerning announcements or calls for papers. Especially towards the end of her doctorate job advertisements in mailing lists became important for her. She noted that she could advance projects through email, as academic work more often meant collaborating than working solo and that email was a vital tool for exchange. Similarly, 52H3m mentioned that he communicated more often with scholars from other nations since he had email. For 49N3f, the medium made it easier to keep in touch with other scientists, but it did not intensify the contact. To her, the intensity of a cooperation depended on how interesting it is for her scientifically.

While the email creates more opportunities to get or keep in touch, it is up to the academic’s personal interests if he or she makes use of them. In addition, most interviewees expressed that emails did not replace personal contact.

5.3.2 *Blurring of boundaries*

In their media diary, the interviewees documented that they accessed email via computer or laptop 72,22 percent of the time, 17,56 percent via mobile phone and 7,11 percent via tablet. Emails were read and written at the office (53,56 %), but also at home (35,56 %) and in transit (10,78 %).

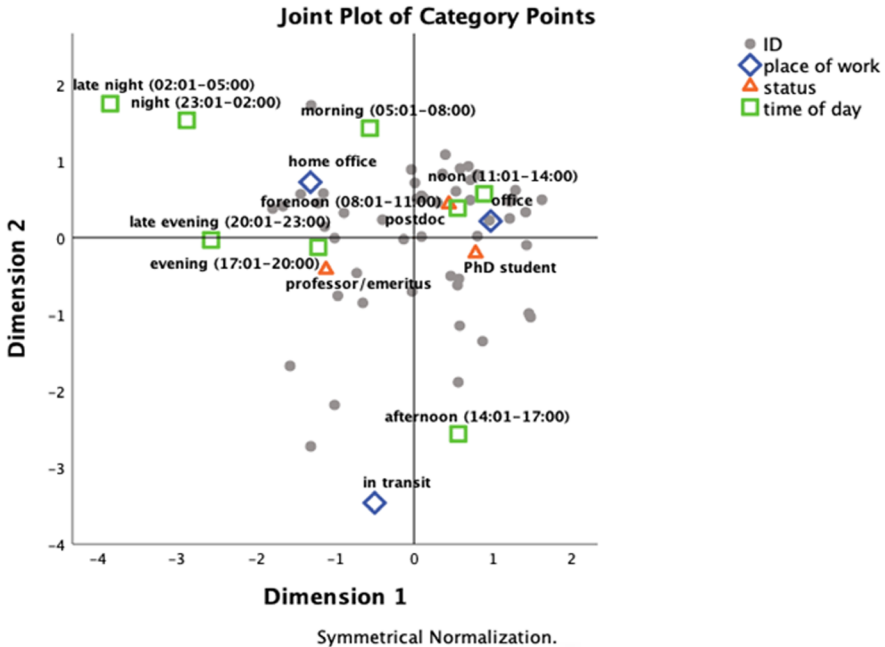
The interviews made clear that checking emails was a work-related practice which participants from all disciplines and career levels conducted outside of work and working hours. Of all the work-related activities that were conducted on the weekend, the email was mentioned the most frequently. Even when the interviewees said that they would not work during weekends, many of them would still check their emails on their mobile devices and not consider it work.

Among the doctoral students and postdocs, we could identify two different user groups. The first group consisted of eight people, who stated that they hardly ever worked or checked emails on the weekends or after hours. The second group consisted of twelve people, who reported to check their email regularly at home in the morning (three people) and some even right after waking up (three people). One doctoral student mentioned going through his emails on the way to work and one postdoc at the queue of the supermarket. In this group, reading and writing emails on weekends was not unusual. 39E1m said that on Sunday it was sometimes nice to know what to expect on Monday, but that at other times he would purposefully refrain from looking at his emails. 58S2m, however, checked his emails at least once a day “automatically” as it had “developed a momentum of its own”. 31S1f came to the conclusion that “it was a routine that might not be good” and 47S2f tried to reduce reading and writing her emails on the weekend.

The amount of emails as well as the time devoted to email management rose with the status of the interviewed person. 43S3m said that since he became a professor, his tasks had changed. He wrote less articles himself, but rather managed and commented on them.

Professors reported to dedicate longer time slots to replying to their emails. They often wrote their emails outside classical office hours (from nine to five) and physically away from their office. This can be seen in a correspondence analysis of the place and time of email usage, which is based on the results from our media diary (Figure 2). In the correspondence analysis, profiles that are similar are close to each other, while different profiles are further apart. Doctoral students, postdocs, the office and email hours from eight in the morning until noon are close to each other, meaning that these groups tended to do their email at work in the first half of the day. Professors on the other hand were more often found reading and writing their email in their home office or in transit as well as in the evening, late at night and in the early morning.

