

# SComS

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## Editorial

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Dear SComS readers,

We are pleased to introduce the first issue of 2021, which comprises many contributions from a wide range of research fields in communication and media studies, including digital communication, gender studies, media reception and effects, political communication, journalism research, and science communication. With authors from the universities of Zurich, Berne, and Fribourg, as well as from universities in Germany, Austria, Spain, Sweden, and Canada, this issue illustrates that SComS is a home for Swiss studies as well as international research. This is also highlighted by our advisory board, which was renewed in spring 2021. Its fourteen members are distinguished scholars with expertise in a wide range of research areas within communication and media studies. They also represent different Swiss language regions, neighboring countries of Switzerland, and other European countries (see more information on our website).

With this issue, SComS has also renewed its editorial team and journal management. While Jolanta Drzewiecka and Silke Fürst are welcomed as new editors and Mike Meißner as new journal manager, SComS bids farewell to Sara Greco and Thomas Häussler, who served the editorial team for more than five years. Their engagement greatly contributed to SComS becoming a well-established open access journal within communication and media research. We now celebrate the fifth anniversary of SComS as an open access journal (see *Latest Issues*) and are thankful to the *Schweizerische Akademie der Geistes- und Sozialwissenschaften* (SAGW) for their support and to the Seismo Press and the Hauptbibliothek Open Publishing

Environment (HOPE) of the University of Zurich for the good cooperation during the past years.

Recent, very positive developments of our journal are worth being highlighted. During the last year, the then journal manager Silke Fürst witnessed tremendous growth in submissions, leading to a total of 34 full papers submitted to our journal for the General Section alone. Some of these submissions did not comply with the basic rules of our submission guidelines and the scope of our journal or did not meet general standards of scientific quality, therefore resulting in 15 desk rejects. One submission was rejected because of plagiarism. All in all, 18 submissions went to peer review, of which four were rejected based on the recommendations by the reviewers. Six submissions were accepted, four of them published in this issue. The other eight submissions are still in review, most of them in the second review round.

The two Thematic Sections in 2020, *Financial Discourse* (Issue 1) and *The Dissolving Boundaries of Hybrid Journalism* (Issue 2), received an additional number of nine submissions, of which seven were accepted and published. We are very thankful to the guest editors for their engagement, to all authors who consider SComS as a venue for their work, and to all reviewers for their careful reviews and thoughtful comments.

The growth in submissions was accompanied by a significant increase in total downloads of articles, from nearly 5500 downloads in 2019 to around 10 500 downloaded articles in 2020. In addition to the downloads on the HOPE open access platform, SComS is also read in the printed edition created by Seismo Press.



The General Section of the current issue contains four contributions. It opens with an article by Dorothee Arlt which takes up the recent case of the Swiss popular initiative “Yes to a veil ban” and examines audiences’ perceptions of (hostile) media bias. The study is based on a standardized online survey conducted in March 2019 with 976 respondents from the German and French language regions in Switzerland. The results show that perceptions of media coverage on Islam and Muslims differ decisively among audience members. While about one-third of the population consider the Swiss media coverage as accurate, another one-third each think that the media overstate or understate certain threats and integration problems. Perceptions of media bias vary according to attitudes toward Islam and Muslims, political orientation, and personal contacts with Muslims. In contrast, media exposure had no direct effect on bias perceptions. Moreover, the study indicates that perceptions of media bias are a strong predictor of voting intentions and therefore deserve more attention in future research.

Thomas Zerback and Dominique S. Wirz apply appraisal theory and focus on political communication in social media. They investigated how message-inherent factors influence emoji reactions of Facebook users. The authors used a disproportionately stratified random sample of  $N=600$  messages posted by German political parties between 2017 and 2018 and combined automatic and manual quantitative content analysis. Their analysis indicates that message-inherent factors indeed influence the use of emojis, with anger triggering more angry emoji reactions and sadness triggering more sadness emojis. Moreover, the authors conclude that “anger and sadness eliciting posts are shared more often than other posts on Facebook” (p. 40). This could also explain “why negative news and hate speech spreads fast on social media” (p. 40). The results also suggest that emotion-eliciting content and the use of emoji reactions vary between political parties, with the political party “Alternative for Germany”

(AfD) inducing the most emotionalized content and activity.

The following article connects the fields of audience studies, journalism research, and science communication. Nina Wicke and Monika Taddicken applied Wolling’s theory of subjective quality assessments (TSQA) and carried out a qualitative study with German media users. The authors conducted four group discussions with 26 participants, used excerpts from German public broadcasting as stimuli, and analyzed the material by means of qualitative content analysis. The study shows that media users have various expectations regarding the coverage and representation of science, including the media’s responsibility to prominently cover climate change and raise societal awareness about it. It turned out that the current coverage of climate change does not fulfill these expectations – it is often perceived as too low a quality and sensational. Given the gap between expectations and the evaluation of coverage, Wicke and Taddicken conclude that contextual, constructive, and more multifaceted coverage could “enable the re-awakening of interest in climate change” (p. 62).

The last paper of the General Section also gives insight into users’ perspectives. Michael V. Reiss, Noemi Festic, Michael Latzer, and Tanja Rüedy combined qualitative interviews with a representative online survey of Swiss Internet users. Their comprehensive study was conducted between 2018 and 2019 and investigates the “subjective relevance that Internet users assign to algorithmic-selection applications in everyday life” (p. 71). The authors distinguish five life domains, that is, political and social orientation, entertainment, commercial transactions, socializing, and health. Across these domains, algorithmic-selection applications are perceived to be of comparatively low relevance, while offline activities are considered as most important. However, “younger and more frequent Internet users assign greater relevance to various algorithmic-selection applications” (p. 84). Overall, the findings contribute to understanding the social relevance of algorithmic selection and could

inform regulation of platforms and algorithmic selection.

The Thematic Section of this issue is dedicated to *Visibility in the Digital Age*. In their introductory text, guest editors Cornelia Brantner and Helena Stehle clarify the concept of (digital) visibility and invisibility and summarize the five research papers of this section. These papers shed light on issues of accessibility, representation, participation, diversity, and inequalities and examine science communication, algorithms, social media, locative media apps, free software, and television programs. While Claudia Wilhelm, Darryl A. Pieber, and Julia Metag contribute conceptual papers, Christine Linke and Elizabeth Prommer, as well as Dafne Calvo, add empirical studies that point out gender inequalities of visibility.

The guest editors Cornelia Brantner and Helena Stehle are part of the network *(In)Visibility in the Digital Age* (<https://in-visibility.net/>), which was funded and hosted by the Center for Advanced Internet Studies (CAIS). Workshops and discussions in this network led the guest editors to the idea of organizing a Thematic Section in SComS with papers that address questions raised in their discussions and contribute to this area of research. All studies in this Thematic Section were published online first and together were seen around 1300 times (abstract views) and downloaded more than 700 times during the first six months, which highlights the importance of advance online publications. In SComS, this publication format was introduced in 2020 and has already enhanced production processes, the pace of publishing, and the visibility of articles.

A book review and two conference reports complete the issue. Ulrich van der Heyden reviewed Ingo von Münch's book *Die Krise der Medien (The Media Crisis)*. The book sheds a critical light on German-language news media and addresses issues of news quality, political correctness and the diversity of opinions and voices in public discourse, the societal responsibility of the press, and the relationship between journalists and audiences. Ulrich van der Heyden considers this book a use-

ful contribution for reflecting on the role of media in democratic societies.

Silke Fürst reports on the DACH 21 preconference *Public Communication Science in Times of the Covid-19 Crisis*. Held online on April 7, 2021, the preconference was organized by the association *Öffentliche Medien- und Kommunikationswissenschaft*, which aims to establish, promote, and further develop the concept of public science in communication and media research. After an introductory talk, "What Is Public Science?" by Caroline Robertson-von Trotha, Beat Glogger and Matthias Egger outlined expectations of and from science in the context of the Covid-19 pandemic. Then, three communication and media scholars from Germany, Austria, and Switzerland gave insights into their research projects on the Covid-19 coverage. Thorsten Quandt, Josef Trappel, and Linards Udris reported on how they communicated the findings of their projects to the public and the public responses they received. The following discussion emphasized the need for further exchange on issues of public communication science.

The DACH 21 conference took place from April 7 to 9, 2021, and was the first three-country conference on communication science, jointly organized by the German DGPK, the Austrian ÖGK, and the Swiss SACM. The online conference *#Communication #R)Evolution: Changing Communication in a Digital Society* was hosted by the Department of Communication and Media Research (IKMZ) at the University of Zurich. It was attended by more than 500 participants from 16 countries. The report by Philipp Bachmann highlights the keynote by Dietram A. Scheufele, professor at the University of Wisconsin-Madison and at the Morgridge Institute for Research. Scheufele emphasized the current challenges of communication and media research, including open science and computational studies, with the latter focusing, so far, on accessible data rather than on the most relevant channels. The report concludes with a "hats off" to the conference organizers.

The last words in this editorial are in memory of Dr. Jost Aregger, who died this year. A beautiful obituary is given by Bettina Nyffeler, with whom he worked at the Federal Office of Communications (OFCOM). Bettina Nyffeler describes the academic and professional career, personal path, and inspiring mind of the man who was

also a very active and highly esteemed member of the SACM board of administration.

We hope you will enjoy reading this issue.

Silke Fürst and Sébastien Salerno

# **SComS**

## General Section

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## Banning burkas and niqabs? Exploring perceptions of bias in media coverage of Islam and Muslims in Switzerland and their relation to people's voting intention concerning the burka-initiative

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### Abstract

In Switzerland, Islam and Muslims are repeatedly the subject of political debates and, thus, of media reporting. While content analyses show a certain bias in Western media coverage of Islam and Muslims, relatively little is known about the audience's perspective on media bias in this context. Using data from an online survey of the Swiss population (n=976), this study examines people's perceptions of bias in the media coverage of Islam and Muslims in Switzerland and how it relates to their intention to vote on the popular initiative "Yes to a veil ban". The study was conducted in March 2019, two years before the actual vote took place on 7 March 2021. The results show that the majority of the Swiss non-Muslim population perceives the reporting as distorted. In the study's investigation of media bias perceptions, attitudes towards Islam and Muslims, political orientation and personal contact with Muslims proved to be the most relevant influencing factors. By contrast, exposure to political information via traditional news media and social media was not associated with bias perceptions. Finally, a stronger perception that the media understate certain problems related to Islam and Muslims in Switzerland was positively related to people's intention to vote for a national ban on wearing burkas or niqabs in public.

### Keywords

Hostile media effect, media bias, Islam and Muslims, burkas, niqabs, popular initiative "Yes to a veil ban", Switzerland

## 1 Introduction

In many European countries, the veiling of Muslim women has been an issue of public controversy. In most cases, however, this controversy is not so much about Muslim women as about Islamic customs and symbols, which have been instrumentalised by political, societal and intellectual leaders. Islam has been increasingly stigmatised by right-wing populist parties across Europe as a threat to national populations as a means of promoting stricter immigration policies (Betz, 2013; Kaya & Tecmen, 2019). Consequently, public debates about Islam are accompanied by issues such as the threat of Islamic terrorism, endangerment of public security, incompatibility of Western and Islamic values and difficulties in integrating Muslims into Western societies. Such arguments also surface in the arguments for the Swiss popular initiative "Yes to a veil ban", launched in March 2016

by Walter Wobmann, a politician affiliated with the right-wing populist Swiss People's Party (SVP), and his Egerkinger Committee, which previously launched the anti-minaret initiative, which has forbidden the construction of minarets in Switzerland since 2009. In general, the initiative demands a ban on face covering in public spaces and other places accessible to the public. However, as the Egerkinger Committee, by its own account, "fights against the advancing Islamisation of Switzerland" (Wobmann, 2019), the initiative is directed primarily against the Muslim minority in Switzerland and particularly against Muslim women's wearing of burkas or niqabs in the public. For this reason, the initiative is also popularly known as the burka-initiative.

In Switzerland, as a democratic society, the media create the public sphere in which controversial issues concerning Islam and Muslims in Switzerland in general



and the Swiss burka-initiative in particular are publicly debated. Consequently, various actors from politics, law, churches, Muslim organisations and non-profit organisations strategically circulate their positions, frames and narratives through the media to influence public opinion and political processes on these issues. However, in view of empirical findings on media coverage of Islam and Muslims in Western countries, the media's role in this context has to be evaluated critically. First, various scholars reveal that the media in Western countries have a strong tendency to associate Islam with terrorism, violence, conflict and religious extremism (Arendt & Karadas, 2017; Baker, 2010; Baker, Gabrielatos, & McEnery, 2013; Hoewe & Bowe, 2018; Kabir, 2006; Powell, 2011, 2018). Second, Western media cover Islam in a predominantly negative way in comparison to their coverage of Jews and Christians (Bleich, Stonebraker, Nisar, & Abdelhamid, 2015,) and Islam's quest for peace and religious tolerance (Bowe, Fahmy, & Matthes, 2015; Bowe, Fahmy, & Wanta, 2013). Third, several studies have found that Western media employ strategies to construct images of "us" and "them" and depict Muslims as an "alien other" for the West (Creutz-Kämpfi, 2008; Saeed, 2007; Silva, 2017).

These general findings also reflect media coverage in Switzerland. Swiss media have paid disproportionately more attention to Muslims in connection with political events (e. g., the vote on the anti-minaret initiative) and terrorist attacks (e. g., the attack on the French satirical magazine *Charlie Hebdo*) compared to routine times without such incidences (Ettinger, 2018; Ettinger & Imhof, 2014). In particular, since the Madrid attacks in 2004, the imagined threat of Islamic terrorism in Switzerland has been established as a common frame to depict the Muslim minority in Switzerland as a problem and to question Muslims' willingness to integrate (Ettinger & Udris, 2009). Likewise, findings on the Swiss minaret initiative show that the initiative's supporters have succeeded in constructing their arguments of increasing Islamisation, Islamic terror and the es-

tablishment of parallel societies with their own law (Sharia) to evoke the perception that Islam is a serious threat to Swiss society (Ettinger & Imhof, 2014). Examining media coverage of religion in Switzerland, Dahinden, Koch, Wyss, and Keel (2011, p. 97) found that "while Christianity and its denominations are mainly presented in positive frames and positive narratives [...], the image of Islam is rather negative". In sum, existing research shows that media coverage of Muslims and Islam in Western countries predominantly depicts Muslims negatively, as incompatible with Western majorities and unwilling to integrate, with "Islam [...] dominantly portrayed as a violent religion" (Ahmed & Matthes, 2017, p. 219). In the case of Switzerland, "Muslims are represented in a massive majority in the media discourses [...], but they are in fact a minority in the sociological reality" (Lindemann & Stolz, 2014, p. 52).

In conclusion, researchers have sufficiently documented such biases in media coverage of Islam and Muslims using content analysis. In contrast, the audiences' perspective on media bias in this context has been little considered. While a few studies have investigated bias perceptions and their consequences from the Muslim minority perspective (Ahmad, 2006; Brown & Richards, 2016; Saleem & Ramasubramanian, 2019), to my knowledge, no study has taken a closer look at the majority, non-Muslim perspective.

Against this background, the first aim of this paper is to explore how widespread perceptions of bias in the media coverage of Islam and Muslims are within the Swiss population and how these perceptions relate to attitudes, political media use and personal contact with Muslims. Specifically, the perception relates to different sub-issues, including whether the media exaggerate or understate increasing Islamisation, the supposed danger posed by Islamic terror in Switzerland, the incompatibility of Islamic and Western values and the difficulties of integrating Muslims in Switzerland. The perception of bias in the reporting on these issues is particularly significant as right-wing populist actors typically use these four sub-issues to call

for stricter integration policies and strong assimilation, even to the point of requiring immigrants to completely abandon their own cultural identity. The second goal of this study is to examine the possible political consequences of the perception of bias in reporting in relation to the Swiss burka-initiative. Previous research has shown that perceptions of media bias have the potential to trigger social and political behaviours (see, for an overview, McLeod, Wise, & Perryman, 2017; Perloff, 2015; Tsifti & Cohen, 2013). Consequently, perceptions of media bias are of particular interest when the Swiss population, predominantly non-Muslim, had the opportunity to vote on the Swiss burka-initiative and, thus, to a certain extent, decided how to react to a religious, in this case, non-Christian, minority living in Switzerland.

## 2 Literature review

Research on the audience perspective on perceptions of (hostile) media bias was triggered by the pioneering experimental study of Vallone, Ross and Lepper (1985), who exposed Israeli and Palestinian supporters to the same neutral television news coverage of the 1983 Beirut Massacre. Scholars found that both partisan groups perceived the television news as biased against their own position, while non-partisans classified it as neutral. Thus, on both sides of the controversy, partisans have a tendency to perceive media coverage as biased against or even hostile to their side, which is called the “hostile media phenomenon” (Vallone et al., 1985).

The original concept states that people with strong beliefs about an issue perceive neutral issue-related media coverage as biased against their viewpoints; however, the concept’s assumption that media coverage is neutral and balanced is hardly tenable in the prevalent reality of news selection and production. Knowing this, Gunther and his colleagues expanded the original concept and tested it using explicitly one-sided media coverage (Gunther & Christen, 2002; Gunther, Christen, Liebhart, & Chih-Yun Chia, 2001; Gunther,

Miller, & Liebhart, 2009). The findings of these studies show that even if partisan groups agree that news coverage is biased in one direction, both sides still consider the same coverage “relatively less sympathetic – along the continuum of bias – to their own positions” (Gunther et al., 2009, p. 751). Consequently, it does not matter whether media coverage is actually neutral or biased because partisan groups will always perceive a relative negative bias in relation to their own position (Gunther et al., 2001, p. 313), which is called the “relative hostile media effect”. To date, the original concept and its extension have been proven in numerous experimental and non-experimental studies with different partisan groups and a variety of controversial issues, including topics such as immigrants/immigration (Matthes & Beyer, 2017; McKeever, Riffe, & Carpentier, 2012) and refugees (Arlt, Dalmus, & Metag, 2019; Arlt & Wolling, 2016; Merten & Dohle, 2019), among others.

Concerning the factors that explain perceptions of media bias, previous research has provided strong evidence that a person’s level of involvement plays a major role in the process of forming hostile media biases. In general, hostile media perceptions are stronger among individuals who are highly involved cognitively (Hansen & Kim, 2011; Perloff, 2015). However, scholars have used very different indicators to represent people’s cognitive involvement (see Gunther et al., 2009; Matthes, 2013), including political partisanship/party affiliation (e.g., Dalton, Beck, & Huckfeldt, 1998; Glynn & Huges, 2014), political ideology (e.g., Arlt et al., 2019; Hwang et al., 2008; Matthes, 2013), issue attitudes (e.g., Arlt et al., 2019; Hwang, Pan, & Sun, 2008; Matthes, 2013; Matthes & Beyer, 2017), issue importance (Matthes, 2013; Matthes & Beyer, 2017) and issue interest (Arlt et al., 2019).

Studies from the United States using political partisanship as an indicator of involvement have found that perceptions of media bias in general seem to be stronger among conservatives than among liberals (Dalton et al., 1998; Eveland & Shah, 2003; Glynn & Huges, 2014; Lee, 2005, 2010).

However, studies that consider the role of political ideology (measured as political orientation on the left-right spectrum) on bias perceptions in the context of media coverage of refugees and immigrants can only partly confirm this tendency. While Arlt and Wolling (2016) found that Germans with a stronger affiliation to the right-wing conservative end of the political spectrum perceive the media coverage as being biased in favour of refugees, Arlt et al. (2019) could not confirm such a relationship for German and Swiss people in a later study. In addition, two studies that considered political ideology as a control variable found no relations with perceptions of bias in media coverage of illegal immigrants (Matthes & Beyer, 2017) and refugees (Merten & Dohle, 2019).

Concerning the role of issue attitudes, findings from hostile media studies that focus on immigrants and refugees show that people with negative attitudes towards immigrants (McKeever et al., 2012) and refugees (Arlt et al., 2019; Arlt & Wolling, 2016; Merten & Dohle, 2019) more strongly perceive the media coverage as biased against their views. In support of this research, Matthes and Beyer (2017) found that people who believe that immigration should be limited perceive media coverage as biased in favour of illegal immigrants.

It seems plausible that perceiving media coverage of a certain issue as biased requires at least a certain degree of experience with an issue, if not personal involvement. From a communications science perspective, the media are often considered the primary source of information for the public on most issues and developments in the real world. For this reason, scholars have started to consider media exposure as a relevant factor in the process of forming perceptions of bias under non-experimental, field conditions. For example, scholars have found that exposure to news media in general (Barnidge, Sayre, & Rojas, 2015) and to news transmitted via social networks in particular is positively related to perceptions of media bias (Rojas, Barnidge, & Abril, 2016). With other types of news media, the relationship is not as clear. Ho et al. (2011) discov-

ered a positive relation between the use of newspapers for news and hostile media perceptions but no such relationship for television news use. Matthes (2013), in contrast, found no relation for newspaper news use but a negative one for television news.

In an analysis of issue-specific media exposure, McKeever et al. (2012) found a positive correlation between exposure to news coverage of immigrants and perceptions that news coverage was biased in favour of immigrants. Similarly, Arlt and Wolling (2016) found that higher exposure to news coverage of refugees was positively related to people's perceptions that media coverage was biased in favour of refugees. Using a different measurement to assess hostile media perceptions, Arlt et al. (2019) found that Germans who frequently received information about refugees from newspapers perceived the media as less biased against their views; for people living in German-speaking Switzerland, however, the researchers found a negative correlation between receiving information about refugees from the television and bias perceptions. Overall, the findings from existing research on the role of media exposure are rather mixed.

Finally, in addition to considering the role of media exposure, this paper examines how people's direct experience with an issue – in this case, personal contact with Muslims – relates to perceptions of media bias. Building on intergroup contact theory (Allport, 1954; Pettigrew, 1998), the intergroup contact hypothesis suggests that the personal intergroup contact of majority society members with racial minority members has the potential to reduce prejudices and aversion against this outgroup (Dixon & Rosenbaum, 2004; Pettigrew & Tropp, 2006). Accordingly, it was also found that personal contact with Muslims can reduce negative attitudes towards this outgroup (Ahmed, 2012; Brockett & Baird, 2008). Considering this finding in the context of hostile media perceptions, it seems reasonable that a higher level of personal contact with outgroup members leads more strongly to the perception that media coverage is biased against this spe-

cific outgroup because increased contact makes people more sympathetic. The first evidence for this assumption can be found in a study by Arlt and Wolling (2016), who identified an indirect effect of personal contact with refugees on bias perceptions mediated through positive attitudes towards refugees.

Concerning the relation between media bias perceptions and behavioural consequences, most scholars have examined this relation with reference to the corrective action hypothesis (Rojas, 2010). According to this hypothesis, people are more likely to become involved in corrective political behaviours if they perceive the media as biased against their political views, prompting them to seek to correct these wrongs (Rojas, 2010). Such political reactions have been confirmed by numerous studies (Barnidge et al., 2015; Feldman, Hart, Leiserowitz, Maibach, & Roser-Renouf, 2017; Ho et al., 2011; Rojas et al., 2016). For example, Barnidge et al. (2015) found a positive relationship between perceptions of hostile media and political participation. Similarly, Rojas et al. (2016) observed that perceptions of media bias influence people's participation in voting for a new president in Colombia. Finally, a recent study showed that people who perceived the media's reporting as being in favour of the European Union (EU) were more likely to vote for an anti-EU party in European Parliamentary elections and vice versa (Kleinnijenhuis, Hartmann, Tanis, & van Hoof, 2019).

### 3 Research questions, hypotheses and the research model

An examination of existing research shows that various content analyses reveal a negative bias in reporting on Islam and Muslims by the Swiss media. However, there have been no studies of how consumers of news perceive media bias in this thematic context. Therefore, the first aim of this study is to explore whether and to what extent the Swiss population perceives the media coverage of Islam and Muslims as

distorted. In support of this objective, the first research question is:

RQ1: How widespread are perceptions of bias in media coverage of Islam and Muslims among the Swiss population?

Moreover, this paper explores how perceptions of media bias relate to attitudes, media exposure and personal contact with Muslims. Based on previous research findings on the role of involvement in the process of perceiving the media as biased, I propose the following hypotheses regarding two different indicators of people's involvement:

H1a: Negative attitudes towards Islam and Muslims will be positively correlated with perceptions of media bias in favour of Islam and Muslims.

H1b: Political orientation to the right end of the spectrum will be positively correlated with perceptions of media bias in favour of Islam and Muslims.

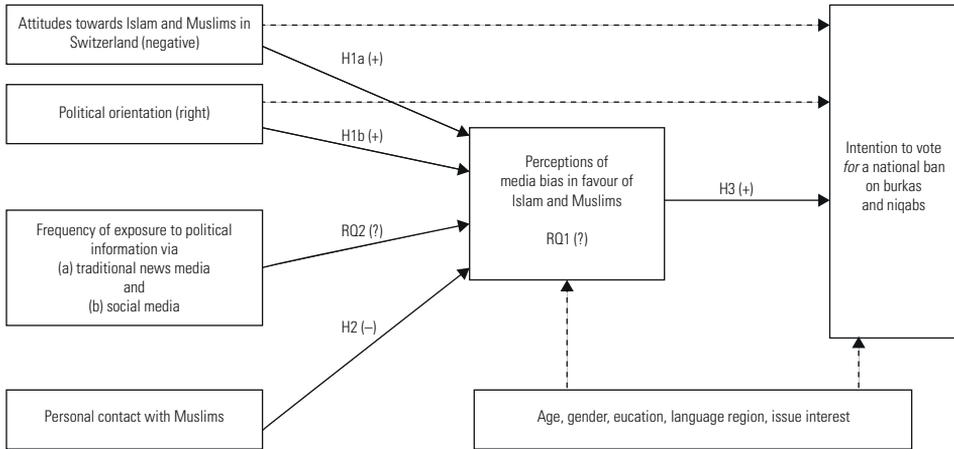
Concerning the role of media exposure for media bias perceptions, findings from previous research are not consistent. These relationships seem to differ depending on whether news exposure in general or exposure to news and information via different media forms (e.g., television, newspaper and social networks) has been considered. Thus, I have formed the following question:

RQ2: What is the relationship between perceptions of media bias in favour of Islam and Muslims and exposure to political information via (a) traditional news media and (b) social media?

With reference to the assumptions of intergroup contact theory, I propose the following hypothesis about personal contact with Muslims:

H2: Personal contact with Muslims will be negatively correlated with perceptions of media bias in favour of Islam and Muslims.

Figure 1: Research model



Regarding the potential consequences of bias perceptions, previous research has provided strong empirical evidence that people who perceive the media as biased against their own political position tend to become politically active to correct these perceived wrongs. Applied to the context of the current study, I assume the following hypothesis:

H3: Perceptions of media bias in favour of Islam and Muslims will be positively correlated with the intention to vote for a national ban on wearing burkas and niqabs in public in Switzerland.

I control for demographic factors (sex, age, education), the German- and French-speaking language region and issue interest on perceptions of media bias as well as on voting intentions. In addition, I consider the effects of attitudes towards Islam and Muslims and political orientation on voting intention as it seems quite likely that they will be strongly related. Taken together, these assumptions lead to the final research model, which is shown in Figure 1.

#### 4 Methods

The following chapter comprises three sections. First, information on data collection and the sample, second a description of the operationalisation of all relevant variables, and finally an explanation of the data analysis procedure.

##### 4.1 Data collection and sample

The empirical basis for this study is data from a standardised online survey conducted by the professional Swiss survey institute DemoSCOPE, using the Intervista online access panel. The data gathering took place in March 2019. Based on quotas for age, gender and language region, a sample representing the German- and French-speaking populations of Switzerland over the age of 15 with internet access was obtained. After removing the most obvious carelessly invalid responses ( $n=39$ ) based on response time and long-string analysis (see Curran, 2016), the sample consisted of  $n=976$  respondents (50% male, 50% female; 74% German-speaking and 26% French-speaking) between 15 and 74 years old, with an average age of 46 years.<sup>1</sup> The sample was slanted towards

1 Observations with *response times* below the cut-off value of 429 seconds, that is, one

highly educated respondents as 35% had a university degree. Moreover, Muslims ( $n=9$ ) were seriously underrepresented in the sample. For this reason, and to avoid in-group biases concerning attitudes and perceptions of bias in media coverage of Islam and Muslims, these nine cases were excluded from the study.

#### 4.2 Measures

With reference to studies on *bias perceptions* concerning the refugee issue (Arlt & Wolling, 2016; Merten & Dohle, 2019), this study used four items to measure people's perceptions of bias in media coverage of different aspects publicly debated in relation to Islam and Muslims in Switzerland. The *perception of an increasing Islamisation in Switzerland* refers to the impression that Islam as a religious community is spreading rapidly and that the proportion of Muslims in the Swiss population continues to rise. Closely related to the perception of increasing Islamisation are fears of the native non-Muslim population related to radicalism attributed to Islam and of Islam being something (culturally) foreign. These fears are expressed in the *perception of a threat to public security caused by Islamist terror in Switzerland* and an *impression of Islam's incompatibility with Western values and lifestyles*. As a consequence, these fears lead to the *perception that it is difficult for Muslims to integrate into Switzerland*. For each item, respondents were asked to specify on a five-point scale (from 1, "strongly overstated", to 5, "strongly understated") whether the media overstate or understate this aspect. To test the hypotheses, the items were compiled into an index (mean [ $M$ ] = 3.0, standard deviation [ $SD$ ] = 0.9, Cronbach's  $\alpha = .87$ ) representing respondents' perceptions that the media understate issues pertaining to

Islam and, hence, are biased in favour of Islam and Muslims in Switzerland.

*The intention to vote* for or against the national popular initiative "Yes to a veil ban", which includes wearing the burka and niqab, was measured with one item. On an eleven-point scale (from 0, "against", to 10, "for"), respondents were asked to indicate how likely it was that they would vote for or against a national ban on wearing the burka and the niqab in Switzerland ( $M=6.2$ ;  $SD=3.6$ ). In March 2019, the majority of the Swiss population (63%) said they would vote for the burka-initiative, while 33% said they would vote against it. Approximately four percent of respondents were undecided at the time of the survey. In the actual vote, which took place two years later on 7 March 2021, the Swiss voted narrowly in favour of the veil ban (yes: 51.2%; no: 48.8%, Bundeskanzlei BK, 2021).

*Attitudes towards Islam and Muslims living in Switzerland*. With reference to studies on Islamophobia and anti-Arab prejudices (Elchardus & Spruyt, 2014; Kunst, Sam, & Ulleberg, 2013; Lee, Gibbons, Thompson, & Timani, 2009), people's attitudes were examined on two dimensions, Islam in general and Muslims living in Switzerland in particular, each with four items.<sup>2</sup> Analogous to the measurement of attitudes towards immigrants in the European Social Survey, opposite pairs of statements were formed about different aspects of Islam, such as culture, values, gender equality and security, to obtain variance in the answers (see Table 1). On a scale from 0 (e.g., "Women are respected in Islam") to 10 (e.g., "Women are oppressed in Islam"), respondents could indicate which statement corresponded most closely to their opinion. For further analysis, the items were compiled into an index representing respondents' negative attitudes towards Islam and Muslims liv-

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standard deviation below the mean calculated response time, excluding outliers with standardised values above 2 were excluded. For the *long-string analysis*, we checked the longest string of identical responses within a battery of questions with reverse formulated items.

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2 For the index, one pair of statements had to be deleted (Fundamentalist Muslims are a real threat to public security in Switzerland/ Fundamentalist Muslims do not pose any threat to public security in Switzerland).

**Table 1: Operationalisation of attitudes towards Islam and Muslims living in Switzerland**

Operationalisation	M <sup>a</sup>	(SD)
Pairs of statements for measuring attitudes towards Islam		
Women are respected in Islam. // Women are oppressed in Islam.	7.4	(2.6)
Islamic and Western European values are not compatible. // Islamic and Western European values can be easily reconciled.*	5.5	(2.9)
Islam stands for peaceful coexistence. // Islam advocates acts of violence.	5.3	(2.9)
Islamic customs threaten Western culture. // Islamic customs enrich Western culture.*	5.3	(2.8)
Pairs of statements for measuring attitudes towards Muslims living in Switzerland		
Most Muslims in Switzerland respect Western values. // Most Muslims in Switzerland do not respect Western values.	4.4	(2.7)
In Switzerland, Muslim women and men have equal rights. // In Switzerland, Muslim men dominate their wives.	6.2	(2.6)
For most Muslims in Switzerland, the local laws stand above the rules of the Koran. // For most Muslims in Switzerland, the rules of the Koran take precedence over local laws.	4.9	(2.9)

Notes: <sup>a</sup> Mean (M) and standard deviation (SD) on an eleven-point scale, where 0 and 10 mark the poles; n=875–915; \*items have been reversed.

ing in Switzerland ( $M=5.5$ ,  $SD=2.0$ , Cronbach's  $\alpha=.84$ ).

*Political orientation* was measured by a single item, which asked respondents to place themselves on a left-to-right scale ranging from 0 “left” to 10 “right” ( $M=4.7$ ;  $SD=2.3$ ). Of the respondents, 46% placed themselves left of the centre and 35% right of the centre.

To measure people's behaviour in *gathering political information via traditional news media versus social media*, respondents were asked to indicate on a seven-point scale (from 1, “never”, to 7, “daily”) how often they obtained information on political issues using the following media outlets: public broadcasting ( $M=4.8$ ;  $SD=2.1$ ), private broadcasting ( $M=2.7$ ;  $SD=1.9$ ), boulevard newspapers and freesheets, e.g., *20 Minuten* ( $M=4.0$ ;  $SD=2.1$ ), national newspapers ( $M=3.4$ ;  $SD=2.2$ ), Facebook pages/posts from media outlets ( $M=3.0$ ;  $SD=2.3$ ), Facebook pages/posts from political parties and/or politicians ( $M=1.9$ ;  $SD=1.7$ ) and Twitter posts from media outlets ( $M=1.7$ ;  $SD=1.6$ ) and political parties and/or politicians ( $M=1.5$ ;  $SD=1.3$ ).

*Personal contact with Muslims* was measured by one item, which asked respondents to indicate on a seven-point scale (from 1, “never”, to 7, “daily”) how often they had personal contact with Muslims, such as through family and friends,

work, neighbourhood contacts or leisure activities ( $M=3.9$ ;  $SD=2.0$ ).

*Issue interest* was assessed using one statement asking respondents to indicate on a five-point scale (1, “not at all interested”, to 5, “strongly interested”) how strongly they were interested in issues concerning Islam and Muslims ( $M=3.2$ ;  $SD=1.0$ ).

#### 4.3 Data analysis

To test the research model, a structural equation model (SEM) was calculated (maximum likelihood estimations) for  $n=821$  cases with valid data for all the relevant variables using the “Analysis of Moment Structures” statistical software program (AMOS 24). As a starting point, an SEM that contained all the theoretically postulated relationships as well as the effects of the control variables was specified (see Figure 1). The model also assumed correlations between independent and control variables.

The model fit was not satisfactory in the first step ( $\chi^2/df=5.3$ ; CFI=.98; RMSEA=.07;  $p<.001$ ), using the ratio of chi-square values and degrees of freedom ( $\chi^2/df<3$ ), the comparative fit index (CFI>.95) and the root mean square error of approximation (RMSEA<.06) as model fit indicators, as well as presuming that the model should not significantly differ from the data (Hu & Bentler, 1999; Kline, 2011). According to the modification indices, some media effects on voting intentions

**Table 2: Perceptions of bias in media coverage of Islam and Muslims**

	M (SD) <sup>a</sup>	perceived non-bias (adequate)	perceived bias <sup>b</sup>	direction of perceived bias	
		%	%	over-state-ment <sup>c</sup>	under-state-ment <sup>d</sup>
		%	%	%	%
Media coverage of the increasing spread of Islam in Switzerland is...	3.0 (1.1)	30	70	38	32
Media coverage of the threat to public security caused by Islamist terror in Switzerland is...	2.9 (1.1)	36	64	35	29
Media coverage of the incompatibility of Islam with Western core values is...	3.0 (1.1)	33	67	36	31
Media coverage of the difficulty of integrating Muslims in Switzerland is...	3.1 (1.0)	39	61	28	33

Notes: <sup>a</sup> Mean (M) and standard deviation (SD) of data measured with a five-point scale (1 “strongly overstated”, 2 “rather overstated”, 3 “adequate”, 4 “rather understated”, 5 “strongly understated”); <sup>b</sup> points 1, 2, 4 or 5 on the scale; <sup>c</sup> points 1 and 2 on the scale; <sup>d</sup> points 4 and 5 on the scale.

were missing; they were supplemented in a second step.<sup>3</sup> Hence, the adapted model achieved a good model fit ( $Chi^2/df=1.3$ ;  $CFI=.99$ ;  $RMSEA=.02$ ;  $p<.238$ ).

**5 Results**

As a first step, this study examined the existence of bias perceptions concerning media coverage of Islam and Muslims among the Swiss population (RQ1). The findings show that perceptions of media bias are very widespread (see Table 2): The great majority of the Swiss population perceives the reporting on the Islamisation of Switzerland (70%), the endangerment of public security through Islamist terror (64%), the incompatibility of Islam with Western values (67%) and the difficulty of integrating Muslims into Swiss society (61%) as biased. If the direction of the perceived bias (overstatement versus understatement) is also taken into account, around one-third of the population feels

that the media either exaggerate or understate reporting on the various aspects that are often discussed as problematic in connection with Islam and Muslims in public discourse. About one-third (between 30% and 39%) perceives the reporting on these aspects as adequate.

In an investigation of the factors influencing these bias perceptions (see Table 3), the findings of this study clearly confirm the role of people’s involvement: People with more negative attitudes towards Islam and Muslims ( $\beta=.52$ ;  $p<.001$ ) and a stronger political orientation to the right ( $\beta=.20$ ;  $p<.001$ ) perceive the media as more biased in favour of Islam and Muslims. Hence, both H1 hypotheses, H1a and H1b, were strongly supported by the data.

Concerning the various variables tested to examine the relationship between exposure to political information and bias perceptions (RQ2), no relationships were found – neither for traditional news media nor for social networks.

Concerning the relation between bias perceptions and direct contact with Muslims, the results reveal that people who have more personal contact with Muslims have less of an impression that media coverage is in favour of Islam and Muslims in Switzerland ( $\beta=-.08$ ;  $p<.01$ ). Thus, H2 was supported by the data.

With respect to the control variables, the results show that bias perceptions are more pronounced among older people ( $\beta=.13$ ;  $p<.001$ ), men ( $\beta=.07$ ;  $p<.01$ ),

3 The modification indices suggested that effects occurred through exposure to political information via private television news, national daily newspapers and Twitter. Although media effects on political participation were not the focus of this study, the proposed modifications confirm the findings of several studies in political communications research. Accordingly, the modifications are theoretically quite plausible, which is why the model was modified.

**Table 3: Standardised direct effects on perceptions of bias**

Dependent variable: Perceptions of media bias	$\beta$	p
Age (in years)	.13	***
Male	.07	**
Education (high)	-.03	ns
German-speaking part of Switzerland (yes)	.11	***
Issue interest (high)	.07	*
Attitudes towards Islam and Muslims (negative)	.52	***
Political orientation (right)	.20	***
Exposure to political information via public broadcasting	.01	ns
Exposure to political information via private broadcasting	-.01	ns
Exposure to political information boulevard newspapers and freesheets	.01	ns
Exposure to political information via national newspapers	.01	ns
Exposure to political information via Facebook pages/posts from media outlets	-.04	ns
Exposure to political information via Facebook pages/posts from political parties and/or politicians	.03	ns
Exposure to political information via Twitter posts from media outlets	-.01	ns
Exposure to political information via Twitter posts from political parties and/or politicians	-.05	ns
Personal contact with Muslims	-.08	**

Notes: \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ; not significant (ns).

**Table 4: Standardised direct effects on voting intention**

Dependent variable: intention to vote for a national ban of wearing the burka and the niqab	$\beta$	p
Age (in years)	.07	*
Male	-.04	ns
Education (high)	-.06	*
German-speaking part of Switzerland (yes)	-.04	ns
Issue interest (high)	.05	ns
Attitudes toward Islam and Muslims (negative)	.26	***
Political orientation (right)	.16	***
Exposure to political information via private broadcasting	.14	***
Exposure to political information via national newspapers	-.10	***
Exposure to political information via Facebook pages/posts from media outlets	-.07	**
Perceptions of bias in media coverage of Islam and Muslims	.26	***

Notes: \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ; not significant (ns).

people living in the French-speaking part of Switzerland ( $\beta = .11$ ;  $p < .001$ ) and those with a stronger interest in issues ( $\beta = .07$ ;  $p < .01$ ). Overall, the tested variables explain 47% of the variance in people's bias perceptions.

Concerning the behavioural consequences of bias perception, perceptions of media bias still turned out to be one of the strongest predictors of voting intentions, and this finding held even after controlling for the strong effects of Islamophobic attitudes ( $\beta = .26$ ;  $p < .001$ ) and political ori-

entation ( $\beta = .16$ ;  $p < .001$ ) (see Table 4). The more people perceived the media coverage as biased in favour of Islam and Muslims, the greater their intention to vote for the burka-initiative ( $\beta = .26$ ;  $p < .001$ ). Therefore, the findings strongly confirm H3.

Moreover, as indicated by the modification indices, there are three direct effects of media exposure on voting intentions. People who frequently use private television news for political information ( $\beta = .11$ ;  $p < .001$ ) showed a greater intention to vote for the burka-initiative. By contrast, peo-

ple who frequently use national newspapers ( $\beta = -.10$ ;  $p < .05$ ) and Facebook pages/posts from media outlets ( $\beta = -.07$ ;  $p < .01$ ) for political information showed a lower intention to vote for the initiative. Finally, older ( $\beta = .07$ ;  $p < .05$ ) and less-educated people ( $\beta = -.06$ ;  $p < .05$ ) reported a greater intention to vote for the initiative. Overall, 43% of the variance can be explained by these variables.

## 6 Discussion and conclusion

This study examines perceptions of bias in the media coverage of Islam and Muslims in the Swiss population, how these perceptions relate to attitudes, media exposure and personal contact with Muslims and what possible consequences arise from these perceptions with regard to the intention to vote on the burka-initiative. Hence, the study contributes to the audience perspective – here the perspective of the non-Muslim Swiss population – on perceptions of bias in media coverage of Islam and Muslims, which has not been considered in previous research.

The descriptive results show that the majority of the Swiss population perceives the reporting on various issues that are controversially discussed in connection with Islam and Muslims as distorted. These perceptions of bias in the reporting refer both generally to Islam (an increasing spread of Islam in Switzerland, threats to public security posed by Islamic terror, and cultural differences between Islam and the West) and specifically to Muslims living in Switzerland in relation to their integration into Swiss society. Moreover, the findings show that the Swiss do not agree on the direction of the media bias: While around one-third has the impression that the media tend to exaggerate these aspects, approximately another one-third has the impression that the media tend to understate the same aspects.

Contrasting the subjective bias perceptions of the three different thirds of the Swiss population with actual findings from objective media content research provides an interesting starting point for future re-

search. Media content research has clearly shown that reporting on Islam and Muslims is predominantly negative; however, this “negative bias” is only perceived by approximately one-third of the Swiss population. Subjective perception and actual reporting coincide only for those who perceive the reporting as too negative. By contrast, subjective perception and media-mediated reality diverge in the other two groups. Particularly interesting is the group that has the impression that the media understate certain “problems” in relation to Islam and Muslims in Switzerland even though content analyses prove a general negative bias in the media’s coverage of Islam and Muslims. It can be assumed that this group contains a large number of people with very specific, rather radically conservative patterns of attitudes. However, to date, media bias research has mainly examined individual attitudinal variables instead of a complex structure of interrelated attitudes. Hence, with a view to future research, it would be helpful to pursue a more typological approach to identify groups with differently pronounced media bias perceptions and their complex structure of attitudes.

With regard to possible explanations for bias perceptions, the findings of this study strongly confirm the substantial role of people’s involvement in promoting perceptions of hostile media bias as indicated in previous research (Hansen & Kim, 2011; Perloff, 2015): Perceptions of bias in media coverage of Islam and Muslims are particularly noticeable among persons with pronounced Islamophobic attitudes and a political orientation to the right. This finding underlines the challenge for journalists in reporting objectively on such controversial issues as audiences will rarely perceive and evaluate media coverage impartially; rather, they will perceive the coverage subjectively based on their personal angles. Nevertheless, it is crucial that journalists and the media take up this challenge and try to report on various aspects of Islam in a differentiated way, particularly because some topics, such as Islamist terror, are negative, while others are not. The present findings justify the need for greater differ-

entiation in reporting; for example, the recipients hardly distinguish between the danger posed by Islamist terror in Switzerland and the difficulty of integrating Muslims into Swiss society in their perceptions.

In contrast to previous research, this study finds no significant relationship between media use for political information and media bias perceptions. One possible explanation is the very strong effect of Islamophobic attitudes ( $\beta = .52$ ) on media bias perceptions, which covers possible effects of media use on media bias perceptions. However, evaluating the situation more critically, it can be questioned whether the relationships between media use and media bias perceptions are really as “simple” as originally assumed in this study. Various studies have found relationships between exposure to news media and attitudes towards immigrants (e.g., Beyer & Matthes, 2015; De Coninck et al., 2018; Eberl et al., 2018; Jacobs, Meeusen, & d’Haenens, 2016). Consequently, it seems reasonable to expect that media exposure does not affect bias perceptions directly but indirectly through Islamophobic attitudes. Hence, such an alternative effect model needs to be theorised and tested in greater depth in further research.