Figure 2. Correspondence analysis of the email usage in the sample by place, time and career level.



Among the professors, only 69N3m said that he tried to refrain from working and replying to emails at home. Two professors reported that they typically checked their email on the weekends. 50L3m did it even when being on holiday, because he saw no other way to process the accrued workload of 1,000–2,000 emails, which would pile up after two weeks. A female postdoc reported similar reasons for reading and writing her email during her holidays:

“I am also someone who – and I really have to withdraw myself a little – when I am on holiday...at home, who still checks emails, because you simply know that when you’re coming back, you’ll have around 200 mails and you cannot get it under control, so if you do it on holidays, little by little, well, yeah, (laughs), then you do it. You are held hostage by your work, but well, the job entails this (very quietly).” (30L2f)

A clear distinction of the different environments of nonwork and work sphere was made by 70N2m. He had eight different email addresses to keep his personal and work-related activities separated, which was rarely found. Instead, two of the postdocs (47S2f, 58S2m) and one professor (44S3m) reported to no longer separate their work-related and personal email accounts.

However, even though the professors had more emails to process, the structural power coming with their status gave them more possibilities to reduce email-induced overload and stress (e.g. by outsourcing email-related tasks to sec-

retaries) than postdocs had: “I have an office and they are always inside [my email account]. They are always reading them. [...] otherwise I would be suffocated [by the amount of them] of course, I could not process them.” (44S3m).

5.3.3 Increased stress level

Among all career levels, especially in social and natural sciences, the participants mentioned that email communication had increased. The younger interviewees more often attributed the increase to career changes like starting to work or being responsible for a (bigger) group of people. Two of the professors (social and natural scientists) on the other hand mostly attributed it to digitalization, a life and a natural scientist to the diffusion of the medium email, one life scientist to the swiftness of the medium and another one to the fact that more irrelevant messages were being sent.

While 35L3f (like 74N3m) approved of the new media technology, she also saw its disadvantages:

“You think you have to reply to an email immediately, it’s funny, that’s how people are ... in former times you got a reviewer request via mail, then you replied and there was at least a week in between, in which you could say: ‘Okay, yes, I have agreed, but this paper will come next week [...]’ Whenever I am getting a request nowadays, I directly click ‘I agree to review this paper’, then one second later the paper arrives via email and I personally as a very assiduous and very conscientious person feel – in a way – pushed to do it as quickly as possible, even though it says ‘You have time within the next three weeks to answer.’ It’s putting some sort of pressure on me. It pressures me and until today I am struggling to not get harassed by its swiftness.” (35L3f)

Another professor pointed out that he was “suffering” from the fact that “you could be occupied with this stupid emailing all day if you did not resist”. Therefore, one had to use it “very, very effectively” (49N3f). Many like 44S3m mentioned that they had trouble coping with the sheer amount of emails they received:

“I have days where I, where I am at 200-something emails. That is too much. And when it is 60, 80 that is fine by me, but when it goes to excess and I am gone for a day or two or three days and I cannot open all the attachments on the small device – that is simply hard to handle (laughs) – then I am annoyed about having to deal with endless emails afterwards.” (44S3m)

38E2m described that since his research group grew at the beginning of the year, he could never really empty his email account, but that every professor he knows has the same problem. He said it meant a loss of control for him and compared it to an “untidy life.”

“It hardly ever occurs that all my emails are done, but it is more a question of how to set priorities ... and which ones [emails] you leave out and sometimes you decide to simply, yeah, let go. So, I think that those emails are

actually something, which stressed me quite a lot in the beginning, because you keep getting new messages from outside and have to somewhat react to them, which can easily interrupt the normal progress. And I also consider all these emails to be a bit annoying because they are telling you from the outside that you need to do things, that you have to do them [...], which, in a way, chases you a little.” (38E2m)

Expectations play a very big role in the email-induced stress. Several of the interviewees expressed that due to people always being online, their colleagues would expect them to reply quickly (56S3f) within hours or a day (67N2f, 68N2m) and that students would want an answer almost instantly (67N2f). “And if you have not, so to say answered the next day, you will get a sore inquiry” (63N3m) or colleagues would call after writing an email to get a quick reply (56S3f). Thus, a professor in natural sciences mentioned that one had to be careful or you would end up just reading and writing emails all day. A doctoral student in social sciences reported that with her prior employer at university she felt she was expected to be available at all times and to reply to emails even on weekends. Although all her colleagues were working on the same floor, they wrote each other emails instead of walking over to talk face-to-face and according to her the messages had a rather hostile tone. She perceived being constantly available as stressful and slept a lot worse while working there.

“I actually always checked my emails before going to bed and was always afraid that some emails with a new task which needed to be done, had arrived and I do not have that feeling here. So, I do not open my email anxiously in the morning, which actually used to be the case.” (36S1f)

6. Discussion: Email induced integration of spheres

Since its first days in the ARPA network the email has served as a tool for communication among scientists, but also as a file cabinet, notebook, reminder and organizer for tasks and appointments (Siegert, 2008). In Germany, emails became more common at universities in the mid-90s. Many early users among the interviewees valued the advantages that the new media technology brought them especially in terms of (international) scholarly communication.

Similar to findings from organizational practice, our results showed that the email is used as a multifunctional, malleable tool (Watts & Ducheneaut, 2005) enabling “e-synchronous” (Renaud et al. 2006: 6) rather than asynchronous communication.

Other than in the early days, the email nowadays is not only used to communicate with locally dispersed people, but also with colleagues who work on the same floor. While it allows more flexibility to reply whenever seems fit, it increases the overall number of messages sent, making it harder for people to manage them. Similar to Barley et al. (2011), we found that with rising email volume came a feeling of loss of control, not just because the emails had to be read and there was the social expectation to respond quickly, but because they included an

external request for action (Barley et al., 2011; Thomas et al., 2006). The action had not been on the recipients' agenda before it arrived and therefore (re)structured the interviewees' day(s). The rising amount of emails caused more interruptions for our interviewees and like in the study by Burgess, Jackson, and Edwards (2005) the amount of emails the individual received increased with higher job grade. Thus, the time spent on replying to them rose as well.

Though many of the findings were similar to those in organizational research, we have reasons to believe that the process of field-specific mediatization of the email causes an even higher pressure for academics to respond. Unlike some companies, who have taken it upon them to protect their employees' work-life-balance (Höfllich, 2016), researchers are entrepreneurs of their own workforce and it is up to the academic her- or himself to draw the line between work and non-work space and time. It seemed to be especially difficult for postdocs, of whom some reported to get about as many emails as the professors. They, however, did not have secretaries to help them deal with it. They are also under more pressure to write papers in order to advance their career, which requires longer periods of uninterrupted reflection and concentration (Renaud et al., 2006, p. 13) that incoming emails disturb.

In order to cope with news information overload Song, Jung, and Kim (2017) suggest to either filter content or withdraw from accessing it. Of course, a complete withdrawal from work-related emails seems rather impracticable. But the interviewees did describe that they would turn off their email programs for some time or single out important emails, they needed to reply to and leave the rest unanswered. Especially the professors mentioned to cope by reading and writing their emails after hours, on the weekends and during vacations, like they did in the study by Barley et al. (2011). They also outsourced their emails by giving their secretaries access to them.

Unlike in the study of Barley et al. (2011), the participants did not report reading and writing email during teleconferences but during presentations and – as it is more typical for academics to travel – in transit or at conferences. Mobile devices and mobile internet access cater to this scholarly mobility. They have led to more flexibility, freedom and independence in choosing when and where to work. It comes at the price of boundaries having a high permeability and flexibility for academics in all career stages. This leads to a blending of the different domains, which is also enhanced by using email accounts for personal as well as work-related matters (Capra et al., 2013). Reasons that our interviewees named for the integration of spheres were mostly a fear of overload as well as a developed habit. While the dissolution of boundaries is typical among knowledge workers (McCloskey, 2018), there seemed to be career stage differences, as the doctoral students and postdocs mostly accessed their email at work and professors more often at home and in transit.

Some of the interviewees preferred to work from home because there were no disturbances by people coming into their offices, but they mentioned that it increased the (perceived) expectation to be available via email all the time. Said expectation enforces and depends on social norms or a field habitus that has evolved around email usage. Since the agents are part of their social field and the

field habitus is incorporated, invisible and remains unconscious, it is hard for the participants to oppose it. Instead, they work longer to comply with the rules. As professors write less articles themselves but rather manage and revise other people's work, they need fewer uninterrupted timeslots than doctoral students and postdocs, who most of the time write articles and do research. Still, these junior researchers very often did their email outside working hours. The reason might be that the academic field very much relies on intrinsic motivation for advancement. To become professors, people must best many other suited candidates, which makes it very likely that they are highly motivated and might show in the displayed willingness to do emails on weekends. This was less often the case among postdocs as not all wanted to become professors. It was very interesting that seven of the twelve people, who regularly checked their email outside of work and on the weekends, were social scientists (five of them communication scientists of which there were 16 in the sample), among which research shows that intrinsic motivation is rated extremely high in order to get a professorship (Enders, 2008).