There are two further explanations for the lack of evidence of relationships between media use and media bias perceptions. The first concerns the measurement of media exposure and is also a limitation of this study. Islam and Muslims are regularly subjects of controversial political debates in Switzerland; thus, people’s behaviour patterns in gathering political information have been used as an indicator for contact with media content about Islam and Muslims. Consequently, political information behaviour does not necessarily mean that recipients actually consume media content about Islam and Muslims. To solve this problem, one would have to assess people’s issue-specific media usage differentiated according to the type of media. In the best case – if the resources allow it – one would not use self-reported measures of media usage but more elabo-

rate methods to observe actual media use behaviour (e.g., tracking techniques).

The second explanation could be the often-abstract rather undifferentiated measurement of media perceptions and media use in survey studies. In most cases, recipients are asked about their general use of television news or newspapers but not which news programme or newspaper they consume specifically, despite the fact that there are significant differences, for example, between news from private and public broadcasters or between quality and tabloid news. Similarly, recipients are asked about their perceptions of media bias in general and not in specific media outlets that they use or not. However, if one assumes that recipients choose and consume media content selectively, depending on dispositional factors (Valkenburg, Peter, & Walther, 2016), then a fundamental weakness of this research strand becomes apparent. To solve this problem and gain more precise insights into the complex relationship between media use and media perception, it is, therefore, necessary to record both use and perception in a much more differentiated way in future research. This would, among other benefits, allow researchers to investigate the extent to which perceptions of bias differ according to media content that recipients use themselves and to media content they do not use.

In addition to involvement and media exposure, direct contact with Muslims was tested as an additional explanatory factor. As expected, people with more personal contact with Muslims perceived the media coverage as less favourable towards Islam and Muslims and sought to counteract the effects of negative attitudes towards Islam and Muslims, at least in the present study. Hence, this study provides direct evidence for the relevance of personal experiences/contact in processes leading to hostile media perceptions. However, this approach certainly needs to be deepened in further research. In particular, the effects of the type and context of the personal contact must be taken into account as it seems plausible that it makes a difference whether the personal contact is experienced as

positive or negative and whether this contact takes place in a personal or a professional context (Freitag & Rapp, 2013).

With regard to behavioural consequences of bias perceptions, the findings of this study strongly support the corrective actions hypothesis (Rojas, 2010); that is, Swiss people who have the impression that the media understate certain problems related to Islam and Muslims in Switzerland showed a greater intention to vote for a national ban on burkas and niqabs. The findings presented here should not be overestimated with regard to the actual vote on the burka-initiative that took place two years later. Nevertheless, the present findings should encourage Swiss voting research to take greater account of the media, and media perceptions in particular, as a factor explaining voting behaviour.

In addition to the limitations related to the theoretical conceptualisation and the operationalisation of media exposure, a limitation of this study is its reliance of cross-sectional data. Consequently, this study reveals only correlations between involvement, bias perceptions and voting intentions but no causal relationships. Future research should collect more panel data to investigate causal relationships between the variables associated with the causes and consequences of bias perceptions.

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## Appraisal patterns as predictors of emotional expressions and shares on political social networking sites

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### Abstract

Emotions are considered important drivers of the diffusion of messages on social networking sites. Therefore, emotion-eliciting political communication yields the potential to reach broad audiences and to influence citizens' attitudes and behavior. In this study, we investigate message characteristics that potentially trigger emotional reactions on part of the users of political social networking pages and test if this fosters the diffusion of political content in the network. Based on appraisal theory, we employ a manual coding scheme to identify appraisal dimensions in political parties' Facebook posts that should trigger sadness or anger. We subsequently combine the manual codings with information of the users' reactions to the respective posts, which we gathered using an automated content analysis. More specifically, we determine (1) if posts that include sadness or anger appraisals are associated with the corresponding emotional reactions in the form of emojis and (2) if these posts are shared more often.

### Keywords

appraisal emotions, affect, social media, shares, social networking sites, automatic content analysis, political communication

## 1 Introduction

For a long time, political communication research has largely neglected the role of emotions, mostly because they seem to contradict the image of an informed citizen guided by rational considerations (Marcus, 2000; Redlawsk, 2006). This began to change about two decades ago, when scholars started to question the notion of affect-free politics and found instead that emotions play a critical role throughout the communication process.

Most importantly, emotions or emotionalized content are a regular and salient feature of mediated political messages and the strategic communication efforts of political actors (e.g., Brader, 2006; Cho et al., 2003; Engesser, Fawzi, & Larsson, 2017) and therefore frequently encountered by citizens. The exposure to such emotionalized political messages can lead to emotional reactions on the part of the audience (e.g., Chang, 2001; Lecheler, Schuck, & Vreese,

2013; Wirz, 2018), with important further implications. First, communication and linguistic scholars have emphasized that emotional states affect the processing of political information (Plantin, 2004) and the formation of political attitudes (Kühne, 2012; Nabi, 2002), by serving as facilitators of argumentation and even as arguments themselves (Micheli, 2010). Second, specific discrete emotions – such as anger or sadness – inhere a strong motivational component and therefore can foster or inhibit political behaviors (Brader & Marcus, 2013), such as political participation (Valentino, Brader, Groenendyk, Gregorowicz, & Hutchings, 2011; Weber, 2012) and information seeking (Valentino, Hutchings, Banks, & Davis, 2008).

With the advent of social networking sites (SNS), emotions have gained new impetus in the field of political communication. Not only do political actors use them as a strategic means in their online communication (Engesser et al., 2017), but



also because citizens express and spread emotionalized content and reactions on the respective platforms (Eberl, Tolochko, Jost, Heidenreich, & Boomgaarden, 2020; Stieglitz & Dang-Xuan, 2014). Despite this recent interest in the role of emotions in the online world, we still know very little about (1) the prevalence of emotionalized content on political SNS, (2) how specific content triggers emotional reactions, and (3) how emotional reactions relate to other online behaviors, particularly sharing political content with others. These are the main questions we attempt to answer in the current paper.

To do so, we look at a widely used form of emotional expressions on SNS, the so-called *emojis*. Emojis are graphical representations of facial expressions, gestures, persons, objects, activities, or ideas that users of SNS can employ as a communicative means to express themselves (Tian, Galery, Dulcinati, Molimpakis, & Sun, 2017). On Facebook, e.g., users can choose between six emojis (“Like”, “Love”, “Haha”, “Wow”, “Sad”, and “Angry”) to make their opinions and emotional states visible to others. We attempt to extend the existing body of research by identifying message-inherent factors that can explain the type and intensity of such emoji reactions to political messages. Our paper proceeds in four steps: First, we give a short overview on the literature on emoji use on SNS. After that, we use cognitive appraisal theory and the concept of intergroup emotions to identify message characteristics that potentially trigger emotional reactions. Because of their relevance as motivators of political action, we concentrate particularly on anger and sadness. Finally, we present the results of a quantitative content analysis we used to collect data on the emotion-eliciting message features of political posts and the number of emoji reactions and shares associated to them. The contribution of this study is thus two-fold: On the one hand, we show that appraisal theory can be applied to predict user reactions to political posts on SNS. On the other hand, we examine if emotion-eliciting message features influence how often a

post is shared, and how shares depend on specific discrete emotions.

## 2 Emojis as emotional expressions on SNS

The term “emoji” denotes a graphic representation of facial expressions, gestures, persons, objects, activities, or ideas (Tian et al., 2017). In contrast to “emoticons”, emojis do not consist of simple ASCII character sequences, e.g., “;-)”, but take the form of actual icons. Emojis were developed in Japan in 1999 to facilitate computer-mediated communication (CMC) and from there quickly spread worldwide to become a popular communicative feature in text messengers and on social networking sites (SNS) (Novak, Smailović, Sluban, & Mozetič, 2015). On Twitter e.g., 4 to 13% of all messages (Novak et al., 2015; Pavalanathan & Eisenstein, 2015) contain at least one emoji and according to a (non-representative) study examining the messages of two million U.S. Facebook users, 24% of all posts included an emoji, with 89.9% of the users including them at least once in their messages (Oleszkiewicz et al., 2017).

Compared to the use of emojis as elements within messages on SNS, far less is known about their function as possible reactions to previous messages. This seems surprising, since all large SNS provide predefined emojis that users can click on as a response to preceding posts. Instagram and Twitter e.g., offer a heart-shaped emoji (“like”). Facebook also provides a “like”-button, but introduced five additional reactions in 2016, termed “love” (heart), “angry” (angry facial expression), “sad” (sad facial expression), “haha” (laughing facial expression), and “wow” (surprised facial expression), which since then became frequently used features as well. Tian et al. (2017) e.g., examined the Facebook sites of 15 media outlets in four different countries (US, UK, France, and Germany) and detected 57 million emoji reactions to the 21,000 posts analyzed in their study. This equals an average of 2,700 reactions per post. The most prominent

reaction was “like” (78.9%), followed by “love” (5.5%), “angry” (5.4%), “sad” (4.0%), “haha” (3.7%), and “wow” (2.5%) with only marginal country-specific differences. Similarly, a study by the Pew Research Center shows that emoji reactions are also frequently used in the political realm (Hughes, 2018). Analyzing all Facebook posts by members of the U.S. Congress between February 2016 and July 2017, the authors observed 47.1 million emoji reactions (41.6% “love”, 37.4% “angry”, 13.4% “sad”, 4.7% “wow”, 3.0% “haha”). Moreover, the distribution of users’ reactions considerably varied over time: In the run-up to the 2016 Presidential Election, the dominant response was “love” followed by anger, whereas after Election Day anger reactions increased considerably, eventually exceeding those of love after the inauguration. The study also provides some first hints on possible causes for users’ “angry” reactions: In cases where the messages expressed opposition toward another political actor (e.g., a party or politician), 13% received angry reactions, compared to only 3% in cases without confrontational elements. A recent study by Eberl et al. (2020) demonstrates that “love” and “angry” reactions may also vary considerably between political parties. During the campaign for the Austrian parliamentary election in 2017, “angry” reactions made up 72% of all emoji reactions to posts by the Freedom Party (FPÖ), but only 15% for the Social Democrats (SPÖ). “Love” on the other hand was a frequent reaction to the SPÖ’s posts (50%), but not to posts by the FPÖ (6%). The empirically observed variance in emoji reactions to political messages calls for a deeper examination of their causes.

Although their name might suggest it, emojis do not necessarily express an emotion.<sup>1</sup> In fact, most of them do not even depict emotional expressions, but other concepts, like activities (e.g., dancing), objects (e.g., beer mugs), or gestures (e.g.,

victory sign) (Tian et al., 2017). Also, even emojis showing facial expressions can have non-emotional meanings, like e.g., a smiley with the tongue sticking out or a winking emoji used to mark a non-serious comment (Dresner & Herring, 2010). To determine the meaning of different emojis, researchers have asked users to interpret them (Miller et al., 2016) or analyzed the textual context in which they appear (Novak et al., 2015). These studies show that some emojis have more ambiguous meanings than others. Particularly, different variants of sad faces with tears (Miller et al., 2016) and angry faces (Jaeger & Ares, 2017) are among the less ambiguous emojis and strongly associated to sadness and anger as the respective discrete emotions. Hence “angry” and “sad” emojis are more likely to represent actual emotional expressions in response to a message, whereas others have non-emotional or less distinct emotional meanings. Therefore, we focus on “angry” and “sad” emojis in the current study. These reactions are not as ubiquitous as “like” or “love” reactions, and not as seldom as “wow” or “haha”; it seems that they represent adequate reactions in specific situations. In addition, anger and sadness are considered important drivers of political action. Anger e.g., is known to foster political action such as different forms of political participation (Brader & Marcus, 2013), whereas sadness can exert a de-activating effect (Weber, 2012). Consequently, both emotions can be strategically employed by political actors to influence people’s political activities.

In the following, we will take a closer look at how emotional reactions can be triggered by previous messages. We will (1) identify specific message characteristics that evoke certain discrete emotions and (2) explain why we can expect different individuals within a certain group to react similarly to these characteristics.

### 3 Emotions as responses to messages on SNS

The majority of emotions a person experiences are triggered by first-hand face-

1 In fact, the term’s resemblance to “emotion” is merely coincidental, since it is a combination of the Japanese words “e” (picture) and “moji” (character).

to-face contacts, and take place within established social relationships like the family, among friends, or in the workplace (Scherer, Wallbott, & Summerfield, 2010). However, it is uncontested that emotional reactions can also result from contacts with media content and most of us probably have already experienced such media induced emotions, e.g., while watching a sad movie. In fact, Scherer et al. (2010) as well as Scherer and Tannenbaum (1986) estimate that 5% to 20% of all emotional episodes can be traced back to media use. Given the significance of media as a source for emotions, it is relevant to ask how exactly mediated messages can trigger emotional responses.

Previous studies have identified several message characteristics that motivate user reactions on SNS. However, most of them focus on reactions such as likes, shares, and comments (e.g., Bene, 2017; Blassnig, Ernst, Engesser, & Esser, 2020; Blassnig & Wirz, 2019; Bobba, 2019; Dang-Xuan, Stieglitz, Wladarsch, & Neuberger, 2013; Heiss, Schmuck, & Matthes, 2019; Keller & Kleinen-von Königslöw, 2018), while less is known about factors triggering emoji reactions. An exception is a recent study by Eberl et al. (2020), demonstrating that posts with negative sentiment (i.e., containing more keywords with negative than positive valence) increase the number of angry reactions, while posts with positive sentiment increase the number of love reactions. This valence-based approach may however not explain how posts on SNS elicit different negative emotions, i.e., why some posts receive more “angry” and others more “sad” reactions. Appraisal theory is a promising way to predict different discrete emotions as reactions to messages.

#### 4 The role of cognitive appraisals in the elicitation of discrete emotions

According to Scherer (2005, p. 697), an emotion is “an episode of interrelated, synchronized changes in the states of all or most of the five organismic subsystems in response to the evaluation of an exter-

nal or internal stimulus event as relevant to major concerns of the organism.” The five components Scherer refers to in his definition are (1) the cognitive component (appraisals), (2) the neurophysiological component (bodily symptoms), (3) the motivational component (action tendencies), (4) the motor expression component (facial and vocal expression), and (5) the subjective feeling component (emotional experiences). For example, anger occurs when a person perceives a situation as threatening and as intentionally caused by another person (cognitive appraisal). In such a situation, the person will experience physiological arousal indicated e.g., by an increased heart rate (bodily symptoms), their eyebrows will lower and slant inward (motor expression) and they will prepare to counter the perpetrator or remove the threat (motivation). Moreover, this person will also be able to express how the emotion “feels” (subjective experience). In the context of the study at hand, appraisal processes play a key role, because they are considered an important mechanism of how media messages can elicit emotions on the part of the audience (Gross & D’Ambrosio, 2004).<sup>2</sup>

Appraisal theories of emotion elicitation rely on the notion that discrete emotional responses (like e.g., anger, fear, joy, or sadness) are the result of individual appraisals of situations or events that are important or relevant to a person (Scherer, 1993). Various appraisal approaches have been developed (e.g., Frijda, 1986; Lazarus, 1991; Scherer, 2001; C. A. Smith & Ellsworth, 1985) showing a remarkable overlap regarding the central cognitive assessments that are assumed to influence the type and intensity of an emotional response to a given stimulus (Scherer, 1993). In the case of anger and sadness, these mutual appraisals are goal relevance, goal congruence, cause, responsibility, coping potential, and future expectations (see

2 There are other ways how the media can induce emotions, particularly emotional contagion and empathetic responses. However, in the case of political messages these mechanisms play a less important role than cognitive appraisals (see Scherer, 1998).

e. g., Nerb & Spada, 2001). In the following, we will focus on these appraisals and their combinations to explain the emergence of anger and sadness in response to political messages.

*Goal relevance.* A situation or event (e. g., a message) is relevant for the individual if it affects its central goals, motives, or concerns (Frijda, 1986). Relevance varies according to the position of the goal within one's personal goal hierarchy and / or with the number of goals affected (Scherer, 2001). For a student e. g., a message indicating that his university is planning to raise tuition fees should be of higher relevance compared to a message stating that another university is raising fees. The assessment of goal relevance is a decisive step in the appraisal process, because emotions are expected to occur only if the individual considers the situation relevant (Scherer, 2001). The more relevant the situation or event, the more intense the emotional reaction will be.

*Goal congruence.* Relevant events or situations can contribute to the achievement of personal goals, but also work against them. To stick to the above example, a raise of the universities tuition fees would be considered goal incongruent, because it may endanger the student's financial well-being or even the possibility to continue his studies, whereas a reduction of fees would be considered an improvement in this regard. The assessment of goal congruence determines whether the situation elicits positive or negative emotions. Appraisal theory predicts that goal incongruence results in negative emotions (e. g., sadness, anger, fear) whereas goal-congruent situations trigger a positive response (e. g., joy, pride) (Lazarus, 1991, pp. 217–296).

*Causes and personal responsibility.* When assessing a relevant situation, people usually tend to determine its cause or discern the agent responsible for its occurrence. Possible causes can be internal or external. Internal causes are located within the individuals assessing the situation, e. g., their abilities, character traits, or decisions. External causes, on the other hand, can either be other persons (e. g., their

abilities, character traits, or decisions), or situational conditions (e. g., weather conditions). Closely related to the identification of a cause or agent for a given situation is the attribution of responsibility. In cases where solely situational conditions are identified as the cause of an event, an attribution of personal responsibility is not possible. However, when a person is identified as the agent, perceived personal responsibility for the situation can vary considerably. Individuals can blame themselves or others for a certain situation, because it was under their control and / or they willingly produced the respective outcome. On the other hand, perceived personal responsibility can be low or absent in cases of little control and / or intentions to produce a certain outcome. Depending on the congruence of the situation with one's personal goals, the attribution of causes and personal responsibility specific emotional responses will occur. For example, goal incongruent situations that are perceived to be caused by others who are held responsible for the situation should lead to anger (Frijda, 1986, p. 198), whereas situations with no personal responsibility should lead to sadness (e. g., Kühne & Schemer, 2015; Nerb & Spada, 2001). Goal congruent situations should always lead to positive emotions like joy or happiness, regardless of who or what is held responsible. However, if one attributes a positive situation to one's own personality and intent, pride should be the resulting emotion (Lazarus, 2001).

*Coping potential.* When someone is confronted with a goal-incongruent event (e. g., a threat), he or she will also tend to assess if there are ways to cope with the situation. Coping abilities depend especially on the perceived control over the situation and the power to exert this control. For example, if the student in our example sees no possibility to deal with the increased tuition fees, he will most likely experience sadness or even despair. If he recognizes a way out, e. g., by asking a wealthy relative for financial support, hope will evolve. The perception to be able to cope with a goal incongruent situation is also a characteristic of situations that evoke anger. Anger

**Table 1:** Appraisal patterns and predicted emotional responses

Appraisal	Anger / Rage	Sadness / Dejection
Goal relevance	medium – high	High
Goal congruence	obstruct	obstruct
Cause / Agent	another person	Open
Responsibility	high	none – low
Coping potential	high	very low
Core relational theme	A demeaning offense against me and mine	Having experienced an irrevocable loss

Note: Based on Scherer (2001, pp. 114–115) and Lazarus (2001, p. 64) and adapted for the study.

prepares the organism for action, i. e., to counter the source of the anger (Carver & Harmon-Jones, 2009). Therefore, some authors see perceived control over a situation as a necessary condition for anger to occur (Lerner & Keltner, 2001). Although anger and sadness differ strongly with regard to perceived coping potential, both emotions are associated with an approach tendency; sad as well as angry individuals will dwell on the emotion-eliciting situation in order to find relief (Nabi, 1999).

Appraisal theory states that emotional responses result from specific combinations or configurations of single appraisals. These combinations are depicted in Table 1 for the two emotions central to our study (anger and sadness). Both appraisal patterns can be further synthesized to a denser and abstract meaning, which Lazarus (2001, pp. 63–64) termed “core relational themes”. Core relational themes (bottom row of Table 1) reflect the central gestalt of an emotion-eliciting situation or event. In the case of anger, it is described as “a demeaning offense against me and mine” and for sadness, it is “having experienced an irrevocable loss”.

Our previous remarks indicate that appraisal processes are highly subjective in nature and strongly depend on individual assessments. Consequently, people’s emotional reactions to the same situation can be quite different, depending on what they personally consider important respectively good or bad. A Democrat e. g., probably shows a less intensive and / or more positive emotional response to a negative event happening to the Republican Party (e. g., joy), compared to a Republican whose reaction would probably be

more intense and negative (e. g., sadness or anger). At the same time, emotional reactions *within* a group of Democrats or Republicans should be more homogenous, because group members usually share more similar notions of what is good / bad or relevant / irrelevant. In the following paragraph, we will therefore have a closer look on how group membership influences the formation of discrete emotions.

## 5 Intergroup emotions

Appraisal theory puts a strong focus on individual assessments of a specific situation or event. However, mediated messages differ in two important ways from this premise: First, a person encountering a message is usually not part of the situation depicted, but experiences it in an indirect and virtual way.<sup>3</sup> Second, in many cases, the situations described in mediated messages (e. g., parliamentary debate) will not affect the person as an individual, but rather as part of a collective like, e. g., a group. Given this discrepancy, one has to justify why under such premises, appraisal theory is still a suitable approach to explain the emergence of emotions on the individual level.

The concept of “intergroup emotions” or “group-based emotions” (Mackie & Smith, 2015, pp. 263–264) offers a theoretical link between the individual level processes described by appraisal theory and

<sup>3</sup> An exception from this notion is Kepplinger’s (2007) theory of reciprocal effects. The approach explains how the media affect subjects of media coverage (e. g., politicians).

the group level. Group-based emotions are felt because of group membership and rely on processes of self-categorization and group identification (Mackie & Smith, 2015, p. 263). For group-based emotions to occur, the group itself is neither required to be present, nor has the individual itself to be part of the emotion-eliciting situation (Niedenthal & Brauer, 2012, p. 269). In addition, research has shown that especially political group affiliations promote the emergence of group-based emotions (E. R. Smith, Seger, & Mackie, 2007).

Scholars of group-based emotions have integrated appraisal theory in their frameworks to explain emotions as a result of group membership. Very similar to the original psychological studies, they assume that specific combinations of appraisals in a given situation lead to specific emotional responses (Mackie & Smith, 2015). The difference between the traditional and the group-based approaches is that the latter rely on intergroup rather than individual appraisals. Self-categorization leads individuals to see the world through the eyes of their in-group and consequently, the appraisals mentioned before are carried out from a group perspective as well. For example, when reading a political party's message on Facebook describing a certain event, a follower of that party might ask himself questions such as: Is the event relevant for my party? Does the event help or harm my party? Who is responsible for the situation? Can my party cope with the consequences? Depending on the answers – the group-based appraisals – emotional reactions like joy, anger, pride, guilt, or sadness can occur.

Research has shown that individuals as group members experience emotions on behalf of their group, even when they are not part of the respective events nor directly affected by them (see Mackie & Smith, 2015 for an overview). Soccer fans for example – although not playing for their favorite team themselves – usually show strong emotional reactions, like joy, anger or sadness, if their favorite team wins or loses (Crisp, Heuston, Farr, & Turner, 2007). Similarly, individuals can feel guilt or pride as a reaction to the actions taken

by their group without being personally involved in the group's actions (Doosje, Branscombe, Spears, & Manstead, 1998).

Based on both approaches (appraisal theory and intergroup emotions) we predict the following associations between message-inherent appraisal patterns and emotional expressions in the form of emojis:

H1: Facebook posts including an anger-specific appraisal pattern will receive a higher number of anger emoji reactions compared to those without such a pattern.

H2: Facebook posts including a sadness-specific appraisal pattern will receive a higher number of sad emoji reactions compared to those without such a pattern.

## 6 Emotions and political action

Several studies have linked media induced emotions to political attitudes or behavior (see Brader & Marcus, 2013 for an overview). Thereby, anger and sadness have shown to have different effects (e.g., DeSteno, Petty, Rucker, Wegener, & Braverman, 2004; Lerner & Tiedens, 2006). Although both emotions go along with a tendency to approach the emotion-eliciting situation (Nabi, 1999), anger is associated with heuristic information processing, while sadness leads to more substantial processing (see Lerner & Tiedens, 2006 for an overview). This is explained with the difference of perceived control that is associated with the two emotions. Angry people feel they are in control of the situation, engage in more risk-seeking behavior (Lerner & Keltner, 2001) and have a lower need for accuracy. Sad people on the other hand exhibit a lower level of perceived control and therefore act more carefully. Anger and sadness also differ in their appraisal tendencies, or the emotional needs they induce, which results in different political preferences. Angry individuals look for punishment of the culprit and therefore are more favorable of putative

measures, while sad individuals look for help to cope with the loss they or someone else experienced, are more favorable for preventive measures (DeSteno et al., 2004; Kühne & Schemer, 2015) and tend to engage more in information seeking behavior (Brader & Marcus, 2013). Hence, although both emotions are negative in valence and lead to some engagement with the emotion-eliciting event, they result in different information processing behavior as well as in different policy preferences and actions.

The emotional reactions individuals experience in response to a post on SNS may not only find expressions in emojis, they can also affect further actions such as sharing the message. Compared to liking (and other reactions), which represent low-threshold options for opinion expression, sharing a post is considered to be a result of higher elaboration (Porten-Cheé, Haßler, Jost, Eilders, & Maurer, 2018). First, individuals are aware of the visibility of shared posts and the potential consequences of expressing their opinion in public, and second, they consider if content is relevant to their peers before sharing it. Porten-Cheé et al. (2018) therefore conclude that the more individuals are cognitively involved with the content of a post, the more likely they will share it. In line with these reflections, Dang-Xuan et al. (2013) found that emotional tweets are shared more frequently than non-emotional tweets, as emotions generate attention and foster cognitive involvement.

Following this line of argumentation and the different action tendencies triggered by anger and sadness, we could expect that content evoking sadness would be shared less often than content evoking anger, as anger reduces the need for accuracy, promotes risky behavior (Lerner & Keltner, 2001) and mobilizes the individual to counter the cause of the anger (Brader & Marcus, 2013). Another explanation for why emotional content is shared more frequently is provided by Berger and Milkman (2012), who identified emotional arousal as a driver for sharing content online. From this perspective, we could also expect that content evoking anger is shared

more often than content evoking sadness, as anger is a high-arousal emotion, whereas sadness is a low-arousal emotion. Indeed, empirical evidence points into this direction; in their study, Berger and Milkman (2012) found that anger increased the frequency of sharing while sadness did not. This finding indicates that in the case of content evoking anger or sadness, emotional arousal is the better predictor for sharing than cognitive involvement. Based on these considerations we predict a positive relationship between anger and sharing political content on SNS:

H3: Anger-eliciting posts will be shared more frequently than posts that do not elicit anger.

In the case of sadness, theoretical predictions are less clear, because – as we have seen – sadness is associated with higher levels of cognitive elaboration, which should result in stronger action tendencies, but also with a lower arousal level, which inhibits subsequent actions. Therefore, we additionally pose the following research question:

RQ1: Is there an association between sadness-eliciting posts and the frequency of shares?

## 7 Method

To test our hypotheses, we analyzed the Facebook pages of the six largest German political parties (CDU, SPD, AfD, FDP, The Left, and The Green Party). From all posts published during our period of investigation ( $N=4,160$ ; 1 January 2017 to 26 February 2018), a disproportionately stratified random sample of  $N=600$  posts was drawn (Davern, 2008) by randomly selecting 100 posts from each party's overall corpus. In doing so, we ensured that less active parties on social media still entered the overall sample with a statistically sufficient amount of posts. It is important to note that while (non-weighted) disproportionate random samples do not provide valid point estimates regarding the whole

population, they do so for the different strata – in our case the six parties.<sup>4</sup>

To gather post specific information, we employed a combination of automatic and manual quantitative content analysis. The automated part was completed by using “Facepager”, a software tool that allows to retrieve publicly available information via Facebook’s API (Jünger & Keyling, 2017). For each post, we collected its date and time, the posting political party and – most important – the number of users’ “angry” and “sad” reactions as well as the total number of shares. The manual coding procedure was used to obtain information on the emotion eliciting content within each post, i. e., to assess the appraisal dimensions. We thus used automated coding for some variables, and manual coding for others, depending on which approach was most suitable to measure the given variable with high reliability and validity. For the manual coding, twenty-two human coders were randomly assigned an equal number of party postings and trained to secure reliable measures. Five of the coders did not take part in the reliability test and their codings were therefore removed from the final sample<sup>5</sup> resulting in a total of  $N=463$  posts as the basis for the following analyses. Intercoder reliability was determined based on 18 jointly coded posts using the Lotus coefficient (Fretwurst, 2015) with acceptable results ( $= .64$  to  $.78$ ).

### 7.1 Measurement of appraisals

The coders analyzed each post and identified anger- and sadness-specific appraisal patterns. In a first step, they identified the main event of each post as indicated by the

headline. In cases where no headline was available, the main event was determined as the one taking up most of the post’s text. After that, the coders separately went through the appraisal steps described above (goal relevance, goal congruence, causes and responsibility, coping potential) to identify anger- and sadness-specific appraisal patterns. As a result, each post was assigned only one emotional core theme. All coders were instructed to evaluate each post from the perspective of the partisans of the respective party. This instruction was given based on our earlier remarks on intergroup emotions, because we assumed that regular visitors of the political parties’ sites would most likely be partisan followers or at least likeminded sympathizers holding relatively similar notions of what is good, bad, or relevant for the party (Klinger & Svensson, 2014). This is a critical assumption, because a sufficiently high intragroup agreement regarding the assessment of an event’s goal relevance and goal congruence is necessary to evoke similar group-wide emotions.

*Goal relevance* was coded on a four-point scale reaching from 1 (the situation described in the post has no relevance for the party) to 4 (high relevance for the party). To measure *goal congruence*, we employed a simple dichotomous category indicating if the situation described in the post was congruent (1) or incongruent (0) with the party’s goals. We also assessed if the post mentioned a *cause* for the given situation and differentiated between four possible agents: the party itself or one of its members, another party or one of its members, another organization or one of its members, and external circumstances (e. g., the economy). For all possible causes, we then determined the degree of *personal responsibility* for the situation using a four-point scale reaching from 1 (the actor bears no responsibility for the situation) to 4 (the actor bears high responsibility for the situation). In cases where external circumstances were identified as the cause, personal responsibility was coded as absent. Finally, we coded the parties’ *coping potential* to deal with the situation using a dichotomous category indicating if

4 In addition to this advantage, stratified random samples (proportional and disproportional) increase the efficiency of sample estimates in cases where the variables used to stratify the target population are related to the characteristic being studied (Davern, 2008). Since the number of emotional reactions and shares strongly depend on the type of party (due to the varying number of followers) this advantage especially applies to our case.

5 Since all coders were randomly assigned the posts, no systematic bias was expected from removing particular coders.

the (negative) situation can be reversed / improved (1) or not (0).

Following the theoretical configurations shown in Table 1, we used the appraisal codings above to construct two new dummy variables indicating the presence of an anger- or a sadness-specific core relational theme in a posting. An “anger core theme” was operationalized as a situation depicted as at least moderately relevant to the party, goal incongruent, identifying another party or organization as the cause of the situation and blaming it for it. However, there still had to be a possibility to cope with the situation. An example would be a post accusing the governing party of being responsible for high unemployment rates accompanied by the suggestion to vote for the opposition. Similarly, the “sadness core theme” was assigned to all posts mentioning situations that were coded at least moderately relevant to the party and goal incongruent. However, unlike in the case of anger, the cause of the situation described (regardless of its type) had to be free of responsibility. Finally, a sadness core theme required that there was no way for the party to reverse or improve the situation. An example for the latter case were death notices of politicians on the parties’ Facebook pages. Sadness and anger themes were thus eventually coded to be either present (1) or absent (0) in a post based on the appraisal components.

## 7.2 Control variables

In addition to the effects of our independent variables, we also accounted for several control variables that can affect reactions and sharing. First, all posts were collected at the same date (26 February 2018), hence some had been online for more than a year, and others just for a few days. Since an earlier publication date may be associated with more reactions and shares, we included the number of *days since publication*. Second, the number and characteristics of followers of the investigated Facebook pages may influence the frequency of reactions to the posts (see also Table 2). The *party pages* (CDU, SPD, FDP, The Left, and The Green Party while AfD was the reference category) were thus

included as dummy coded controls. Third, reactions may be more frequent when posts include *visual elements* such as a picture or video, therefore their presence was also controlled for. Finally, the general newsworthiness of posts is known to foster reactions in online settings (Weber, 2014); therefore, a *news value index* was constructed for each post by summing up all present news factors (i. e., prominence, sex, spatial proximity, consequence, surprise, conflict, humor, presence of political actors, and personal information about political actors, see Eilders, 2006). Next to this, we included some variables that might specifically influence the frequency of sharing a post: Some posts contained an explicit *call to share*, thus a dummy variable was introduced to control for this. Further, since sharing might also be influenced by positive emotions (Berger & Milkman, 2012), we included the *number of non-negative emoji reactions* (i. e., “haha”, “wow”, “love”) and the *number of likes* as control variable.

## 8 Results

Before we test our hypotheses, it is worthwhile to look at how frequently the two core relational themes on each party’s Facebook page occurred. As can be seen in Table 2, the anger theme dominated and was found in 8.9% of all posts, whereas the sadness theme was less common and only present in 4.8% of the cases.

We can also observe significant party-specific differences: Whereas the two currently governing political parties (CDU and SPD) make only marginal use of both core themes, the opposition shows significantly higher shares. This especially applies to the populist AfD, who also was the only party using both core themes almost equally often. All other opposition parties prioritized the anger over the sadness theme. These results coincide with the work of other scholars who claim emotionalization to be a central component of the populist communication style (Engesser et al., 2017).

**Table 2: Prevalence of anger and sadness core relational themes on political parties’ Facebook pages**

	CDU (n=81)	SPD (n=76)	AfD (n=73)	FDP (n=78)	The Left (n=78)	The Green Party (n=77)	All (N=463)
Anger (%)	1.2	3.9	16.4	7.7	14.1	10.4	8.9
Sadness (%)	1.2	1.3	13.7	3.8	5.1	3.9	4.8
Number of fans*	124 293	121 265	310 407	56 678	169 109	132 540	914 292

Note: \*Number of Facebook fans at the beginning of the investigation period (January 1<sup>st</sup> 2017). Anger:  $\chi^2(463)=16.31, p=.006$ , sadness:  $\chi^2(463)=17.40, p=.004$ , total share:  $\chi^2(463)=32.43, p=.000$ .

We now turn to the main goal of our study and examine the relationship between the presence of anger and sadness core themes in the parties’ posts, users’ emoji reactions to them, and the resulting number of shares. Since our endogenous variables are counts and show a substantial level of over-dispersion, we employed a negative binomial regression model to determine the relationships between them (see Gardner, Mulvey, & Shaw, 1995 for an overview of the method and its application for count data). The analyses were performed using SPSS 25. Results are displayed in Table 3 and 4; since negative binomial regression coefficients represent the log change of expected counts on the dependent variable and are thus not easy to be interpreted, the tables also show the exponential estimates, which represent the incident rate ratio (IRR). This value can be interpreted as a factor, with which the outcome is multiplied. Thus, values smaller than 1 represent a decrease and values higher than one an increase in the dependent variable.

H1 predicts that posts featuring an anger theme receive a higher number of angry emoji reactions than posts without such a theme. This assumption is supported by the data,  $b=0.54, SE=0.17, p<.001$ . Similarly, as predicted by H2, posts reflecting a sadness theme led to a higher number of sad emoji reactions compared to posts without such a theme,  $b=1.16, SE=0.23, p<.001$ . The exponential coefficient reveals that the presence of an anger theme increases angry emojis by a factor of 1.71, thus posts with an anger theme get 71 % more angry emojis than posts without this theme. The presence of a sadness

theme increases sad emojis by a factor of 3.19. However, the results also reveal that the sadness theme fosters angry emojis, and the anger theme also fosters sad emojis (see Table 3). While sad emojis are driven more strongly by the sadness compared to the anger theme, anger emojis are driven more strongly by the sadness theme, which is an unexpected result. The control variables further reveal that the presence of visual elements drives both types of emoji reactions, while news value only fosters sad emojis. Posts on the AfD page further generate a higher number of sad and angry reactions compared to posts on other party pages.<sup>6</sup>

H3 predicts that posts that elicited anger are also shared more often. This assumption can be tested in two ways. First, we can look at the effect of the presence of an anger theme on the number of shares (see Model 1). There is no significant effect of the anger theme on sharing, but there is one for the presence of a sadness theme,  $b=0.57, SE=0.24, p=0.02$ . Shares increase by 77 % percent when a sadness theme is present in a post. A second way to test the hypothesis is to look at the relationship between the presence of angry emojis and number of shares (see Model 2). Here we see a small but significant effect,  $b=0.001$ ,

6 Since emoji reactions seem to be driven particularly by the AfD, we conducted an additional analysis to see if the relationship between anger and sadness themes and the corresponding emoji reactions exists for posts of all parties. The analysis is reported in the online appendix of this paper. The results show that the phenomenon is enhanced for posts on the AfD page, but it also exists for the other parties’ posts.

**Table 3: Model estimates (unstandardized negative binomial regression coefficients)**

	Angry emoji reactions				Sad emoji reactions			
	b	SE	Exp(b)	p	b	SE	Exp(b)	p
Constant	6.79	0.22	884.96	0.00	4.82	0.23	123.85	0.00
Anger theme	0.54	0.17	1.71	0.00	0.38	0.18	1.46	0.03
Sadness theme	1.64	0.23	5.16	0.00	1.16	0.23	3.19	0.00
Days since publication	-0.01	0.00	1.00	0.00	0.00	0.00	1.00	0.00
Party: CDU	-3.32	0.17	0.04	0.00	-3.38	0.18	0.03	0.00
Party: SPD	-2.68	0.18	0.07	0.00	-2.30	0.18	0.10	0.00
Party: FDP	-4.25	0.17	0.01	0.00	-3.41	0.18	0.03	0.00
Party: The Left	-2.10	0.17	0.12	0.00	-1.10	0.18	0.33	0.00
Party: The Green Party	-3.29	0.17	0.04	0.00	-1.21	0.17	0.30	0.00
News value	0.01	0.02	1.01	0.62	-0.06	0.02	0.94	0.00
Visual elements	0.27	0.16	1.31	0.09	0.34	0.17	1.40	0.04
	AIC: 4292.45 Log-likelihood: -2135.23 Omnibus-Test: 1209.60*** (df=10) n=462				AIC: 3250.35 Log-likelihood: -1614.18 Omnibus-Test: 756.44*** (df=10) n=462			

**Table 4: Effects of emotional expressions and emotion-eliciting themes on the number of shares (unstandardized negative binomial regression coefficients)**

	Model 1				Model 2				Model 3			
	b	SE	Exp(b)	p	b	SE	Exp(b)	p	b	SE	Exp(b)	p
Constant	5.20	0.25	180.67	0.00	4.30	0.27	73.78	0.00	4.31	0.27	74.33	0.00
Anger theme	0.30	0.19	1.35	0.11					0.16	0.19	1.17	0.41
Sadness theme	0.57	0.24	1.77	0.02					0.18	0.24	1.19	0.46
Angry emoji reactions					0.001	0.00	1.001	0.00	0.001	0.00	1.001	0.00
Sad emoji reactions					0.002	0.00	1.002	0.04	0.002	0.00	1.002	0.04
Days since publication	0.00	0.00	1.00	0.55	0.00	0.00	1.00	0.38	0.00	0.00	1.00	0.41
Party: CDU	-1.11	0.19	0.33	0.00	-0.41	0.21	0.66	0.05	-0.41	0.21	0.67	0.05
Party: SPD	-0.67	0.19	0.51	0.00	0.04	0.20	1.04	0.86	0.04	0.20	1.04	0.83
Party: FDP	-1.50	0.19	0.22	0.00	-0.74	0.21	0.48	0.00	-0.74	0.21	0.48	0.00
Party: Left	-0.63	0.18	0.53	0.00	0.00	0.20	1.00	0.99	-0.01	0.20	0.99	0.95
Party: Green	-0.91	0.20	0.40	0.00	-0.05	0.24	0.95	0.84	-0.06	0.24	0.94	0.79
News value	0.02	0.02	1.03	0.18	0.03	0.02	1.03	0.06	0.03	0.02	1.03	0.09
Visual elements	0.41	0.18	1.50	0.02	0.43	0.18	1.53	0.02	0.42	0.18	1.52	0.02
Call to share	0.81	0.19	2.25	0.00	0.54	0.21	1.72	0.01	0.54	0.21	1.71	0.01
Likes	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00
Positive emoji reactions	0.00	0.00	1.00	0.52	0.00	0.00	1.00	0.48	0.00	0.00	1.00	0.43
	AIC: 5419.20 Log-likelihood: -2695.60 Omnibus-Test: 573.22*** (df=13) n=408				AIC: 5376.49 Log-likelihood: -2674.24 Omnibus-Test: 615.93*** (df=13) n=408				AIC: 5379.36 Log-likelihood: -2673.68 Omnibus-Test: 617.06*** (df=15) n=408			

$SE=0.00$ ,  $p<.001$ . For 100 additional angry emojis, the number of shares increases by 10%. Again, there is also a significant effect for sad emojis on sharing, which suggests that for 100 additional sad emojis, the number of shares increases by 20%. If both approaches are combined (see Model 3), the significant effect of the core relational theme disappears, while the effects of emoji reactions on the number of shares persist. Additionally, visual elements, a call to share the post, inherent news value and the number of likes have a positive effect on the number of shares. Posts on the pages of CDU and FDP were shared significantly less often than posts of the AfD (reference category), while no difference emerged between other parties and the AfD. H3 is thus partly supported, since there is a positive effect of angry emoji reactions and the number of shares. Regarding RQ1 we find that sadness emojis also have a positive effect on the numbers of shares.

## 9 Discussion and conclusion

The aim of this paper was to investigate whether political communication on Facebook triggers emotional reactions and influence the frequency of sharing a post. Based on functional theories of emotions, we expected that specific appraisal dimensions in Facebook posts elicit discrete emotions, such as anger or sadness, expressed by the respective emoji reaction to a post. In line with the appraisal tendency framework, we further expected that anger eliciting posts would be shared more often, while no clear theoretical prediction was possible for sadness eliciting posts. The results of our content analysis of the Facebook pages of German political parties were mostly supportive of these assumptions. Facebook posts exhibiting appraisal dimensions known to elicit anger triggered more angry emoji reactions than posts without these characteristics, while posts exhibiting sadness eliciting appraisals resulted in more sadness emoji reactions. In addition, the number of angry and sad emoji reactions were also pos-

itively related to the number of shares. It is noteworthy that this relationship exists after controlling for the number of likes of the posts, which may indicate positive reactions as well as the general popularity of a post.

Unexpectedly, posts reflecting a sadness theme also triggered angry emoji reactions, even more so than they triggered sad reactions. Further, when not considering reactions to the post as a predictor for shares, the sadness theme has a stronger effect on sharing than the anger theme. We can conclude from this finding that sadness themed posts are shared more often, not only because they elicit sadness, but especially because they elicit anger. Anger and sadness are both caused by negative events; if someone can be held responsible for the event, then the resulting emotion should be anger, if nobody can be held responsible sadness should occur. The results suggest that even if a Facebook post does not blame someone for the situation, individuals might still perceive someone to be accountable and therefore react with anger rather than sadness. This points to a limitation of our content analysis with regard to the intersubjective coding of appraisal dimensions.

Unlike previous research (Berger & Milkman, 2012), we also found a positive effect of sadness emojis on the number of shares (on top of the effect caused by angry emojis). It could be that media induced sadness triggers different motivational goals than sadness in response to real events; media induced sadness is most likely not caused by a personal loss, but by the loss of someone else, and in some cases, individuals might perceive that sharing a message can protect others (including themselves) from similar experiences. Thus, it might be that while individuals are not particularly motivated to share sad news stories in general (Berger & Milkman, 2012), they might do so when they feel this could have a political impact. The relationship between sadness and sharing of media content and political posts should therefore be investigated more thoroughly in the future.

The study of emotional reactions on social media is particularly interesting because these platforms have a high potential to elicit emotions due to their social component on the one hand, and because such emotional expressions may serve as indicators of an existing emotional norm within a certain group. Studies in the context of intergroup emotions have shown that when individuals become aware of emotional reactions within their group, they tend to converge toward this perceived emotional norm or prototype. This effect has been demonstrated for positive (happiness) and negative emotions (fear and anger) (Moons, Leonard, Mackie, & Smith, 2009). Other researchers have already pointed out the potential importance of online popularity indicators (e. g., likes or shares) as cues to public opinion or other aspects of social reality (Porten-Cheé et al., 2018). Such perceptions might not only strengthen the in-group identity of group members, they might also provoke a chain of emotional reactions, which might lead to the spread of online emotions (e. g., in the course of so-called firestorms). Future research could therefore investigate the dynamics of emotional reactions on social networks in order to obtain more insights on emotional contagion on online platforms (see e. g., Stieglitz & Dang-Xuan, 2014). Our results suggest that the group context does matter on Facebook; not only did the messages posted by the AfD exhibit more emotion eliciting characteristics than posts by other parties, the AfD followers were also more likely to use emotional reactions and to share posts in their network. Future research should therefore also consider characteristics of the communicator of political messages on social media, as well as those of the followers of a page.

All in all, this study has used an innovative approach to assess the emotion eliciting potential of social media posts by measuring appraisal components on the one hand, and by measuring users' emotional reactions to such posts relying on emoji reactions on the other hand. Our results suggest that both measures are useful, as the captured appraisal patterns

triggered the corresponding emotional reactions. Further, the study has shown that anger and sadness eliciting posts are shared more often than other posts on Facebook. This may help to understand why negative news and hate speech spreads fast on social media, especially within certain groups. The results also suggest that political actors can reach a larger audience on social media using messages evoking negative emotions.