7. Conclusion: Introduction of email regulations

As described in the chapter on the theoretical background, media innovations interact with the individual habitus, logic of the fields, subfields and social space. Communication cultures and institutional rules influence email usage behavior. Doctoral students at the beginning of their academic career are very likely to adopt those rules and act in accordance to perceived expectations. Since doctoral students in Germany are very often graded by the professors they work for, it is a relationship of severe dependency which increases the pressure to perform well at work and to adopt the field habitus.

A few of the young scholars in our study displayed an alarming behavior as they reported that the first thing they did in the morning, while they were still lying in bed, was to look at their emails. Checking emails early in the morning and late at night is associated with higher levels of perceived email pressure (Kelly, MacKinnon, McCrudden, & Tatham, 2015) and high boundary permeability. Also, younger people have been reported to be more susceptible to experience information overload (Schmitt et al., 2018; Song et al., 2017), which might have negative effects on their well-being. Once these scholars become professors it is very unlikely that this behavior is going to change. Instead, email boundaries will become even more elusive and professors' expectations of their staff to respond to emails all day long even higher. This may cause a downward spiral, where work becomes more and more present and absorbing outside office hours, possibly with negative effects on people's health. If we want to induce change in email behavior in any field – which we highly recommend – it has to happen on all levels that are affected by field-specific mediatization. Due to the complex and dynamic interactions of media innovations with social space, changes need to be induced to the individual habitus, the social field and its subfields and – at best – to society as a whole (see Figure 1).

Though guidelines and tips on how to write and use emails have been around for more than ten years (Dressel, 2008; Thomas et al., 2006; Weber & Horn,

2011) our results show, that strategies to deal with email-induced information overload in academia are still only implemented on the individual level and that emails are a cause of stress. A reason for that is certainly that academics are usually highly intrinsically motivated. Especially when they pursue an academic career, they try to comply with the habitus of the field, institute or superiors to reply immediately and be available at all times. Those, who are equipped with the power to change the rules of the field have very often already incorporated the field-specific habitus and do no longer see it as a problem.

Roth-Ebner (2015, pp. 317–324) recommends to do media and technology training with adults for work, which is also a countermeasure for experiencing information overload (Eppler & Mengis, 2004). We think that it makes sense, to try changing the field-specific mediatization of scholarly communication on an institutional level by supplying mandatory training on email usage for university employees and academic staff. The training could focus on when to use email, how to aggregate, structure and compress email information as well as how to filter and prioritize information in an email management system (*ibid.*). Furthermore standards for email operating procedures could be set (compare Eppler & Mengis, 2004, p. 334).

We think it is especially important to train academics who are in charge of staff as their tasks are similar to those of managers. People in these positions receive more emails (Boswell & Olson-Buchanan, 2007), but can also influence other people's emailing behavior by sending out messages.

In France it is illegal to send emails to employees on weekend or during holidays (Kozicka, 2016). The German Ministry of Labor has banned managers from emailing their employees outside their regular shift (Vasagar, 2013) and big companies such as Volkswagen have taken it upon them to introduce regulations, in order to protect employees from receiving emails after hours, while sick or on holiday (Höflich, 2016). The same restrictions could be introduced to the field of science at university level or – more generally – in social space by making it illegal to send emails after working hours. If no policy can be introduced on the institutional or state level, professors could set email rules for the staff of their chair or institute.

The email-induced stress and overload is just the tip of the iceberg in an overall process of acceleration, mediatization and mobilization in our communication. It has a massive impact on our lives in general and the field of work in particular. Therefore, we think that we should find ways to slow it – or at least aspects of it – down.

8. Limitations and future research

Our study has several limitations we would like to point out. First, only very few of the participants are humanities scholars (which were especially hard to recruit) and engineers, while communication scholars among the social scientists are over-represented. Therefore, our results have very limited validity in the area of humanities and engineering. Within various disciplinary groups the discipline-specific media usage diverges strongly (Thiele, 2016). It therefore seems likely that differences in the intensity of email usage would occur across disciplines. For future

research, we recommend an observational study with scientists from different disciplines, to see if they use email in different, discipline-specific manners.

Second, the results of the study are based on a very small sample of German scholars, who do not represent the German scientific community as a whole. Therefore, neither the findings concerning disciplinary differences nor status groups can be generalized.

Third, only activities of 30 minutes and longer have been documented in the media diary. It is very likely that many email activities of the participants have not been recorded, which would have added more depth to the findings.

Overall, we think that creating binding email policies for academics on an institutional level is important. From our personal experience as academics, we would recommend introducing email hours which do not extend core times from seven in the morning to nine in the evening and a ban for sending (not necessarily writing) emails after hours and on the weekends, especially by superiors to their staff. It might make sense to introduce a two-day waiting period after which a new email request can be sent, to lower expectancy to get an answer right away. This would help turning email into an asynchronous medium again. However, in order to figure out what specific email policies could look like exactly, more research on the matter is necessary.

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