Of course, our study has also limitations. First, we cannot be sure if users express emotions they experience in response to a Facebook post by using emojis, and we also cannot be sure whether they use the "correct" emojis. For example, users who experience guilt or shame in response to a post may also use the sad emoji. In other words, the congruence between experienced emotions and emoji expressions is not always given. However, our results suggest that at least anger and sadness emojis are good indicators for the respective emotions, as they are triggered by the corresponding appraisal patterns. Second, we decided to assign only one emotional core theme to a post. Although this seemed to be an adequate procedure, since the parties' messages were rather brief ( $M=67.04$  words) and mostly focused on one event, it ignores the fact that a single post may deal with several events or with a single event that triggers more than one emotion. Cases where several emotions co-occur are also known as "emotion blends" (Scherer, 1998, p. 147). As a subset of emotion blends, "mixed emotions" specifically refer to the co-occurrence of emotions that are of opposite valence. A prominent example of mixed emotions are so-called "bittersweet events" that elicit joy and sadness (Larsen & McGraw, 2014). Whereas some researchers assume that emotions of opposite valence are mutually exclusive and therefore cannot exist at the same time (e. g., Russell & Carroll, 1999), others find support for the opposite. Larsen and McGraw (2014) e. g., provide evidence for mixed emotions after participants watched a film whose ending contained both a good and a bad event. While recent studies indicate that mixed

emotions exist, not much is known about their behavioral consequences. However, studies in health communication suggest that mixed emotional appeals (e.g., fear appeals that also elicit hope), can increase a person's behavioral motivation compared to mere negative emotional appeals (Carrera, Muñoz, & Caballero, 2010; Myrick & Oliver, 2015). Third, in the current paper, we proposed and implemented a content-analytic way to measure the implicit emotionalization of text messages derived from appraisal theory. One restraint of this approach when analyzing large quantities of text like social media messages surely lies in the limited capacity of human coders. Although human coding offers various advantages, automated methods would be much more efficient in this regard. However, existing automated tools (like the Linguistic Inquiry and Word Count, LIWC or the NRC Emotion Lexicon) are dictionary-based and detect emotions by counting emotion-specific expressions (e.g., “angry” or “mad”). Our approach, on the other hand, focuses on the implicit emotionalization of a message, by analyzing the specific situation described in the text. Such a situation can be highly emotional without using any explicit emotional expressions. For example, a post can describe the situation in a refugee camp and completely lack explicit emotional expressions like “sad” or “grief”. Nevertheless, it evokes sadness, because it contains information on the situation or conditions the refugees face (e.g., lack of food or shelter, diseases, or death). Although dictionary-based methods are well capable of detecting the general negative tone or valence of such a text by counting negatively connotated words (e.g., death), they fail to distinguish which specific negative emotion is transmitted (here: sadness or anger). Despite these restraints, we think dictionary-based methods inhere great potential for the analysis of implicit emotionalization, when they are supplemented by specific appraisal categories. These supplements e.g., could include the attribution of responsibility or future expectations that are addressed in the text. Similar to our operationalization, specific

configurations of these categories could be used to determine situations that are likely to trigger specific discrete emotions. Finally, some of the variation in the use of emoji reactions to the posts may also be explained by variables we could not observe. For example, user-characteristics like e.g., gender or age have been shown to influence emoji use (e.g., Prada et al., 2018).

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### Supplementary Material

Supplementary material for this article is available online in the format provided by the authors (unedited).

<https://www.hope.uzh.ch/scoms/article/view/j.scoms.2021.01.003>

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## “I think it’s up to the media to raise awareness.”

### Quality expectations of media coverage of climate change from the audience’s perspective

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#### Abstract

This study aims to increase the understanding of how the media should report scientific issues by exploring audience’s expectations of how the media cover the contemporary, global issue of climate change. Drawing upon qualitative group discussions (n = 26) and on the theoretical perspective of Wolling’s Theory of Subjective Quality Assessments (TSQA), we provide insights into the relations between public views on climate change and the expectations and assessments of its media coverage. Stimuli material of climate change media coverage presenting uncertainty, a scientific claim, and emotional appeal was integrated. Overall, the relevance of the media for this public issue was emphasized. Despite diverging opinions on how the media should adopt its societal function, a more solution-oriented, detailed and diversified coverage was desired to provide guidance and to overcome topic fatigue. Differing quality dimensions regarding content and reporting style from the audience’s perspective were derived.

#### Keywords

science journalism, quality expectations, assessments, audience perspective, climate change, group discussions, Theory of Subjective Quality Assessments (TSQA)

## 1 Introduction

The media play a relevant role in the dissemination and communication of scientific research and its findings. Usually, citizens receive this information through mediated communication, not through scientific publications or first-hand experiences such as engagement processes (National Science Board, 2018; Newman, Nisbet, & Nisbet, 2018; Su, Akin, Brossard, Scheufele, & Xenos, 2015). Thus, the media coverage is of particular importance for the social handling of a scientific topic and often forms the basis for everyday decisions. Therefore, science journalism plays a dominant role. However, it is challenging to report about science as its findings are often highly complex and, at the same time, very abstract. Further, these findings are sometimes uncertain and conflicting and are therefore not easily understood by

laypeople. Journalists must consider how to present this scientific abstractness, uncertainty, and contradictoriness while at the same time being guided by journalistic principles, organizational structures, and individual preferences (Dunwoody, 1999; Maier et al., 2016; Stocking & Holstein, 2009). Moreover, Loosen and Schmidt (2012, p. 873) describe the audience as “a highly important point of reference” for journalists and to consider this when producing content in order to be noticed and to justify its existence. This can be underscored by the finding that dissatisfaction with media coverage reinforces “media frustration” and even a loss of trust (Donsbach, Rentsch, Schielicke, & Degen, 2009; Newman & Fletcher, 2017). This is particularly problematic for science journalism, where trustworthiness of content and sources is of particular importance. Moreover, recipients’ decisions of selection and



usage, as well as their issue perception and awareness, are also affected by their needs and demands. It is crucial to know what is actually expected of science journalism. Research on audience's expectations and their evaluations of media's coverage of scientific issues is scarce and fragmented. Previous research has emphasized that understanding the audience is at least as important as analyzing the media and its frame-building (Morton, Rabinovich, Marshall, & Bretschneider, 2011; O'Neill, 2013; Olausson, 2009; Schäfer & O'Neill, 2017).

We both address this critical gap and contribute to the analysis of the audience's perspective on media coverage by focusing on the issue of climate change, which is a highly complex, uncertain scientific topic with a high degree of abstraction. The media are one of the key players in creating awareness of climate change, influencing political discourse, and impacting public opinion. Further, as people often derive their knowledge of climate change from the media, their topic-related attitudes, as well as their behavior, are affected by it (e. g., Arlt, Hoppe, & Wolling, 2011; Bolin & Hamilton, 2018; Carmichael, Brulle, & Huxster, 2017; Lowe et al., 2006; Metag, Füchslin, & Schäfer, 2015; Weingart, Engels, & Pansegrau, 2000). Previous research has shown that the acceptance of anthropogenic climate change may decrease or increase depending on news media preferences (Bolin & Hamilton, 2018).

Other than journalistic content, fictional content such as movies like "The Day After Tomorrow", television series, and books have also been shown to be important for people's climate change perceptions and knowledge (e. g., Balmford et al., 2004; Beattie, Sale, & Mcguire, 2011; Howell, 2011; Lowe et al., 2006; Nolan, 2010). While climate change coverage is a well-researched objective, particularly journalistic content (for an overview, see Schäfer, 2017), how it is perceived and assessed by its audience has received less attention in the research literature.

We remedy this shortcoming by drawing upon four group discussions (n=26) with integrated stimulus material. By considering Wolling's Theory of Subjective

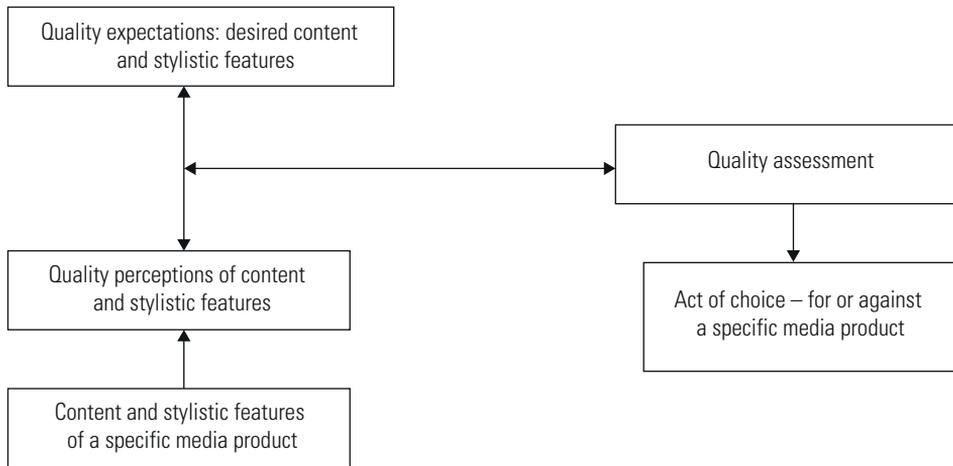
Quality Assessments (TSQA; 2004, 2009), we are able to apply a broad media concept, including news and fictional content. However, science journalism on climate change is the main focus. With this, we aim to both expand the understanding of how science journalism should report about scientific issues such as climate change and to broaden the scholarly discussion in this field.

## 2 Quality expectations and assessments of media coverage

The Theory of Subjective Quality Assessment (TSQA; Wolling, 2004, 2009) is based on the assumption that usage decisions depend on the evaluation of different characteristics of a media product. Wolling's approach postulates that the audience has expectations of quality for certain media product features, which are desirable characteristics, in terms of both content and form, of the media product. The audience can specify what qualities they desire for an ideal product, which can be influenced by their motives. Wolling (2004) has empirically shown that these quality expectations have a significant influence on the media product's level of use. Assessments of these features are the basis for selection behavior. Quality in this approach is understood as "the features of any media product (...) that are significant in the recipient's (...) choosing to give attention to that product" (Wolling, 2009, p. 86). Quality is used in the sense of a descriptive term and is measurable and should not be understood as a normative expression but as a subjective perspective (Wolling, 2004; 2009).

The TSQA states that the perception of these features, and thus the media products' qualities, is an integral part of the reception process. This can be understood as a cognitive process, the result of which is the quality assessment, which is created by comparing the expectations and perceptions of the features. This is then expressed in the act of (not) using a media product (Wolling, 2009). Therefore, the recipients do not primarily evaluate their

Figure 1: Theory of Subjective Quality Assessment (TSQA)



Note: Figure is based on Wolling (2004, p. 175) and Wolling (2009, p. 88).

own behavior, but the media features. Recipients “are more in the position of observers who express an opinion about an external object (the media product) than in that of people who have to judge their own activities [in this case media choices]” (Wolling, 2009, p. 89). If the audience perceives its individual desire regarding specific quality characteristics as fulfilled, it is assumed to assess the media product positively. The same applies to the case that the audience deplores certain features and perceives them as absent. If recipients are disinterested in a particular feature, it is of no significance to their usage choice (Wolling, 2009). However, “deficits in one aspect are not capable of compensation by particularly high performance on the opposing aspect” (Wolling, 2009, p. 93). In summary, the quality of a media product not only depends on its characteristics, but also on the audience’s expectations of the ideal format, how they perceive the actual format, as well as how they evaluate and weigh its various characteristics. All of this affects the usage decisions: “The more positive the judgment of quality [...], the more likely the user is to select and regularly use this media format” (Wolling, 2004, p. 174; own translation).

By integrating both a recipient-oriented and a content-oriented perspective, the TSQA (Wolling, 2004, 2009) takes the criticism of the well-known uses and gratifications (U&G) approach into account which is the disregard of specific media content and the insufficient consideration of how the audience processes and understands the media content (Vorderer, 1992). Within the U&G approach, it remains unclear what the individual gratifications are based on, why and how those gratifications can be obtained, and what has caused the effect (Blumler, 1979). To explain why the audience seeks specific gratifications and respectively specific effects by certain media products, the media content and its attributes should be included. The TSQA addresses this by emphasizing the relevance of “features of the media product”. However, this approach has thus far rarely been used. In particular, it remains unclear which features are relevant for the audience when evaluating media. As such, this must be investigated (Wolling, 2009).

In our study, we adopt the TSQA as a framework to explore the relevant features for the audience’s perspective on climate change coverage. We follow its premises in order to understand climate change-related media use and media coverage assess-

ments more deeply. Previous research has shown that the audience has an idea about what constitutes appropriate means for the dissemination of science and scientific findings (Maier et al., 2016; Milde & Barkela, 2016; Wicke & Taddicken, 2020). For instance, they expect science journalism to be trustworthy so that it may be relied up and thus to empower them to make their own decisions. Moreover, the audience is interested in background information about research study funding (Milde & Barkela, 2016). However, studies that considered expectations are scarce, as research has mainly focused on the assessments. For example, national surveys such as the German Science Barometer (Wissenschaft im Dialog, 2020) only evaluate whether the public feels informed about science. Little attention has been paid to quality dimensions from an audience's point of view, and as a result, their examination may also give the media, and particularly journalists, an orientation for effective ways of reporting about science. Therefore, this paper analyzes the following research questions through an explorative study:

[RQ1] What does the audience expect regarding the quality of the media's coverage of climate change?

[RQ2] How is the quality of the media's coverage of climate change assessed by the audience?

The TSQA “operates at a fairly high degree of abstraction” (Wolling, 2009, p. 93). This allows for a wide application field. The audience decides between different media and between different media products. To research their usage decision on these different levels, the explanatory approach can be helpful. We perceive this as an additional value of the theory, due to our assumption that desires also depend on specific media formats and their content, i. e., the audience's quality expectations may differ depending on the mode of presentation such as a documentary report, television news clip, or newspaper article. These expectations also depend on the kind of content, for example fiction versus non-fiction

as movies versus news. Accordingly, it enables us to consider different media genres and products, and therefore different ways of depicting science and scientific findings. To specify our research aims in this regard, we briefly outline how climate change is presented by the media.

### 3 The media coverage of climate change

Many communication science scholars have researched media coverage of climate change. Most often, the content analyses focus on selected topics as well as on how science journalists present climate change findings (e. g., Barkemeyer et al., 2017; Brüggemann & Engesser, 2017; Nisbet et al., 2017; Olausson, 2009; Schäfer, 2017). Because of this research, it is known that the amount of climate change coverage has increased in recent years, especially due to the *Fridays for Future* movement (Sommer, Rucht, Haunss, & Zajak, 2019) and in the context of events such as the Global Climate Conferences (Schäfer, 2017; Schmidt, Ivanova, & Schäfer, 2013). The news related to those conferences was found to predict serious consequences of climate change for humanity with little indication to the uncertainty of scientific findings (Ashe, 2013; O'Neill, Williams, Kurz, Wiersma, & Boykoff, 2015; Painter, 2014). Skeptical frames within the German media's news reporting are rather rare (Kaiser & Rhomberg, 2016). In general, scientific issues are often portrayed as more certain than they actually are, which is also true for Germany, where this study took place (Guenther, Bischoff, Löwe, Marzinkowski, & Voigt, 2017). German journalists generally emphasize the evidence of scientific findings, such as highlighting the certainty of a future increase in global temperatures (Maurer, 2011). However, communicating possible effects of climate change inevitably also involves communicating uncertainties, as they go hand in hand with forecasts, for example. This communication affects the audience's perception of scientific authority, especially that of scientists' competence

and trustworthiness (Jensen, 2008; Johnson, 2003; Morton et al., 2011; Retzbach & Maier, 2015; Visschers, 2018; Wiedemann & Schütz, 2008). Furthermore, it has been shown that mentioning scientific uncertainties can raise skepticism about climate change and can lead to confusion and anger in recipients. This in turn can undermine their willingness to mitigate climate change (Corner, Whitmarsh, & Xenias, 2012; Ding, Maibach, Zhao, Roser-Renouf, & Leiserowitz, 2011; Rabinovich & Morton, 2012). Therefore, the manner in which *scientific uncertainty* is presented is highly relevant for public perceptions of science issues such as climate change. Previous research on the audience's expectations of media coverage on uncertainty is inconsistent. For example, some prefer to be informed about the current state of research, including uncertainties, while others explicitly do not want to be informed about uncertain research findings because they regard this lack of definitiveness as a sign of an incomplete research process (Maier et al., 2016; Milde & Barkela, 2016). We explore this more deeply in our study:

[RQ2a] How does the audience assess the quality of climate change coverage by the media regarding the portrayal of uncertainty?

Aside from the aspects of uncertainty, media coverage of scientific issues often has a *strong scientific character* with a focus on scientific experts' statements (Summ & Volpers, 2016). Scientists usually provide background information and knowledge (Albæk, 2011). Thereby, they often use jargon, inter alia to demonstrate expertise (Bullock, Colón Amill, Shulman, & Dixon, 2019). Summ and Volpers (2016) examined the current state of science coverage in German print media and showed that the majority of articles about science are fact-oriented and written in a neutral reporting style. Journalistic content is found to frequently focus on scientific arguments such as those in the IPCC report and to be climate change consensus-oriented (Engesser & Brüggemann, 2016; Peters & Heinrichs, 2008; Summ & Volpers,

2016). However, science journalism is often accused of using *dramatization and sensationalism* (Summ & Volpers, 2016). Fear appeals, or messages that emphasize the severity and salience of threats, have been found to be common in the climate change coverage (Feldman, Hart, & Milosevic, 2017; Hart & Feldman, 2014); for instance, extreme weather phenomena such as storms and melting of the ice sheets (Peters & Heinrichs, 2008). Ubiquitous images of floods and polar bears, some of the most typical pictures associated with global warming, depict threats to humans (Metag, Schäfer, Füchslin, Barsuhn, & Kleinen-von Königslöw, 2016; O'Neill & Nicholson-Cole, 2009). As a result, the media are accused of exaggerating scientific claims for the sake of the story (Weingart et al., 2000). Olausson (2011) confirmed this through group discussions where she found that most recipients criticized sensational forms of climate change reporting. Participants in Ryghaug, Sørensen, and Naess's (2010) study similarly stated that they are fed up by what they perceived as sensation-making media coverage. However, the reception of such media coverage – that said to dramatize climate change – can lead to greater problem awareness (Taddicken, 2013), although this does not have a long-lasting effect and simultaneously reduces the belief in the likelihood of extreme events as a result of climate change (Lowe et al., 2006). Moreover, while using fearful representations of climate change can attract people's attention to climate change, it contributes to public disengagement (Lidskog, Berg, Gustafsson, & Löfmarck, 2020; O'Neill & Nicholson-Cole, 2009). To avoid such outcomes, the use of *humor and satire* can help the audience manage feelings of fear, helplessness, and guilt (Pinto & Riesch, 2017) and in general, has the potential to make science more appealing, accessible, and may promote reflection on climate change issues, information gathering, and positive engagement (Bore & Reid, 2014; O'Neill & Nicholson-Cole, 2009). With this in mind, it is imperative to strike a balance between humor and seriousness. Although the audience may appreciate humorous,

satirical elements as a pleasant contrast to the serious scientific information, the associated textual ambiguity opens up certain space for interpretation and may lack a clear message about climate change, undermining the impact and credibility of climate change research (Bore & Reid, 2014; Pinto & Riesch, 2017). In addition, important issues could be perceived as simplified and trivialized, even more so as a certain level of knowledge about climate change is needed in order to understand related jokes (Riesch, 2015).

Whether forms of emotionalization, i.e., the use of satire, are appropriate means of communicating information on climate change has not yet been extensively researched (Lidskog et al., 2020). We thus explore how the perception of such media content meets and affects the audience’s expectations and interpretations, particularly in contrast to a neutral, “scientific” reporting style:

[RQ2b] How does the audience assess the quality of climate change coverage by the media regarding a scientific claim on an issue?

[RQ2c] How does the audience assess the quality of climate change coverage by the media regarding the emotionalization of it?

**4 Method**

To investigate these research questions, four group discussions (n=26) were conducted. Wolling (2009, p. 94) himself suggested choosing a qualitative method to “discover which elements and aspects they [individuals] talk about to other people when discussing the relevant media product”. It is assumed that those are the dimensions individuals base their selection and evaluation of the media product upon. Moreover, the method group discussion was chosen because the increased social interaction, as compared to individual interviews, serves to stimulate thought processes and reflections (Cyr, 2016; Morgan, 1997; Vogl, 2019). This is significant here as reflecting and verbalizing their desires

and expectations is typically challenging for participants, particularly regarding science issues. We wanted to explore how climate change reporting is processed by the audience and how understandings of the issue are constructed (i.e., what they thought and why they thought about climate change and its coverage as they did.)

**4.1 Recruiting and participants**

The discussions each had six to seven participants, aged 21 to 69. We decided that smaller groups would be more suitable for the rather complex topic and that this group size would enable participants to have enough time to voice their views and provide detailed information. The 26 German-speaking participants (11 men and 15 women) were recruited via different avenues, including local newspapers and online forums in Hamburg (Germany). As an incentive, all participants received € 30. A brief standardized screening questionnaire was used to ensure, among other things, sociodemographic heterogeneity, and to construct the discussion groups. For this, we asked about climate change related media use, interest in the topic, problem awareness, and knowledge. Overall, only individuals with at least a minimum level of interest in climate change participated. There were four groups; the

Table 1: Overview of the sample

Gender	
female	58 %
male	42 %
Age	M=44.2 (SD=14.5)
Education	
certificate of secondary education <sup>a</sup>	27 %
higher education entrance certification <sup>b</sup>	69 %
other	4 %
Climate change related media usage (1 = “never” to 6 = “daily”)	M=2.1 (SD=1.2)
Interest in climate change (1 = “do not agree at all” to 5 = “strongly agree”)	M=4.2 (SD=1.0)
Knowledge of climate change (Index 1–13, the more the higher)	M=7.3 (SD=2.9)
Problem awareness (1 = “do not agree at all” to 5 = “strongly agree”)	M=1.4 (SD=0.5)

Note: n=26. a) Haupt-/Volksschulabschluss and Mittlere Reife/Realschulabschluss. b) Fachhochschulreife and Abitur.

first of which was highly educated, in their twenties, and possessed middle to high knowledge about basic climate change facts. The second group was still highly educated, but to a lesser degree. They were middle-aged, with a low level of climate change knowledge. The third group was composed of participants with the highest knowledge level, were middle-aged (although on average slightly younger than the second group). The fourth group was the most heterogeneous regarding age with participants in their twenties, forties, and fifties, all of which had a medium level of knowledge.

#### 4.2 Discussions and conversation guidelines

The discussions lasted between 90 to 120 minutes and were led by one of the authors with experience in qualitative interviewing. Her role was to manage the discussion, to ask follow up questions for elaboration on interesting points, and to encourage engagement among participants (Kühn & Koschel, 2011). She relied on conversation guidelines (see Online Supplement A) to structure the discussions and to ensure that all relevant topics regarding the study's research interests were considered (Hellferich, 2011; Kühn & Koschel, 2011). The guidelines had been discussed beforehand among the whole research group to ensure quality control. The first group discussion was conducted as a pretest to observe the time length of the discussion and whether or not the participants become weary. Moreover, the pretest aimed to ensure whether the guidelines were functional and that there were no difficulties in understanding the questions (Hurst et al., 2015; Lindlof & Taylor, 2019). As this was the case, this discussion was also included in the analysis.

The research team created a friendly and welcoming atmosphere before and during the discussions. After a joint round of introductions, most of the participants took part in the discussion on their own accord. In the beginning of the sessions, the participants' attitudes toward climate change as well as their media usage were discussed. Following this, the participants

were invited to explain how they perceive and assess the media coverage of climate change, such as its adequacy, extent, and credibility. Questions were then introduced to stimulate discussion on typical reports about climate change in the German mass media and, in order to ascertain their expectations, what an ideal report would be like. All groups debated in a committed and intensive manner, to the extent that many questions in the conversation guide were covered through the natural flow of conversation. The participants used their personal experience and specific media usage occasions to explain their reasoning. As such, intervention was minimal aside from a few instances where participants were either not participating or were not giving others opportunity to speak.

#### 4.3 Stimulus material

After around 45 to 60 minutes of conversation, participants were shown three audiovisual excerpts from German public broadcasters representing different forms of climate change coverage (see Online Supplement B). We focused on television as it is still the medium by which the majority of Germany's population obtains information about science and technology (Wissenschaft im Dialog, 2018). The stimuli consisted of three videos and each lasted around 90 seconds. These were used in order to further the discussion about the style of media coverage and expectations of the audience regarding the presented level of (a) uncertainty, (b) "scientific" claim, and (c) emotional appeal. The first stimulus was a news broadcast showing two scientific experts – a well-known climate scientist and a geophysicist – who advocated contrarily about climate developments. This video addressed the uncertainty and contradictoriness of climate science findings. The second stimulus, a documentary report, featured an oceanographer who explained the results of his climate change research and the applied scientific method behind it in detail. A third television excerpt portrayed climate change from a satirical, humorous and entertaining perspective

where possible negative implications of climate change, such as global warming, were highly exaggerated and portrayed as positive developments. The message was critical of the often sensationalistic and dramatizing way of reporting.

#### 4.4 Saturation

The guiding principle for sample size and data collection was the concept of saturation (Charmaz, 2014; Mason, 2010; Moser & Korstjens, 2018; Nelson, 2017; O'Reilly & Parker, 2013; Saunders et al., 2018). Charmaz (2014) proposes defining saturation by robust, rich categories which have conceptual depth, showing the patterns, categories, and variety of the phenomenon under study (Moser & Korstjens, 2018). The study's aim was to achieve richness and depth of analysis, and thus to extend and advance knowledge. Elements of both theoretical and data saturation were combined (Saunders et al., 2018). Saturation was reached when we had the impression that no new analytical information had arisen (Moser & Korstjens, 2018). New perspectives about the participants' media usage, their perceptions of climate change coverage and ideas on how climate change should be reported could not be gathered, but a sufficient depth of understanding was reached to allow for theorizing (Nelson, 2017). To be sure of this, the final group was made to be more heterogeneous than the previous ones so as to capture additional aspects through possible differing opinions, experiences, and perspectives.

#### 4.5 Transcription and content analysis

Group discussions were audio recorded and later transcribed with the software "f4transkript" based on a set of transcription rules by Kuckartz (2018) and Dresing and Pehl (2015) which focus on the content. Transcripts were analyzed thematically according to our research questions (Mayring, 2014). We immersed ourselves in the data by reading and rereading the transcripts carefully and conscientiously, in search of deeper understanding (Moser & Korstjens, 2018). We applied an iterative approach to analyze the group discussions

and, based on theoretical considerations and following our conversation guidelines, predefined a coding scheme. The analysis focused on exploring and identifying quality expectations and assessments regarding the content and style of climate change coverage. Based on the actual data, we developed additional categories. Within this process, we went through the data and examined what emerged from it. In accordance to Mayring (e.g., Mayring, 2014; Mayring & Fenzl, 2019), we used both structuring and summarizing content analyses, thus combining a deductive and an inductive approach. We defined categories and created coding rules and added anchor examples. The coding scheme (see Online Supplement C) was applied using the software "MAXQDA" for the coding process. We used this to structure and organize the data and to classify and annotate relevant text passages. For quality control of the coding process, we applied a consensual coding method (e.g., Kuckartz, 2018) to improve the reliability of the codings. The iterative coding process was conducted by the authors, supported by another senior researcher. Using the same coding scheme, the results of the analysis were compared to determine whether coders agreed on the coded content. Early in the process, differences were discussed and a common understanding of the coding scheme was developed to ensure consistency. Following the analysis, selected quotations from the group discussions were translated to English by the authors and proofread by a native English speaker. Those presented in the following results section function as illustrations and typical examples from the coded empirical data.

## 5 Results

The findings of our study reveal a range of "media features" (Wolling, 2009) individuals take into account when evaluating the media with regard to climate change. We differentiate between the expectations [RQ1] and assessments [RQ2; RQ2a-c] and

assign the media features to content and style to allow for greater clarity.

All participants indicated they were interested in climate change and that the media are their main source of information. They mentioned that they do not actively search for information about climate change, but come across such content in their usual media consumption. They relied especially on content reported in newspapers and on television. Other people, such as family and friends, were not mentioned as sources.

### 5.1 Quality expectations of media coverage of climate change [RQ1]

We first explored the audiences' quality expectations of the media with regard to climate change. For this, we focused on the media's coverage of climate change and analyzed "the ideal coverage", while naturally allowing statements on the media in general. Overall, the participants expected the media to provide high quality, detailed, comprehensible, and accurate information about climate change. Acknowledging the "gate-keeping" role, the journalists were expected to select relevant science information and to structure it in their reporting. Participants in the study were aware of differences between media channels, as they, for example, assessed radio as an "incidental" medium, which was considered unsuitable by some of them for communicating complex topics such as climate change. Although all participants often argued using the term "the media", it eventually became clear that, on occasion, that they had journalism in mind when saying this. Furthermore, other media content, such as movies, series, and novels, were explicitly mentioned throughout the discussions. In the following, we attempt to differentiate between the media and journalism or other content where possible, but it is important to be aware that the different contents seem to merge for the participants.

#### A) Quality expectations on content

A typical first response to the question asking what participants' ideal coverage would be like was that the media should

report constantly on climate change more broadly. Participants indicated that they expect the media to generate and maintain attention for the topic: "*I think it's up to the media to raise awareness.*" (GD3, M32).<sup>1</sup> Participants emphasized the agenda-setting function of the media. They assigned a high normative relevance to the media in general. Thus, they problematized the economic constraints and profit orientation that the media, here mainly journalism, underlies which was particularly seen as negative for complex and unpopular topics such as climate change. Among the suggestions made by participants for improvement were that unappealing television broadcasting times be changed to prime time, for example immediately following the news, and that there should be theme days and special formats for children.

The shared expectation of providing high quality climate change information was discussed in greater detail. The participants do not want to have to check or reinvestigate the content published, but do want to be able to trust it. Overall, they desired more scientific facts on the issue. This was understood to be background information on scientific methods and findings. For instance, transparency aspects of scientific research – and thus information on its trustworthiness – should be presented clearly. In particular, donors and the source of a study's funding are of interest to some participants:

I am interested in more information about "behind the scenes", so to speak, about climate change. [...] What role does it play if a company somehow funds these investigations or these research programs? I do not know anything about these processes. (GD1, F31)

Furthermore, participants hoped for more information on the effects of climate change, not just its causes. A lack of contextualizing was highlighted, such as global contexts and consequences of climate

1 To retrace quotations, participants were labelled with a personal ID (Gender/Age).

change, to offer the audience a higher level of orientation and knowledge. Nearly all participants believed that human beings are responsible for causing climate change. Interestingly, they questioned the political efforts against climate change and strongly emphasized the individual’s responsibility to act. Consequently, the participants felt that the presentation of behavioral options at the individual’s level was lacking in the media coverage. Some participants clearly called for journalism to provide the population with explicit recommendations for climate friendly action and to increase the problem awareness among the public. In their eyes, educationally effective journalism is necessary in order to evoke and foster reflections on the consequences of climate change, particularly those caused by humans. Although this was not denied, some, however, felt uncomfortable with this: “The task of the media is not to spread opinions” (GD3, M50).

*B) Quality expectations on style*

Overall, the participants perceived the media, journalists in particular, as “science translators” and required a high level of comprehensiveness. For instance, journalistic presentations should be scientifically well founded, but also generally easy to understand. Visualizations of climate change can be helpful for this. The reception of media content on climate change should not be too time-consuming, but rather reported “briefly and concisely” as news content which is too extensive might overly strain the audience, causing fatigue and leading them to tune out: “When I look at ZEIT [German weekly quality newspaper], there are five pages about climate change and at some point I stop reading, because it becomes too much for me” (GD2, M67). According to the participants, the ideal reporting style is optimistic or at least oriented to what can be done, and somehow constructive. One participant suggested featuring individuals in the media who combat climate change as they could serve as role models for the audience. Journalistic content should be more measures-oriented and informative as to what individ-

uals can do for the mitigation or adaption of climate change:

I would ask for a report [...], [about] what we can do as individuals, because political solutions such as the Kyoto Protocol etc. do not make a difference [...]. What is really important is what every individual can do. This could be taught [by the media]. With examples from all over the world, how others try to fight [climate change]. (GD2, F44)

Moreover, the media coverage should have a higher news and entertainment value in order to overcome topic fatigue which was also related to uninteresting media content. Although a neutral and objective style of reporting was found to be necessary, the German media’s coverage was criticized for being too “uniform”: participants expected varied and multifaceted journalistic content on climate change. Some suggested presenting it in an entertaining and humorous manner, so that a larger and more diverse audience can be reached.

**Table 2: Quality expectations of the ideal climate change coverage**

A) Content	<ul style="list-style-type: none"> <li>– high information level</li> <li>– trustworthiness of information</li> <li>– communication of scientific facts and scientific research processes</li> <li>– contextualization of effects of climate change</li> <li>– educational role</li> </ul>
B) Style	<ul style="list-style-type: none"> <li>– comprehensible</li> <li>– too time-consuming</li> <li>– measures-oriented, constructive</li> <li>– varied, multifaceted</li> <li>– entertaining</li> </ul>

In general, the participants seem to have set high standards. Some of the quality expectations of ideal media coverage are partly contradictory and difficult to fulfill. For instance, most of the participants would like journalists to report in a neutral and balanced way, while at the same time expecting the media to help them form their own opinion and give clear advice on how to mitigate climate change. Participants called for an increase in the quality of information, which includes the con-

textualization of climate change research – but indicated that the content should be not too extensive. These rather conflicting, irreconcilable expectations can be placed on an “arc of suspense” (Vowe & Wolling, 2004, p. 17). Therefore, high quality is probably not achieved by increasing certain features of a program more and more, but probably corresponds to an ideal point on the arc of suspense where the mutually opposed demands meet best in combination (Wolling, 2009).

**5.2 Assessments of media coverage of climate change [RQ2]**

The participants discussed not only how media coverage should be (idealistic) but also how it is and what they think about it (realistic). In this context, the participants did not talk much about the actual media coverage, but rather what kind of content they feel is lacking. The participants agreed that there is overall too little reporting on climate change.

*A) Assessments of content*

Several of the participants criticized the media for reporting in a superficial way and considered the information level to be low. Generally, climate change was seen to be covered mainly in documentaries and reportage. The presented content was found to be homogenous. Certain statements and topics such as the forecasted global temperature rise were seen as overly repetitive. Some participants suspected different media outlets of using the same sources or copying and adapting content from each other.

*B) Assessments of style*

The media’s coverage of climate change was assessed as being negative, emotional, and particularly sensationalistic. Further, the participants agreed strongly that climate change seems to be frequently reported in the form of dramatic events such as (natural) disasters, when “there are as many dead people as possible to lament” (GD3, F53) and shocking images, such as – at least in Germany – the ubiquitous polar bear on a melting ice floe and desert-like landscapes, which can be used to attract

attention, at least in the short term. This has led to a certain level of frustration and a reduction in participants’ interest in climate change:

I also think that with this subject in particular, somehow, [...] there seems to be a need to sensationalize everything. There is no frame in which it can otherwise be done; it always must be linked to some dramatic event, and I think that the issue is beginning to wear out, that one gets fed up with this never-ending sensationalist reporting on this issue. (GD1, M27)

**Table 3: Assessments of climate change coverage with regard to the audience’s expectations**

A) Content	– <i>information level</i> : low, no content diversity – <i>trustworthiness of information</i> : one-sided, copied content
B) Style	– <i>measures-oriented, constructive</i> : sensationalized, negative – <i>varied, multifaceted</i> : stereotypical visualization

The TSQA (Wolling, 2009) states that quality assessments are composed of a comparison of individuals’ expectations and their perceptions of the media features. Comparing the media features the participants discussed while describing their ideal media coverage of climate change and the media features they considered for assessing it, it becomes clear that they are related to each other. For example, as participants expected media content with “high information levels”, they criticized what they perceived as “low information level”. They want the media to report in a varied and multifaceted way and are unsatisfied with what they perceived as stereotypical visualizations. In addition, the participants focused mainly on the negative and missing aspects of media coverage. Apart from the criticism, the participants believed that reporting on climate change is a thankless task given its multidimensionality, abstraction, and complexity. Some considered it to be also a visual challenge as few aspects of climate change could be displayed graphically. This indicates that participants consider their own

expectations to be difficult to meet. Moreover, it was acknowledged that journalists themselves are rarely scientific experts in the field: “Overall, I don’t find it that bad what the media are doing” (GD1, M27). A further discussion on the extent to which journalists are actually either able or required to fulfill the ideas of the audience is needed.

### 5.3 Assessments of three different forms of climate change media coverage [RQ2a-c]

To explore how the participants assessed the media coverage of climate change, three audiovisual excerpts from German public broadcasters were shown which represent the uncertainty of scientific findings, the “scientific” claim of the issue, and the sensationalized emotional appeals.

#### 5.3.1 *Uncertainty of scientific findings* [RQ2a]

Opinions were divided across the group discussions regarding the communication of uncertainty and differing scientific perspectives. Some participants actually liked this kind of content and said a clear statement by the media was unnecessary as they perceived it their own responsibility to form an opinion. However, the majority of the participants felt uncomfortable. While most of them assessed the content as being scientifically correct, they agreed that the differing perspectives increased the challenge of forming one’s own opinion. This reinforced the perceived complexity of the topic and contributed to a sense of uncertainty in the participants, who also expressed that they do not know how they should utilize this information or which scientist they should trust. According to the participants, this is also due to the fact that they themselves lack knowledge and that the television excerpt presented no scientific methodology when explaining the results and arguments. Therefore, their evaluation of the expert’s credibility and expertise is not based on their statements or on the perceived scientific nature, but instead, as one participant explained, on “absurd” (GD1, M27) criteria such as attractiveness, clothing, and

self-presentation of the experts. Further, in this context the participants discussed the expert’s motives and questioned who might be funding their research. In their opinion, science must be independent. For some participants it seemed that scientists are not working together, but rather against each other which was assessed as being negative. Participants even had the impression that one of the two experts was untruthful: “One of the two must be lying” (GD2, M67), which created a feeling of anger and disillusionment.

Moreover, they were concerned that reporting uncertainties could possibly weaken the threatening character of climate change and its possible consequences and some, indeed, reported that the stimulus had reduced their fears and raised doubts regarding the seriousness of the situation. This was perceived as “dangerous” by other participants who were concerned that media content highlighting the uncertainty of scientific findings could convince laypeople that humankind is not responsible for climate change and thus do not actively engage against climate change. However, some were of the opinion that the balanced nature could foster information-seeking behavior:

There is no one who can do your thinking for you, no media. I must draw on as much media as possible, and when this television broadcast is not enough to enable me to form an opinion, then I need to read up and look up on the internet what kind of expert he is and what he investigated. In other words, to inform myself. (GD3, F53)

#### 5.3.2 *“Scientific” claim* [RQ2b]

The second television excerpt consisted of an oceanographer explaining a specific scientific method and the results found with it. The participants described this stimulus as “very scholarly”, scientifically sound and objective, which they assessed as being positive. The scientist was perceived as comprehensible and trustworthy. Participants indicated this is also due to the fact that the scientist explained the scientific method. Therefore, the results

also appeared valid. Whether the explanation of the method was actually necessary or whether a presentation of the results would have sufficed, led to disagreement among the group discussions participants. One participant explained that “For me, this information [about the method] is of no use, because I can’t comprehend it” (GD1, F25). They also discussed whether the stimulus is too closely oriented to a specialist audience, as many technical terms and scientific jargon were used, and laypeople might find it difficult to understand the topic. Thus, the language used seems to be part of the perceived media features as well.

Some participants lamented that there was no contextualization of the scientific discoveries. For the audience, it remained unclear what its causes were and what the consequences for human beings would be, and in their opinion, a conclusion or the recommendation for action derived from the findings is particularly relevant.

Moreover, the participants assessed this form of media coverage as boring even though they acknowledged that at least an attempt was made to make it entertaining by stylistic features such as ambient music, for example.

### 5.3.3 Emotional appeal [RQ2c]

The third television excerpt presented climate change in a highly emotional, but satirical way: Potential negative consequences of climate change were visibly over-exaggerated and depicted as positive developments. This was assessed as being controversial as well.

This media stimulus was positively perceived as humorous and different to the usual reporting of climate change. Participants believed that, through such entertaining formats, the interest in climate change could be (re)awakened and also expanded to reach those audiences who have so far been less concerned with climate change. Moreover, some participants thought that – due to the exaggerated nature of the representation – the content might be more easily remembered and that reflection on the effects of climate change could be fostered. Other partici-

pants suspected this obvious exaggeration might lead to a failure in recognizing the problematic nature of climate change, and thus, to a certain degree of “diminution” (GD2, M67). Some thought that this satirical way of reporting is inappropriate as the topic is too serious and socially relevant. Parts of the groups also perceived this mode of presentation as difficult and demanding because the content is not communicated clearly and unambiguously. This does not only require knowledge about climate change, but also about the medium or format in order to understand the content correctly.

Table 4: Assessments of three different TV stimuli on climate change and the media features taken into account

1) Uncertainty of findings	<ul style="list-style-type: none"> <li>&gt; <i>communication of scientific facts and scientific research processes:</i> <ul style="list-style-type: none"> <li>+ scientifically correct</li> </ul> </li> <li>&gt; <i>high information level:</i> <ul style="list-style-type: none"> <li>– reinforces the complexity of climate change</li> <li>– increases the challenge of forming one’s own opinion</li> <li>+ fosters information-seeking</li> </ul> </li> </ul>
2) “Scientific” claim	<ul style="list-style-type: none"> <li>&gt; <i>trustworthiness of information:</i> <ul style="list-style-type: none"> <li>+ very scientific and trustworthy</li> </ul> </li> <li>&gt; <i>contextualization:</i> <ul style="list-style-type: none"> <li>– lack of causes and effects</li> </ul> </li> <li>&gt; <i>comprehensibility:</i> <ul style="list-style-type: none"> <li>– difficult to understand due to the measurement method and the use of scientific jargon</li> </ul> </li> </ul>
3) Emotional appeal	<ul style="list-style-type: none"> <li>&gt; <i>varied, multifaceted, entertaining:</i> <ul style="list-style-type: none"> <li>+ interest in climate change could be (re-)awakened</li> <li>+ reaching different audiences</li> <li>– underestimating relevance of climate change</li> <li>– inappropriate due to the topic’s seriousness</li> </ul> </li> <li>&gt; <i>comprehensibility:</i> <ul style="list-style-type: none"> <li>– requires knowledge about the issue and the medium or format</li> </ul> </li> </ul>

Note: as positively (+) / negatively (–) assessed.

Overall, the participants described the media as an important source of information from which to form an opinion about climate change. All participants considered themselves to be laypeople, with regard to climate change science, and perceived themselves as being dependent on what and how the media report about climate change: “That is why I also find

it very hard [...] to form a firm opinion, since I ultimately rely on research results which I read in the newspaper” (GD1, F25). Hence, apparently the media play a relevant role in informing the audience about climate change and are perceived as quite important.

**5.4 Quality dimensions of the media coverage**

Based on both the expectations of, and assessments by the participants, and the related media features, different basic quality dimensions for the media coverage of climate change can be derived. These dimensions can be transferred to the communication of science and scientific issues and are outlined in the following descriptions:

(1) The media were expected to raise awareness and to generate a broad reach for the scientific issue. It was particularly important to the participants that scientific content, which is often highly abstract, complex, and therefore difficult to understand, is explained in a *comprehensible way*. The use of technical terms and scientific jargon was seen as an obstructive barrier for comprehensibility. They expected the media to contextualize scientific findings so as to provide them with a greater level of orientation. (2) Additionally, the audience is usually unfamiliar with *scientific research processes and methods*. The participants wanted a better explanation of how science actually works in order to increase their understanding, but at a low level. (3) This could also help them to deal with the *uncertainty and contradictoriness of scientific findings*. The participants made clear that it is difficult to form one’s own opinion regarding scientific issues such as climate change as they consider themselves to be laypeople and thus as not able to judge the quality of scientific research. Therefore, it is a substantial challenge for the media to expose their audience to uncertain scientific findings without increasing distrust. (4) In line with this, the audience may take into account another dimension when evaluating the media coverage: The participants had the impression that the media are overly re-

petitive with the same information. The *presentation of the diversity of (scientific) perspectives and findings*, to show which disciplines are involved in researching the topic, for example, could raise transparency and trust. (5) Furthermore, related to the abstractness and complexity of climate change, it was difficult for the participants to recognize and understand the importance of the topic for their own lives. They stated several times that they would like the media to recommend implementable behaviors for their own lives which can mitigate climate change. Therefore, the *everyday relevance of the scientific issue* which illustrates the “practical application” of the scientific findings could be pointed out. (6) With regard to reporting style, the participants desired a certain *news and entertainment value*, including emotional appeals, though to a reasonable extent, and to be optimistic and encouraging, as well as high quality and trustworthy.

Table 5: Quality dimensions of science communication

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- (1) Comprehensibility of complex scientific issues
  - (2) Explanation of scientific research processes and methods
  - (3) Pointing of the uncertainty and contradictoriness of scientific findings
  - (4) Presentation of the diversity of (scientific) perspectives
  - (5) Highlighting of the everyday relevance of the scientific issue
  - (6) Consideration of a certain news and entertainment value
- 

**6 Discussion and conclusion**

This study contributes to the empirical analysis of the perceived quality of media by exploring the expectations of, and assessments by the audience. The aim of this paper is to describe relevant media features and dimensions for the communication of the scientific issues that matter for audiences. This is important because their expectations assumingly affect assessments and thus selection and usage decisions that in turn influence issue perception and awareness of individuals. We applied an all-encompassing approach of “the media” to include non-journalistic

media content as it has been shown to be important (e.g., Balmford et al., 2004; Beattie et al., 2011; Howell, 2011; Lowe et al., 2006; Nolan, 2010).

In order to better understand the audience's media perceptions, we applied the idea of differentiating quality evaluations in expectations and assessments (Vowe & Wolling, 2004; Wolling, 2004, 2009). For this, we chose the qualitative approach of group discussions that proved to be beneficial. We integrated different reporting styles by presenting three short audiovisual excerpts from German public broadcasters.

The analysis of the participants' contributions revealed a basic and general common ground on the media's role in general as well as some divergent and contradictory opinions. The relevance of the media for disseminating information about this issue was generally accepted and its authority well-acknowledged. Further, its agenda-setting function and societal relevance was highlighted. The participants saw the media as responsible for keeping this important topic on the agenda. They disagreed on whether the media should provide neutral and balanced information, or play a guiding role by helping individuals to form their opinion and provide clear recommendations for individual climate friendly action. Here, the extreme positions of "the media as information broker" and "the media as opinion-maker" were both enunciated.

Even though the participants often talked about the media in general, they recognized the differences between different media channels and formats. For instance, they considered the economic constraints which influence program structures, and they determined that different media formats enable different forms of representation, and thus how various media can present the issue. In other words, the variety of content in the heterogeneous media landscape is acknowledged and welcomed. This also underscores the idea of the TSQA taking media product characteristics into account.

However, the media coverage was overall only assessed as being of little in-

formative value and uncreative. Further, the repetitive manner in which the information was given was criticized. Other information which was expected from the media, such as issue backgrounds, scientific processes, and contexts, were exceedingly felt to be lacking. From this study, it remains unclear whether the quality of science-based information is indeed as low as perceived by the participants. But it has indeed been found that the occurrence of science-centric frames in media coverage of climate change has decreased over time, whereas socio-political frames have increased (Kirilenko & Stepchenkova, 2012).

The underlying tenor of the media coverage was important for the participants as well. They believed the issue to be permanently sensationalized. The media coverage was overall seen by participants as threat-and-risk-oriented, though, they desired a constructive style of reporting by presenting actionable options for individuals, although this might be at the adapting level. The mutual character of expectations and assessments (Wolling, 2004, 2009) is important here as the assessment of a sensationalized, predominantly negative style of reporting interacts with the unfulfilled expectation of a more solution-oriented and multifaceted coverage which assumingly leads to a loss of interest. In the German media, the human-being's own accountability, as well as responsibility, are underlined which is almost never questioned among the public (Engels, Hüther, Schäfer, & Held, 2013; Peters & Heinrichs, 2008). This may sensitize people and motivate them to act even though they believe they lack sufficient information on what action they can actually take to mitigate climate change. However, they lack references at the individual's level, and to their own world (Lörcher & Taddicken, 2017). This corresponds with the finding that the media mostly reported climate science findings regarding appropriate political solutions (Schäfer, 2017).

Moreover, it underlines the findings of Olausson (2011), O'Neill and Nicholson-Cole (2009) and Lowe et al. (2006). In their studies on climate change, the participants also complained of a certain degree of top-

ic and media fatigue. Rather than raising awareness of the problem, the intensity of the negatively perceived media coverage of climate change seems to lead to a certain level of frustration and a decrease in attention. The audience may distance and disengage from climate change (Lidskog et al., 2020). Thus, as Arlt et al. (2011) have shown, the media do not always have an awareness-heightening effect. Moreover, if the fear appeals within reporting do not actually occur, media and scientific authority may lose its credibility. Therefore, sensationalism and fear seem to be inappropriate tools for climate change communication.

In this study, a constructive reporting and more multifaceted coverage was said to enable the re-awakening of interest in climate change. This goes along with a shift in journalism toward what can be called either *solution journalism* (McIntyre, 2017) or *constructive journalism* (McIntyre & Gyldensted, 2018). This style can be described as an “emerging form of journalism that involves applying positive techniques to news processes and production in an effort to create productive and engaging coverage, while holding true to journalism’s core functions” (McIntyre & Gyldensted, 2018, p. 22). This emerging journalism style has not yet been well-researched. In addition, framing analyses prove that the framing component of treatment recommendation (following Entman, 1993, p. 52) has yet to gain prominence in the media coverage of climate change (Brüggemann, Neverla, Hoppe, & Walter, 2018; Hart, 2010; Schäfer & O’Neill, 2017) – but is greatly desired by the audience as our findings show.

Perhaps equally important is the perception of an uncreative and uniform media coverage. A broader variety, considering the differences of media channels, could help to overcome the climate change fatigue expressed in the discussions and also meet the audiences’ desire for high quality information which is, at the same time, not too extensive.

Furthermore, the use of humor has the potential to make science more appealing and assessable to the general au-

dience (Pinto & Riesch, 2017). The participants shared this idea and considered this kind of reporting style as a pleasant approach in contrast to the usually serious, unstimulating scientific information. This might stimulate attention and critical reflection. However, participants also expressed their concern that humor might trivialize the importance of issues such as climate change and overly simplifies science. These findings are in line with results of previous studies (Bore & Reid, 2014; Riesch, 2015), but should be researched more deeply in the future.

How the media should handle the science-inherent uncertainty as well as the complex and abstract character of science issues such as climate change was discussed inconsistently as well. It became obvious that some participants did not feel comfortable with media content representing different science perspectives: They seemed to feel overwhelmed and at a loss when comprehending and assessing the scientific details. Similar statements were found among participants by Maier et al. (2016) on the issue of nanotechnology. Here, the participants desired reliable information, which enables them to make everyday decisions. They felt insecure and hoped for guidance from the media. Others found their expectations of scientifically accurate information on processes and different science perspectives fulfilled. So far, the perception and processing of scientific uncertainties in the media is not yet fully understood. It is assumed that individual predispositions are relevant here, such as uncertainty and ambiguity tolerance, need for cognition, attitudes toward science and the issue, as well as the individual’s media usage of science-related content.

These findings not only reflect the assumption of the TSQA that the audience does not only consider the fulfillment of their own needs and demands when assessing media coverage, but evaluates specific characteristics and structures of media products (Wolling, 2009). The audience also takes into account the specifics of the topic being reported about. Their individual view on climate change and

their knowledge and attitudes toward the issue have strongly influenced how they desired the topic to be presented in different genres and reporting styles. Moreover, their opinion on what tasks and functions the media should fulfill also played an important role. Both aspects have not yet been addressed in the theoretical framework of TSQA, but should be integrated as possible influencing factors on expectations. Although it is plausible to assume overarching quality dimensions, the expectations of how the media should report on a scientific issue – and thus how the dimensions should be put into practice – may be to a certain extent individually dependent.

Further theoretical developments and investigations of the relation between expectations, assessments and media use can contribute to research about science communication which has only just begun to examine questions of quality. To date, no established definitions of characteristics and standards exist (Wormer, 2017). The proposed six quality dimensions in this study do not represent an exhaustive catalogue of criteria, but may serve as a starting point to systematically group characteristics by which the quality of science journalism can be described and assessed.

## 7 Limitations and outlook

In general, the audience perspective should be given more attention in future studies. This study contributes to this research gap, however, some limitations must be kept in mind.

First, while our study focused on the issue of climate change, we assume that our findings can be generalized well beyond. Nonetheless, future studies may continue working on quality expectations and expanding the questions asked here to other scientific issues or even the field of science in general.

Moreover, it would be interesting to explore the role of the Fridays for Future movement and its coverage in more detail. We found that it was important for the

participants that the media cover activities at the individual's level, possibilities to engage and “do something”. Participants also suggested presenting more role models. Greta Thunberg has certainly been one such role model, as well as other Fridays for Future activists (Bergmann & Ossewaarde, 2020).

Although we used a pre-questionnaire to create heterogeneous groups, only individuals with at least a minimum-level of interest in climate change participated. Furthermore, as participants converse in groups, effects of social desirability are to be expected. Statements about the participants' strong interest in science, their willingness to combat climate change, and their critical perspective of the media could have been made partly due to the social situation.

Moreover, it is important to consider that the assessments and expectations of the media coverage's quality were partly initiated by three audiovisual stimuli. Unfortunately, it was not possible to explore how their stated expectations and assessments are related to their daily media usage behavior and how far their expectations can be traced back to this. As the interaction between expectations and assessments are not only mutual but also particularly iterative, a methodological approach to consider the dynamics of the process seems to be promising. Moreover, the actual media use and selection processes should be considered more intensively in future work using representative methods.

Furthermore, Wolling (2009, p. 98) states that, regarding the operationalization of the TSQA “[g]ranted, the conceptual development and theoretical hypotheses are by no means complete; neither are the means of getting empirical testing fully operational.” We suppose that within a quantitative survey, both perceptions and assessments could be measured more differentiated than in qualitative studies, e.g., to let the participants agree with statements about the climate change coverage in order to measure their perceptions and to ask in a second step how well this is liked. This could contribute to a deep-

er understanding of differentiated quality assessments. Moreover, different views and perceptions of climate change in the media have become obvious throughout the discussions. There were participants who argued clearly from a pro anthropogenic climate change stance and seemed well-informed, and others seemed to be more open to different perspectives and welcomed multifaceted media information. Thus, we believe developing an audience typology regarding different expectations and assessments of climate change in the media to be clearly helpful (Wicke & Taddicken, 2020). Such a typology could not only improve goal-oriented communication or facilitate the tailoring of communication campaigns, but also help to better adapt the media content to the differing needs of the audience and thus prevent or eliminate media frustration with climate change.

One of the greatest challenges science journalism presently faces is how to reach a broad audience. Raising the understanding of how the media should report about scientific issues and research findings from the perspective of the audience may help to develop appropriate means and effective ways of reporting and therefore deserves further attention in future research.

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### Conflict of interest

The authors declare no conflict of interests.

### Data availability statement

The original, unedited data that support the findings of this study are available from the corresponding author upon reasonable request.

### Supplementary material

Supplementary material for this article is available online in the format provided by the authors (unedited). <https://www.hope.uzh.ch/scoms/article/view/jscoms.2021.01.004>

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# The relevance internet users assign to algorithmic-selection applications in everyday life

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## Abstract

The rapidly growing academic and public attention to algorithmic-selection applications such as search engines and social media is indicative of their alleged great social relevance and impact on daily life in digital societies. To substantiate these claims, this paper investigates the hitherto little explored subjective relevance that Internet users assign to algorithmic-selection applications in everyday life. A representative online survey of Internet users comparatively reveals the relevance that users ascribe to algorithmic-selection applications and to their online and offline alternatives in five selected life domains: political and social orientation, entertainment, commercial transactions, socializing and health. The results show that people assign a relatively low relevance to algorithmic-selection applications compared to offline alternatives across the five life domains. The findings vary greatly by age and education. Altogether, such outcomes complement and qualify assessments of the social impact of algorithms that are primarily and often solely based on usage data and theoretical considerations.

## Keywords

algorithmic governance, algorithmic selection, algorithms, subjective relevance, everyday life, survey data, social media

## 1 Introduction

*Algorithmic selection* is the automated assignment of relevance to certain selected pieces of information (Latzer, Hollnbuchner, Just, & Saurwein, 2016). On social media, for instance, algorithmic selection is responsible to filter users' news feeds, to allocate advertisements, and to recommend specific content to users. The great attention toward algorithmic selection in public and academic debates reflects widespread assumptions that it has an extensive influence on daily life in digital societies (Beer, 2017; Gillespie, 2014; Latzer & Just, 2020; Willson, 2017).

Such appraisals of the relevance of algorithmic selection, combined with assumptions on the associated risks including political and economic manipulation, discrimination, data breaches, and a biased perception of the world (Latzer et al., 2016), form the rationale for the need and kind of governance of algorithmic se-

lection. Appropriate governance choice, however, calls for an accurate and up-to-date understanding of the social relevance of algorithmic selection in order to, among other things, assess the scope and magnitude of potential risks associated with it. This paper aims to contribute to the systematic assessment of the social relevance of algorithmic selection in order to provide for a profound basis for governance measures. For this purpose, it suggests including the Internet users' assigned relevance of algorithmic-selection applications in such assessments.

Investigations about algorithmic selection all share the commonality that algorithms are a complex concept and difficult to grasp in empirical social science research (Kitchin, 2017). In practice, algorithmic selection is embedded in and applied by a wide and fast-growing range of online applications such as social media, search engines, news websites, or online shops. These applications are the place



where users experience and are potentially influenced by algorithmic selection. Hence, the social relevance of algorithmic selection mainly unfolds via such applications and along the lines of users' usual but manifold and deliberate daily online practices (Bucher, 2017; Willson, 2017).

Previous studies have predominantly deduced the relevance of algorithmic selection and algorithmic-selection applications either from purely theoretical reasoning or from non-generalizable empirical investigations (Abril, 2016; Baek & Kim, 2016; Beer, 2017; Park, 2019, Yang & Men, 2020). These empirical accounts approximate the social relevance of algorithmic selection from a user perspective by measuring the amount and frequency of the use of algorithmic-selection applications and the effects of or attitudes toward them.

In order to question and substantiate these existing assessments and to gain a more holistic understanding of the relevance of algorithmic selection for Internet users' everyday life, this paper argues for an additional empirical indicator: the relevance that people *subjectively assign* to algorithmic-selection applications.

This approach takes into account that algorithmic selection is experienced by users often unknowingly in everyday situations: Although search engines fundamentally build on algorithmic selection, users may not be aware of it, for example. However, the social relevance of algorithmic selection, its benefits, and risks are provided with or without users' awareness. Asking users about concrete applications (e.g., Google Search) and not about the software technology that lies behind them is therefore imperative when aiming to assess the relevance of technologies like algorithmic selection in daily life that users might not even be aware of. The measurement of users' assigned relevance of algorithmic-selection applications is hence a valuable, but hitherto missing piece in current efforts to assess the actual relevance of algorithmic selection in digital societies.

This paper uses the term algorithmic selection and not algorithm in order to highlight that the focus is on the so-

cio-technical context algorithms are embedded in, and not merely on algorithms as technical artefacts (Latzer & Festic, 2019). Consequently, this article chooses algorithmic-selection applications as its unit of analysis, as the tangible and accessible manifestation of algorithmic selection. Measuring the subjective relevance makes it possible to weight and better interpret existing findings on the overall social relevance of algorithmic selection that are solely based on the amount and frequency of use (Latzer & Festic, 2019).

Drawing on a combination of qualitative interviews and a nation-wide, representative online survey of Swiss Internet users, this study examines five domains of everyday life: *political and social orientation, entertainment, commercial transactions, socializing, and health*. Furthermore, in order to establish a benchmark for the assessment of algorithmic-selection applications, the relevance of alternatives, i.e., non-algorithmic online and offline daily services and activities, such as reading news, watching television, and talking to friends, is investigated as well.

The main contributions of this article to the literature on the social relevance of algorithmic selection are its subjective user perspective, the comprehensive, empirical assessment of the assigned relevance of algorithmic-selection applications relative to online and offline alternatives, and comparisons between different life domains and socio-demographic groups. These representative results complement the current debate, promote more nuanced assessments, and may form the basis for empirically better-informed policy-making regarding the governance of algorithmic selection and algorithmic-selection applications. Such up-to-date, empirical results are especially essential in the light of ongoing discussions about regulatory interventions regarding social media, for example in the context of manipulation and biased political information (Bayer et al., 2019; European Commission, 2018).

The paper continues by providing a literature review on existing research regarding the social relevance of algorithmic selection in five life domains. Subsequent-

ly, an overview of current measurements on the social relevance of algorithmic selection discusses suitable methodological approaches. Finally, the guiding research questions are derived, and the empirical research design is presented. The final sections summarize the results, discuss implications, and draw conclusions.

## 2 The relevance of algorithmic selection – existing evidence for five life domains

According to recent research, algorithmic selection is increasingly prevalent in people's everyday lives. As a result, algorithmic selection increasingly governs what Internet users see and, consequently, how people perceive the world (Just & Latzer, 2017). The distinction between the following five life domains observed in this paper: political and social orientation, entertainment, commercial transactions, socializing, and health helps to investigate ramifications of algorithmic selection in a more nuanced way:

The life domain *social and political orientation* has so far received the most attention from research on the social relevance of algorithmic selection. The widest academic focus lies on the usage time of online services for political topics (Baek & Kim, 2016; Gil de Zúñiga, Ardèvol-Abreu, & Casero-Ripollés, 2021; Karakaya & Glazier, 2019; Lee, Lee, So, Leung, & Chan, 2017; Park, 2019; Vraga & Tully, 2021; Westerwick, Johnson, & Knobloch-Westerwick, 2017; Yang & Men, 2020). The results indicate increased social media use for information seeking (Newman, Fletcher, Schulz, Andi, & Nielsen, 2020; Shearer, 2018) and the consideration of online services as alternative daily news sources (Althaus & Tewksbury, 2000; Bialik & Matsa, 2017; Schmidt, Merten, Hasebrink, Petrich, & Rolfs, 2019). Facebook's news feed algorithm's logic can also directly influence news production and lead to increasingly similar content across different media outlets (Caplan & Boyd, 2018).

Mainly through the emergence of online applications like Spotify, YouTube, or

Netflix, which automatically recommend content to individual users, algorithmic selection has also become key for everyday *entertainment*. However, more traditional recommendations have repeatedly been shown to influence everyday music consumption more heavily (Hamilton, 2019), although there are different usage types for which applications based on algorithmic selection are not equally relevant (Lepa & Hoklas, 2015).

Algorithmic selection increasingly accompanies people's daily *commercial transactions*, including recommender systems and the allocation of personalized advertisements. While the advertising industry heavily relies on algorithmic allocation of user-specific content (eMarketer, 2020), various findings from a user perspective show that users mainly perceive algorithmically allocated advertisements as useless, inaccurate, or even offensive (De Keyser, Dens, & De Pelsmacker, 2015; Kim & Huh, 2017; Smit, Van Noort, & Voorveld, 2014). This rather negative attitude likely reflects concerns caused by the collection of user data (Phelan, Lampe, & Resnick, 2016). Furthermore, with regard to product recommendations, scientific findings show that even though algorithmic recommender systems may be considered helpful (Chen, 2012), they lead to less conversion than recommendations from real people, such as other Internet users (Lin, 2014).

With regard to *socializing*, algorithmic selection increasingly governs the interaction between Internet users (Bucher, 2012, 2017; Celik & Dokuz, 2018). For instance, by rating and scoring user profiles, algorithmic selection is responsible deciding who is considered a potential friend on social network sites or a match on dating services. In terms of dating services, recent studies show that these services are especially of interest for people belonging to societal minorities, such as the LGBT community (Sumter & Vandenbosch, 2019; Wang, 2020). On the one hand, these applications likely facilitate the social interaction not only within but also across various societal groups. On the other hand, scholars have raised concerns that an in-

creased governance of rating and scoring algorithms likely fuels existing discrimination and strengthens biases (Courtois & Timmermans, 2018; Wang, 2020). However, to better assess who is most likely to be exposed to these risks, more research that takes account of different societal groups is needed.

People have increasingly been seeking *health* information online for a long time (Rains, 2007). More recently, self-tracking devices that gather vital data can be empowering for patients when dealing with medical professionals (Lomborg & Frandsen, 2016). They are positively related to the overall health status and can be a superior alternative to traditional paper-and-pencil tracking (Abril, 2016). Their adoption depends on various characteristics of the devices (Adapa, Nah, Hall, Siau, & Smith, 2018) as well as user and context variables (Canhoto & Arp, 2017). Using self-tracking devices to monitor vital aspects about oneself can result in measurable, transparent, and connected bodies. This consequence has been called “algorithmic skin” (Williamson, 2015).

As this literature review shows, comprehensive research with respect to algorithmic selection is lacking, especially when aiming to compare the relevance of algorithmic-selection applications to alternatives, such as print media or human interactions apart from the digital sphere. Furthermore, to better assess risk exposure, there are no comparative findings on the social relevance of algorithmic selection that take different societal groups into account. Beyond this, as the following chapter shows, there is a methodological research gap regarding the relevance that people subjectively assign to algorithmic-selection applications.

### **3 Approaches to measuring the social relevance of algorithmic selection: An overview**

The assessment of the social relevance of algorithmic selection and risks arising from its applications as well as related initiatives to regulate such services have

predominantly been based on purely theoretical reasoning and their mere existence (Pariser, 2011; Seaver, 2019). However, there is an increasing number of empirical approaches illuminating this topic using different methodological designs to expand the understanding about algorithmic selection and its societal relevance (Kitchin, 2017), each with their own advantages and disadvantages. Subsequently, an overview of the methodological approaches to measuring the social relevance of algorithmic selection is given. From this review, we derive the need for including measures on the subjective significance assigned to algorithmic-selection applications and proceed to contribute to filling this gap.

Existing empirical research on the social relevance of algorithmic selection can be divided into two broad perspectives: a bottom-up user, or a top-down supplier perspective. Of the two, the former is by far the more popular and frequent approach. The user perspective is mainly acquired by collecting self-reported data in order to approximate individuals’ Internet behavior (de Vreese & Neijens, 2016), predominantly relying on surveys of the amount and frequency of usage of online services. Repertoire studies also fall into this category and they increasingly take online sources including social media into consideration, enabling a partial assessment of the social relevance of algorithmic-selection applications. To avoid potentially biased self-reported data, a rather novel strand of research – which, like the previously mentioned approaches, also utilizes the amount and frequency of usage of algorithmic-selection applications as a proxy for their relevance – gathers respective data by *tracking online behavior* (Kilger & Romer, 2013; Mattlin & Gagen, 2013). Studies based on tracking data are still quite rare and often limited to social media behavior (Deng et al., 2019; Junco, 2013).

Self-reported data and tracking data are also combined and compared in order to investigate usage time as a proxy for the social relevance of algorithmic-selection applications (Thorson, Cotter, Medeiros, & Pak, 2021). Results reveal that self-report-

ed data are often inaccurate because people are likely to overestimate the time they spend online (Araujo, Wonneberger, Neijens, & de Vreese, 2017; Deng et al., 2019; Guess, Munger, Nagler, & Tucker, 2019; Junco, 2013; Scharkow, 2016). This suggests that even though self-reported usage time is widely employed, it does not permit precise but rather distorted assessments of the relevance of algorithmic-selection applications. But tracking data can also be subject to specific biases, e.g., self-selection (Jürgens, Stark, & Magin, 2019). Another limitation is its methodological restriction to the online sphere, hence being insufficient to appraise the social relevance of algorithmic-selection applications compared to offline alternatives.

A limited number of qualitative studies consider a broader range of settings where people rely on algorithmic selection in daily situations (Bucher, 2017; Festic, 2020) and allow a more in-depth understanding of their social relevance. Qualitative studies also rely on self-reporting from a user perspective. In contrast to quantitative survey data, they provide a more in-depth understanding, for example, of the embeddedness of algorithmic-selection applications in Internet users’ daily practices but lack generalizability across services and life domains.

In addition to studies on the usage of algorithmic-selection applications, *attitudes* toward them are examined to derive their social relevance from users’ reliance on them, mainly measured through the credibility ascribed to algorithmically produced content. These studies can produce contradictory findings. On the one hand, research indicates that people may be rather skeptical toward applications that build on algorithmic selection (Logg, Minson, & Moore, 2019; Promberger & Baron, 2006), and on the other hand, Internet users are more likely to adhere to advice proposed by algorithms as opposed to human sources (Logg et al., 2019).

The social relevance of algorithmic selection is also assessed by directly investigating the effects that the use of algorithmic-selection applications has on individuals’ attitudes and behaviors, instead of

indirectly inferring them from theoretical reasoning or mere usage data. Effect studies usually apply experimental settings.

Lastly, there are endeavors to measure the social relevance of algorithmic selection taking the *top-down, supplier-side perspective* by simulating algorithms (Möller, Trilling, Helberger, & van Es, 2018), reverse-engineering algorithmic program code (Diakopoulos, 2015), or interviewing programmers (Rosenberg, 2008) in order to understand exactly how algorithms seek to and may actually influence Internet users’ everyday lives. Table 1 provides an overview of the existing methodological approaches presented in this chapter.

Table 1: Existing methodological approaches to measuring the social relevance of algorithmic selection

Who?	What?	How?	
User perspective (bottom-up)	Usage (amount/frequency/repertoires)	Quantitative	Surveys
			Tracking
	Qualitative	Interviews	
	Effects	Experiments	
		Multivariate analysis of survey data	
Attitudes	Surveys		
Supplier perspective (top-down)	Code	Reverse engineering	
	Output	Simulations	
	Input	Interviews programmers	

We argue that one crucial missing piece in this field of research is to ask the users how relevant they regard algorithmic-selection applications to be for their lives. There have been limited endeavors to fill this gap for single issues such as gathering information on the 2016 US presidential campaign (Gottfried, Barthel, Shearer, & Mitchell, 2016), but comprehensive empirical assessments are lacking.

The methodological approach used in this article fills this gap: We take a user perspective and aim at empirically approximating the social relevance of algorithmic selection by measuring the subjective relevance Internet users assign to algorithmic-selection applications. This approach

will be introduced in greater detail subsequently.

#### 4 Introducing assigned relevance as a measurement of the social relevance of algorithmic selection

To measure the social relevance of algorithmic selection, empirical approaches have already addressed a few important questions but also come with limitations, as outlined above. We propose exploring subjectively assigned relevance as a complementary measurement in quantitative surveys in order to provide more comprehensive, nuanced empirical assessments of the social relevance of algorithmic selection in people's daily lives.

Algorithmic selection is associated with a variety of social risks to which Internet users are often understood to be highly vulnerable and helplessly exposed. Such a view widely neglects Internet users' agency by underestimating their capacity to manage their Internet use and its consequences. It has been shown, for example, that people are well aware and make sense of the algorithms they encounter online (Bucher, 2017), apply various practices to deal with them (van der Nagel, 2018), and thereby significantly shape algorithms in turn. Hence, it seems vital to investigate individuals' perceptions of the relevance of algorithmic selection.

Previous studies have shown that perceptions of relevance and preferences are likely to differ from usage time and should therefore be considered an additional element in assessing the social relevance of algorithmic selection (Festic, 2020; Swart, Peters, & Broersma, 2017). For example, people may use social media very extensively but still rate information from a printed newspaper as more relevant and more influential for their social and political orientation, even though they spend much less time on it. The primary purposes for which people use social media are not necessarily information seeking but rather being entertained, passing time, or maintaining social relations (Quan-Haase & Young, 2010; Whiting & Williams,

2013). Consequently, empirical data on the relevance subjectively assigned to algorithmic-selection applications considering users' perceptions and preferences is required in order to interpret and weight data on the usage of these services. By functioning as an additional, weighting dimension, the subjective relevance complements existing findings, allows for a more differentiated interpretation of them, and contributes to a more nuanced assessment of the social relevance of algorithmic-selection applications. When people are asked to assess the relevance of a service or activity it is intentionally left to them to intuitively decide how they conceptualize relevance in the given context; for example, why they assess online games as very relevant for their daily entertainment. Although people might have varying concepts of relevance or reasons for their evaluation, this openness assures that the relevance is assessed exactly as each individual finds it most appropriate. This leads to the intended unbiased *subjective* relevance assessment. The reasons behind a certain subjective relevance assessment can be manifold but are not the focus of this study.

Another argument for the measurement of subjectively assigned relevance is that people's perceptions of the relevance of algorithmic-selection applications are likely to influence how concerned they are about potential risks. Regardless of whether these concerns are justified or not, they are likely to affect users' protective behavior (e.g., deleting cookies), which in turn affects their exposure to risks of algorithmic-selection applications (e.g., biases by search engines or manipulations by targeted ads).

To conclude, investigating what people regard as relevant contributes another component to the empirical assessment and understanding of the social relevance of algorithmic selection.

Following the tenets of media repertoire research (Hasebrink & Domeyer, 2012), the social relevance of algorithmic selection can only be accurately assessed when taking individuals' media repertoires into account as comprehensively

as possible. For example, to measure the relevance of algorithmic-selection applications for people's everyday entertainment, it is imperative (1) to assess all the services and activities that individuals use for entertainment purposes in their everyday life and (2) to compare the relevance of algorithmic-selection applications with the relevance of their alternatives. Scholars agree that Internet users' news repertoire should be considered cross-media, since in a digitized environment recipients can choose between a growing number of media outlets (Dimmick, Chen, & Li, 2004; Picone, Courtois, & Paulussen, 2015; Schmidt et al., 2019; Swart et al., 2017). Accordingly, the following research question is at the core of this article (RQ1): What subjective relevance do Internet users assign to algorithmic-selection applications relative to online and offline alternatives?

A large amount of research theoretically discusses the social relevance of algorithmic selection in the context of everyday life (Bucher, 2017; Willson, 2017). Because of the great public interest in effects of algorithmic selection on news consumption, there has been a strong focus on this life domain. But algorithmic-selection applications are also important to several other domains of everyday life. More comparative research is needed to assess their social relevance across these domains because any governance of algorithmic selection ideally requires considering the manifold contexts in which algorithmic-selection applications operate and hence the varying social relevance thereof. This leads to the second research question (RQ2): How does the subjective relevance assigned to algorithmic-selection applications differ across five selected life domains (political and social orientation, entertainment, commercial transactions, socializing, and health)?

Lastly, it is likely that the subjective relevance of algorithmic-selection applications is not equally distributed within a society. Previous findings show, for example, that younger Internet users rely on certain algorithmic-selection applications more heavily than older Internet users, including social media (Shearer & Matsa,

2018; Gottfried et al., 2016; Shearer, 2018), online dating (Smith, 2016; Sumter & Vandenberg, 2019), and mobile fitness tracking (Abril, 2016). However, so far, there are no findings to evaluate whether social groups with higher levels of usage time also assign higher levels of relevance to those algorithmic-selection applications. Hence, to better grasp whether certain social groups are more exposed to risks associated with algorithmic selection, information on subjective relevance is needed as an additional dimension to better interpret existing findings on frequency and amount of use. This is why the third research question addresses these differences (RQ3): How are socio-demographic variables (gender, age, education, income, and region) and personal characteristics (political interest, Internet use) associated with the subjective relevance that individuals assign to algorithmic-selection applications?

In order to answer these research questions, this article relies on a combination of qualitative interviews and quantitative survey data.

## 5 Measuring subjectively assigned relevance

This study consists of a mix of a qualitative (1) and a quantitative (2) phase, which are both described in-depth below.

### 5.1 Data collection

(1) Between June and August 2018, qualitative interviews were conducted with Swiss Internet users on the relevance of algorithmic-selection applications, the awareness of risks associated with algorithmic selection, and related questions (Festic, 2020). The interviewees were recruited through leaflets that were spread as widely as possible (train stations, fitness centers, youth clubs, retirement homes, restaurants, etc.) and received a gift card as a remuneration for their participation. The face-to-face interviews were conducted in German by a team of three researchers and lasted one hour on average. To ensure

a congruent planning, data collection, and interpretation, all team members collaborated closely during all phases of the interviewing process.

(2) The quantitative survey data were collected between November 2018 and January 2019. Participants were recruited from an existing Internet panel by an independent market research company and received a small pecuniary incentive for their participation. The samples for the online survey and the qualitative interviews did not overlap. All participants in the quantitative survey gave informed consent about their participation and the research design was approved by the university’s ethics review board. The survey lasted 30 minutes on average and covered topics such as attitudes towards algorithmic selection, risk assessments, awareness of algorithmic selection, and the subjective relevance assigned to algorithmic-selection applications and online and offline alternatives.

As stated above, both the interviews and the survey relied on five life domains. The classification of life domains was adopted from Büchi, Just, & Latzer’s (2016) analysis of the most widespread Internet activities in Switzerland.

**5.2 Sample characteristics**

Both the qualitative and the quantitative empirical parts of the study relied on a sample of Swiss Internet users. In Switzerland, 92% of the population used the Internet in 2019. Hence, Switzerland continually ranks among the highest-diffu-

sion countries worldwide, similar to other Western countries (Latzer, Büchi, & Festic, 2020).

(1) The sample for the qualitative interviews consisted of 58 Swiss Internet users and was composed applying a conscious choice and with the goal of reaching maximum variation within the sample regarding age, gender, education, and amount of Internet use (Festic, 2020).

(2) The sample for the quantitative survey comprised 1202 participants and is representative of the Swiss online population over the age of 16 with respect to age, gender, language region, household size, and employment status. Table 2 describes the sample characteristics in detail.

**5.3 Measures**

(1) In the qualitative interviews, we asked the interviewees to name algorithmic-selection applications, online non-algorithmic selection, and offline services and activities that are relevant for the life domains under investigation. Applying a sorting technique (Hasebrink & Hepp, 2017), the interviewees named and ranked the activities and services they mentioned. For example, being on social media (algorithmic-selection application), calling on Skype (non-algorithmic selection online service), or meeting friends (offline activity) are among the relevant services and activities for the life domain of socializing. Interviewees sometimes had varying conceptualizations of how they define relevance but all could easily solve the task and give reasons for their choices.

**Table 2: Sample characteristics**

	Mean (SD)	Percentage (N)
Age	43.5 (15.91)	
Female		49 % (590)
Secondary education		66 % (797)
Higher education		25 % (301)
Income (CHF per month, median category)	6001–8000	
Political interest (5-point likert scale, 5 = high interest)	3.33 (1.35)	
Internet use (hours per day)	3.52 (2.82)	
German-speaking		72 % (865)
French-speaking		24 % (288)
Italian-speaking		4 % (49)

(2) The aggregated list was used as a basis for the development of the questionnaire for the subsequent quantitative online survey. The survey participants were asked to assess the relevance of the list of given services and activities for five life domains on a 5-point Likert scale with 1 = “not at all relevant” and 5 = “very relevant”. For each of the five life domains, participants had to assess ten to fourteen services and activities, comprising algorithmic-selection applications, as well as non-algorithmic selection online and offline services and activities. In order not to restrict the subjectivity of participants, the survey questions on the relevance assessment were intentionally left open and non-leading to reflect and allow for varying concepts of relevance participants might have. Non-users of “social media” and “YouTube etc.” did not have to state their relevance for the respective service and were hence assigned the lowest relevance score “not at all relevant”.

It is important to note that for both the qualitative interviews and the quantitative survey, the participants were asked to rate the relevance they assigned to a list of different services and activities for different life domains. They were not given any information about whether the services and activities under investigation were based on algorithmic selection or not. Rather, the team of researchers classified the services and activities according to Latzer et al.’s (2016) definition of algorithmic selection. This approach appears appropriate given the black-box nature of algorithms and the oftentimes low awareness of algorithmic selection among Internet users. Furthermore, where possible, participants were not asked for specific services or activities but for the broader category of similar services or activities (e.g., “music streaming services such as Spotify, Soundcloud, iTunes”).

#### 5.4 Analysis

(1) The qualitative interviews were audio-taped and transcribed verbatim. Using the qualitative data analysis software MAX-QDA, we composed a list of mentioned services and activities for all life domains

which served as an input for the development of the questionnaire. This approach appeared fruitful since the subjectively assigned relevance to algorithmic-selection applications has not been empirically addressed hitherto and sufficient literature for the development of the survey questions and items was lacking.

(2) The dependent variable of interest in the quantitative data is the relevance participants assigned to various services and activities. To answer the first and second research question, the distribution of the ascription of relevance and means for all services and activities grouped by life domains are presented. This provides a comprehensive overview of the relevance assigned to algorithmic-selection applications and to their online and offline alternatives. Moreover, similarities, differences, and general patterns regarding the assignment of relevance to algorithmic-selection applications in five life domains are identified. The third research question is approached by exploring the influence of socio-demographic characteristics on the individual assignment of relevance. Standardized linear regression models for selected activities and services show its association with age, gender, education, income, political interest, Internet use, and language region.

## 6 Results

Figures 1 and 2 present the distribution of the subjectively assigned relevance (lower x-axis) to respective activities and services in five life domains as well as the mean relevance attribution (vertical bars, higher x-axis) by life domain. The activities and services are sorted in descending order regarding the mean relevance assignment. Algorithmic-selection applications are in bold while online alternatives are in italics.

Results for the *political and social orientation* life domain can be interpreted as follows. Participants assigned the relevance that 13 activities and services had for their individual orientation on political and societal issues. “Offline contacts” such

as talking to family and friends were not only most frequently assigned the highest relevance score (45%) but also had the highest mean relevance. With the “voting booklet” (a printed information brochure that is mailed to every Swiss household prior to each vote), “traditional TV/radio”, and “print media” ranking second to fourth, offline alternatives were assigned the highest relevance. “Social media”, an algorithmic-selection application, was ascribed the lowest relevance of all activities, both when looking at the frequency of the highest relevance score (3%) and measured by the mean (2.10). Ranking fifth (3.28), “online news media” was attributed the highest relevance of all algorithmic-selection applications for *political and social orientation*, closely followed by “Wikipedia” and “search engines”.

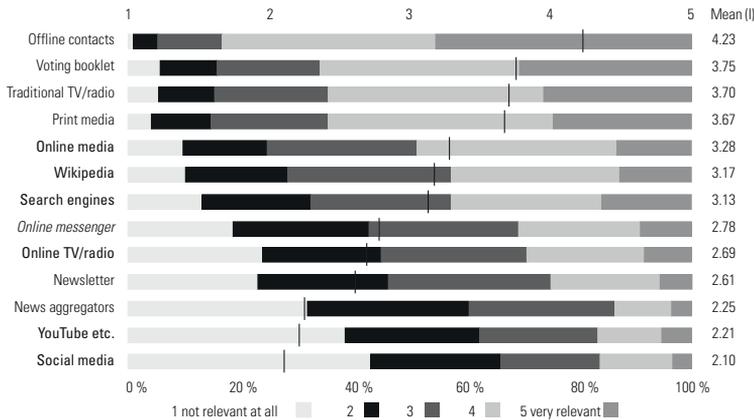
The results for the other four life domains are presented in figure 2 in analogue form. In the *commercial transactions* life domain, “online reviews” and “online shops” were amongst the most relevant services and activities. They seem to have substituted traditional alternatives substantially and were more relevant than other algorithmic-selection applications such as “personalized ads”. In the *health* domain, algorithmic-selection applications (“health websites”, “Wikipedia”, “search en-

gines”) were reported as relevant, though still less relevant than “offline contacts” or “blood pressure etc.”. The results further suggest that people rather rely on non-algorithmic activities to keep in touch and to meet new people (*socializing*).

Uniformly across all domains, offline alternatives ranked comparatively high whereas algorithmic-selection applications, in particular “social media”, were assigned a low relevance. This was especially the case in the *entertainment* and *socializing* domains.

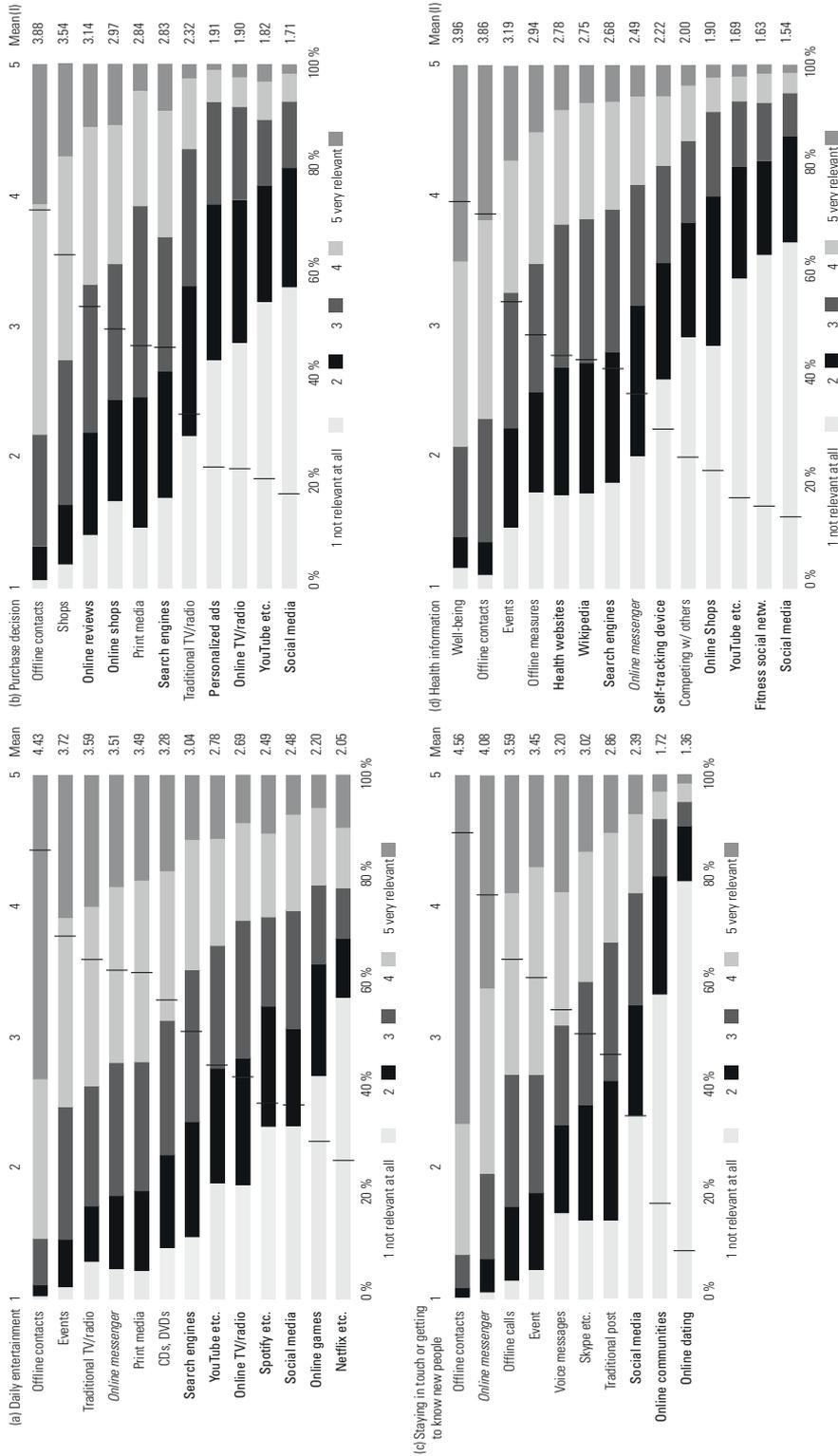
Table 3 on the page after next summarizes the results of five standardized linear regression models on the relevance of “social media” for the five life domains, controlling for the participants’ socio-demographics. Coherently across all five life domains, increasing age was associated with a lower assignment of relevance for “social media”. Except for the socializing domain, the same applied for having higher education, whereas increased Internet use was associated with higher assignments of relevance to “social media” for all life domains. For all domains, the effects of education were the greatest, followed by age. No uniform pattern was found for gender, income, political interest, and different regions.

Figure 1: Subjectively assigned relevance for political and social orientation



Note: The question was formulated as follows: *Please assess the relevance of the following services and activities for your orientation on political and societal issues.* N=1,202. Algorithmic-selection applications are in bold, other online services in italics.

Figure 2: Subjectively assigned relevance for entertainment (a), commercial transactions (b), socializing (c), and health (d)



Note: The questions were formulated as follows: Please assess the relevance of the following services and activities (a) for your daily entertainment, (b) for your purchase decisions, (c) for staying in touch or getting to know new people, (d) for health information. N = 1,202. Algorithmic-selection applications are in bold, other online services in italics.

**Table 3:** Assigned relevance to social media in five life domains

	Pol./soc. orientation	Entertainment	Commercial trans.	Socializing	Health
Age	-.216 (.034)***	-.294 (.033)***	-.234 (.034)***	-.254 (.033)***	-.124 (.035)***
Female	.038 (.032)	.071 (.031)*	.030 (.034)	.052 (.032)	.013 (.034)
Sec. education	-.272 (.153)	-.262 (.148)	<b>-492 (.186)**</b>	-.188 (.148)	<b>-388 (.189)*</b>
High. education	<b>-508 (.159)**</b>	<b>-435 (.155)**</b>	<b>-614 (.194)**</b>	-.291 (.156)	<b>-497 (.194)*</b>
Income	-.042 (.032)	-.013 (.032)	-.021 (.034)	.002 (.032)	-.074 (.034)*
Political interest	-.065 (.035)	-.056 (.034)	-.106 (.036)**	-.044 (.034)	-.057 (.036)
Internet use	.104 (.034)***	.113 (.03)***	.104 (.034)**	.115 (.033)***	.098 (.040)*
French-speaking	.134 (.076)	.122 (.074)	.033 (.080)	<b>.221 (.075)**</b>	<b>.166 (.080*)</b>
Italian-speaking	-.049 (.151)	-.055 (.129)	-.100 (.113)	-.134 (.124)	.023 (.162)
R <sup>2</sup>	.122	.163	.140	.129	.075
Adj. R <sup>2</sup>	.114	.156	.133	.121	.067
Num. obs.	1043	1044	1045	1044	1041
RMSE	.926	.910	.933	.924	.969

\*\*\*p < .001, \*\*p < .01, \*p < .05; standard errors in parenthesis. Absolute effect sizes of significant coefficients are highlighted for >.15 (light grey), >.3 (grey) and >.45 (dark grey).

Table 4 presents standardized linear regression models on the association of the assignment of relevance regarding selected services and activities with sociodemographic variables. These models represent typical patterns and noteworthy cases. An overview of all activities and services can be found in the online supplement to this study.

Altogether, a few patterns emerged across the five life domains for their associations with different socio-demographic variables. Age was positively associated with the relevance assigned to “print media”, and, with only a few exceptions, age and the relevance assigned to algorithmic-selection applications were negatively associated.

Across all life domains, being female was associated with a greater relevance assigned to offline activities and a lower one to algorithmic-selection applications. However, there were noteworthy exceptions with contrary relationships: “social media” for entertainment (see table 3), “traditional TV/radio” for commercial transactions, and “health websites” and “competing with others” in the life domain health.

Higher education was negatively associated with some algorithmic-selection applications such as “social media” and “YouTube etc.” for the life domains political and social orientation, entertainment, commercial transactions, and health.

Overall and for most services and activities, education had the greatest effect.

In contrast, a greater amount of Internet use was never negatively associated with the relevance assigned to any algorithmic-selection application. Often, there was a positive effect of a greater amount of Internet use on the assignment of the relevance of algorithmic-selection applications. The level of Internet use had no significant effect on most offline activities and services.

## 7 Discussion

This paper argues for the inclusion of the perspective of subjectively assigned relevance in order to adequately assess the relevance of algorithmic selection in Internet users’ daily lives. Qualitative interviews and a representative survey were conducted in Switzerland to assess the relevance that people assign to various algorithmic-selection applications and to their online and offline alternatives in five life domains. The findings substantiate current claims regarding the social implications of algorithmic-selection applications and can contribute to an empirically better-informed basis for policy-making regarding the governance of algorithmic selection. Evaluating the usage time of a specific algorithmic-selection application

**Table 4: Assigned relevance for selected services and activities in five life domains**

	Political and social orientation			Entertainment		
	Search engines	Print media	Voting booklet	Netflix etc.	YouTube etc.	Events
Age	.017 (.036)	.203 (.031)***	-.108 (.033)**	-.311 (.034)***	-.226 (.034)***	.018 (.035)
Female	.015 (.034)	.091 (.031)**	.077 (.033)	-.039 (.031)	-.153 (.031)***	.121 (.032)***
Sec. education	-.063 (.123)	-.120 (.155)	.117 (.134)	-.385 (.146)**	-.350 (.142)*	.315 (.151)*
High. education	-.222 (.135)	.057 (.124)	.128 (.146)	-.423 (.154)**	-.348 (.149)*	.531 (.160)***
Income	.007 (.033)	.074 (.032)*	.030 (.033)	.029 (.033)	-.066 (.030)*	-.046 (.032)
Political interest	-.122 (.036)***	.218 (.034)***	.221 (.036)***	-.058 (.034)	-.048 (.034)	.123 (.035)***
Internet use	.074 (.036)*	-.066 (.035)	-.021 (.039)	.141 (.035)***	.148 (.033)***	-.041 (.032)
French-speaking	-.079 (.078)	-.119 (.069)	.041 (.075)	-.006 (.073)	.043 (.074)	-.044 (.075)
Italian-speaking	-.115 (.126)	.404 (.130)**	.436 (.130)***	-.049 (.112)	-.034 (.123)	-.074 (.140)
R <sup>2</sup>	.028	.137	.052	.175	.140	.045
Adj. R <sup>2</sup>	.019	.129	.044	.168	.132	.036
Num. obs.	1041	1043	1040	1011	1045	1044
RMSE	.985	.917	.964	.898	.921	.958

	Commercial transactions		Socializing		Health	
	Online shops	Personaliz. ads	Online dating	Onl. messenger	Wearables	Well-being
Age	-.181 (.33)***	-.101 (.036)**	-.127 (.036)***	-.155 (.032)***	-.068 (.035)	-.052 (.033)
Female	-.098 (.032)**	-.088 (.034)**	-.117 (.031)***	.180 (.030)***	.004 (.034)	.107 (.032)***
Sec. education	-.101 (.129)	-.330 (.172)	-.304 (.186)	.251 (.130)	.047 (.143)	.083 (.137)
High. education	-.105 (.141)	-.430 (.181)*	-.420 (.191)*	.361 (.137)**	.052 (.155)	.215 (.148)
Income	.021 (.031)	.012 (.034)	-.087 (.035)*	-.002 (.031)	-.002 (.034)	-.021 (.031)
Political interest	-.036 (.034)	-.434 (.034)	.018 (.034)	.076 (.032)*	-.050 (.035)	.117 (.035)***
Internet use	.148 (.032)**	.069 (.033)*	.114 (.038)**	.087 (.032)**	.060 (.035)	-.044 (.033)
French-speaking	-.323 (.077)***	.011 (.078)	.128 (.080)	-.139 (.080)	-.139 (.073)	-.709 (.086)***
Italian-speaking	-.228 (.144)	.120 (.155)	-.007 (.106)	-.353 (.142)*	-.031 (.140)	-.227 (.123)
R <sup>2</sup>	.101	.039	.077	.079	.017	.119
Adj. R <sup>2</sup>	.094	.031	.069	.071	.008	.111
Num. obs.	1043	1039	1017	1044	1034	1043
RMSE	.945	.987	.947	.925	.980	.932

\*\*\*p < .001, \*\*p < .01, \*p < .05; standard errors in parenthesis; algorithmic-selection applications are in bold, other online services in italics. Absolute effect sizes of significant coefficients are highlighted for > .15 (light grey), > .3 (grey) and > .45 (dark grey).

is not sufficient for the assessment of its relevance and effects in daily life. In line with a comprehensive, mixed-methods measurement model of algorithmic governance (Latzer & Festic, 2019), this paper suggests using subjectively assigned relevance as a weighting for the interpretation of other findings such as data on the amount and frequency of social media use.

Major findings according to the paper’s research questions include, first, that Internet users perceive algorithmic-selection applications as less relevant in particular compared to offline but also to online alternatives. This empirically supports

claims from qualitative news repertoire studies that – although increasingly used – algorithmic-selection applications are unlikely to replace established sources such as traditional journalistic content for news consumption (Schmidt et al., 2019).

Second, algorithmic-selection applications, in particular social media, are found to be of relatively low assigned relevance for all life domains investigated. Offline activities are consistently ranked highest. Search engines are ranked as the most relevant algorithmic-selection applications across all life domains. This is in line with studies (Pew Research Center,

2016; Purcell, 2011) that document the wide embeddedness of search engines in daily lives.

Third, younger and more frequent Internet users assign greater relevance to various algorithmic-selection applications across life domains. This underlines earlier findings that younger people integrate algorithmic-selection applications such as fitness trackers, music streaming, or social media more heavily in their everyday lives (Abril, 2016; Anderson, 2016; Shearer & Matsa, 2018; Gottfried et al., 2016; Shearer, 2018; Smith, 2016). Further, people with higher educational levels are more likely to assign a lower relevance to algorithmic-selection applications than lower-educated Internet users. This result may qualify findings by the Pew Research Center (2019), that the proportion of social media users is greater for those with higher education (79%) than for the less well educated (64%). Subjectively assigned relevance proves beneficial as an additional dimension to weight previous findings on usage time.

Altogether, results on assigned relevance allow for a better interpretation of usage data. The relevance for people does not necessarily rise with the amount of use. Services may be highly influential, even if people report a low usage time – and vice versa. These discrepancies seem to apply in particular for social media like Facebook. Its assigned relevance is consistently very low across all life domains, including political and social orientation, where it ranks lowest. This qualifies and calls for rethink of concerns about the prevalence of risks in societies, if they are solely raised on the basis of intensive social media use.

Findings that algorithmic-selection applications are assigned a comparatively low relevance can be interpreted in two ways (Festic, 2020). On the one hand, the social relevance of algorithmic selection may generally be overestimated and – despite their high user counts and long usage times – these applications may not be so relevant after all when comparing their relevance to more traditional online and offline alternatives. On the other hand, since this article relies on self-reported assignments of relevance, it is conceiv-

able that people may be misjudging the relevance of certain services and activities, algorithmic-selection applications in particular.

There could be two reasons for this: (1) there is the notion that (media) effects are often undetectable for individuals. Third-person effects may occur (Davison, 1983), people may tend to overestimate media effects on others and underestimate them on themselves (Tsay-Vogel, 2016). (2) Effects may be denied, because individuals do not want to accept the influence of algorithmic selection or because of social desirability (Holtgraves, 2004). Moreover, there may be different reasons why people under- or overestimate the relevance assigned to algorithmic-selection applications. Altogether, further research is needed to determine the likelihood of such effects on self-reported data in the respective cases.

There are a few limitations to consider when interpreting the results of this article. The selection of activities is derived from qualitative interviews conducted prior to this study and the life domains that we refer to in this study draw on a selection suggested by Büchi et al. (2016). Although meticulously aiming for saturation for these selections, neither the lists of offline and online activities nor the chosen life domains are necessarily exhaustive and simplify everyday realities. Furthermore, to allow interaction by participants, data was gathered on the subjective relevance for the specific services but not directly the actual algorithmic aspects of it. Hence, one could rate “YouTube etc.” or “social media” as very relevant without being affected by its algorithmic aspects. Additionally, the degree to which the algorithmic aspects interfere with the main usage purpose of a service varies greatly.

Moreover, spillover effects between different activities and services are likely but difficult to grasp. An influencer who became famous via social media might subsequently be present on traditional TV, in print, or be the topic of offline conversations. Further investigations may resolve these relations, for example, by explicitly asking for such instances. Taking all lim-

itations into account, it is likely that people underestimate the actual relevance of algorithmic-selection applications, “YouTube etc.” and “social media” especially, for their lives.

Finally, cultural differences between countries should be taken into consideration. Our representative results on the relevance assigned by the Swiss population should not be applied uncritically to qualify empirical usage data from countries with a quite different cultural imprint.

## 8 Conclusion

An adequate and up-to-date understanding of the social relevance of algorithmic selection is a prerequisite when aiming to regulate algorithmic selection. Applications that are based on algorithmic selection have been under public scrutiny for bearing a plethora of risks. For example, algorithmically curated social media feeds are claimed to be responsible for manipulation and the distribution of biased information. From a public-policy perspective, this raises questions about the need for regulatory measures. Choosing an appropriate governance of algorithmic-selection applications can be supported by accurate knowledge about their social relevance. This includes, for example, information on how strongly Internet users actually rely on social media for their daily social and political orientation, what other sources they consult and how much they know about the process of algorithmic selection. Only such a thorough empirical investigation can form an appropriate basis for assessing the magnitude of risks that might be induced by algorithmic selection and consequentially the adequate governance measures. This paper adds to the debate on the relevance of algorithmic selection in two ways.

First, it introduces subjectively assigned relevance as an additional approach to weight findings on the overall social relevance of algorithmic selection that rely on measures of the frequency and amount of use of algorithmic-selection applications. The combination of these

measures can lead to a more realistic assessment of the matter at hand, allowing more appropriate policy decisions.

Second, by taking a user perspective and analyzing subjectively assigned relevance on a nation-wide, representative level for five different life domains, the paper directly adds to a more comprehensive and nuanced empirical understanding of the social relevance of algorithmic selection, provides novel empirical insights for the ongoing debate and informs policy-makers aiming for adequate governance decisions.

According to the findings, young as well as heavy Internet users assigned a high relevance to algorithmic-selection applications. As a result, members of these groups are more likely to be exposed to risks associated with algorithmic selection. To mitigate these risks, policymakers should focus on these high-risk groups when attempting to raise awareness regarding potentially negative consequences of algorithmic selection.

In addition to existing self-reported data on the amount and frequency of use and this paper’s approach to subjectively assigned relevance, further research could include tracking data, for example, to reduce problems with inaccurate and biased self-reporting. This would facilitate an improved assessment of the social relevance of algorithmic-selection applications.

With slight variations across life domains and socio-demographic groups, this article suggests that Internet users generally perceive algorithmic-selection applications as not overwhelmingly relevant for their everyday lives. Within this group of services, search engines are assigned a relatively high and social media a very low relevance. Although potential risks should not be trivialized, these findings render the image of an Internet user who is at the mercy of algorithms and strategies of platform companies slightly less likely. Differences identified in the relevance assigned to algorithmic-selection applications in societies should be appropriately considered in the assessment and governance of chances and risks they pose for them.

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## Supplementary material

Supplementary material for this article is available online in the format provided by the authors (unedited). <https://www.hope.uzh.ch/scoms/article/view/j.scoms.2021.01.005>

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**SComS**

Thematic Section

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## Visibility in the digital age: Introduction

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In the digital age, calls for transparency and openness as well as for privacy and confidentiality prevail: Struggles for visibility occur simultaneously with conflicts regarding invisibility and hidden battles for power and privileges of interpretation. Concerns about a loss of digital self-determination exist, just like those regarding the “right to be forgotten” or the right to become invisible and unseen. While the idea of a “transparent user” – as the ultimate notion of (in)voluntary visibility – has caused a broad outcry in society and in scientific debates a few years ago (Palfrey & Gasser, 2008), the discussion has shifted toward considerations of Internet governance and regulation (Camenisch, Fischer-Hübner, & Hansen, 2015). Brighenti (2010, p. 109) has pointed out that visibility has long been one of the key aspects “associated with the public sphere” and that in today’s digitized publics, the “project of democracy can no longer be imagined without taking into account visibility and its outcomes” (Brighenti, 2010, p. 189). Visibility and invisibility, along with their societal outcomes, are increasingly being discussed and analyzed, as they are becoming important dimensions in the accurate description and explanation of digital communication. They can be addressed with regard to individuals and institutions (e. g., their ability to speak, their power, or opinion leadership, etc.), structures and processes (e. g., in terms of becoming visible or making visible), and data and information (e. g., their accessibility and comprehensibility, or their exploitation).

While the original meaning of visibility is closely related to spatiotemporal proximity and the human senses, especially the visual sense, this link is effectively dissolved in the digital space (Thompson,

2005). “Digital visibility” refers to perceptibility as the likelihood of being ‘seen’ in the sense of being noticeable (this understanding is closest to the original understanding), in being heard or noticed, or in the sense of being respected or recognized. This distinction points to at least three different levels of visibility, which have been discussed in varying degrees in different fields of communication and media studies.

The first level refers to what Leonardi and Treem (2020, p. 12, emphasis added by the authors) define as “the sociomaterial performance of the behavior of people, collectives, technological devices, or nature in a format that can *be observed* by third parties *through minimal effort*”. It is also evident, for example, when studies look at whether and how actors (e. g., journalists, scientists, politicians, teachers, media outlets, corporations, political institutions, etc.) seek – intentionally or unintentionally – visibility or invisibility or become potentially recognizable (e. g., Bock & Probst, 2018; Cruz, 2017; Flyverbom, Leonardi, Stohl, & Stohl, 2016; Karlsson, 2011; Wilhelm, Stehle, & Detel, 2021). Stohl, Stohl, and Leonardi (2016, p. 125) shed light on actors’ (strategic) handling of visibility by analyzing it as “(1) the availability of information, (2) approval to share information, and (3) the accessibility of information to third parties”.

The first level is also often linked to “visibility as presence” in traditional media, which refers to “being noticed” or “being heard” by the media (e. g., Bantimaroudis, Zyglidopoulos, & Symeou, 2010). Likewise, media presence itself reveals connections to the second level: For example, opportunities for the second level (“being heard” by others) open up when



someone or something is present in the media. Research on media content and media use can also be situated at the interface between the first and second levels, for example, regarding media salience, awareness, attention, or prominence of an object or content (e.g., Kiouisis, 2004).

The third level is often discussed in research on diversity or inequality, which focuses on “being recognized” or “being respected”. This research addresses structures, conditions, and constraints of equality or inequality, especially with regard to gender issues or diversity. Dahlberg (2018) associates visibility with conceptions of the public sphere for which mutual recognition and participatory equality (among others) are normative requirements. Meanwhile, Brighenti (2007) points to the close association of visibility to social recognition and to visibility as empowerment. Furthermore, the author defines recognition as one of two possible outcomes of visibility, with the other being control.

These examples demonstrate that the three levels of digital visibility are by no means unrelated. Rather, they are often closely linked to one another and may even merge to a certain extent. Accordingly, defining visibility is not straightforward; and the conception is to some extent one of emphasis and nomenclature. Furthermore, the concept of “visibility” is linked to other concepts, such as “transparency” (Stohl et al., 2016) or “legitimacy” (Koopmans, 2004). In his work on social movements and the recognition of their causes and aims by the “mainstream” public sphere, Koopmans (2004) defines visibility as a precondition of legitimacy. In such a definition, visibility is located at the second level, among the three levels mentioned. However, other authors, such as Brighenti (2007) and Dahlberg (2018), define legitimacy or recognition as a form of visibility. As expected, research has indeed shown that visibility at the first two levels does not necessarily lead to visibility at the third level (e.g., Brantner, Lobinger, & Stehling, 2020).

In summary, the different concepts focus on visibility and/or invisibility in var-

ious ways with respect to the three levels. These also incorporate the characteristics of digital communication in different ways (e.g., with regard to objects, agents, or technological contexts of digital (in)visibility). All these aspects, when combined, make it difficult to take a systematic look at the field. This is exacerbated by the fact that related studies are scattered across various research fields in communication and media studies. Therefore, this Thematic Section aims to present cutting-edge research on visibility and invisibility in digital communication, especially those that take up the three levels of digital visibility in various forms.

The articles gathered in this Thematic Section contribute to the burgeoning field of visibility research in communication and media studies. These works shall provide the ground for further discussions and studies on the social, cultural, and political conditions, patterns, and implications of online visibility and invisibility. They encompass both classical and new fields of research regarding (in)visibility, such as research on inequality, diversity, and representation, as well as research on science communication and location-based apps. Three authors take the more theoretical and/or conceptual approach by reviewing the literature on their specific topics: Claudia Wilhelm on gendered (in)visibility, Darryl A. Pieber on locative media and social accessibility, and Julia Metag on the tension between visibility and invisibility in science communication. Three authors use empirical data to reveal new insights into (in)visibility in digital communication contexts, namely, Christine Linke and Elizabeth Prommer on the diversity of media representation and production culture, and Dafne Calvo on inequalities in online communities in Spain.

*Claudia Wilhelm* strives to characterize gendered digital visibility based on a literature review of gender and feminist research as well as of communication and media studies. She focuses on women's participation in digital communication (especially on social media), on the role gender plays in digital media environments, and on aspects that drive or inhibit

women's digital visibility. Wilhelm identifies the representation and integration of all genders, gender norms, and power relations as sub-dimensions of digital visibility, thus primarily addressing the third visibility level. She particularly draws upon the example of the #MeToo movement and proposes a taxonomy of research based on the patterns of replication, reinforcement, and resilience. These patterns show how the role played by gender in digital media environments is framed in the literature reviewed. By replication, Wilhelm refers to the process of analyzing digital visibility against the background of (non-diverse) binary gender conceptions from the offline world, such as regarding the integration of women in discussions, while the reinforcement pattern points to characteristics of digital media environments that amplify gendered inequalities (e.g., anonymity, invisibility, etc.). The literature assigned to the resilience pattern, meanwhile, addresses empowerment and aspects that foster the visibility and inclusion of all genders in digital media environments. Thus, Wilhelm shows how the literature deals with the digital visibility of women and how the interplay between technological aspects and social norms can be explored.

In his paper on locative media apps, Darryl Pieber links visibility to Simmel's (1992, 1955) concept of "social accessibility". The author states that social accessibility, defined as the ability to be reached by others, is only possible when a person is visible. Thus, he first addresses the first visibility level but later extends it to the third level. Pieber reviews and synthesizes the existing literature, which regards the ways in which people use location-based media apps to manage their social accessibility and, therefore, their visibility in the urban environment. Using a narrow definition, Pieber further focuses on location-based apps that utilize the location coordinates of users' mobile devices and present them with information about their surroundings. The author points out that while these apps are being increasingly used, the non-use by certain groups, the biases embedded in the algorithms, or

the unwillingness of people to squeeze themselves into categories set by the app lead to the invisibility of certain people and groups. These aspects can even reinforce racial and social divides by preventing people from developing what is called an "indifference to difference" (Tonkiss, 2005) in urban spaces. However, both visibility and invisibility within these apps are associated with certain downsides. While being invisible entails the risk of being further marginalized, being visible also carries the risks of potential surveillance. Pieber concludes that the existing studies show that location-based apps have a tendency to oversimplify or filter out differences among their urban users – processes in which existing manifestations of racism and prejudice are reinforced and solidified. Following Young (1986), Pieber argues that making the complexity of differences invisible is "anti-urban".

Scientific findings, along with the people behind them, are being increasingly placed under the watchful public eye or are being asked to be made publicly visible. In her work, *Julia Metag* addresses and theoretically models the tensions that accompany science communication in digital contexts. She demonstrates how science communication research focuses on public visibility, which is particularly understood as media presence (and thus primarily addressing the second visibility level), but often forgets to consider tensions and divergences that accompany it (e.g., between journalistic and scientific logic). In her analysis, the author first makes a distinction between the visibility of scientific knowledge and that of scientists as actors. Then, she further distinguishes between two reference systems of such visibility: that of the science system itself and that of the public. In doing so, she shows how different tensions arise depending on visibility and frame of reference. Based on a discussion of key paradigms of science communication research, Metag concludes her work by addressing three concerns: the consequences of visibility in digital media environments for scientists and scientific knowledge, the process in which visibility can be strategically man-

aged, and where the limits of strategic visibility management might lie.

*Christine Linke's* and *Elizabeth Prommer's* contribution is one of the two empirical analyses of visibility in the Thematic Section. Like the contributions of Wilhelm, Pieber, and Calvo, Linke and Prommer address the visibility of difference as they discuss and analyze the visibility of diverse people in German audio-visual programs, with a focus on gender portrayals in fictional and non-fictional German TV productions. In their work, the authors explore visibility before and behind the screen, scrutinizing both the media production level and the media product level, and are concerned with representational visibility, thus addressing the first and second visibility levels, respectively. They base their study on gender theory and intersectionality theory and conceptualize visibility as an intersectionality dimension. The authors' perspective combines the normative goal of achieving equality with the deconstructivist interpretation of their findings against the background of societal and media power structures, culminating in an attempt to uncover the "doing gender" in media. Empirically, they apply content analysis to measure diversity in terms of the visibility of people of different genders, ages, professions, and roles on and behind the screen. In line with the assumptions, they find that women, and increasingly so with age, are less often visible on German television than men, both on and behind the screen. Other genders are invisible. Whether in fictional or non-fictional programming, women are less visible on television in almost all depicted occupations than their proportion in "real life" would suggest. While the study also reveals that the visibility of women at the production level is accompanied by increasing visibility of women on screen, they still comprise a low share of the total media production workforce. An additional analysis of online content reveals a similar picture in the German YouTube universe, wherein women are also not equally visible and are mainly shown in stereotypical gender roles.

*Dafne Calvo's* contribution completes the Thematic Section. The author examines the diversity of Spanish free software and free culture communities. From the perspective of intersectionality theory, Calvo defines visibility as the ability to discuss underrepresentation in these communities and thus addresses primarily the third visibility level. She seeks to identify visibility gaps in these communities and understand the communities' perspectives on visibility issues, such as whether and how they themselves identify and interpret visibility issues and develop tactics to deal with them. For this purpose, Calvo applies a multi-method design that combines an online questionnaire answered by 290 different communities and interviews with members of 37 of those communities. One result is that even though men and people with high educational levels and technical expertise are overrepresented, the proportion of women in the groups is relatively high compared to previous studies. This result, however, cannot hide the fact that the world of free software and free culture communities is predominantly a world inhabited by males. The author concludes that, on the one hand, there exists a tension between the ideal of community members' invisibility (in the sense of anonymity) and their willingness to recognize inequalities within the communities. On the other hand, in the interviews, community members reflected on the exclusion of certain segments of society. They also showed an awareness of the intersectionality of different categories of difference, in whose interplay the non-participation of certain segments of society in technological production may be grounded. Calvo concludes that, despite the underrepresentation of certain groups, inequalities are an issue of visibility that can be linked to the communities' goals of social justice and social change.

The articles of the Thematic Section discuss digital visibility from different angles and analyze it against the background of various fields of communication and media studies. These articles address the three levels of digital visibility in different ways and contextualize them with regard to

the respective research fields. In each case, innovative perspectives on and approaches to open questions in the research fields are presented. First, Wilhelm systematizes a field of research based on the concept of digital visibility. Second, Pieber combines a classic theory with an analysis of modern technology and its opportunities and challenges. Third, Metag takes a look at a hitherto rarely examined issue within science communication, whereas Linke and Prommer address multimodal media realities with an innovative empirical method. Finally, Calvo uses a multi-method design to gain insights into communities that value their anonymity.

As shown by both the introduction and the contributions to the Thematic Section, when it comes to digital communication, digital (in)visibility is a fruitful analytical concept for conducting research in communication and media studies. With regard to the three levels of digital visibility (being noticeable, being heard, and being recognized), intriguing questions remain open in relation to the manifold perspectives on this subject and the particularities of digital communication that have not yet been conclusively grasped (e. g., multimodality, blending of human and technical processes of perception and selection). They include questions about the transferability of findings about digital visibility to digital invisibility and of findings about the legacy media world to the digital world, as well as questions about the significance of technical aspects for digital (in)visibility and the blending of human and machine.

Last but not least, ongoing discussions on the advantages and disadvantages of both (un)intended visibility and (un)intended invisibility (e. g., in the context of surveillance and digital hate, on the one hand, and participation in discourse and empowerment on the other) must be continued. This Thematic Section hopes to stimulate further exchanges on these and other issues related to intentional and unintentional digital (in)visibility.

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## Gendered (in)visibility in digital media contexts

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### Abstract

In digital media environments, gendered inequalities can be observed on the level of representation and participation in online discussions and digital communities as well as regarding the prevalence of gender norms in self-presentations, and power relations in social interactions. The #MeToo debate exemplifies how gendered inequalities become visible in social media but also reveals the increasing hostility against women online. Drawing on the concept of digital visibility and informed by theoretical perspectives on gendered digital visibility from gender and feminist research and media and communication studies, the article reviews current research and identifies three distinct processes that characterize gendered digital visibility: (1) replication, (2) reinforcement, and (3) resilience. In doing so, the article proposes a taxonomy of research on gendered digital visibility. Findings highlight the ambivalence of women's participation in online discussions as well as the replication and reinforcement of gender norms through digital technology. Moreover, interrelatedness of these processes and implications for future research are discussed.

### Keywords

gender, gender stereotypes, digital media, social media, social networks, (digital) visibility, invisibility, #MeToo

## 1 Introduction

The #MeToo campaign is one of the most prominent examples of a feminist movement that has spread worldwide. Discussions on social media drew the attention of mass media and the public to women experiencing sexual abuse and harassment (Tambe, 2018). At the same time, the case #MeToo also shows that this great attention was accompanied by hostility and trolling in response to digital feminist activism (Mendes, Ringrose, & Keller, 2018). Being publicly visible on social media platforms or in digital news environments not only exposes individuals and social groups to direct responses of potential target groups (e. g., peers, the scientific community, politicians) but also to the public at large. Not only feminist activists, but also women journalists and scholars working on controversial topics experience harassment when they make themselves publicly visible on social media platforms (e. g., Stahel & Schoen, 2019; Veletsianos, Houlden, Hodson, & Gosse, 2018). By being agentic, i. e., speaking out in the public and defending their positions, these wom-

en violate prescriptive gender stereotypes. Being attacked for this behavior is called a backlash effect (Rudman & Glick, 2012).

Drawing on the concept of digital visibility (Thompson, 2005), the article analyzes gendered inequalities regarding digital visibility. Therefore, it reviews literature on the role of gender in digital media environments, focusing on social media and women's online participation as these contexts provide distinct examples of gendered visibility (Herring & Stoerger, 2014). It considers gender and feminist concepts and media and communication theories to identify drivers and inhibitors of women's digital visibility. The literature review reveals that gendered visibility in digital media contexts can be explained by three different processes that derive from the interplay of gender and digital technology: (1) *replication* of offline standards, e. g., the representation of women in online discussions (Herring & Stoerger, 2014), (2) *reinforcement*, e. g., anonymity and invisibility in digital media environments foster harassment (Suler, 2004), and (3) *resilience*, e. g., the diffusion of social movements (Henry, 2009) increases the



digital visibility of women and gender issues. These patterns serve as a taxonomy of research on gendered digital visibility and are illustrated using the example of the (online) feminist movement #MeToo. This movement can be traced back to the “MeToo” workshops for survivors of sexual violence by the African American women’s rights activist Tarana Burke in 2006 (Tambe, 2018). The phrase “MeToo” was then adapted in the respective Twitter hashtag created by the actress Alyssa Milano in October 2017. In their tweets, Milano and other women denounced sexual abuse in the movie industry and raised public and mass media attention (Manikonda, Beigi, Liu, & Kambhampati, 2018; Mendes et al., 2018). It became a globally visible movement as millions of women worldwide shared their personal experiences on social media (Rodino-Colocino, 2018).

Finally, implications for future empirical investigations of the three different patterns of gendered visibility are suggested. The term gender is not restricted to birth-assigned gender categories as it encompasses multiple facets of self-categorization, i.e., people’s current gender identity, perceived self-relevant social expectations associated with one’s self-categorization, gender performance as well as group-related societal evaluations (Hyde et al., 2019). It is important to note that the current analysis focuses on the visibility of women in digital media environments. Yet, it does not cover research on other genders, e.g., the visibility of non-binary and transgender people (e.g., Miller, 2019).

Before reviewing current literature on women’s digital visibility, the next section introduces the concept of digital visibility and briefly outlines theoretical assumptions of gender and feminist research as well as media and communication studies that are relevant to the analysis of the relationship between visibility and gender.

## 2 Theoretical approaches on gendered digital visibility

Visibility in digital communication contexts means that perceptibility is separated

from temporal, spatial and sensory limitations due to digitization (Thompson, 2005). These new perceptual conditions involve new forms of action and interaction between groups and individuals in order to struggle for their visibility in terms of representation, norms of interaction and power relations (Tenenboim-Weinblatt, 2013; Thompson, 2005). Besides race, class, religion, ethnic origin, ability and age, gender is deemed to be one relevant category to describe inequalities in digital visibility comprising the following sub-dimensions (Thompson, 2005): (1) The visibility of actors and groups addresses the *representation and participation* of all genders in digital media environments. (2) The visibility of *gender norms* applies to the gender-stereotyping of self-presentations and behaviors in social interactions online. (3) The visibility of *power relations* refers to gendered inequalities regarding the control of privacy as well as harassment and abuse in digital media environments.

To explain gendered digital visibility with respect to these sub-dimensions, one can refer to both gender and feminist communication research. Whereas gender communication scholars primarily focus on how gender representation and norms in media content and production affect individuals, feminist communication scholarship aims at a structural social change toward gender equality (Mendes & Carter, 2008). Following the first line of research that originates from social psychological gender research, women’s representation in digital media and their participation and communication styles are guided by societal gender role perceptions. As proposed by social role theory (Wood & Eagly, 2012), gendered role perceptions in society are informed by gender stereotypes that derive from a gender-specific division of labor. Moreover, social-cognitive theory of gender development (Bussey & Bandura, 1999) states that conforming to gender roles is part of a learning process in which individuals are rewarded when fulfilling gender role expectations and are punished if they do not. These theories support the idea that individuals internalize hierarchical gender relations that are reflected in

gendered media representations and portrayals. Moreover, backlash theory (Rudman & Glick, 2012) argues that violating gender norms can lead to social sanctions and punishment. Women are punished when they violate prescriptive gender stereotypes that define how they should be (e.g., warm and caring). They are also sanctioned when confirming to proscriptive gender stereotypes that define how they should not be (e.g., dominant and forceful; Prentice & Carranza, 2002). In addition, taking a social constructionist perspective, concepts such as doing gender (West & Zimmerman, 1987) and gender performativity (Butler, 1990) highlight the notion of gender as a recurring act that guides interactions and interpretations, establishing binary conceptualizations of opposing gender stereotypes. These approaches are inspired by Goffman's (1979) gender display framework considering gender as a collective negotiation through interactions (Baker & Walsh, 2018). In sum, gender communication research mainly addresses individual level effects of gendered inequalities in media and communication contexts (Mendes & Carter, 2008; Thiele, 2015) and tends to rely on binary conceptions of gender, although partially acknowledging the performative act of doing gender. Communication research representing the gender perspective investigates how the relationship between digital technology (e.g., platform characteristics) and gender norms affects self-presentations in social media (Baker & Walsh, 2018; Bivens, 2017; Butkowski, Dixon, Weeks, & Smith, 2020). Moreover, following the tradition of gender representation studies in media and communication research (Thiele, 2015), gender differences in political online participation are examined (Vochocova, Stetka, & Mazak, 2016). Further studies that can be assigned to this line of research analyze how ideological orientation and social characteristics induce backlash effects against women in digital communication contexts (Wilhelm & Joekel, 2019) and how women professionals deal with online harassment and abuse (Chen et al., 2020; Sobiraj, 2018; Stahel & Schoen, 2019; Veletsianos et al. 2018).

In contrast to gender communication research, the research interest of feminist communication scholars is closely linked to political movements such as feminist activism (Mendes & Carter, 2008). Critical and feminist scholars characterize social media as a neoliberal postfeminist environment that promotes a hegemonic gender construction (Banet-Weiser, 2015). Being aware of ongoing inequalities, women adopt a neoliberal economic imperative and visibly demonstrate their self in accordance to the market (Toffoletti & Thorpe, 2018). In contrast, digital feminism argues that digital media can make gender inequalities visible to the public at large and enables new forms of discourse about gender and sexism (e.g., hashtagfeminism; Baer, 2016). Moreover, feminist activism benefits from enhanced possibilities of self-synchronization of latent groups (Shirky, 2008) to take collective action in social media environments as it reduces the costs of coordination, i.e., bringing people together that are only loosely connected. The downsides of digital activism are captured by the concept of digital labor that emphasizes the safety and emotional work performed by feminist researchers (Arcy, 2016). Engagement in feminist digital activism is immaterial, unpaid work and has been considered a new digital and social form of labor (Gleeson, 2016). From this perspective, digital labor is assumed to reify problematic gender constructions.

Aiming at structural social change, certain feminist movements such as Black feminism refer to intersectional inequalities. The concept of intersectionality stresses the role of interrelations between social categories of difference such as gender, religion, social class, race or age that should be considered when analyzing social inequalities (Crenshaw, 1991; Hughes, 2011). These intersections also apply to representation, participation and power relations in digital media environments (e.g., Gabriel, 2016; Massanari, 2017; Prieler & Kohlbacher, 2017).

The feminist perspective on gendered digital visibility is represented by critical analyses of postfeminist gendered self-presentations in social media (Bruce,

2016; Toffoletti & Thorpe, 2018), research analyzing the potential and practice of digital feminist activism (Clark-Parsons, 2018; Gabriel, 2016; Jackson, 2018; Jackson, Bailey, & Foucault Welles, 2018; Linabary, Corple, & Cooky, 2019; Mendes et al., 2018; Myles, 2019; Pruchniewska, 2019; Turley & Fisher, 2018) and studies uncovering the threats to feminist activism such as online harassment (Drakett, Rickett, Day, & Milnes, 2018; Massanari, 2017; Vera-Gray, 2017) and abuse (Eckert, 2018; Mendes, Keller, & Ringrose, 2019; Stubbs-Richardson, Rader, & Cosby, 2018).

In addition, media and (computer-mediated) communication theories complement the gender and feminist perspective by emphasizing or specifying the role of digital technology within these processes. The online disinhibition effect (Suler, 2004) serves to explain norm violations such as hate speech, harassment and abuse (e.g., Chen et al., 2020). Social media attention economy (Van Dijk, 2013) is linked with neoliberal postfeminist perspectives (Banet-Weiser, 2015) to explain gendered self-presentation online (Toffoletti & Thorpe, 2018). In addition, actor-network theory is applied to incorporate the influence of platform components (Latour, 2005) on gendered representations and participation in online spaces (Duguay, 2016; Massanari, 2017). Another line of research links gender perspectives with theories of the public sphere (Fraser, 1990; Noelle-Neumann, 1974; Habermas, 1962) and the role of social networks (Gabriel, 2016; Sobiraj, 2018).

### **3 A taxonomy of published research: Replication, reinforcement, resilience**

In order to identify drivers and inhibitors of gendered digital visibility, the literature review focuses on contemporary research investigating prevalence, standards and norms of women's digital visibility. The current review incorporates research on the three sub-dimensions of digital visibility outlined above, i.e., gendered representation and participation, gender

norms and gendered power relations. For this purpose, it considers research articles published 2015–2019 in communication journals (e.g., *Information, Communication, & Society*, *Journal of Communication*, *New Media & Society*) as well as gender and feminist journals in social sciences (e.g., *Feminism & Psychology*, *Sex Roles*) to cover different fields of gender and feminist communication research. To identify relevant literature, journal websites and literature databases were searched, using the terms gender, gender roles, gender stereotypes, #MeToo, and backlash in combination with the terms digital media, social media, social networks, (digital) visibility / invisibility as key words. Although, #MeToo was referred to as an example of digital visibility of feminist movements, the search was not restricted to this case, but extended to other phenomena of women's visibility in social media. Literature was reviewed with regard to theoretical background, i.e., gender and/or feminist scholarship as well as media and communication theories the studies refer to. Furthermore, it was examined whether the studies provide empirical evidence and/or assessment of women's digital visibility with respect to at least one of the three sub-dimensions, i.e., representation/participation, gender norms and power relations. The literature corpus was then systemized in accordance to these sub-dimensions of digital visibility. Analysis of literature revealed three patterns that describe how findings on women's digital visibility are framed: (1) replication, (2) reinforcement, and (3) resilience.

#### **3.1 Replication**

The replication pattern is guided by current observations of gender inequalities being reflected in digital technologies (Sobiraj, 2018). Replication tendencies can be observed on all three sub-dimensions of digital visibility as they concern the representation and participation of women in the public sphere, gender norms affecting self-presentation, identity and social interaction as well as inequalities in power relations fostering harassment and abusive behavior.

### 3.1.1 *Representation and participation*

Women's underrepresentation in politics (Hughes, 2011) and in the public sphere at large is reflected in online political participation such that men are more visible as political actors than women (Vochočova et al., 2016). Relying on survey and content analysis data, Vochočova, Stetka, and Mazak (2016) show that men are more present and more active in political commenting on Facebook than women. Authors question the equalizing effect of social media environments on political participation stated in previous research (e.g., Gil de Zúñiga, Veenstra, Vraga, & Shah, 2010). Furthermore, they point out that gender inequalities in online political participation mainly apply to more expressive, publicly visible participation, such as posting comments in public groups, and less to lower-threshold participation such as “liking” and sharing content or private communication.

On platforms such as Reddit, even higher degrees of homogeneity in terms of gender and race can be observed (Masanari, 2017): The dominance of White men in these communities promotes perceptions of women as objects or interlopers, which in turn reduces the attraction of these spaces for women and inhibits women's participation.

Further, research refers to the ‘digital double bind’, which entrenches structural inequalities in digital entrepreneurship (Duffy & Pruchniewska, 2017). The digital double bind highlights the binary assignment of public and private to masculine and feminine respectively, which is also reflected in mainstream perceptions of gender on social networking sites such as Facebook (Bivens, 2017).

### 3.1.2 *Gender norms*

When users present themselves and interact with others in digital media environments, they widely conform to gender norms and stereotypes. Following Banet-Weiser's (2015) gendered “economies of visibility”, Toffoletti and Thorpe (2018) claim that women's self-objectification of their bodies and visual appearance on Instagram fosters the persistence

of gender stereotypes and conventional perceptions of gender and sexuality in digital media. From this perspective, neoliberal post-feminism (Banet-Weiser, 2015) linked with the attention economy in social media (Van Dijk, 2013) build the ground for a new currency in digital media contexts that is visibility. Post-feminist attitudes as well as the technology itself foster these replication tendencies. For instance, through app description and rating, content navigation, cross-platform connections and content generation tools, Instagram “guides users to create selfies congruent with the dominant discourses” (Duguay, 2016, p. 7). As such, in social media women are faced with gender norms of publicity and privacy that highlight the singularity of their appearance and expose them to public criticism and judgement whereas men's self-presentation and participation conforms to gender norms and therefore remains unquestioned (Salter, 2016). In sum, self-presentation is characterized by stereotypical cues amplified by technological affordances of social media, i.e., social media feedback options that serve as popularity cues (Butkowski et al., 2020). That is, posts of visual self-presentations that confirm hegemonic conceptions of gender are high ranked and gain high levels of acceptance (Baker & Walsh, 2018). Similarly, #MeToo has been criticized by feminists for overemphasizing celebrities and their self-representation due to the attention economy of commercial platforms, while at the same time marginalizing the experiences of colored women and low-income women (Clark-Parsons, 2019). The prevalence of gender norms in social media also touches the performance of gender identity. Although non-binary options are available, the binary gender norm is replicated through technology as software-user interactions still follow a binary structure (Bivens, 2017).

### 3.1.3 *Power relations*

A replication of traditional gendered power relations in online spaces is indicated by the emergence of sexual harassment and abuse, gender trolling, misogyny, and oth-

er aggressive behaviors directed against women. In this context, researchers stress the reproduction of offline gender inequalities in social media (Sobiraj, 2018). That is, digital technologies reflect power dynamics established in face-to-face situations and other offline settings (e.g., representations in the mass media, workplace hierarchies, romantic relationships, harassment). Stubbs-Richardson, Rader, and Cosby (2018) report on the transfer of victim blaming in physical sexual assaults to incidents in social media contexts. In addition, men's intrusive practices that women experience in public physical spaces largely overlap with their practices in public online spaces (Vera-Gray, 2017). Hence, women may have similar intrusion experiences in public spaces online and offline. Accordingly, gender trolling is not a phenomenon that takes place exclusively in online spaces, but rather exemplifies the misogynistic nature of a society (Mantilla, 2015).

Online harassment is assumed to be an extension of oppressive power structures, i.e., systemic gender inequality in society (Rubin, 2016). Being visible in social media, feminist online activists as well as other women professionals face digital expressions of these power structures. Women bloggers' experiences of high levels of online harassment and abuse seem to be a result of the dominance of men in the public sphere that is transferred to online spaces (Eckert, 2018). Chen et al. (2020) conducted in-depth qualitative interviews with 75 female professional journalists from five different countries. Nearly all of them reported experiences of online harassment. Hence, for women, being agentic, e.g., confident and decisive, can induce backlash effects against them. This is particularly the case in leading positions in the workplace (Heilman, 2012; Leskinen, Rabelo, & Cortina, 2015), but also in the media and academic context when publicly presenting their expertise or reporting on controversial issues (Chen et al., 2020; Dowell, 2013).

Backlash effects (Rudman & Glick, 2012) can be interpreted as manifestations of gendered power relations. Thus,

backlash effects against women in online environments illustrate the replication of offline power relations. Current online communication research shows that such backlash effects occur when women speak out in public or semi-public spaces, e.g., as journalists or scholars (e.g., Eckert, 2018; Veletsianos et al., 2018), and when they behave agentic or dominant in online discussions (Wilhelm & Joeckel, 2019; Winkler, Halfmann, & Freudenthaler, 2017). Wilhelm and Joeckel (2019) examined the effect of the author's gender on the acceptance of hate as well as counter speech comments. They found a backlash effect towards women commenters for both comment types: Comments by women were more likely to be flagged as harmful than comments by men. Winkler, Halfmann, and Freudenthaler (2017) investigated backlash effects in online discussions. Their research revealed a greater persuasive power of comments by men than by women. Women communicating in an agentic style appear to be less persuasive than men who communicate agenticly (see also Heilman, 2012).

In sum, studies assigned to the replication pattern mainly – although there are exceptions (Bivens, 2017) – follow binary gender conceptions by focusing on differences between women and men. This can be seen as a continuation of gender research conducted in traditional mass media contexts that analyzed binary differences in representation and the reproduction of gender norms and stereotypes in advertising, movies, and newspapers (Mendes & Carter, 2008). This approach has been criticized for exaggerating differences (Hyde et al., 2019) and contributing to the persistence of binary gender stereotypes (Thiele, 2015).

### 3.2 Reinforcement

The reinforcement pattern describes developments where digital technology (enabling or inhibiting visibility) enhances persisting gender inequalities. Taking a critical and feminist poststructuralist perspective, Banet-Weiser and Miltner (2016) argue that the increased masculine hostility towards women online is the result of

perceived changes in gendered power relations. Moreover, research revealing the replication of gender inequalities, as outlined in the previous section, also provides evidence of reinforcement tendencies.

### 3.2.1 *Representation and participation*

Increased political participation of women, e. g., feminist online activism, is inhibited due to a fear of backlash (Rudman & Glick, 2012). That is, the perception of lacking emotional safety results in a stronger reluctance to make feminist views, opinions, and identities visible in public digital spaces (Jackson, 2018). Yet, feminist online activism involves safety and emotional work (Arcy, 2016).

Being sexually attacked online, women journalists who exhibit a more traditional gender role orientation reduce their engagement with the audience or even consider quitting journalism (Stahel & Schoen, 2019). Moreover, against the background of hate speech and trolling, feminist online activism is described as “putting oneself out there ‘in the line of fire’” (Mendes et al., 2018, p. 240). Such observations are indicative of a spiral of silence (Noelle-Neumann, 1974), muting women’s voices. The perception that one’s opinion is in the minority leads individuals to fear social isolation and punishment if they speak out in public. Hence, they prefer to remain silent, particularly when salient moral issues are being discussed. For example, they avoid disclosing their positions on controversial issues (e. g., gay marriage, same-sex adoption) as well as evidence of their sexual identity in mainstream social networks where they are connected to various social groups that are likely to disapprove their opinions and sexual identities (Fox & Warber, 2015). As a consequence, women’s self-censoring and averting controversy in social media fosters their underrepresentation in social media environments (Fox & Warber, 2015; Jackson, 2018).

### 3.2.2 *Gender norms*

Relying on Goffman’s (1979) gender display framework, Butkowski, Dixon, Weeks, and Smith (2020) find both replicating and reinforcing effects of social media

feedback on gendered self-presentation through Instagram selfies, as gender display cues increase the number of likes and followers. The prevalence of postfeminist attitudes in social media hinders feminist activism online, as it promotes the acceptance of gender norms by emphasizing individuals’ choice and self-determination in their conformity to traditional gender roles (Linabary et al., 2019).

### 3.2.3 *Power relations*

Drawing on sexual harassment and gender-related violence, previous research state that these incidents are facilitated by digital technologies (Sobiraj, 2018; Henry & Powell, 2015; Vera-Gray, 2017). Applying actor-network theory (Latour, 2005), Massanari (2017) describes how Reddit’s design, algorithm, and platform politics implicitly support these kinds of toxic digital cultures. In particular, based on long-term participant-observation and ethnographic study of the Reddit community, the author shows how Reddit’s karma point system, aggregation of material across subreddits, ease of subreddit and user account creation, governance structure, and policies against offensive content support antifeminist and misogynistic activism. From this perspective, the platform reinforces the influence of antifeminist groups and contributes to an increase of gender inequalities.

Additionally, in social media women are faced with rape threats that are neutralized by elements of humor such as the use of emoticons (Drakett et al., 2018). In this way, and similar to using justifications and excuses in hate comments against other vulnerable social groups (Wilhelm, Joeckel, & Ziegler, 2020), violence against women is downplayed, which is likely to increase the acceptance of such posts by a wider audience. Humor focusing on gender, race, sexuality, or sexual activities in the context of victim-blaming in social media can increase sexual violence issues (Stubbs-Richardson et al., 2018). The online disinhibition effect is also evident in gendered digital visibility, as one group’s disinhibition online, e. g., posting hateful

comments, causes another one's inhibition, e. g., refraining from online activism, (Suler, 2004). Engaging with the #MeToo campaign, participants also experienced negative outcomes such as being subject to harassment on Twitter (Clark-Parsons, 2019).

More generally speaking, studies assigned to the reinforcement pattern address the role of digital media in fostering inequalities by facilitating harassment and gendered self-presentation (Mendes & Carter, 2008). They also reveal the ambivalence between increased participation fostering empowerment and increased risks of backlash and emotional work as negative side effects. A further aspect of the reinforcement pattern is only marginally addressed, namely the overlap of social group affiliations affected by online discrimination and harassment, e. g., race and gender (Massanari, 2017).

### 3.3 Resilience

Resilience occurs when digital visibility serves to diminish gender inequalities or even leads to social change. Although it is argued above that platform characteristics can replicate and reinforce gender inequalities and binary gender norms (e. g., Butkowski et al., 2020; Linabary et al., 2019), these developments can also be the starting point of resistance. However, most studies that state tendencies of resilience are predominantly highlighting digital media's potential for enabling resilience (e. g., Jackson, 2018; Turley & Fisher, 2018) rather than providing empirical evidence of the envisioned developments.

#### 3.3.1 Representation and participation

Besides experiences of harassment and hostility, women's increased presence and activism in public online spaces as well as in male-dominated subcultures can build the ground for higher rates of participation. Women bloggers as being highly exposed to hate speech and harassment reported that they have become resistant to a certain degree when dealing with online abuse (Eckert, 2018). Hashtag activism, as enacted by participants in the #MeToo movement, can increase the representa-

tion of gender issues in social media channels (e. g., Myles, 2019). Openness and accessibility facilitate the emergence of new discourses on femininity as well as enable women to get into discourse and online spaces previously reserved for men (Bruce, 2016). Minority groups can establish an intersectional networked counter-public to fight misrepresentation and to get into mainstream media outlets (Jackson et al., 2018).

#### 3.3.2 Gender norms

As argued above, participation and representation are prerequisites of gender diversity online, which in turn is likely to increase the acceptance of deviations from binary gender norms and can therefore initiate social change, e. g., decreasing women's objectification in the visual online economy (Salter, 2016). As a result, heightened acceptance can lead to higher levels of engagement. Sharing experiences of sexism and violence in social media groups or by using hashtags such as #MeToo increases visibility of feminist activism and research (Vera-Gray, 2017).

The constitution of counter-publics not only supports social inclusion of different feminist groups but also helps them to create and perform gender identities that challenge binary gender norms (Jackson et al., 2018). By sharing impressions of their everyday life and promoting their cultural authenticity, Black British women bloggers create powerful counter-narratives to challenge negative representations of Black British female identity (Gabriel, 2016).

#### 3.3.3 Power relations

The concept of the public sphere (Habermas, 1962), the idea of self-synchronization of latent groups (Shirky, 2008) and the creation of a counter public (Fraser, 1990) lead researchers to think about the potential of inclusivity, discursivity and solidarity with respect to marginalized groups in online spaces. Digital public spaces offer women possibilities of making their opinions and identities visible (Duguay, 2016; Mendes et al., 2018; Sobiraj, 2018). Feminist activists can initiate

counter-discourses through subversion or denouncement of harmful social media content such as problematic memes (Drakett et al., 2018), sexism, and rape culture (Turley & Fisher, 2018). Disclosure of gendered power relations, e.g., sharing experiences of sexual violence, can be seen as the first step to create new digital narratives on gender relations (Mendes et al., 2019). However, activism in online spaces such as #MeToo can have both simultaneously liberating (sharing experiences and finding community) and oppressing effects (through re-victimization; Linabary et al., 2019). Further, scholars stress the role of digital technologies for solidarity and social change, e.g., providing networked publics that create a sense of belonging for young feminist activists and enabling social change via online petitions (Jackson, 2018; Lokot, 2018; Mendes et al., 2018). These studies also support the idea of the integrational capacity of social media for community building (e.g., Jackson, 2018).

Veletsianos et al. (2018) describe resistance as one coping strategy of women scholars to deal with online harassment. This strategy involves speaking out as well as the attempt to engage harassers into a dialogue. Besides resistance, self-protection is another coping strategy that aims at reducing harassers' power by increasing security settings or outsourcing reading of comments to others (Veletsianos et al., 2018). In a similar fashion, Pruchniewska (2019) refers to safe online spaces for women that are created by women to support each other in their real work life.

Overall, resilience studies highlight the empowering aspects of visibility in digital media. Increased digital visibility of women manifests itself in feminist online activism such as #MeToo, which is seen as a part of a broader social movement. In line with deliberative norms of online participation, this body of research argues for inclusion and solidarity of all genders. At the same time, the critical feminist perspective stresses the vulnerability of feminist digital activism as well as the contrasting developments of feminism and

antifeminism in online spaces (Linabary et al., 2019).

#### 4 Discussion and conclusion

The #MeToo campaign was initially started to empower women and other groups by making their experiences of sexual violence visible. Hence, in this article, the campaign was considered as indicative of the new conditions of gendered visibility in digital media environments. Although the hashtag enabled wide-spread participation, not all women benefited equally from this viral visibility, as "access to mainstream media representation continues to be structured by race, sexuality, and class" (Clark-Parsons, 2019, p. 12).

This article presented a literature review against the background of gendered inequalities in digital visibility. The analysis of research thereby followed three distinct processes of how gender representation, gender norms, and gendered power relations relate to digital technology, which are described as replication, reinforcement, and resilience. Table 1 summarizes the main results of this review. This research identified gender-related and / or technology-based mechanisms that force the *replication* of offline standards in gendered inequalities. The review showed that the dominance of (White) men in political online discussions and digital communities, as well as persisting gender-stereotypes held by women and men, inhibit women's stronger participation and representation. Furthermore, by prioritizing dominant gender perceptions and gender binarity, social media software reproduces normative gender conceptions. In addition, users themselves support these replication tendencies by conforming to traditional gender roles in online self-presentations and interactions. Hence, the persistence of gender norms in online spaces is a precondition of the conservation of gendered power structures, as phenomena like slut-shaming and victim-blaming, which occur online and offline, arise from highly gender-stereotyped attributions.

**Table 1: Processes of gendered visibility in digital media contexts**

Dimensions of digital visibility	Replication	Reinforcement	Resilience
Representation and participation	(White) male dominance in digital spaces, e.g. political online communication, inhibits participation	Fear of backlash leads to avoidance of masculine digital spaces eliciting spiral of silence processes	Creation of counter and networked publics increases visibility, in particular, if they are acknowledged by mainstream media; e.g., <i>hashtag activism as enacted by #MeToo</i>
Visibility of gender norms	Social media platforms prioritize dominant discourses and gender binarity, gendered self-presentation and interaction patterns online; e.g., <i>#MeToo's overemphasis on celebrities' self-presentation at the cost of diversity and visibility of women of color</i>	Social media feedback supports post-feministic self-presentations in social media	Visibility of counter-stereotypical gender identities fosters their normalization and social change; e.g., <i>#MeToo counters women's objectification and increases the visibility of feminist activism</i>
Power relations	Persistence of gender norms as a precondition of, gender trolling, slut-shaming and victim blaming	Anonymity facilitates objectification and disinhibition; e.g., <i>#MeToo campaigners' experiences of harassment on Twitter</i>	Solidarity and empowerment of women through digital technology, e.g., <i>feminist online activism such as #MeToo, online petitions, creation of safe online spaces</i>

Note: Examples in italics refer to the #MeToo movement.

Additionally, it was shown that fear of backlash (e.g., social isolation) and the perception to belong to a minority can *reinforce* women's underrepresentation in online discussions and digital communities. Moreover, the combination of prevailing binary gender norms and digital media characteristics (social media feedback) is a driver of the reinforcement of gendered stereotyping, which is reflected in highly objectified self-presentations; although these self-objectifications are assumed to be freely chosen and to support women's independence.

Lastly, the analysis revealed processes of *resilience* that reduce gender inequalities online. Research findings indicate that issues of underrepresentation can only be solved by higher levels of participation and stronger engagement, even though it could be embarrassing and demanding (referred to as digital labor; Vera-Gray, 2017). Thus, as proposed by movements of digital activism, increased participation can be a strategy to invert spiral of silence processes. In a further step, counter-publics and counter-narratives can help to deconstruct gender stereotyping and to make gender diversity visible to a wider audience. Fem-

inist groups and movements practicing online activism foster women's empowerment and benefit from openness and accessibility of online platforms. Beyond that, these spaces can also be used to create safe places that facilitate community building and reduce digital labor.

It is important to note the dynamic character and reciprocity of these patterns, i.e., replication may blend into reinforcement (e.g., self-objectification in social media) whereas reinforcement can also be a consequence of increased resilience (e.g., harassment of feminist online activists). Furthermore, offline resilience can be replicated online. For example, increased representation of women in politics is likely to increase their online visibility. Digital mediation (Kember & Zylińska, 2012), i.e., the process of blurring boundaries between real life and online space, can be a useful concept to account for such tendencies.

The theoretical and methodological approach of this literature review is not without limitations. Acknowledging that the result of the strategy of selecting literature applied here is non-exhaustive, this procedure aimed at an informed selection of current research covering gender

research and feminist scholarship as well as different dimensions of digital visibility. The current research focused on the explanation of gendered inequalities. The theoretical lens applied here might have led to an overestimation of (binary) gender gaps, differences, and their effects. However, reviewed research assigned to the resilience pattern may serve to balance the possible bias of this perspective. Including a feminist perspective also highlights the need for a critical, non-binary, and intersectional approach to research on digital visibility. The categorization and critical assessment of the studies that guided this literature review bear the risk of oversimplification as some studies can be assigned to more than one category. Further, it must be taken into account that the fields of gender and feminist communication studies often overlap (Mendes & Carter, 2008). It is important to note that the focus on studies analyzing the digital visibility of women left aside other inequalities in digital visibility at the expense of e.g., non-binary and trans persons (e.g., Miller, 2019). Future studies can adopt the proposed taxonomy and apply it to research on other genders to overcome this deficiency. Moreover, the current analysis focused on gender as a relevant category of social difference, only partially accounting for relations to other social categories. Analyzing the intersections in digital visibility between gender and other social categories reveals the heterogeneity of women's online experiences (Prieler & Kohlbacher, 2017; Pruchniewska, 2019). Moreover, the critical assessment of the #MeToo debate (e.g., Trott, 2020) stresses the need for an intersectional perspective that goes beyond the scope of this article.

The taxonomy of research on different dimensions of digital visibility proposed in this article sheds light on the antecedents of inequalities, polarization, and social change in digital media environments that can be described as an interplay of technological affordances and social / gender norms. Applying this taxonomy to research on women's digital visibility is only a first step that should be complemented by investigating further gender categories (non-binary, trans) and their intersections

with other social categorizations and characteristics (e.g., sexual orientation; Ferris & Duguay, 2020). Further development of this approach can help to disentangle the causes and consequences of inequalities in digital visibility by identifying processes of replication, reinforcement, and resilience. Future studies should investigate how digital technology can be used to foster resilience and to facilitate social change. Furthermore, most of the studies in this review relied on qualitative interview data (e.g., Sobiraj, 2018) and content analyses (e.g., Drakett et al., 2018), but also innovative methods such as app walkthrough (Duguay, 2016) and long-term observation (Massanari, 2017) were applied. Innovative methods and qualitative research could be complemented by quantitative data on participation, gathered using computational methods. Further analyses on power relations in social media contexts could apply network-analysis techniques. Moreover, experimental designs could be useful to test causalities and interrelations between the visibility dimensions proposed in this article, e.g., to assess the effects of increased participation on the perception of gender norms online. Extending study results on gendered inequalities in digital visibility reviewed in this article, future research should make greater efforts to derive practical implications, i.e., what measures social media platforms, news organizations, and governments could and should take, to protect and increase the visibility of women and other social groups online (also see Veletsianos et al., 2018).

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## Filtered in / filtered out: Locative media apps and social accessibility in urban spaces

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### Abstract

Social accessibility involves the capacity of a person to be reached by other people, typically through established social networks. Locative media provide new complications to the issue of social accessibility in urban spaces. They do not connect people with their existing social networks, but rather with people – often strangers – immediately around them. Locative media apps provide users with the ability to manage these anonymous connections through filtering functionalities. This filtering out and filtering in functionality has profound implications for the social relations of strangers in urban spaces. At the heart of the matter is the question of who is made visible and who is made invisible. Many studies of locative media use demonstrate troubling directions in the ways in which they are developed and used. Often, locative media apps reinforce and reify existing racisms and other forms of prejudice, and a general tendency to try to simplify or eliminate differences.

### Keywords

locative media, social accessibility, mobile communication, algorithms, filtering, cities, urban, information and communication technologies

## 1 Introduction

Cities have long been a destination point for marginalised people who find they do not or cannot fit in within smaller communities (Fincher & Jacobs, 1998; Ryan, 2019). This has led to the great diversity characteristic of modern cities, along with corresponding efforts to manage the resultant sensory overload. Simmel (1922 [1955]) proposed the notion of social accessibility as a way of understanding efforts to manage urban social relations. Social accessibility is understood as the ability to be reached by other people (Quan-Haase & Collins, 2008; Simmel, 1922 [1955]; Weber, Gerth, & Mills, 1946). The increased use of information and communication technologies has changed the dynamics of social accessibility in urban spaces along with the norms that regulate this accessibility (Milgram, 1970; Simmel, 1922 [1955]; Wellman & Leighton, 1979; Zerubavel, 1979). People cope with the resulting sensory overload through a series of strategies that help them prioritise and manage social

interactions: prioritising relationships, reducing time spent on interactions, blocking unwanted connections (Milgram, 1970; Quan-Haase & Collins, 2008). The rise in the use of mobile devices has complicated the development of these strategies by making people potentially available anywhere, anytime.

The rise of locative media apps – software programs for mobile smart devices that use the device's location coordinates as a central organising logic for the information that they send and receive (Pieber & Quan-Haase, in press) – have the potential to profoundly affect the relationship between a city and its inhabitants and among those inhabitants. They have the capacity to challenge efforts to manage social accessibility by providing ad hoc access to nearby strangers, thereby providing users with more information about the people around them than they would otherwise have – or want to have. However, they also offer filtering functionalities and other tools to help manage this increased information.



In this paper, I examine locative media apps as a communication medium, and the ways in which people can use these apps to manage their social accessibility. At the heart of the matter is the extent to which people are made to be visible or invisible: a person cannot be socially accessible if they are not visible, and people cannot access people they cannot see. While locative media apps have much potential to assist in the relationships between a city and its inhabitants as well as communication efforts among inhabitants, many studies to date demonstrate some concerning trends in the ways in which these apps are made by their developers and deployed by their users. Often, locative media apps reinforce and reify both existing racisms and other forms of prejudice, as well as a general tendency to try to simplify or eliminate differences.

## 2 Cities as spaces of difference

Urban spaces are socially produced. They are not, as Leszczynski (2020) notes, “a priori vacant *tabulae rasae*” (p. 195). For Lefebvre (1996), there is a symbiotic relationship between a city and its inhabitants. These spaces are produced through the daily mundane movements through the city and the interactions among its diverse inhabitants. These movements and interactions shape the city and in the process the city shapes its inhabitants.

Difference has long been a key characteristic of the modern city. As Fincher and Jacobs (1998) note, this difference manifests through “gender, race, ethnicity, age, life course, sexuality, or any other referent” (p. 5). Furthermore, many people’s identities will involve various combinations of these referents. As such, different people will experience the same city differently, even from those immediately around them. This difference is a serious concern for Castells (2002), particularly in fast-growing urban areas. He argues that a lack of a dominant culture to facilitate some degree of assimilation leads to a lack of common vocabulary and values, and therefore no way to communicate

with one another and coexist successfully in these large urban areas. He sees within these areas growing fragmentation and alienation from one another leading to an entrenchment away from the communal and the familiar: “I get close to myself, my family, my group, my project, and we split” (p. 555). In this way, he sees communication breaking down altogether within the wider urban environment.

It is not at all clear however that this lack of assimilation is a problem in today’s (or tomorrow’s) cities. As Tonkiss (2005) notes, this concern about growing alienation and a loss of a sense of community have been common themes in the works of many urban theorists. For Young (1986), this notion of community is typically ill-defined, but she does see some common threads. There is a preference for face-to-face communication among small groups of people in a multitude of situations: work, leisure, family, etc. These groups typically need to be small enough that the members know one another personally. There must be a high degree of commonality.

Tonkiss (2005) sees this “lament” (p. 9) for the loss of community as containing an implicit criticism of urban society. She agrees with Young (1986) that this desire for a return to community is “anti-urban”:

The idea of community is not simply an antidote to the anonymity of the city; it is a rejection of the urban as a space of strangers, a retreat to familiarity and intimacy as the safest place to be. Such a stance narrows the range of one’s concern for others to those who appear familiar or who share similar problems. It stands in difficult relation to the claims of anonymity, to questions of regard between strangers, and to the kind of urban ethics that can bear difference. (Tonkiss, 2005, p. 26)

Young (1986) and Tonkiss (2005) recognise the value of face-to-face, close relationships in particular contexts: friendship, cohabitation, family, and so on. However, they both suggest that this approach is inappropriate as a means to examine urban social relations overall. They argue that urban social relations are relations among

strangers. Rather than face-to-face interaction, the urban social relations of strangers are characterised by “side-by-side” relations that take place in public spaces such as parks, streets, bars, cultural venues, etc. Young (1986, p. 21) notes that “in such public spaces, the diversity of the city’s residents comes together and dwells side by side, sometimes appreciating one another, entertaining one another, or just chatting, always to go off again as strangers”.

Tonkiss (2005) suggests that there exists among strangers in urban environments an indifference to difference. She contends that, “alongside an active politics that recognises differences...there lies an ordinary urban ethics that looks straight past it” (Tonkiss, 2005, p. 10). While admittedly “fragile, grudging, uneven” (p. 10), this indifference can afford people some space in which to express individual difference. As Urry notes, urban spaces afford the possibility for differing bodies to find a space:

The modern city gives room to the individual and to the peculiarities of their inner and outer development. It is the spatial form of modern urban life that permits the unique development of individuals who socially interact with an exceptionally wide range of contacts. (Urry, 2007, p. 23)

### 3 Sensory overload and social accessibility in the city

For Simmel (1997), “[t]here is perhaps no psychic phenomenon which has been so unconditionally reserved to the metropolis as has the blasé attitude. The blasé attitude results first from the rapidly changing and closely compressed contrasting stimulations of the nerves” (p. 178). The sheer volume of strangers with whom urban dwellers come into daily contact results in the reduction of both the quantity and the quality of social interactions: they engage in fewer interactions with strangers than may be the case in small towns and rural environments, and these interactions tend to be considerably more superficial, so as to be able to manage the sensory overload

that arises from the larger populations of urban spaces.

Simmel’s (1922 [1955]) almost 100-year-old concept of social accessibility still is a useful tool to investigate the ways in which urban dwellers navigate the information overload brought on by the significant increase in the number and diversity of people encountered daily in cities. Social accessibility is the ability to be reached by other people (Quan-Haase & Collins, 2008; Simmel, 1922 [1955]; Weber, Gerth, & Mills, 1946). Milgram (1970) established 50 years ago that urban dwellers manage social accessibility by restricting moral and social interactions with others. He observed that urban social relations are often interpreted as being considerably colder and ruder than in rural settings (Milgram, 1970). However, he proposes an alternative interpretation:

A rule of urban life is respect for other people’s emotional and social privacy, perhaps because physical privacy is so hard to achieve. And in situations for which the standards are heterogeneous, it is much harder to know whether taking an active role is unwarranted meddling or an appropriate response to a critical situation. (Milgram, 1970, p. 1463)

In addition to serving as a coping strategy for stimulus overload in urban spaces, this “respect for other people’s emotional and social privacy” can facilitate the indifference to difference that Tonkiss (2005) identifies as essential to a functioning, heterogeneous city.

Quan-Haase and Collins (2008) contend that the concept of social accessibility takes on a greater relevance in the study of urban social relations with the rise in information and communication technologies (ICTs) such as e-mail, instant messaging and social networking. Such ICTs greatly expand the ways in which people can be reached, irrespective of time or distance. In this way, they pose new challenges to urban dwellers’ efforts to manage their social accessibility among their networks of connections (friends, family, colleagues, and so on). The increased use of information and communication technol-

ogies has changed the dynamics of social accessibility in urban spaces along with the norms that regulate this accessibility (Milgram, 1970; Simmel, 1922 [1955]; Wellman & Leighton, 1979; Zerubavel, 1979). And, as Quan-Haase and Collins (2008) point out, these new challenges are even more pronounced for urban youth: numerous studies have documented both the greater likelihood of urban youth to adopt these technologies and a greater sense of pressure to be always accessible. The rise in popularity and use of locative media further complicates the management of urban social accessibility by introducing potential ephemeral, ad hoc connections with nearby strangers.

#### 4 What are locative media?

Locative media are a set of ICTs – hardware and software – for mobile smart devices (smartphones, tablets, etc.) that make use of the device's location coordinates as a central component of their operations. On the software side, locative media apps are software programs for mobile smart devices that rely on the device's location coordinates to send and receive information that is relevant to the specific location where the device is, at the specific moment that it is there (Pieber & Quan-Haase, in press). As Wilken (2019) notes, there has been a significant rise in the use of a device's location coordinates by a wide variety of mobile apps on the market:

Every day, tens of millions of mobile users identify and register their location in various ways via the functions embedded within or downloaded onto their mobile devices. For example, the images and videos we tag, upload, and share to sites such as Snapchat, Instagram, WhatsApp, Flickr, Facebook, and Kakao, are now typically geocoded. Positional information is also a core component of dating and hook-up apps. (Wilken, 2019, p. 7)

A number of scholars (Sutko & de Souza e Silva, 2011; Wilken, 2019; Wilken & Goggin, 2015) include under the umbrella of locative media any mobile app that makes use

of the device's location coordinates. In this instance, geotagging photos on Instagram or checking in on Facebook constitute locative media functionality. However, I am interested in a much narrower understanding of locative media. In this paper, I consider those mobile apps that make use of the device's location coordinates as their central organising principle, that is, those apps which present to their users information about their immediate surroundings. This information can be about points of interest that are nearby (restaurants, tourist attractions, entertainment, and so on). It can also be information about the people in their immediate vicinity. As well, it can be about navigating and travelling through a city. Examples of locative media apps include information sharing apps like Yelp; dating apps like Tinder and Grindr; mobile gaming apps like Pokémon Go; navigation apps like Google Maps and ride-sharing apps like Uber and Lyft. By contrast, a weather app is not a locative media app in this understanding of the term because it provides weather information from the nearest weather station rather than from the specific location where the app user is standing (Pieber & Quan-Haase, in press).

These types of mobile apps directly mediate between their users and the people and spaces immediately around them (Leszczynski, 2015). As such, they evoke a profound shift in the way we understand ICTs – from “anytime anywhere” computing to “right here and right now” computing (Kitchin, 2014; Villi, 2015). Where traditional ICTs require us to enter a *virtual* world to access generic information, locative media attach information to specific spaces at specific times, thereby augmenting a user's experience of the *physical* world with information that is specific to the space and time the user is occupying (McCullough, 2006). For Farman (2012), locative media bring together the virtual and physical worlds into a new, hybrid space. However, this notion of a hybrid space risks ignoring a key characteristic of locative media: its central organising principle is physical space. Locative media users do not go to some other space to ac-

cess the information in the way that virtual reality users might. Rather, as Leszczynski (2015) proposes, locative media users access digital information in the physical space where they are standing. The information is *anchored* to the physical space.

Locative media apps complicate Lefebvre's (1996) notion of the symbiotic relationship between a city and its inhabitants by adding another participant in the production of urban space. Kitchin and Dodge (2011) have coined the term *code/space* to describe the role of locative media in the production of urban space whereby "software and the spatiality of everyday life become mutually constituted, that is, produced through one another" (p. 16). As I explore in this article, this third wheel in the symbiotic relationship has the capacity to affect this relationship in significant ways. It can help render parts of the city visible or invisible to some or all of its inhabitants. Similarly, locative media apps can render the inhabitants of the city visible or invisible to other inhabitants. In this way, it can have profound effects on people's social accessibility.

An additional important feature of locative media apps is that they tend to mediate connections among strangers. For example, while it is possible to come across the profiles of friends and family members on hook-up apps like Tinder, this is not their main purpose. As well, information sharing apps like Yelp rely on ratings and other data that is crowdsourced by their many users (Frith, 2017; Sutko & de Souza e Silva, 2011). In this paper, I look specifically at locative media use in urban spaces in large part because of this mediation among strangers. As discussed earlier, social relations in cities tend most often to be among strangers. Locative media apps can connect nearby strangers with one another, as well as provide information about unfamiliar surroundings that urban users may find themselves in (McCullough, 2006).

## 5 Locative media and social accessibility

As mentioned earlier, ICTs present significant challenges to urban dwellers' ability to manage their social accessibility because they make it possible to be reached anywhere anytime, thereby greatly increasing the potential for sensory overload. This increase in accessibility, however, is largely from existing social networks: friends, family, co-workers, and so on (Quan-Haase & Collins, 2008). Locative media apps further complicate the issue by making people potentially reachable by nearby strangers. And as people move through the city, they become reachable by different strangers – the ones they pass along their way. Locative media apps can increase awareness of these strangers by increasing the amount of information available, turning strangers passing one another on the street into what Licoppe (2016, p. 108) calls *pseudonymous strangers*: people "with whom one may never have interacted or talked about before [...] but who are not complete strangers either, for the locative app usually makes available some info about them". Conversely, as Sutko and de Souza e Silva (2011) point out, locative media apps can be deployed to help manage users' social accessibility. Most apps have some degree of filtering functionality which allows users to establish parameters around which strangers' information they see, and which strangers can in turn see their information. When deployed effectively, these apps have the potential to facilitate mutually sought-after serendipitous connections with nearby strangers. However, when deployed less than optimally, they can contribute to the already overwhelming stimuli of the urban spaces they are passing through. And, as I discuss below, they can reinforce existing racisms and other prejudices. As locative media apps increase in popularity and use (Wilken, 2019), Licoppe (2016) warns about the implications of a city full of people accessing and sharing their location and other personal information through these apps. The sophistication and flexibility of apps' filtering capabilities will

become of great importance in helping to manage the sensory overload that these apps can bring on in a way that can still allow for a city's diversity and city dwellers' indifference to difference.

## 6 Locative media apps and (in) visibility in the city

Visibility and invisibility play a pivotal role in social accessibility. In order to be accessible, people must be able to be aware of who else is around them. Thus, the filtering capabilities of locative media apps can play a significant role in an urban dweller's social accessibility. This is because locative media apps can make people visible through their interface in a physical space where they might not otherwise be noticed. They can in turn make people invisible through their interface in a space that they are physically present in. As people come to rely more and more on locative media apps to navigate through cities, who and what is visible (or not) through the apps' interfaces will come to have an increasingly important role in how people perceive the urban spaces they move through, and who they can and cannot see in those spaces.

### 6.1 Making people visible

Locative media apps have the capacity to make people visible in spaces where they might otherwise go unseen. In a study (Blackwell, Birnholtz, & Abbott, 2014) of users of Grindr, a dating app for gay men, participants remarked that the app made gay men visible to one another almost anywhere in the city where they used the app. This awareness of other LGBTQ+ people nearby can have the effect of making them feel safe in spaces that may otherwise feel uncomfortable or even threatening. As Roth (2014) observes, locative media dating apps like Grindr and Scruff (another dating app, targeted at gay men who self-identify as "bears") complicate the identification of spaces as either gay or straight:

Concerns over whether spaces are hetero- or homosexual – and, consequently, whether those spaces can be “reterritorialised” as queer – neglects the possibility of heterogeneous spaces in which queerness can coexist, omnipresently, with heterosexuality [...] Queerness does not need to be subsumed by heterosexuality for the two to occupy the same physical space when queer communities can exist, invisibly but to their participants, on mobile phone screens. (Roth, 2014, p. 2127)

In making LGBTQ+ people visible to one another throughout an urban space, locative media apps like Grindr and Scruff can also reveal a queer map of the space that is layered over and anchored to the physical space, visible for those with the eyes (or apps in this case) to see it.

However, this visibility is not without its risks because these apps are not only available for use by people who identify as either LGBTQ+ or friendly toward this population. Anyone can download and use gay-targeted locative media apps and view the queer map of the city and its LGBTQ+ inhabitants. In a study by Albury and Byron (2016), participants identified being “outed” to the wrong people in the wrong spaces as being one of the biggest risks for them in using gay-targeted locative media apps. Hjorth, Pink, and Horst (2018) found similar concerns in their study of lesbian couples' use of locative media. In their study, participants expressed varying degrees of comfort and discomfort in their use of locative media as it concerned broadcasting aspects of their sexuality. Where this information was broadcast widely through these apps, participants often saw this act as “political [...] as a form of everyday activism” (p. 1217).

Visibility through locative media apps thus presents significant implications for social accessibility in urban spaces. Indeed, it is a prerequisite for social accessibility: one who is invisible cannot be reached and conversely one cannot reach people who they cannot see. Prior to the introduction of locative media apps targeted at LGBTQ+ populations, members of this community would have to find each other in designated spaces in the city – gay

bars, gay neighbourhoods, and so on – or by using a series of established codes and cues (Crooks, 2013). These locative media apps open up the whole city as a possibility for social accessibility among LGBTQ+ people, but this new openness comes with risks and requires new strategies for negotiating social accessibility to avoid unwanted (and potentially dangerous) attention.

## 6.2 Making people invisible

Locative media apps have the capacity to make people invisible in spaces where they are physically present. Locative media apps typically provide users with ways to filter the information they see, usually based on some set of personal interests. Grindr, for example, allows gay men to set filters based on the types of men they are interested (or not interested) in meeting (Conner, 2019). Tinder, by contrast, requires that both users “swipe right” on respective profile pictures in order to connect with one another (David & Cambre, 2016). Such functionalities are essential tools for the management of social accessibility: they help users make themselves visible or invisible to other people (and to make other people visible or invisible to users). However, these functionalities are not without their consequences.

Grindr’s filtering functionality makes it possible for users to filter people out based upon identity markers such as race, age, body type and so on. While filtering is an essential tool in the management of urban sensory overload through social accessibility, the way in which it manifests in apps like Grindr has been widely criticised for entrenching existing prejudices into the app.<sup>1</sup> And, while these prejudices already exist in the offline world, these filters become in a way more insidious because the filtering is invisible

to those being filtered out (Conner, 2019; Mason, 2016). As one participant in Conner’s (2019) study remarks: “Users can just select me out of the equation. When I look at my White friends’ Grindr accounts they have messages in the hundreds. I can barely even get a single message. I feel sometimes as if I don’t exist” (p. 403). In addition to this participant’s difficulties in connecting with other gay men through the app, the erasure he experiences also serves to reduce – or even eliminate – any sense of security he may feel though being able to locate other LGBTQ+ people in unfriendly spaces (as discussed earlier) because he has been blocked from seeing them.

Frith (2017) introduces another dimension to the problem of invisibility through locative media apps. He discusses the situation in Denton, a city in Texas where the city’s entire Mexican neighbourhood is all but invisible through locative media information sharing apps (what he calls spatial search apps). He also discusses the near total absence in locative media apps of an African American neighbourhood in Pittsburgh, Pennsylvania, known as The Hill. These two examples demonstrate a reinforcement in the apps of historical racial divides in the two cities. But they also point out a case of digital divide: the people who frequent the bars, restaurants and other venues in these two neighbourhoods tend not to have smart devices and/or tend not to make use of locative media apps such as Yelp. Given the rise in popularity of locative media apps (Wilken, 2019), and the accompanying reliance on them to navigate both the city and social accessibility in the city, such absences serve to entrench and reify historical segregations, and confound efforts to achieve the indifference to difference that Tonkiss (2005) identifies as essential to the navigation of diversity in urban spaces.

1 In June of 2020, Grindr announced that it would be removing its ethnicity filtering functionality as a response to the Black Lives Matter protests taking place throughout the United States and other countries. As of the writing of this paper, however, the ethnicity filter is still present and functional within the app (Hunte, 2020).

## 7 Algorithms of (in)visibility

Given that the information available through locative media apps is largely crowdsourced, it can be argued that much of the responsibility for how these apps

work rests with those people who use them and indirectly with those who do not. However, locative media apps – like all software applications – have underlying logics that guide how they work. These logics are coded into their algorithms.

At the most basic level, algorithms are collections of computer programming code that work together to provide sets of instructions to platforms on how to accumulate, process and manipulate the data they gather. But as Finn (2017, p. 5) notes, algorithms are much more than this basic definition would suggest: “they are also bodies of knowledge, sets of rules and procedures, that can be implemented in practice. They are technical entities that have their own existence independent of their human practitioners, but which operate through the medium of culture”. Such complications in the understanding of what algorithms are and how they work often go unacknowledged, because they are assumed to operate “objectively.” As Chander (2017, p. 1034) notes: “Algorithms can make decisionmaking seem fair precisely because computers are logical entities which should not be infected by all-too-human bias. But that would be an unwarranted assumption”.

While a computer engineer may argue that the code within algorithms is unbiased, “a pinnacle of Enlightenment, rationalist thought” (Finn, 2017, p. 7), they in fact have biases – intended and unintentional – encoded into them.

### 7.1 Encoding biases

Ruha Benjamin (2019) takes an extensive look at the ways in which biases are encoded into algorithms. While she is primarily concerned with racial bias, she notes that other identifications such as class, gender, and so on, interact with and compound instances of algorithmic bias. She identifies three main ways in which these encodings occur. The first involves programmers encoding their own deeply held biases. While the programmers may be unaware of these biases because they are so deeply engrained, Benjamin (2019, p. 28) argues that the encodings themselves cannot be considered to be unconscious or unin-

tended because “there is no way to create something without some intention and intended user in mind”. Programme designers have a target audience in mind when developing their programmes. The characteristics of these target audiences inform the design of the programme. A second way in which existing biases can be encoded into programmes is through the programmes’ processes of “deep learning”. Programmes increasingly absorb data from a vast array of existing sources to fine tune their processes. In this way, they incorporate the existing biases of the people who have contributed the data. As this process of deep learning unfolds, programmes become increasingly more complicated and, as Chander (2017) observes, even the programmes’ developers may end up not knowing exactly what the programmes are doing. A third way in which these encodings can occur is through a lack of recognition of the social and historical contexts in which the programme will operate. If existing biases are not examined and accounted for, they will be replicated and reinforced in the programme code (Benjamin, 2019).

We can see these encodings at work in Grindr’s filtering functionality as discussed earlier. The ability to filter out users based upon their ethnicity and other identifications has the effect of making people invisible in the app even though they are present in a space. This encoding is not an accident – the app is meant to work in this way. The app has been coded to meet the needs of their target audience. As noted earlier, these biases already exist in the gay male community where, as Mason (2016) notes, racism (and other forms of prejudice) masquerade as personal preference. The app’s developers do not seem to have considered the social and historical contexts in which the app will be used, as Benjamin (2019) argues for.

### 7.2 Erasing difference

As Veel and Thylstrup (2018) point out, locative media algorithms are, in the background, forever classifying users and data into distinct categories, and identifying who and what to include and exclude.

These processes can have the effect of discouraging or altogether erasing differences that cannot or will not fit neatly into the defined categories. A case in point is the gay dating app Scruff. Scruff is targeted at gay men who self-identify as “bears”. This term is intentionally difficult to define. As Roth (2014) notes, the term “originally emerged as a form of resistance to the ‘body fascism’ of American gay culture in the mid-20<sup>th</sup> century. In the case of bearishness, this was encapsulated in the feeling that ‘You can’t be gay. You’re too old, hairy, and fat’” (pp. 2124–2125). The category “bear” has historically been intentionally left as an empty signifier, as a rejection of the restrictive norms of mainstream gay male society in the United States. But despite this intentional ambiguity around body image, Scruff encourages its users to slot themselves into one of several categories of bear that its developers have established. While this self-categorisation is not mandatory, those who do not categorise themselves risk becoming invisible in the app if other users choose to filter their searches based on the categories. In this way, Scruff restricts the potential diversity of body expressions possible among bears. And those that do not or cannot slot themselves into one of the app’s predefined categories risk being made invisible to other members of their community (Roth, 2014). Such efforts to simplify or eliminate the complexity of differences on display in urban spaces are, to borrow Young’s (1986) term, anti-urban.

### 7.3 (In)visibility

A key concern for Benjamin (2019) involves an algorithm’s ability to expose marginalised people to systems of surveillance and corresponding policing of behaviours and ways of being. She (2019, p. 99) usefully compares this act of exposure to the processing of film, which she describes as “a delicate process – artful, scientific, and entangled in forms of social and political vulnerability and risk”. Like the art of film processing, negotiating visibility and invisibility – and social accessibility – through the algorithms of locative media

apps (and other technologies) is fraught for marginalised people.

On the one hand, to be absent – invisible – within these apps is to risk being further marginalised. A major problem with locative media apps in this regards seems to be its reliance on user-generated data, as we see, for example, in Frith’s (2017) examination of Denton’s Mexican neighbourhood and The Hill neighbourhood in Pittsburgh: Yelp lacks data about these neighbourhoods because users of the app are not adding it. However, we can also see the effects of intentional coding that causes marginalised people to become invisible in the gay dating apps Grindr and Scruff. Filtering functionality has been added to both to facilitate the erasure of some people as discussed earlier (Conner, 2019; Roth, 2014).

On the other hand, to be visible within locative media apps can bring many potential risks. For Benjamin (2019), a key concern of visibility for Black people (and other marginalised groups) involves the surveillance potentials that these technologies can afford. As she says, “a key feature of Black life in racist societies is the constant threat of exposure and of being misread; and that being exposed is also a process of enclosure, a form of suffocating social constriction” (Benjamin, 2019, p. 101). And this is equally true for LGBTQ+ people where the threat of exposure – and even being read as LGBTQ+ – can bring serious physical and other dangers (Albury & Byron, 2016; Hjorth, Pink, & Horst, 2018). This concern is particularly relevant for locative media apps which, by their nature, can track people’s movements through space in real time, and can keep a record of places they’ve visited.

The issues of visibility and invisibility of marginalised people through locative media apps are thus not straight forward. There are many ways in which biases are encoded into the apps’ algorithms, thereby perpetuating and potentially exacerbating already existing discriminations against marginalised people. As Benjamin (2019, p. 99) observes: “Who is seen and under what terms holds a mirror onto

more far-reaching forms of power and inequality”.

#### 7.4 Reading the glitch

As Chander (2017) points out, the increasing complexity of algorithms makes it difficult if not impossible to examine biases encoded into the algorithms themselves. This situation is further complicated by the fact that many algorithms driving locative media and other apps and internet services are typically proprietary. As a result, the companies that hold the patents on them are unlikely to be willing to make them available to public scrutiny. Chander instead argues that we should pay attention to both the inputs (the data that algorithms process) and the outcomes of algorithmic processing. Benjamin (2019) and Leszczynski (2020) both argue for an examination of the “glitches” that are found in these systems as a fruitful approach to identifying inherent problems. At its simplest level, a glitch is an instance where a technological system does not operate the way its developers or users expect it to. But Benjamin and Leszczynski argue that glitches are in fact much more than this. For Benjamin, glitches can act as a “technological canary in the coalmine” (Benjamin, 2019, p. 47) that indicate biases encoded into the algorithm:

Glitches are generally considered a fleeting interruption of an otherwise benign system, not an enduring and constitutive feature of social life. But what if we understand glitches instead to be a slippery place [...] between fleeting and durable, micro-interactions and macro-structures, individual hate and institutional indifference? Perhaps in that case glitches are not spurious, but rather a kind of signal of how the system operates. Not an aberration but a form of evidence, illuminating underlying flaws in a corrupted system. (Benjamin, 2019, p. 80)

In short, Benjamin (2019) argues, when algorithmic outcomes (re)produce biases, the algorithm is working exactly as its designers intended.

Both Benjamin (2019) and Leszczynski (2020) also see glitches as potential sites of

resistance. For Benjamin, this potential for resistance begins with a recognition and rejection of the complex ways in which algorithms contribute to a process of dehumanisation. She goes further, though, in arguing that it is not enough simply to reject biased systems. It is essential as well to begin the process of imagining new ones. Leszczynski argues for bringing a “feminist politics of the urban everyday” (Leszczynski, 2020, p. 191) to understanding systems and their algorithms. She wants to examine questions of biases that manifest (or are dismissed) as glitches from the perspective of those experiencing the biases and glitches. Rather than understanding glitches as failures of the system to operate, she understands them as potential “opportunities for mundane digital tactics to negotiate, divert, diffract, or differently assemble” the interfaces between system and user in ways that are “inherently and immediately political” (Leszczynski, 2020, p. 201).

Frith’s (2017) discussion of the Denton and Pittsburgh neighbourhoods that are not visible on the Yelp app provides a useful subject for considering this notion of the glitch as potential warning of systemic bias and possibly as site of resistance. Frith rightly identifies these absences in Yelp’s information offerings as being evidence of a systemic replication of existing biases in the physical structuring of both cities. As he notes, deciding which locations, streets, neighbourhoods, and so on, are represented on a map have serious consequences for how a space is navigated and understood by those moving through it. Even though locative media mapping apps like Yelp put the decisions about what to include and what not to include largely in the hands of their users, this power to define a space and how it will be read is still not available to everyone. As Frith (2017, p. 543) notes, some people are excluded “because they do not have access to the right technologies or the inclination or digital literacies necessary to contribute to community mapping projects. Research has also shown that only a small minority of users actually create spatial content for location-based services”. As Kitchin

and Dodge (2011) point out, locative media apps are increasingly implicated in the production of urban spaces as a third player in the symbiotic relationship between a city and its inhabitants (Lefebvre, 1996). This invisibility of the Hispanic inhabitants of Denton and the African American inhabitants of Pittsburgh means that they have no say in the way in which their respective cities are mapped and thereby navigated and understood. The absence of these neighbourhoods on Yelp reinforces the already existing physical divides in the respective cities, and limits possibilities for interactions between the residents on either side (Frith, 2017).

But could there be other ways to read these glitches? Given the systems of surveillance that people of colour are already subject to on a daily basis (Benjamin, 2019), could it be that the residents of these neighbourhoods understand locative media mapping apps as yet another layer of surveillance? Could it be that the residents of these neighbourhoods have alternative tactics for navigating through their cities in use that better serve these residents' needs and avoid the increased layer of surveillance from locative media apps?

The algorithms of locative media apps are heavily implicated in the ability of city dwellers to be visible or invisible in urban spaces, thereby affecting their social accessibility with other inhabitants of their city. These algorithms can and do replicate and often exacerbate existing biases against some people based on various identifications such as race, ethnicity, gender, sexual orientation, and so on. But issues of visibility and invisibility are not straightforward. The ability to be visible in a space is not always desirable, but nor is invisibility. Benjamin's (2019) notion of the glitch as a warning signal indicating systemic racism, together with Leszczynski's (2020) notion of the glitch as potential site of resistance provide useful tools for interrogating the ways in which the algorithms of locative media apps contribute to users' (in)visibility in urban spaces and their ability to navigate social accessibility in and through the city.

## 8 Conclusion

Cities have long been characterised by difference, leading to great potential for sensory overload through the vast increase in the numbers and variety of people, places, information and other sources of stimuli. Urban dwellers develop coping strategies to manage this sensory overload, predominantly by filtering most of it out. To deal with the vast quantity and variety of social interactions that an urban dweller is exposed to daily, urban dwellers engage in a careful management of their social accessibility, understood as the ease with which they can be reached (Simmel, 1922 [1955]). Urban dwellers develop an indifference to the great differences (Tonkiss, 2005) in terms of ethnicity, gender, sexuality and other referents that exist side-by-side every day in urban spaces.

Locative media apps present a range of opportunities and challenges to the successful management of social accessibility. These apps can provide additional information about nearby strangers that can challenge the anonymity among strangers that is at the core of urban indifference to difference. However, locative media provide filters and other tools to their users to help them manage these new challenges to their social accessibility (Wilken, 2019). But careful consideration must be given to the ways in which these tools are programmed by locative media app developers, and the ways in which they are deployed by app users. The visibility and invisibility afforded by these tools lay at the heart of social accessibility management: one cannot be socially accessible if one is not visible; and, one cannot access others one cannot see.

Many studies (Albury & Byron, 2016; Blackwell, Birnholtz, & Abbott, 2014; Conner, 2019; Frith, 2017; Mason, 2016; Roth, 2014) of locative media app use demonstrate disturbing trends toward the over-simplification of difference among the urban dwellers using the apps. These studies also demonstrate a tendency among users to filter out differences and, in the process reinforcing and reifying existing racisms and other prejudices that al-

ready exist in the offline world. These acts of filtering are arguably more insidious than the offline prejudices in that the erasures being enacted are not visible to those being filtered out.

While locative media apps show great potential to mediate relations between cities and their inhabitants – and among those inhabitants (McCullough, 2006) – the underlying logics being programmed into them by some locative media app developers, and the ways in which the apps are being deployed by users often seek to diminish or erase altogether any visible sign of the diversity of a city. In this way, locative media apps become decidedly anti-urban.

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## Tension between visibility and invisibility: Science communication in new information environments

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### Abstract

The visibility and invisibility of scientific knowledge, its creation, and of scientists are at the core of science communication research. Thus, prominent paradigms, such as the public understanding of science or public engagement with science and technology, have implications for the visibility of scientific knowledge in the scientific community and among the public. This article posits that visibility in science communication is achieved with the availability of scientific knowledge, the approval of its dissemination, and its accessibility to third parties. The public understanding of science and public engagement with science paradigms emphasize different aspects of visibility with the latter focusing on the visibility of the creation of scientific knowledge more than public understanding of science which focuses on the knowledge itself. The digital information environment has engendered new formats and possibilities for visibility but also new risks, thereby creating tensions in science communication.

### Keywords

open science, public engagement, science communication, social media, visibility

## 1 Introduction

Science communication has been studied under several well-known paradigms, from the deficit model to the public understanding of science (PUS) and the public engagement with science and technology (PEST) models (Bucchi, 2008). The public visibility of science, scientific knowledge, and of scientists are at the core of each paradigm. It has been argued that science needs to be visible not only to scientists but also to lay audiences to gain legitimacy, enhance knowledge, promote positive attitudes, and increase engagement (Bucchi, 2008). The advent of online communication has exponentially increased possibilities for the visibility of science (Brossard, 2013). Scientists can become more visible to the broader public through social media, and the public can follow “science in the making” online. Thus, aspects of the scientific process that had previously been invisible to the public have become accessible (Schäfer, 2017b). The concept of visibility is also at the forefront of the open science movement, which advocates for transparency, openness, and

reproducibility. Examples are open-access publishing (i.e., making knowledge freely available to the public), open data (i.e., making research data freely available), and freely available tools for collaboration (Fecher & Friesike, 2014; Klein et al., 2018; Nosek et al., 2015).

However, many scholars have been critical of visibility in science communication. While a majority of scientists are open to collaborating with journalists and believe in the need for the public communication of science, studies have demonstrated that journalists and scientists often have competing goals. For example, scientists believe that they should be able to influence news coverage, and journalists naturally strive for independence (Peters, 2019). Opinions on the visibility of science and scientists are even more divergent in the new information environment (Donk, 2011; Schäfer, 2017b). Some scientists are hesitant to communicate online or through social media because they consider it a distraction from their work (Neuberger, 2014). In addition, scientists are concerned that information can be manipulated or misused (Scheufele & Krause,



2019) or that their reputations in the scientific community could suffer from being too visible online (Dernbach, 2012; Weninger, Weingart, & Wormer, 2017). Thus, the internet has created considerable tension between visibility and invisibility in science communication.

This article utilizes a theoretical perspective to discuss this tension. It first examines the concepts of visibility and invisibility in science communication with a focus on scientists and scientific knowledge. Second, it discusses the prominent theoretical paradigms and their implications for visibility and invisibility. Third, drawing on the research on science communication in new information environments, it outlines the tensions engendered by online media and the management of these tensions by scientists and journalists.

## 2 Visibility in science communication

In order to approach the concept of visibility in science communication, we will first present theoretical concepts of visibility and then, based on these approaches, discuss conceptualizations of the visibility of scientific knowledge and of scientists.

### 2.1 The concept of visibility

Visibility in science communication can encompass *the visibility of scientific knowledge* and *the visibility of scientists*. Thus, conceptualizations of visibility that deal with the visibility of information and content as well as those that deal with the visibility of actors are relevant.

The visibility of information, data, or content has been discussed over the last decades in the context of the societal relevance of information and communication technologies that increase the visibility of information and data (Flyverbom, Leonardi, Stohl, & Stohl, 2016; Leonardi, 2014). In this paper, Stohl, Stohl, and Leonardi's (2016) definition is helpful: "Visibility is a construct consisting of three interrelated empirical attributes: (1) the availability of information, (2) approval to share information, and (3) the accessibility of information to third parties" (p. 125). Thus,

information first needs to exist and be available (e.g., data must be recorded and stored). Second, approval is required for the storage, access, and use of data. Third, data access must be facilitated (e.g., directory knowledge, devices that meet the appropriate technological requirements, and the possession of the requisite technological skills must be available; Stohl et al., 2016). This paper therefore follows this definition and considers aspects of availability, approval, and accessibility when scientific knowledge is of concern.

When concerned with the visibility of actors, theoretical approaches utilized in political communication, public sphere theory, and organizational communication can be drawn on. Thompson (2005) addressed the relationship between visibility and power in his discussion on visibility in political communication and focused on politicians' use of mediated visibility to get elected and maintain power. Schaffer (2019) also hinted at the close connection between visibility and the issues of power and hierarchy. She showed that the term "visibility" refers to the power of self-assertion, being publicly present, and the forming of symbolic recognition (Schaffer, 2019, p. 2). Thus, visible actors, be they individuals or organizations, hold some form of power. This already connects to the idea that visibility is tied to the concept of the public sphere. As Dahlberg (2018) pointed out, the public sphere can be defined in terms of visibility through several facets, such as the notion that a disagreement must be visible – that is, it must be exposed to everyone it affects and also be recognized and understood (Dahlberg, 2018, p. 37). Further, "all individuals affected by a dispute should have equal possibility to see and be seen, hear and be heard, which entails equality of control over seeing and being seen, or hearing and being heard, or visibility" (Dahlberg, 2018, p. 38). As a consequence, the public sphere makes power structures visible. In this case, visibility means that the practices of powerful actors are exposed (Dahlberg, 2018).

Additionally, in organizational communication research, the concept of visi-

bility has gained prominence (Cruz, 2017; Jonkman, Trilling, Verhoeven, & Vliegenhart, 2020). Here, the notion of visibility ranges from an organization being identifiable and recognizable (Cruz, 2017; Scott, 2013) to the notion that it is part of the public discourse (e.g., it is covered in the media; Jonkman et al., 2020). This paper focuses on the visibility of scientists as actors and not on scientific organizations. When conceptualizing the visibility of scientists, we draw on the conceptualization of scientists' exposure to others, their identifiability, and the revelation of power structures in science.

## 2.2 The visibility of scientific knowledge

Against the background of Stohl et al.'s (2016) definition, the *visibility of scientific knowledge* needs to be assessed with regard to scientific knowledge's availability, approval by its creators, and accessibility. It addresses several facets, such as the visibility of the workings of science (i.e., journal articles or media coverage that make available and accessible scientific methods, procedures, and results). Generally, the *visibility of knowledge content* and the *visibility of knowledge creation* are distinguishable (Funck, 2015).

For example, the availability of new research findings on breast cancer can be discussed regarding the visibility of scientific knowledge. This requires the existence and storage of new research findings on breast cancer (e.g., in digital formats, as texts, or as visualizations; this constitutes the availability of information). Approval then needs to be granted for this information to be shared. The scientists must give their approval for the results to become visible through journal articles or agreements to make the data available (this constitutes approval to share information), and the data or texts need to be accessible to third parties. Other scientists must be able to read or to analyze the data on breast cancer (i.e., possession of the requisite software and knowledge). Likewise, the public must be able to access the journal in which the results are published (this constitutes the accessibility of information). The criteria of availability, approval, and accessi-

bility are equally important in the visibility of scientific knowledge's creation. In this example, information about the theories, methods, and data analysis that are used in breast cancer research need to be available, approved, and accessible. The visibility of scientific knowledge's creation has become even more important in the recent debate on open science (Bowman & Keene, 2018; Open Science Collaboration, 2015), which this paper addresses in its discussion on visibility in the new information environment.

The above examples point to another important aspect of the visibility of scientific knowledge: whether visibility refers to *visibility in the scientific system and scientific community* or to *visibility to the broader public* (Neuberger, 2014, p. 337). The differentiation between visibility in the scientific system and visibility to the public is also reflected in various forms of science communication. Science communication comprises the formal and informal communication among scientists as well as by scientists or scientific institutions to the public, and it includes communication about science in the public sphere (e.g., news coverage or the public use of scientific information; Bonfadelli et al., 2017). The availability, approval, and accessibility of scientific knowledge can have different meanings in the scientific system and the broader public. New research findings on breast cancer can be available to other scientists (e.g., through presentations at scientific conferences). Their visibility can be approved (e.g., through approval for other scientists to use the data), and the findings can be made accessible (e.g., through other scientists' knowledge and software with which the data are used). This kind of visibility is usually required within the scientific system because peer review is based on the need to make research findings available, approve their submission for review, and make them accessible to reviewers. The peer review system further highlights the relevance that scientific knowledge's creation is visible because reviewers must evaluate the research process (e.g., its theories and methods).

However, visibility within the scientific system is not the same as visibility to the broader public. Although the general prerequisite of availability is met once scientific knowledge exists, approval and accessibility might not be granted to the broader public. Scientists might not approve of the public communication of their findings on breast cancer prior to peer review. Despite their approval of the public visibility of their findings, the findings might not be accessible to the general public. The public might lack the directory knowledge about the existing scientific information on breast cancer, the skills to interpret the data, or the substantial resources to do so (e.g., ability to pay for expensive scientific journals to access the research; Stohl et al., 2016). This creates an opportunity for science journalism. Indeed, providing directory knowledge, interpreting data, and reducing the effort the public must undertake to access scientific information are some of its core functions (Dunwoody, 2014).

### 2.3 The visibility of scientists

The *visibility of scientists* can be further distinguished as visibility in the scientific community and the public sphere. Thompson (2005) linked visibility to the sense of sight (cf. Schaffer, 2019). Thus, scientists are visible if they can be seen. This visibility was originally situational and reciprocal: an individual who is visible can be seen by other individuals and can also see them (Thompson, 2005). However, this approach limits the notion of visibility in science communication because such visibility often refers to a scientist being known within the scientific community. Visibility in this case is related to a scientist's reputation. Reputation is a form of perception that is based on the evaluation of former performances (Eisenegger, 2005; Vogler & Post, 2019). Thus, it does not equal visibility because visibility, in a narrow sense, does not include this evaluative dimension. A scientist's reputation is rooted in two interconnected concepts: (i) collaboration and (ii) publications and citations (Petersen et al., 2014). Collaborations and connections to the scientific

community provide scientists with visibility, at least within their fields or disciplines, but this does not necessarily mean that they are literally seen by other scientists, though they may benefit from awareness. Visibility in the scientific community is thus, at least regarding publications, detached from a physical presence. Rather, it is connected to being known in the scientific system. It results in a scientist having a good reputation because peer-reviewed publications and the fact that other scientists collaborate with said scientist signifies that their work has been given some approval; otherwise, it would not have been published.

Neuberger (2014, p. 337) differentiated between the scientific and general public spheres. In the academic or scientific sphere, scientists are usually visible only to other scientists and the students they educate. With media coverage, they become visible to the general public. When their visibility is analyzed from a communication or social science perspective, the focus is on to what extent and how they are covered by the media. In most studies on visibility in science communication, a visible scientist is one who has media visibility (Brantner & Huber, 2013; Lehmkuhl & Leidecker-Sandmann, 2019; Peters, 2013; Rödder, 2014). Thus, Thompson's (2005) perspective on reciprocity is no longer applicable to traditional mass media because scientists who are visible on television do not see their audiences. Mediated visibility means that scientists could become visible to audiences over large distances with little or no delay (Thompson, 2005).

In legacy media coverage, scientists' visibility is influenced by several factors: reputation, resources, and communication skills (Rödder, 2014). Hence, reputation is necessary for visibility not only to the scientific community but also the wider public. Highly esteemed scientists are more likely to be contacted by journalists and receive mass media coverage (Jensen, 2011; Peters, 2013; Rödder, 2014). Scientists expect colleagues with strong reputations to have a media presence (Felt & Fochler, 2012). Those with more media outreach resources are also more likely

to receive coverage. Institutional support, such as a press office, facilitates the integration of public outreach into scientists' daily work (Rödder, 2014). Finally, scientists' media visibility can be increased if they are willing and able to contact or be contacted by journalists and adapt to media logic (Peters, 2013; Rödder, 2014).

In theoretical works on visibility, the relationship between visibility and power and hierarchy is often discussed (Schaffer, 2019; Thompson, 2005). In science communication, knowledge is the main criterion, not power. The ideas related to visibility in political communication (e.g., Thompson, 2005) are not completely transferrable to science communication. However, some concepts are relevant. Scientists are usually visible in the public sphere when they accept invitations to be subject matter experts (Grundmann, 2017; Huber, 2014; Nölleke, 2013). Thus, their main avenue for gaining public attention is their knowledge or expertise. However, adding their expertise to the public discourse is not their only communication goal. As Horst (2013) asserted, scientists represent science to the public in several ways: as experts but also as research managers and guardians of science. Their role as research managers relates to their managerial role in academics. As guardians of science, they focus on the meaning of their research to citizens and the role of their communication in improving the public's understanding of science.

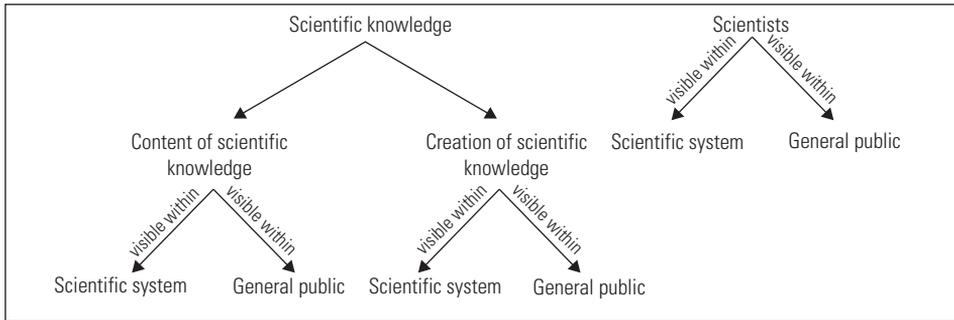
Thompson (2005) painted a dark picture of the results of politicians' inability to achieve mediated visibility: "But equally, the inability to achieve visibility through the media can confine one to obscurity – and, in the worst cases, can lead to a kind of death by neglect" (p. 49). This problem of invisibility is not completely transferrable to science communication. Scientists value their visibility in the scientific system; this, however, can sometimes conflict with their public visibility. Therefore, public invisibility does not necessarily mean neglect – at least, not in the scientific system. Indeed, most scientists who are highly regarded as leading experts in their fields are not visible to the general public

(Rödder, 2014). On the contrary, being too visible in the media can be deemed problematic. Scientists fear a loss of reputation in the scientific community because colleagues can view a media presence as unscientific (Dernbach, 2012).

Even though the scientific system relies on knowledge as its guiding term, the notion of power related to visibility in the public and the scientific system also needs to be discussed. Regarding politicians, Thompson (2005, p. 49) stated: "To achieve visibility through the media is to gain a kind of presence or recognition in the public space, which can help to call attention to one's situation or to advance one's cause" (p. 49). Equally, public visibility through media coverage can attract attention to the results and social implications of scientists' studies. Bourguignon (2017) and Rödder (2014) found that for scientists, public visibility is combined with the hope of increasing their chances to acquire grants and thus strengthen their position within the scientific system. Indeed, scientists who are visible tend to become even more visible (Merton, 1968) and, thus, more powerful in science. At the very least, that some scientists strive for public visibility with the underlying hope that it will lead to power in the scientific system cannot be ruled out.

Figure 1 summarizes the most important theoretical differentiations regarding visibility in science communication. It illustrates the visibility of scientists and scientific knowledge. Regarding scientific knowledge, it also distinguishes between the visibility of scientific content and knowledge creation (i.e., the scientific process). The visibility of scientists, content of scientific knowledge, and knowledge creation can be further differentiated on the basis of their visibility within the scientific system or to the general public.

Figure 1: Visibility of scientists and scientific knowledge



**3 (In)visibility, the public understanding of science, and public engagement with science and technology paradigms**

The histories of science communication and its related models are most commonly divided into different phases: science in the ivory tower, PUS or the popularization of science, and PEST (Gerhards & Schäfer, 2009; Schäfer, Kristiansen, & Bonfadelli, 2015). During the ivory tower phase from the 18<sup>th</sup> century to the mid-20<sup>th</sup> century, communication with the broader public was not important (Felt, 2000); however, scientists’ reputation in the scientific community was. Thus, visibility was confined largely to the scientific system. It was achieved through formal and informal communication among its members (e.g., publications, collaborations, meetings, and conferences).

Around the 1980s, the popularization of science and the concept of the public’s understanding of science became the main paradigms for science communication (Durant, 2010; Miller, 1983). The scientific community placed more emphasis on science communication because of the general public’s lack of interest in and, thus, support for science. The PUS paradigm assumed that the mere enhancement of scientists’ and scientific institutions’ communicative activities was sufficient to improve the public’s scientific literacy (Miller, 1983) and, thus, its support for and positive attitudes toward science

(Durant, 2010; Felt, 2000). It was assumed that news coverage would convey scientific information to the broader public and that journalists would uncritically explain scientific findings.

Visibility thus played a more important role in the PUS paradigm. It is understood as science, scientific knowledge, and scientists’ visibility in the mass media (with the intention to foster positive public attitudes). Therefore, the presence of scientists as experts in the news media and the coverage of scientific results that were selected, simplified, and aimed at lay audiences was at the core of visibility in science communication during the PUS era (Peters, 2013; Schäfer et al., 2015). Peters (2013) asserted that scientists differentiated between internal scientific and public science communication: “This distinction has at least two aspects: the exclusion of the public from communication dealing with knowledge creation and validation, and the conceptualization of scientific knowledge as ‘special knowledge’” (Peters, 2013, p. 14103). Thus, visibility was thought of as the visibility of scientific knowledge but not in its original form. The visibility of scientific knowledge in the news media requires a different form of presentation than in scientific publications. In addition, in the PUS paradigm, public visibility encompasses only scientific knowledge itself and not, at least not to the same extent, knowledge creation and validation (i.e., information about the scientific process).

This changed with the advent of the PEST paradigm. It was acknowledged that merely conveying scientific information through the mass media or other formats of science communication was not sufficient for developing positive public attitudes and scientific literacy. Science communicators stressed dialogic and participatory activities beyond communication through the mass media. Bauer and Jensen (2011, p. 4) stated:

PE [Public Engagement] activities include a wide range of activities such as lecturing in public or in schools, giving interviews to journalists for newspapers, radio or television, writing popular science books, writing the odd article for newspapers or magazines oneself, taking part in public debates, volunteering as an expert for a consensus conference or a «café scientifique,» collaborating with non-governmental organizations (NGOs) and associations as advisors or activists, and more.

Of course, many of these activities were already underway in the previously dominant PUS paradigm. Dialogue and participation, however, were now emphasized. Dialogic and participatory forms of science communication have been shown to increase the public's understanding of science as well as their critical abilities, interest in further scientific information, and perception of science as responsive (Schäfer et al., 2015).

This has consequences for visibility in science communication. First, as a result of public engagement, both scientific knowledge and its creation become visible to the general public via several venues, such as children's universities or science nights. In this paradigm, scientists can demonstrate theories and methods (e.g., experiments) in various formats, such as citizen science programs. Such programs allow the public to experience a scientific project, including the gathering of data and, ideally, their transformation into scientific knowledge. Second, the nature of scientists' public visibility has changed. They are still consulted as experts to disseminate scientific knowledge, but their work can be criticized, and their personal

lives can also become visible (Schäfer & Metag, 2021; Thompson, 2005). Therefore, the visibility of scientific knowledge, its creation, and scientists themselves are crucial in this paradigm.

#### **4 (In)visibility in science communication in the new information environment**

Digitization and the new information environment have provided new opportunities for making scientific knowledge, the scientific process, and scientists visible (for an overview of the changes in knowledge systems, see Neuberger et al., 2019). The internet has engendered changes in the visibility and invisibility of scientists, scientific knowledge, and the scientific process. Therefore, we will now discuss the consequences of visibility in new information environments on scientific knowledge and scientists.

##### **4.1 The visibility of scientific knowledge in new information environments**

The channels and formats utilized to disseminate and access scientific knowledge have increased online. They include collaborative platforms, such as Wikipedia, online video platforms, such as YouTube, science blogs, and, of course, online academic journals. Regarding the visibility of scientific knowledge and its production, these new online formats must be evaluated against the criteria of the abovementioned definition of visibility, which entails availability, approval, and accessibility to third parties (Stohl et al., 2016). Online communication facilitates the availability of scientific knowledge and, occasionally, its production. Usually, scientists approve this availability.

The open science movement exemplifies the possibilities of new visibility through online communication. According to the movement, high visibility is desirable (Fecher & Friesike, 2014). Increased visibility is achieved through transparency in the research process: showing 'science in the making'; preregistering projects in online databases; making the data, code,

and other research materials available online; and publishing the results in open access journals (Klein et al., 2018). In addition, online citizen science projects can increase the visibility of scientific knowledge and its creation. The concept of citizen science implies public involvement in the research process, which can take several forms, from data collection through online gaming and citizen participation in the formulation of the research questions to development of the methods and analysis of the data (Kullenberg & Kasperowski, 2016). Thus, scientific knowledge and the scientific process become more visible to citizen participants.

However, the visibility of scientific knowledge is not always the intention of scientists. Involuntary disclosure is also closely tied to digital media because it facilitates third-party information disclosure (Flyverbom et al., 2016). There is also always a certain degree of competition in science; consequently, scientists sometimes prefer not to disclose their research ideas, hypotheses, or findings to the public or other scientists, lest their ideas be stolen. Invisibility might be preferred for scientists and political actors when science becomes political and affects political actors and policy making (e.g., environmental policy; Lester & Hutchins, 2012). In these cases, scientists or other actors do not approve third-party access to scientific knowledge.

The new information environment increases the risk of uncontrolled or unintentional visibility of scientists and scientific knowledge. In the digital world, controlling visibility is more difficult (Thompson, 2005). Scientific results can potentially be leaked before authors decide to publish them. Another potential pitfall is the strategic manipulation of results or out-of-context use, which can lead to public scandals (Thompson, 2005). One of the most notable examples is the Climategate scandal. The emails of the researchers working on climate change at a British university were hacked and taken out of context to create the impression that the researchers were manipulating

their data (Bowe, Oshita, Terracina-Hartman, & Chao, 2014).

Scientific conferences, which were formerly closed to the public, have been shaped by these developments. In recent years, scientists are increasingly using social media, usually Twitter, to post content from conferences (Bik & Goldstein, 2013). This can include taking pictures of their peers' presentations and posting them. While some scientists enjoy keeping up to date by following a conference's hashtag, others are not comfortable seeing pictures of themselves or their unpublished results on social media. Accordingly, some conference organizers started using signs through which presenters can indicate whether or not pictures can be taken during their presentation (for an example, see the Social Media Guidelines for the World Marine Mammal Conference from 2019). Nevertheless, for scientists who do not have Twitter or other social media accounts, visibility on social media is hard to control: since they cannot be tagged by peers, they do not get notified when someone is making them or their findings visible on social media.

Another aspect of the tension between visibility and invisibility becomes apparent when the content of online scientific knowledge is considered. The digital media enable the dissemination of scientific information by anyone (Neuberger et al., 2019), thus increasing the amount of scientific knowledge available to the public. However, this also creates the possibility for the dissemination of misinformation (Scheufele & Krause, 2019). This issue has been discussed in analyses of the online circulation of misinformation related to climate change and other environmental issues (Kaiser & Rhomberg, 2015; Ladle, Jepson, & Whittaker, 2005). Thus, although scientific knowledge becomes available and accessible for a broader audience online, the same holds true for misinformation.

Within the PUS paradigm, this creates tension because the basic idea is that the spread of scientifically correct information promotes positive public attitudes toward science. Since the effects of the dissemination of scientific misinformation are still

unclear (Scheufele & Krause, 2019), the societal consequences of scientific misinformation online need to be researched.

These examples demonstrate the possibility of the permeability or even collapse of the distinction between the visibility of scientific knowledge in the scientific system and its visibility to the general public in the digital information environment. What is visible to the scientific community could easily become visible to the general public. This highlights the first tension regarding visibility in science communication in a digital world: *the tension between the increased visibility of scientific knowledge and its creation to lay audiences and the risk of information and data theft, manipulation, and out-of-context use.*

The tension between visibility and invisibility in the digital world is also apparent in science journalism. Science journalists were traditionally responsible for making scientific knowledge and experts visible to the general public; however, their role has changed. Working conditions have worsened since the late 1990s and early 2000s. The 24-hour news cycle has created greater time pressures, and journalists have fewer resources (Schäfer, 2017a). Economic pressures are of great concern to traditional journalism in general. This is, however, exacerbated for science journalism, which, as a specialized field, is often regarded as expendable during difficult financial circumstances (Allan, 2011). This situation has led many media companies to shed staff and reduce or even close their science departments (Scheufele, 2013). One of the consequences could be a reduced visibility of scientific knowledge. The science journalist, the traditional intermediary through whom scientific knowledge became available and accessible to the general public, is less able to fulfill this function and, thus, to contribute to increasing the visibility of science.

The internet has certainly contributed to the economic problems of science journalism and thus, indirectly, to the potentially reduced visibility of scientific knowledge. However, it has also given science journalists new opportunities to make scientific knowledge visible to the broader

public. Journalists can use online applications, particularly social media, to publish news about scientific findings, interact with their audiences about their work, and conduct research for their stories (Brumfiel, 2009; Schäfer, 2017a). Thus, the new information environment creates *tension* with regard to the visibility of the scientific knowledge disseminated through science journalism: *on one hand, digital media is a factor in the demise of traditional science journalism, thus heightening the invisibility of scientific knowledge; on the other, it has created new possibilities for science journalists to make scientific knowledge visible to the broader public online.*

#### 4.2 Visibility of scientists in new information environments

The emergence of online media has created new tensions regarding the visibility of scientists. Studies on scientists' interactions with journalists and the mass media have repeatedly shown that public outreach and media contact have been common but not routine (Peters, 2013, 2019). In traditional media environments, interactions with journalists and the mass media has already created tensions among scientists. Most scientists believed that public outreach was necessary because of the potentially positive effects of external science communication (Peters, 2013). However, this outreach was not always appreciated by their colleagues and the scientific community (Rödder, 2014). There were concerns about the misinterpretation or misuse of scientific knowledge and journalists' failure to contact those scientists who, in the view of the scientific community, were the leading experts. Therefore, scientists who engaged in science communication to the broader public had to navigate these issues.

These tensions have been heightened in the PEST paradigm. For scientists, online communication increases the opportunities for visibility and direct contact with lay audiences (Brossard, 2013), and it can be used to combat misinformation (Scheufele & Krause, 2019). The PEST paradigm encourages scientists to engage with the public through all possible

formats, online formats being important among them. Scientists now have to decide whether to have a social media presence, present research projects on a website, or involve the public in projects via online citizen science activities. They also have to consider the potential pitfalls of this engagement, such as the misuse of scientific knowledge and public criticism (Lewis, Van Bavel, Somerville, & Gruber, 2018).

At the same time, social media can also be a tool for fostering diversity in science communication by enhancing visibility. First, *who* becomes visible through social media is more diverse. For example, female scientists, who are still underrepresented in traditional news coverage (Chimba & Kitzinger, 2010; González, Mateu, Pons, & Domínguez, 2017), can use social media as a tool to gain visibility or for empowerment, as studies on protests of female scientists have shown (e.g., Brantner, Lobinger, & Stehling, 2019). Second, visibility on social media can also enhance the diversity of *how* scientists are represented. While traditional news media usually depict scientists in a stereotypical way (e.g., sitting in front of a bookshelf or wearing a white coat; Christidou & Kouvas, 2013), scientists can make their own choices about how they would like to present themselves on their social media accounts, ranging from the use of an official picture provided by the university to personal pictures, avatars, or selfies (Jarreau et al., 2019).

Consequently, scientists must navigate the *tension of creating visibility for themselves and their work more easily through online communication and the potential dangers of online visibility (e.g., reputational harm, misuse of scientific knowledge, and public criticism or even hostility)*. Thus, invisibility to the general public is sometimes preferable. This tension must be considered by science communicators (e.g., university press offices or policy makers) when encouraging scientists to communicate through the new digital tools and spaces (Rödder, 2014).

## 5 Conclusion

The goal of this article was to disentangle the concepts of visibility and invisibility in science communication. It conceptualized visible scientific knowledge as knowledge that is available, approved for dissemination, and made accessible. When conceptualizing the visibility of scientists, this article drew on the conceptualization of their exposure to others and the revelation of power structures in science. The article has highlighted the differences in the application of these definitions to scientific knowledge and on scientists as actors on the basis of their visibility in the scientific system and to the general public. Science communication research is concerned with both kinds of visibility, and discussing its dominant paradigms has highlighted changes in the importance of visibility and invisibility in science communication. While visibility to the general public was traditionally confined to the visibility of scientific knowledge, the PEST paradigm has led to increased focus on the visibility of knowledge creation.

The online environment offers many formats, spheres, and applications for making scientific knowledge, its creation, and scientists visible. Some of the tensions identified in this article cannot be attributed to the internet, at least not initially. However, most have been intensified by online communication. They can be condensed into three categories:

1. The tension regarding *scientific knowledge and its creation* refers to the relative ease of making scientific knowledge and its creation available to the general public through online communication. This comes with the risk of data theft, misuse, manipulation, or out-of-context use. Not only can scientifically correct information be manipulated, but scientific misinformation can also be disseminated.
2. Science journalists must deal with conflicting developments associated with the digital media environment. On one hand, the digital media is a factor in the demise of traditional science jour-

nalism and the increased difficulties in making scientific knowledge visible in the public sphere that traditional mass media created. On the other hand, online communication has created new possibilities for science journalists to make scientific knowledge visible to the broader public.

3. Scientists face the tension of creating visibility for themselves and their work more easily through online communication and dealing with potential dangers and risks. Digital visibility provides opportunities for having direct contact with the general public, making research comprehensible or engaging in direct discussions, and combating misinformation. This comes with the risk of reputational damage and exposure to public criticism and even hostility.

This article focused on the definition of visibility in science communication, the information that becomes visible, the circumstances under which it does, and the shaping of this visibility by various actors. Thus, there is often an underlying notion of strategic communication. Visibility can certainly be used strategically. It relates to the notion of visibility management (Flyverbom et al., 2016). This is also the case in science communication as strategic communication is an important aspect. Universities have expanded their public affairs offices (Fähnrich, Metag, Post, & Schäfer, 2019) to advance their strategic interests by communicating the scientific knowledge that is created at their institutions. Through this strategic management of visibility, institutions and scientists try to maintain or enhance their reputation, increase the public's understanding of and engagement with science, and gain other potential benefits, such as improving their chances of acquiring future funding.

Scholars have assumed that several of the abovementioned visibility strategies would increase the transparency of science and knowledge creation (Klein et al., 2018). Transparency is often regarded as an ideal state in which everything is visible (Ananny & Crawford, 2018; Hood, 2006) or a state

of absolute disclosure of all information (Albu & Flyverbom, 2019). The desirability of this is debatable: increased visibility is not necessarily accompanied by a linear increase in transparency. Stohl et al. (2016, p. 131) formulated the “transparency paradox,” which states that online communication and increased visibility can create information overload. The overwhelming amount of available information could enable actors to strategically conceal information in the endless amount of visible data. Because the amount of available information would be unmanageable for users, information could be visible but not transparent (Stohl et al., 2016). Potential examples of this strategy in science communication include making so many details about a research project available that the methodological problems are not apparent because a lot of information needs to be combined in the correct manner.

This article has also shown the limits of a strategic management of visibility. Especially online, visibility or invisibility can quickly become uncontrollable (Thompson, 2005). The concept of visibility in science communication is not confined to strategy. The aspects of scientific knowledge that are actually visible and invisible, how these should be determined from a science of science communication perspective, and how the scientific community, general public, and other audiences perceive the new visibility of scientists and scientific knowledge must be considered. With regard to public engagement with science, it is necessary to discuss the influence of the visibility and invisibility of scientific knowledge on the public's knowledge about and attitudes toward science as well as their trust in science and scientists (Schäfer, Fuchslin, Metag, Kristiansen, & Rauchfleisch, 2018).

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## From fade-out into spotlight: An audio-visual character analysis (ACIS) on the diversity of media representation and production culture

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### Abstract

The article focuses on gender portrayal in audio-visual media and discusses the visibility and participation of diverse people. Based on a theoretical framework from gender media studies, we conceptualize audio-visual visibility as a dimension of intersectionality and apply this in an empirical approach. Audio-visual character analysis (ACIS) is introduced as a method to investigate media content in order to describe visibility of the represented people. Applying this method, a quantitative content analysis of a representative sample of German television from 2016 was realized to answer the research questions on the portrayal of relevant characters and on the positions behind the camera. The findings show an unequal representation of gender and an intersectional relevance of other categories of difference such as age as well as an interplay between gender of creative positions and visibility of female characters. The article discusses findings and implications for future research.

### Keywords

audio-visual character analysis (ACIS), diversity, intersectionality, gender equality, media production culture, media representation

## 1 Introduction and state of research

Diversity and the media is a vivid issue around the globe. Hereby the matter of visibility on screen, regarding the representation of different people, as well as the participation behind the screen, regarding the diversity of media production, is of relevance. Just recently, activist voices and movements, like *Time's Up*, *5050X2020*, *Inclusion Rider* and *#OscarSoWhite* have contributed to a critical debate on unequal production culture. In Germany, especially the organization *Pro Quote Film* is addressing the issue. For example, the fact that in spite of an equal gender proportion of directing students at German film schools, only one fifth of television is directed by females (Prommer & Schoeller Bouju, 2020).

Screen industry has dealt with the challenge of digital change and is nowadays not only producing traditionally film and television. It turned into a convergent

and highly digitalized media production sector with strong overlapping to social media content and online distribution.

In light of an established convergence culture (Jenkins, 2006; Jenkins & Deuze, 2008) including digitalization of production and distribution, audio-visual media is always *digital audio-visual media* and a vivid part of media culture in the digital age (Storsul & Fagerjord, 2010). There is no “non-digital” media anymore. We see digital convergence on the production side, the distribution side and the audience side. Audiences can watch a digitally produced movie in a movie theater, but also stream it via platforms. Even though we are aware that analog technologies are still present, usage, storage and distribution of audio-visual media are by now mainly digital. Although audience statistics show the relevance of the digital streaming platforms for the younger audience (Frees, Kupferschmitt, & Müller, 2019, p. 317), there are no publicly available figures



from the well-known streaming providers such as *Netflix* or *Amazon Prime* on what specific content is used on the respective platforms, how often and for how long. But sporadic publications from market research are available, which show that series produced for linear television, such as *Modern Family* or *Game of Thrones*, actually have the most viewers on *Netflix* & Co. Originally produced content for the streaming platforms is accordingly less frequently accessed. In its list of the ten most frequently streamed series in December 2019, the German market research company *Goldmedia* lists eight series that were first broadcast on linear television. For example, the most frequently viewed series in 2019 was *Big Bang Theory* (Birkel, Kerkau, Reichert, & Scholl, 2020). Seen in this light, research on visibility in the digital age has to include audio-visual media and hereby the oftentimes seen as traditional, but highly digitalized television media.

Regarding the situation behind the screen, research shows a complex but not complicated picture of gender inequality (Loist & Verhoeven, 2019). Since the digitalization of the film and television sector, a paradox can be observed, as the digital media industry gives access to production to a much wider range of people while at the same time reproducing old and new forms of hierarchies and inequalities. In her case study, Vicky Mayer (2011) shows the hidden issues of gender, ethnicity and class as well as location and place and formulates a critique of the new media economy. Feminist production studies analyze mechanisms of inclusion and exclusion and put a spotlight on hidden (female) labor in media production within the industry (Banks, 2009). Media industry, together with a number of creative industries, reveals gendered patterns of disadvantage that are increased by requirements for flexibility in media organizations (Conor, Gill, & Taylor, 2015). Women in particular are in a difficult position dealing with new requirements of self-presentation on the one hand and old patterns such as social and familial responsibilities on the other.

When it comes to diversity on screen, especially gender representations on television draw on a long research tradition worldwide (e.g., Küchenhoff & Boßmann, 1975; Sink & Mastro, 2017). However, the question whether the recent changes in the audio-visual media industry have contributed to a more equal situation regarding visibility and participation of diverse people is not answered profoundly. In the US, the actress and producer Geena Davis has been a pioneer on addressing not only the imbalance of gender in the media. She has also been advocating the issue of a connection between role models on screen and societal change. The motto “if she can see it, she can be it” stands for this interrelation and the need to call for it is underpinned by the research of Smith, Choueiti and Stern (2012) showing that female characters are underrepresented in US television. In primetime, there is an average of 39 percent female leading characters. In children and family programs only one-third of the leads are female. Aside from this general underrepresentation, female characters were also seldomly depicted in professional leadership positions. A more recent study also shows an imbalance of gender depiction for primetime television and contradicts the popular theses of a “golden age for female television” (Sink & Mastro, 2017).

For German television, the last representative study of gender representation was published in the early 2000s. Küchenhoff and Boßmann found in 1975 that women were severely underrepresented, and only a small percentage were given serious plotlines or took part in conversations of social relevance. Their summary of the research: “Men act, women occur” (Küchenhoff & Boßmann, p. 142). Fifteen years later, Weiderer’s (1995) research presented a wider image of women on television, but highlighted that women are usually shown in a lower-level professional position and were still underrepresented. Even in 1990, the year of the study, women were less frequently shown, were stereotypically young, slim and immaculately beautiful. Women of advanced age were hardly ever encountered. In contrast to

Küchenhoff and Boßmann (1975), women were now seen more frequently in news and topics presented by women were less marginal, but the speaking time of females in information programs made up less than half of those of males. Weiderer measured news time for women of 193 seconds and 499 seconds for men (Weiderer, 1995). In conclusion, Weiderer stated that in 1990 women still were shown in the lower order of priority. The last comprehensive analysis by Lukesch (2004) was conducted in 2002: A sample of about 440 hours of public and commercial television showed once again that females are less likely to occur than males – with a ratio of 35 to 65 percent. At that time, too, the authors found that television was not a mirror image of society, but that women here again were represented as young and beautiful. Looking at specific genres like fictional television series, previous studies (Externbrink, 1992; Scheer, 2001; Weiderer, 1995; Wenger, 2000) showed that the representation of women in series of the 1990s is mainly focused on partnership and family.

What is striking is that there is no more recent representative study for gender images on television in Germany. The question about the visibility of women and men is not part of the regular program research of the television stations. In annual program analysis, which are published for example in the media research journal *Media Perspektiven* (Krüger, Zapf-Schramm, & Jung, 2018), there is no specific gender breakdown. An analysis according to function and age does not occur.

Current studies that deal with diversity and depiction on screen focus on specific genres (Lünenborg, Linke, Konrad, Fritsche, & Flecke, 2012; Wolf, 2008). For both German and international children's television, for example, the overrepresentation of male (hero) roles has been confirmed (Prommer & Linke, 2019; Prommer, Linke, & Stüwe, 2017). Comprehensive and representative data on the situation for German-speaking television was not available when we started the empirical research in 2016. Therefore, our project aimed at realizing a theoretical founded empirical study that analyzes the visibility

of diverse people with emphasis on gender representation. We define visibility as the audio-visual representation on screen and look furthermore into the interrelations between visibility and socio-structural inclusion in media production.

## 2 Theoretical background and conceptual framework

It is not a single program or movie that enfolds an overpowering effect on an audience or on an individual person. Over decades cultural studies have elaborated on the subject and have shown that it is much more the everyday cultural interaction through and with media that is shaping our shared meanings in representations (Hall, 2013). How people are portrayed and how their gender is represented in the media creates ideas of the life world and of identities, which have an impact on the identity construction of the recipients (Klaus, 2005). However, it is important to acknowledge that this media picture is not a mirror of society, but it rather actively produces and reproduces role models and representations of people as well as identities that are based in the structure of an existing media production industry. There is thus a tendency to reproduce and cement traditional gender representations. Laura Mulvey (1985) argues that the representation of females via the male gaze represented in patriarchal Hollywood cinema is threefold: A male director as instructor, a male camera perspective through the cinematographer and a male viewer respectively male audience the film is made for. Still, studies find evidence that this cinematographic apparatus is in place and is creating audio-visual ideas of women and femininity that become part of the societal construction of reality (Lünenborg & Mair, 2013).

Klaus (2005) has systematized feminist media research into three basic categories: equality approach, difference approach and the (de-)constructivist perspective. She argues that all three perspectives must be integrated into a feminist perspective. Our perspective on the visibility/invisi-

bility of diverse people and gender in digital audio-visual media takes all three approaches into account. On the one hand, we define quantifiable categories and will measure the visibility with the normative goal of equal representation. On the other hand, we acknowledge that industry structures and journalistic routines influence audio-visual visibility. In order to grasp these interrelations, we correlate the visibility data with data regarding content creators' gender differences. Lastly, from a deconstructivist perspective we interpret our findings in the context of existing power structures in society and media industries and try to uncover the 'doing gender' in digital audio-visual media.

Regarding the analysis on visibility in audio-visual media and the theoretical framework the following research questions are addressed:

1. How diverse with regard to gender and age are relevant characters on German TV-screens?
2. How are relevant characters portrayed in television?
3. How diverse are the positions behind the camera casted? And, does this have an influence on the visibility of diverse people?

To analyze these questions, we use the perspective of deconstructionist, anti-identitarian gender theory (Butler, 1990, 2009) as well as intersectionality theory (Crenshaw, 1989). Winker and Degele (2011) have shown that issues of equality and anti-discrimination should not just be based on single-issue categories such as gender. At the same time, we acknowledge that statistics are employed in evidence-based argumentation to affect political strategies and change legal frames. We therefore combine the intersectional theory with communication theory addressing media representation and methodological work especially on media content analysis. This empirical approach is based on the definition of distinct categories and the proverbial counting of manifestations on visibility in the media text. However, such pragmatic, clear categories seem to be

at odds with deconstructionist theories, which are set up to problematize clear-cut identities and categories. We are aware of this aspect and aim to problematize normalizing action. At the same time we value the anti-normative potential of quantitative analysis in order to bring invisibilities into spotlight (Brown, 2010). Therefore, we conceptualize audio-visual visibility as a dimension of intersectionality and apply this dimension in a quantitative empirical approach. This perspective is based on an understanding of societal roles as for the most part not firmly established, but rather shaped fluidly through engagement with the social environment (Butler, 1990). Gender is understood as a social category, and this perspective is interwoven with an observation of people's social behavior, their "doing gender" (Fraser, 2007; West & Zimmerman, 1987). As media has an important cultural impact, it is also the "doing in / on media" that is of interest. Research on gender and media has a long history and especially questions of representation, production and consumption can be highlighted (Krijnen & van Bauwel, 2015). Over and above gender as one of the most discussed and social relevant categories of difference, a perspective on the diversity of media representation enables an integrative perspective for media studies (Linke, 2016). In order to focus on the visibility of diversity on German television and to answer the research questions above, we will in the following describe our methodical approach to identify visibility of human representation and to interpret this visibility as a dimension of intersectionality.

### 3 Method and procedure

In order to answer the research questions a study design was developed with the following propositions: The study should include comprehensive material of German television. The data should be comparable and enable representative statements on the research questions regarding gender, age, and a visible function of the persons (like news anchor or politician) and provide information about a possible causal-

ity between diversity in front and employment behind the camera. Aiming at an overall picture for Germany, we decided to include the major television broadcast and cable stations to gather representative data (for more information, see Prommer & Linke, 2019, pp. 33–47). The method of choice was a quantitative content analysis that allows for a systematic, structured and comparative analysis of larger amounts of material (Krippendorff, 2018). It is used in communication and media studies to identify a measurable portrayal of topics or characteristics in different media.

Our specific aim was to find a robust and comprehensive approach to identify visibility of human representation and to interpret this visibility as a dimension of intersectionality in nowadays mediated life worlds. We therefore designed a methodical approach we refer to as *audio-visual character analysis (ACIS)* that enables to investigate how often and in which roles people appear in fictional productions, entertainment and information programs. ACIS enables to point out certain differences in the material. This is necessary because television contents are differently structured. There are also differences within television between television genres, for example between news programs in the information area or quiz shows in the area of non-fictional entertainment. The analysis of the television programs distinguishes quite classically the three program sections *fiction*, *non-fictional entertainment* and *information*. Fictional programs are series and television films with fictional actions and stories. The non-fictional entertainment refers to formats that reflect real facts, settings and situations but with a primarily entertaining character, for example quiz or music shows. Information includes journalistic genres, such as news broadcasts, talk show formats and documentaries, as is best described by its characteristic of news values. Each of the three program sections can be differentiated further into different formats (Weiß, Beier, & Wagner, 2015).

ACIS combines elements of standardized quantitative content analysis with

narrative and reception-aesthetic film analysis (Eder, 2013; Mikos, 2008). For each program section, the relevant characters were measured. Since different program divisions were examined, different definitions of what the main characters and protagonists are, were used. There is a lively debate in film studies on how to define the fictional protagonists and how to record them analytically (e.g., Mikos, 2008, pp. 163–170), which ultimately leads to a wide variety of definitions. Thus, a robust definition that is applicable to all formats had to be found for empirical implementation. These definitions were subjected to multiple inter- and intra-coder-reliability tests and proved to be valid, reliable and stable for the respective program sections and genres ( $\emptyset$  ICR: .89 for the ACIS core variables ranging from .80 to .98).

For the fictional programs, we use the term *protagonists* in accordance with the figure theory of the film scholar Jens Eder. Protagonists are the figures who take on a leading role and pursue central narrative goals (Eder, 2013). A “protagonist” is the character who is the driving force behind the story and who acts in a goal-oriented manner. Furthermore, protagonists in television series were distinguished above all by their enduring character, i.e. they were part of the series’ permanent ensemble. The combination of narration and ensemble related criteria helps to identify relevant figures in audio-visual media.

For television content without scripts and plots (like news or entertainment shows) it was important to determine the visibility of people by other criteria. For this purpose, we inductively developed a robust definition from the work with the specific programs. In non-fictional television broadcasts people are both visually (frequency, density and focusing) and audibly (voice, intercom) perceptible. In information/journalistic formats and in non-fiction entertainment formats, the analysis focused on the *main characters*. In information formats (e.g., German news broadcast “Tagesschau”), three criteria had to be met: A name was mentioned (e.g., is written and/or clearly

Table 1: ACIS coding of the relevant characters

Fictional program	Information program	Non-fictional entertainment
protagonist = the character who is the driving force behind the story and who acts in a goal-oriented manner	main character = each person who is centrally visible <i>and</i> has their name mentioned <i>and</i> speaks (e. g., TV host, news anchor, journalist, reporter, politician, expert, guest)	main character = the person leading through the program (e. g., quiz master, but not the guests; show host, but not candidates)

Summary term: *relevant characters* on German TV as an umbrella term for protagonists and main characters

stated twice), the person was audible (e. g., moderation or original sound) and visibly central to the image section shown. Main criterion in the non-fictional formats was whether the person was in a leading position and became the main character of the program (Table 1).

The ACIS takes up the perspective of the audience, thus excluding editorial and professional contextual knowledge or background knowledge. Instead, only what becomes visible and audible in the broadcast flows into the coding.

First, the appearing persons on TV and their roles (here: protagonist, main character) were identified in the coding process. Then the characters were examined in more detail by analyzing individual characteristics such as gender, age, sexual orientation and specific characteristics that can be clearly coded (e. g., body shape, relationship status, parenthood, profession). The gender of the characters was basically coded non-binary, i. e. openly. Apart from a binary understanding of gender (females and males), all potentially possible categories such as inter- or transsexual or neutral could be coded (referred to here as “other gender”). The same procedure was applied to sexual orientation, with all other possible variants being recorded in addition to hetero-, homo- or bisexual.

By using the ACIS and thus taking the perspective of the audience without prior knowledge, the characters relevant for the analysis had to be explicitly addressed with a gender (female, male or other gender) or made recognizable by themselves. The procedure also applied to sexual orientation. In this context, it must be mentioned that sexual orientation, if it was not explicitly mentioned, was to be coded as “not recognizable”. This led to a high number,

over half of the appearing characters with not recognizable sexual orientation, since this applies to almost all persons in news and information programs. In addition to the gender, other factors such as age and thematic context were examined. The category system was checked for validity and reliability in several stages. Coding was realized by six coders who were trained extensively and were guided through the process. Test coding in the pre-evaluation phase led to a reworking of the code surveys to allow a precise adjustment of the examination instrument to the object of study. Selected examples also supported this process. The inter- and intra-coder agreement in several stages ensures that the coding is valid and unambiguous ( $\emptyset$  ICR: 0.86 ranging from 0.80 to 0.98).

The study is based on a quantitative content analysis of a representative sample of German television from 2016 (over 3500 hours, 21 TV programs). This data provides a comprehensive picture of the current situation on German screens. To capture this representative sample, a 14 days sample of two artificial weeks (random sample) composite of television programming (2 to 12 p. m.) across 17 major public service and commercial broadcast networks was constructed. This random sample is representative for 85 percent of the German television market.

The sample was analyzed with the ACIS-based coding system. The first step defined a single program as the unit of analysis. All programs were coded regarding the visible characters and their characteristics. Furthermore, other categories for the program and the genre of media were coded according to an own adaption of an established program scheme of German television (Weiß et al., 2015). In total for

regular TV 2945 programs were analyzed with ACIS adding up to 11 144 protagonists and main characters.

Moreover, the gender of the people behind the camera was coded. In the following, we present the data for the five creative positions that were examined for each fictional TV program. It was coded whether a man, a woman, a women’s team, a men’s team or a mixed-gender team was responsible for the direction, the screenplay, the production, the camera department and as commissioning editor(s).

#### 4 Findings

We have organized our findings along the research questions addressed: (1) How diverse with regard to gender and age are relevant characters on German TV-screens? (2) How are relevant characters portrayed in television? (3) How diverse are the positions behind the camera casted? And, does this have an influence on the visibility of diverse people? The last question leads to an interrelation between the gender of the content creator and the visibility of female characters.

The following figures are all based on statistically relevant and significant results. They are representative for the German television of the year 2016.

#### 4.1 Research question 1: How diverse with regard to gender and age are relevant characters on German TV-screens?

##### 4.1.1 Key finding 1: Unequal representation and age gap

The first findings of the study show that a binary visibility of gender is manifested in German film and television. Non-binary gender representations are almost non-visible (n=9 of 11 144 main protagonists). Thus, the data show that transgender and other gender identifications are not represented in German television. This is evidence for a non-diverse representation in German media industry that must be profoundly problematized and reflected. Against the background of this situation, the following analysis focuses on the underrepresentation of females.

Regarding the representation of female and male main characters in journalistic content (information) and protagonists in fictional and non-fictional entertainment, for German television the study shows an overall underrepresentation of female relevant characters. Across all television programs and genres there are two men for every woman (Figure 1). One third of the programs do not have any female relevant characters at all (compared to only 15% female only programs). Only telenovelas

Figure 1: Gender representations of relevant characters in German TV programs (n=11 144)



Note: Female n=3,659 (33%), male n=7,485 (67%).

Figure 2: Gender distribution of main characters and protagonists by television genre (German productions or co-productions) (in percent)

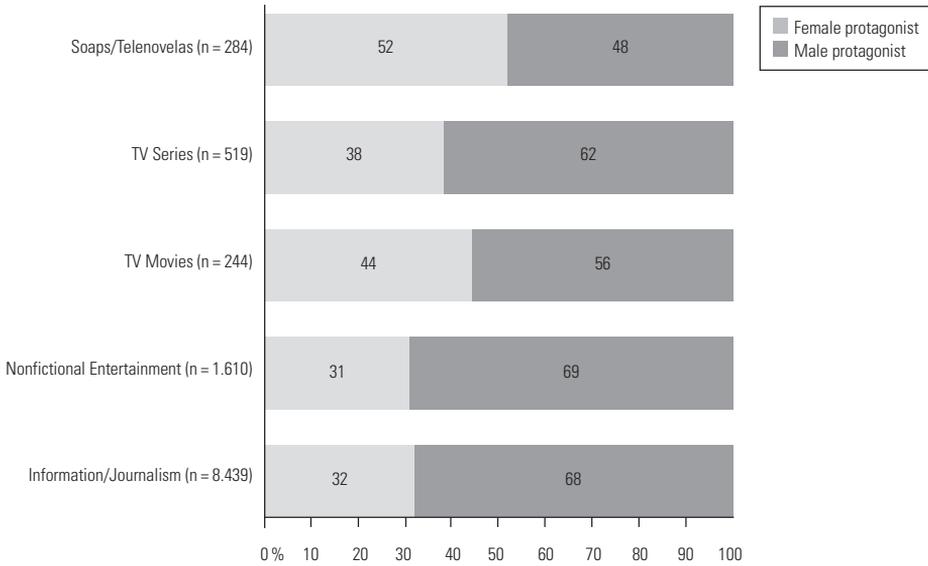
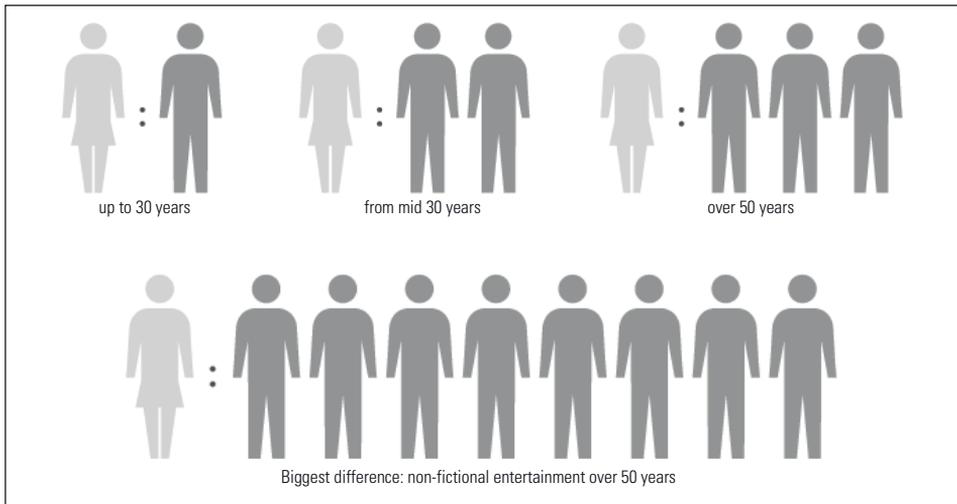


Figure 3: Age-gap in German television, n = 10663

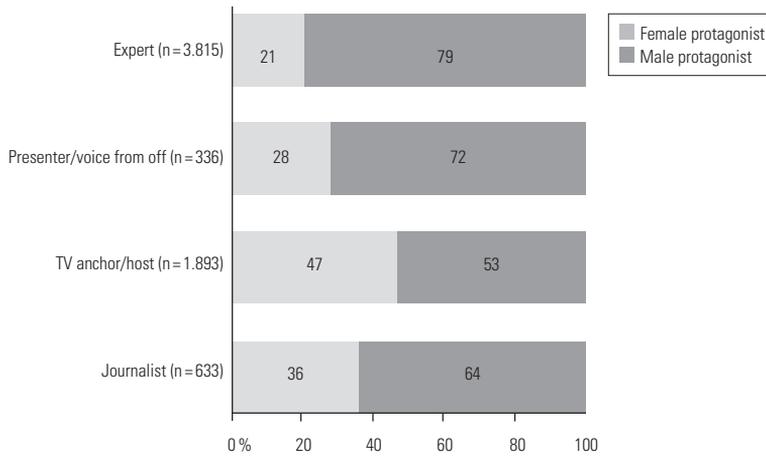


and daily soaps are representative of the actual gender distribution in Germany, i. e. about 51% women and 49% men. However, these formats only account for 3% of all programs. This finding concerns all TV

stations, public and private, and nearly all genres (Figure 2).

If women appear, they appear as young women (Figure 3). From the age of 30 onwards, women gradually disappear from the screen. This applies to all stations and

Figure 4: Journalistic functions in information programs by gender (in percent)



across all formats and genres. Up to the age of 30, women appear more often (in fictional and non-fictional entertainment formats) or about as often as men. From the mid-30s on, the constellation changes: In this age-group there are two men for every woman. From 50 years of age on there are three men for every woman. The biggest difference we find in non-fictional entertainment: Over 40 there are four men for every woman, over 50 there are eight men for every woman.

**4.2 Research question 2: How are relevant characters portrayed in television?**

*4.2.1 Key finding 2: On TV, men explain the world, women are faded out*

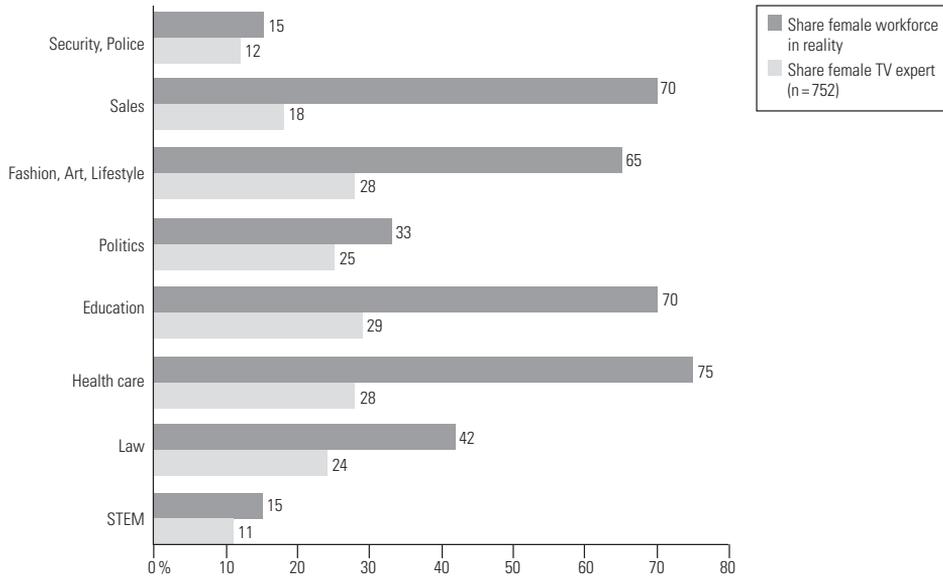
Since women are overall underrepresented in all TV genres but telenovelas, we wanted to see if there are journalistic functions, such as television anchor or expert, where women might be more or less visible. The only function, where we see an almost gender balance, is the TV news anchor. In all other functions (e. g., voice from the off, visible journalist, expert) females are underrepresented. Regarding the function, the portrayed persons filled in fictional as well as in information genre, the data show an imbalance especially regarding the gender of experts. Eight out of ten ex-

pert functions are occupied by men, both in information and entertainment shows. Figure 4 documents the situation for the information program section in detail.

In order to understand this lack of female experts, we decided to include external data to investigate this issue more closely. One explanation would be that there might be fewer women available as experts because hardly any women work in these professions and subject areas. An argument that we often heard in discussions with journalists and media decision makers: “What are we going to do: The mayor or foreign minister is male?”

Aiming to determine whether there are enough women available as experts, we used data from the German Federal Statistical Office on the gender distribution in the various professions and researched the respective professional associations, such as the German Medical Association, the Bar Associations, and the German Association of Lawyers. It shows that even in those professional fields in which women are overrepresented in reality, they remain comparatively underrepresented on television. Thus, television shows an outdated picture of living environments and a distorted picture of our social reality.

Figure 5: Women experts and their professional fields: Comparison of relevant characters in information television programs and real life in the professional field (in percent)



In detail: In real life, half of the judges as well as the prosecutors in the German legal system are female prosecutors (Bundesjustiz, 2017). However, since more men than women work as independent lawyers, we have averaged the sums proportionately and arrived at a gender distribution in the professional field of “law” of 42% women and correspondingly 58% men. Looking at the number of female experts in the field of “law” in the information programs, women appear almost half as often as in real life (24%, see Figure 5). The situation is similar in the area of “health and care”. The German Medical Association (Bundesärztekammer, 2017) reports that in 2016 half of all doctors were female. Medicine is a field in which women are so powerful and strong that even some male university professors are demanding a male quota for admission to university (Pospiech, 2018). There is, however, a drastic under-representation on TV. In the field of “health and care” we see women less often than in real life. If we weight the different occupational groups, three-quarters of the people working in the health and care sector are female. This

proportion is different for female experts on screen. On German television, women are represented by only 28%. In other words: They are under-represented by 300%, i. e. they are almost three times less common than in reality.

The same picture emerges in the area of “education”. A look at the schools shows: In the classrooms female teachers predominate, often women run the schools and there are many more female kindergarten teachers than male (Destatis, 2020). Overall, women are very active in the area of “education” accounting for 70% of the total (Destatis, 2020). As TV experts they are again underrepresented: Only 29% are women, 71% are men. In other words, men are more than twice as likely to appear on television in this professional field as in real life. This disproportionate number of men is present in all areas, whether in the financial sector, the service sector or in sales professions.

There are a few exceptions: In the field of “politics and administration” women are almost as common as in real life. We see 25% women as experts on television, whereas in 2017, in fact, about 33%

of those working in politics were female (Bundestag, 2020). Although fewer women politicians appear on television than in real life, the difference is not as marked as in other areas. In the professional fields of “security and police” as well as in the STEM (in German “MINT”) professions, women are also shown roughly in line with reality.

We have also examined television series, soap operas and television films according to the same logic. There, too, we have assigned all protagonists, if possible, to the professional fields in which they work (total protagonists with identifiable professions  $n=976$ , female  $n=298$ , male  $n=678$ ). It should be mentioned here that authors have the freedom to write more female politicians or chief physicians in their scripts. At the same time, it must be stressed here that fiction per se does not have to reflect reality.

The picture also lags frighteningly behind reality. Even in fiction, women appear less frequently in the professional fields than in real life. On German TV screens, there are half as many women bankers, lawyers, doctors and nurses, fewer female administrative staff, teachers and educators than in real life. The only exceptions are the many female commissioners of crime series. In the field of “security”, female protagonists are more strongly represented in fictional programs than in real life, at 28% they appear almost twice as often (15%, Destatis, 2020).

Otherwise, however, women are less frequently found in the imagined stories of television in all areas of life than in real life. Even as schoolgirls and students they are underrepresented. In reality, half of the student body is made up of female students – just as in the case of college and university students (Destatis, 2020). But on television only 38% are female.

Therefore, we can argue for German television: Overall, women occur less frequently, they do rarely appear as experts, even in professional fields such as education, in which they are well represented and would be available as experts.

### **4.3 Research question 3: How diverse are the positions behind the camera casted? And, does this have an influence on the visibility of diverse people?**

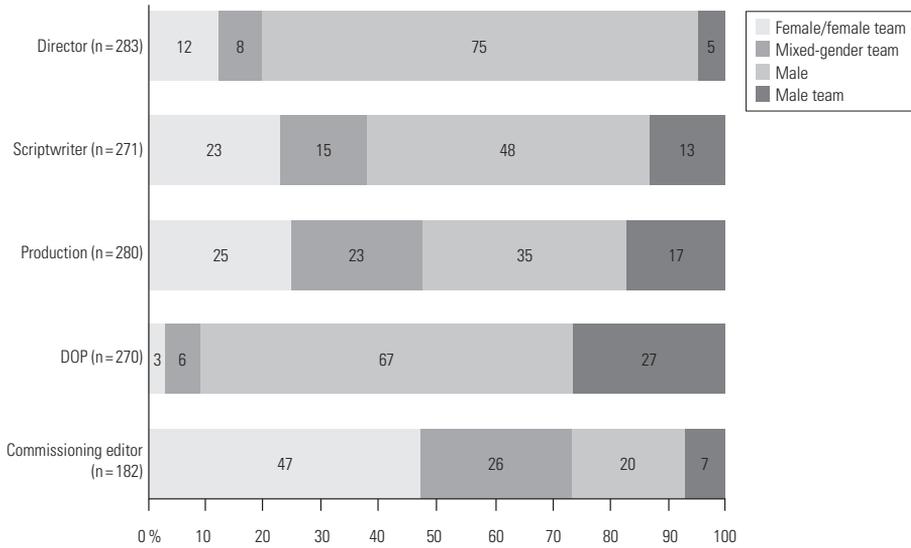
#### *4.3.1 Key finding 3: Interplay between gender of creative positions and visibility of women*

Further findings show the intersection of visibility on screen and participation behind the screen. The question arises how the images we see on television are created: Who are the responsible media makers? What does this mean for the visibility of women and men on the screens? Is there a mechanism of fading out or how can the unequal representation of the sexes be explained? Does it matter whether a woman wrote the screenplay or a man? Does the gender of creative above-the-line functions have an influence on the visibility of the sexes? In addition to the visibility of women and men on screen, we also examined the creative leadership functions involved in the television production.

Analyzing the gender distribution of the creative functions behind the camera shows a significant under-representation of women for German television in 2016. One cannot speak of diversity behind the camera. The basis of the analysis are those of the 310 German produced fictional television programs where we could identify the director ( $n=283$ ), director of photography ( $n=270$ ), producer ( $n=280$ ), writer ( $n=271$ ) or commissioning editor ( $n=182$ ), either via the credits or via online desk research. We excluded co-production here since there are different decision processes for international co-productions. In contrast to the above calculation, the analytic basis are not the protagonists or actors, but the individual programs.

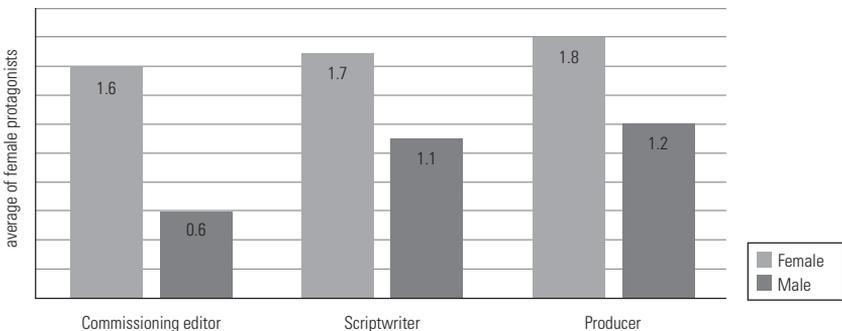
Women directed slightly more than one in ten fictional programs (12%). In eight percent of the cases women were part of a mixed team, which is more common in soap operas. This means that in 80 percent of the cases no woman was involved in directing. Seen in this light, almost two thirds of the scripts were written only by

Figure 6: Gender distribution of creative functions in fictional television programs produced in Germany in 2016, based on programs from all broadcasters (in percent)



Note: Deviations from 100 % are due to rounding error. The figure shows only those cases for each position where the persons filling them could be determined. Due to the low share of female teams in almost every creative function, these were added to the category female. Director female team n=1 (0.4 %); script female team n=12 (4 %); producer n=11 (4 %). Only in the category commissioning editor there are 25 female only teams (14 %).

Figure 7: Average of female protagonists and the intersection of the gender of the creative team for fictional television programs produced in Germany in 2016 TV programs



Note: T-test results for commissioning editor: male ( $M=0.6$ ;  $SD=0.9$ ;  $n=36$ ), female ( $M=1.6$ ;  $SD=1.3$ ;  $n=62$ ),  $t(96)=3.8$ ,  $p<.001$ ; scriptwriter: male ( $M=1.1$ ;  $SD=0.9$ ,  $n=130$ ), female ( $M=1.7$ ;  $SD=1.5$ ,  $n=51$ ),  $t(179)=3.5$ ,  $p<.001$ ; Producer: male ( $M=1.2$ ;  $SD=0.9$ ,  $n=90$ ), female ( $M=1.8$ ;  $SD=1.7$ ,  $n=53$ ),  $t(141)=2.7$ ,  $p<.01$ .

Basis: All fictional German productions, where the persons filling the positions could be determined. The comparison is only made for those cases where the position was filled by a single woman or a single man. Too few cases for director and DOP to conduct t-test and compare averages.

men (61%), and almost no women were involved in the camera department (3% female and 6% mixed gender teams). The ratio is more balanced for the position of the producer, where women are involved in almost half of the films (48%), and women are even prevalent in the television commissioning editorial departments. In almost three quarters of the projects, women are involved as commissioning editors (73%) and men in only 53%. Due to the mixed gender teams (26%) there is an overlap here (Figure 6).

The results show that the television and film industries are areas with highly asymmetric access to creative positions in production. Females are significantly less represented than males. If we look at German fictional television, i.e. television series, television films and soap operas, it becomes clear that a single female commissioning editor in charge makes almost three times as many women visible as a man. With a female commissioning editor, we see an average of 1.6 female protagonists, with a male editor only 0.6 (Figure 7). If a woman writes the script or produces a program, we also see considerably more women on the screen. Since there are so few female directors and female directors of photography (DOP), the numbers are too small and therefore the results are not significant.

The gender of the commissioning editor, scriptwriter and producer in television is significantly related to the visibility of leading female characters on screen. In summary, the data show that the more women are in leading positions behind the camera, the more women we see on the screen as protagonists. This in turn means that both the person(s) who work(s) behind the camera and the gender distribution are important regarding the visibility of women on screen.

## 5 Discussion and conclusion: Audio-visual intersections from fade-out into spotlight

This research has brought up three key findings that bring audio-visual intersec-

tions of unequal representation into spotlight. Firstly, German television is a space of unequal representation of gender including an intersectional age gap. Women are underrepresented in German television. Other gender than the overrepresented male, and the faded-out females, are almost completely invisible. Furthermore, the data show an intersection between gender and age, i.e. an age gap. Women on screens are predominantly young. After the age of 30, women appear gradually less on German screens. These findings can be interpreted according to intersectional theory, highlighting a combination of discrimination by the intersectional categories age and gender, in this case for women of age. This intersection of femininity and increasing age is accompanied by a fade-out from audio-visual representation (Douglas, 2020).

Secondly, a closer look on the social roles and contexts of representation depicted in TV formats shows that male characters are dominantly visible in positions of expertise and knowledge: In German television it seems that men explain the world. Women are faded out. Other gender, again, are invisible. Comparing the data with German national statistics and data from professional institutions we see that television representation is undermining the functions women have in real life. Furthermore, the TV age gap reinforces the effect that women are underrepresented as experts. At an age when women could be experts in their professional fields due to many years of experience, they are hardly ever seen on television.

Thirdly, the study shows an interplay between gender of creative positions and visibility of women on the screen. The argument of an intersection between involvement in media production and the diversity of representations is supported.

The findings of the study can be integrated in the picture that the international body of research draws. Empirically analyzing representations and hereby visibilities and invisibilities is a fruitful way for media studies to investigate inequalities. Our proposition to use gender media studies and intersectionality theo-

ry by applying visibility as a dimension of intersectionality proofed as a reasonable approach. As our analysis exposed a binary and non-diverse picture of representations on German TV screens, the analysis focuses on the matter of underrepresented female characters. For future research and application of the conceptual framework, it is important to broaden both the approach and the database in order to further analyze the diversity of representation as well as the intersectionality of variables of difference.

Nearly 10 years ago, Hegde (2011) published on the *Circuits of Visibility* and pointed to a “global flow of media technologies, migration and the unfettered mobilities of capital [that] rework old logics of domination in new global forms” (p. 1). These issues are still relevant, if not intensified. Research, which is on the one hand based on the state of the art and is answering theoretical requirements and on the other hand accessible to public debate, legislation and activist movements is crucial. Our intention here was to enable both.

Considering that one of the central decisions was to enable a comprehensible study on German television with a representative sample, the study answers questions on a more general level. Therefore, there are limitations regarding more detailed insights within genres as it is not possible to compare single programs as there is no representative information value on this level. Furthermore, it has to be acknowledged that the findings are based on coded quantifications and are not adequate to analyze more contextualized and complex dimensions of characters, for example regarding stereotypic gender representation. Moreover, we have, for example, coded the gender of the so-called key “creative team” positions according to a definition that is used in Germany, Australia and Sweden to measure gender inequality in the industry (Filmförderungsanstalt [FFA], 2020). This includes the production roles of the producer, screenwriter and director. We acknowledge that other creative positions, such as the director of photography (DOP), editor, sound and costume design-

ers are also important creative roles. For the purpose of this research, however, we adhered to the more widely used industry definition of a key creative team. Therefore, the more complex unequal structures discussed in feminist production studies were not analyzed in detail. Nevertheless, the representative findings in this study underline the unequal situation regarding the creative positions in the German audio-visual media industry.

Last but not least, in this study we used a new methodical approach that combines coding steps of classical quantitative content analysis with a more qualitative, but still standardized analysis of visibility of character attributes including dimensions like represented gender, age and sexual orientation as well as specific content and presentation forms. We introduced our ACIS, which allows to code any audio-visual content to describe the visibility and diversity of the people shown on screens. For this purpose, the relevant person is identified by means of film-theoretical concepts such as narration or relevance. In this article, we used the ACIS for TV content. Furthermore, we have been applying the method for cinema movies (Prommer & Linke, 2019), YouTube (Prommer, Wegener, & Linke, 2019; Wegener, Prommer, & Linke, 2020) and streaming media, thereby showing that ACIS can be adopted for any audio-visual medium. ACIS hereby allows a comparability of different audio-visual media measure for visibility: If analyzed using ACIS it is possible to compare different media genres, for example, regarding the visibility of diversity. We were, for example, able to show that German language YouTube is by no means more gender-equal than television, as the female representation for the most popular YouTube channels is less frequent and reduced to traditional topics like beauty and DIY (Prommer, Wegener, & Linke, 2019; Wegener, Prommer, & Linke, 2020). Once again, this finding is another argument for the relevance of research into convergent media representations as visibilities in the digital age.

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## The (in)visible barriers to free software: Inequalities in online communities in Spain

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### Abstract

Free culture communities support self-learning, peer production, and the distribution of knowledge generated without any restrictions. However, free culture communities are not isolated from the social inequalities of the outside world. Understanding (in)visibility as the (in)ability to address internal under-representation within these communities, this research aims to analyse their member profiles and their perception of this issue. To this end, an online questionnaire was administered to 290 communities and interviews were conducted with members of 37 of these previously surveyed communities. The respondents and interviewees acknowledged that technopolitics requires a broad knowledge of the technical implications of their values, which makes access to and participation in a community more difficult. They also criticised the gender bias of their communities and, last but not least, pointed to other inequalities relating to the sexual orientation, socioeconomic level, or ethnic origin of the members of their communities.

### Keywords

free culture, free software, gender inequalities, (in)visibility, knowledge divide, age divide, social movements, participation

## 1 Introduction

Optimistic perspectives regarding the liberating potential of information and communication technologies (ICTs) have accompanied the Internet since its advent. Under the concept of digital commons, free software and free culture groups have organised themselves in favour of self-learning, peer production, the distribution of knowledge, and universal access to technological devices (Benkler, 2006; Himanen, 2001; Ostrom, 1990). Albeit older, the free software movement is embedded in free culture, since the latter concept involves a broader understanding of knowledge to be created and distributed, including the code of computer programs. Privacy is also one of the frequent topics in these communities, for which personal data protection facilitates individual autonomy and freedom of communication on the Internet (Bauman et al., 2014; Coleman, 2011; Solove, 2001).

The accelerated development of the Internet and the expanding individual use of technological devices have created a new public sphere that facilitates anonymous interaction within specific social groups (Lessig, 2004; Rheingold, 1993). Studies of social movements have also traditionally linked the concept of (in)visibility to their capacity to present their specific demands and discursive frameworks as regards the political agenda in both the mass media and on new online platforms (Sobieraj, 2010; van Stekelenburg, Oege, & Klandermans, 2010). Visibility in the media is thus understood as the ability to influence the public discourse and as the potential media impact that the slogans and vindications of social movements may have (Koopmans, 2004).

Consequently, so as to protect themselves from online monitoring these free software communities call into question the traditional concept of visibility as the ability to be included in the public sphere (Dahlberg, 2018). In this sense, (in)visibil-



ity is a process of renegotiation in which social movements “try to control their visibility and invisibility” (Vaserfirer, 2012, p. 624) depending on the context, their tactical strategies, and their objectives.

Some research has questioned the ideal of text-based and anonymous participation, as not having information on contributors may prevent communities from giving visibility to their under-representation, their members’ personal experiences, and the bias of their productions (e.g., source code) (Collier & Bear, 2012; Costanza-Chock, 2018). According to Nafus (2012, p. 669), “patches don’t have gender”, thus expressing the tensions perceived between the assumed anonymity of contributors to free software projects and the existing inequalities within these groups.

Understanding visibility as having a presence in the public sphere, some studies have noted that people with specific sociodemographic profiles (e.g., white men) monopolise representative roles and are thereby more visible (Rohlinger, Redmond, & Stamm, 2019). This discussion also connects to the free software movement. Although decentralisation is one of the core values of these communities, scholars have already cautioned that, more often than not, a group of experts controversially takes on a representative and leadership role in initiatives of this type (Giuri, Rullani, & Torrisi, 2008; Jordan, 1999).

In this study, (in)visibility is understood as the ability to address under-representation in these communities (Crenshaw, 1991; Stoecker, 1995). From the point of view of intersectionality, different studies have analysed the connections between social struggles and the inclusion of more transversal visions of the demands made by social movement, for instance, LGBTQI and feminism, environmentalism and social class, as well as anti-racism and gender (Abdi & Van Gilder, 2016; Magnusdottir & Kronsell, 2015; Milan & Treré, 2019; Patil & Purkayastha, 2015; Seymour, 2019).

Due to the influence of 15M protests, the Spanish free culture movement is closely associated with the global jus-

tice movement and social rights struggles (Postill, 2016). This development has made a dramatic contribution to disseminating the concept of technopolitics (Treré & Baranquero, 2018), namely, the tactical use of digital tools for collective action (Toret et al., 2013), as well as the sociological interpretation of technologies (Sádaba & Gordo, 2011). Owing to the characteristics of the Spanish context, it is particularly relevant not only to identify the (in)visibility gaps in communities, but also to understand how they themselves can interpret (in)visibility problems and devise tactics to deal with them.

Accordingly, an approach is taken here to the (in)visibility debate in free software and free culture communities. In light of the results of the quantitative questionnaire administered to these communities, the first step involves analysing the possible under-representation in them concerning four specific aspects, to wit, gender, age, educational level, and technological expertise. This is followed by a discussion on the causes, consequences, and possible solutions regarding access barriers to their projects. The intention is to address the (in)visible barriers existing in a movement that values universal access to knowledge. Even though code has no gender – nor age or educational level – technology is built on previous structures of inequality and under-representation that should be explored (Costanza-Chock, 2018; Margolis, Fisher & Miller, 1999; Nafus, 2012; Reagle, 2013).

## 2 Inequality issues in the free culture movement

In contrast to the ideal of contributors’ invisibility in culture and free software projects – that is, personal data privacy as one of their core values – several approaches have reflected on the archetypal member profile of these communities. These analyses have been useful for highlighting current under-representation in these communities and the extent to which this unequal structure affects the movement’s participation and internal dynamics

(Hill & Shaw, 2013; Powell, Hunsinger, & Medlin, 2010; Reagle, 2013).

As for gender, some studies have shown that women contribute less to free knowledge than men. Several surveys have even reported a female presence of below two per cent in free software and free culture projects (Ghosh, Glott, Krieger, & Robles, 2002; Hill & Shaw, 2013; Robles, Reina, Serebrenik, Vasilescu, & González-Barahona, 2014). For example, both women and cultural products mostly consumed by them (e.g., television series, specific books, etc.) have less presence on Wikipedia. Additionally, entries on historically or socially relevant women are shorter and their biographies include more references to their romantic relationships (Graells-Garrido, Lalmas, & Menczer, 2015; Reagle & Rhue, 2011; Wagner, Garcia, Jaddi, & Strohmaier, 2015).

The critical analysis of these data offers insights into the internal dynamics of these communities and the broader gender inequalities of contemporary societies as relevant factors in their composition. In the main, women devote less free time to contributing to free software and free culture projects. Besides, their lack of self-confidence in maths, engineering, technology, and science, affects their willingness to participate in these communities (Collier & Bear, 2012). Similarly, the propensity of women to participate in collaborative work and to avoid the often competitive environments of technological communities has led to a lower level of engagement (Antin, Yee, Cheshire, & Nov, 2011; Lam et al., 2011; Powell et al., 2010). In addition, they have sometimes claimed to have been the target of harassment and other types of symbolic violence (Nafus, 2012).

Some research has noted an early interest in technology and free software, especially among men (Lim & Kwon, 2010; Powell et al., 2010; Robles et al., 2014). The survey of 2784 developers conducted by Ghosh et al. (2002) shows that most people joining a community are aged between 16 and 36. They point out that free software is an essential topic for the younger generations, while putting this tendency down

to aspects such as technological breakthroughs and the market development of software products. Since the 1990s, access to computers and other devices from an early age has encouraged people to inquire into programming and to socialise in virtual communities (Ghosh, 2005; Margolis et al., 1999).

These findings contradict those of studies that point to a generational change in the perception of technological issues such as privacy, defended by free software communities. It is the youngest Internet users who have a better grasp of the implications of participating in mainstream social networks, but they also engage in more online activities and disclose their information more frequently (Nosko, Wood, & Molema, 2010; Taraszow, Aristodemou, Shitta, Laouris, & Arsoy, 2010). This behaviour could be related to factors such as the more technologically ubiquitous context in which the younger generations have grown up (Raynes-Goldie, 2010) and their greater tolerance to personal life issues such as sexual orientation (Tufekci, 2008). The results of studies of the early interest in technology and free software support views such as that held by Fuchs (2011), who criticises the discourse that describes young people as irresponsible and less informed, given that it is a one-dimensional argument that presupposes that they are incapable of resolving social problems.

Furthermore, the free software movement has been characterised by hacker ethics (Himanen, 2001), which proposes a learning process through the curious and enthusiastic interaction with technological devices. This principle connects with the scientific literature addressing the educational dimension of social movements as entities with the capacity to generate knowledge on their own (Casas-Cortés, Osterweil, & Powell, 2008; Cox & Flesher Fominaya, 2009; Della Porta & Pavan, 2017; Stephansen, 2016). Barbas and Postill (2017) identify those practices of learning from the experiences of counterparts unrelated to commercial and state institutions with those of 15M activists in Spain.

As to the academic qualifications of community members, it had been contended that those contributing to source codes usually possess a high level of technical training, for which reason those with weaker technological skills limit themselves to undertaking tasks aimed at motivating or galvanising their communities (Coleman & Golub, 2008; Jackson & Kuehn, 2016). In this type of community, the most common qualifications are PhDs and Master's and Bachelor's degrees, usually specialising in software engineering, programming, or telecommunications (Ghosh et al., 2002).

Coding and designing digital tools are often the main activities of these technological communities, which require prior training (Castells, 2012; Coleman, 2011; Jordan, 2017; Langman, 2006). Therefore, the possibilities of protecting themselves against online monitoring are limited, as only a small number of Internet users are familiar with these tools and techniques (Carr, 2008; Christl & Spiekermann, 2016; Reischl, 2008). Projects dedicated to generating Creative Commons (CC) content require a higher degree of abstraction and a more solid cultural background, all of which means that participants, as well as having a high level of knowledge, must put a lot of interest and effort into them (Benkler, 2006).

The spaces and initiatives of political resistance emerging as a result of these previously perceived inequalities have suggested conscious intersections between technological sovereignty and social movements, such as feminism, anti-racism, and LGBTIQI (Costanza-Chock, 2018; Milan & Treré, 2019; Toupin, 2014, 2016). Beyond the differences deriving from technical and technological knowledge in the free culture movement, these projects propose a reflection on the values of freedom and openness, while claiming that under-representation is not unavoidable, but that communities must make inequalities visible and seek solutions that break down the barriers to free culture and technology (Reagle, 2013).

### 3 Design and methods

The aim of this paper is to approach the representation and (in)visibility of diversity in free software and free culture communities in Spain. To this end, the following three research questions have been formulated: a) What is the archetypal member profile of these communities?; b) How do these communities interpret their internal composition?; and c) What strategies do they implement to foster greater diversity in their organisations?

To answer these research questions, a combined methodology with two phases was employed. The first phase involved administering an online questionnaire to several Spanish communities revolving around the values of free culture. Since the sample was not previously defined (Cea D'Ancona, 1996; Howard, 2002), the anthropological snowball technique was used to identify 739 different communities susceptible to being included in the study, given that they met the four basic criteria established for sampling, inspired by the study performed by Barranquero and Montero (2015). Specifically, the sample included those communities that a) had been previously and explicitly identified with free software and free culture, b) operated in Spain, c) were at least one year old, and d) were neither private companies nor public administrations. The questionnaire, which included four items relating to the member profile, especially regarding gender, age, educational level, and technological expertise, was sent to each community included in the sample.

All the questions were closed-ended. The item relating to the educational level of community members was based on the categories established by the Spanish Ministry of Education and Science (2006): pre- and primary school education; secondary school education and vocational training; and higher education. Four activists were interviewed in a pre-test, while the questionnaire per se was completed by the activists of 290 communities (Calvo, 2015).

In the second phase, 37 of the communities that had previously formed part of the survey were contacted. Intentional

**Table 1: Intentional sample of free software communities (n=37)**

Community	Location	Data	Type	Duration
Akelarre Ciberfeminista	Castile and Leon	09/2018	Group	159'
Wikimedia España	Castile and Leon	09/2018	Group	159'
Bit:LAV	Castile and Leon	09/2018	Group	159'
Ondula	Madrid	10/2018	One-to-one	66'
Cuarto Propio en Wikipedia	Madrid	10/2018	Group	115'
la_bekka	Madrid	10/2018	One-to-one	127'
Vivero de iniciativas ciudadanas (CIVICS)	Madrid	10/2018	One-to-one	18'
Avfloss	Madrid	10/2018	Group	133'
Asociación Hackerspace Valencia	Valencia	11/2018	One-to-one	86'
Valencia TechHub	Valencia	11/2018	One-to-one	86'
ValenciaJS	Valencia	11/2018	One-to-one	54'
FabLab Valencia	Valencia	11/2018	One-to-one	54'
Makers UPV	Valencia	11/2018	Group	113'
Asociación gvSIG	Valencia	11/2018	One-to-one	60'
FabLab Cuenca	Castile-La Mancha	11/2018	One-to-one	92'
Panorama 180	Catalonia	11/2018	One-to-one	88'
Hackers at UPC	Catalonia	11/2018	One-to-one	63'
i-LabSo SCCL	Catalonia	11/2018	One-to-one	56'
Barcelona Bitcoin Community	Catalonia	11/2018	One-to-one	87'
Asociación Blockchain Catalunya	Catalonia	11/2018	One-to-one	87'
pyBCN	Catalonia	11/2018	Group	78'
pyladiesBCN	Catalonia	11/2018	Group	78'
Eticas Foundation	Catalonia	11/2018	One-to-one	61'
Python España	Catalonia	11/2018	One-to-one	86'
Aeropython	Catalonia	11/2018	One-to-one	86'
Pybonacci	Catalonia	11/2018	One-to-one	86'
Made Makerspace Barcelona	Catalonia	11/2018	One-to-one	61'
Autofabricantes	Catalonia	11/2018	One-to-one	70'
Llefi@Net	Catalonia	11/2018	Group	120'
Caliu	Catalonia	12/2018	Group	61'
Colectic SCCL	Catalonia	12/2018	One-to-one	62'
CCCBLab	Catalonia	12/2018	Group	122'
Barcelona Free Software	Catalonia	12/2018	Group	61'
Som Connexió	Catalonia	12/2018	One-to-one	71'
Expansió de la Xarxa Oberta (eXO)	Catalonia	12/2018	Group	163'
Drupalcat	Catalonia	12/2018	One-to-one	56'
Educaires	Catalonia	12/2018	Group	60'

sampling was employed to select the communities, including those with different projects as regards their location, objectives, activities, and participant numbers, with a view to creating participatory spaces enriched with diverse perspectives and knowledge of the object of study (Ander Egg, 2003; Ruiz Olabuénaga, 2012).

The interviews were conducted offline with between one and eight people

from the same community (see Table 1), the number of interviewees per community depending on their availability. Neither one-to-one interviews nor group interviews were structured around a set of standard questions, meaning that they adopted the form of deliberative interviews (Cuesta, Font, Ganuza, Gómez, & Pasadas, 2018), in which the activists discussed the

quantitative data gathered beforehand. This methodological decision served the purpose of addressing participatory research that generates knowledge through collective dialogue between researchers and activists (Casas-Cortés et al., 2008; Cox & Flesher Fominaya, 2009; Cox, 2014).

At the beginning of the interviews, the activists were provided with a printed document with the results so that they could discuss them. In attempt to avoid the author's logic and to reflect their interpretations and testimonies accurately, the interviewees were only offered guidelines occasionally (Durstun & Miranda, 2002; Lima Santos, 1983). To ensure their privacy (Valles, 1999), the interviewees' names were anonymised with a random number.

## 4 Results

In what follows, the research question regarding the archetypal member profile of the communities surveyed will be addressed first on the basis of the quantitative data obtained. Following this and based on the results of the qualitative study, the other two research questions will be broached.

### 4.1 Quantitative data on the communities' under-representation

The quantitative survey among the members of 290 communities provides insights into the member profile of free software communities in Spain (Table 2). Firstly, women and people with non-binary gender identities accounted for less than 30 per cent of respondents, while 71 per cent were men. Secondly, almost half of the respondents were in the 35 to 44 age group and there were only a few people younger than 25 or older than 54. Lastly, 91 per cent of the respondents declared that they held an academic degree or a higher vocational training. Only nine per cent indicated that they had only completed primary or secondary education. In this sense, the members of university student associations had not yet completed their studies, whatever the level. Those with only a primary school education or with less than five years of

schooling were conspicuous by their absence in the sample. Concerning expertise in technical and technological disciplines, 60 per cent confirmed that they had studied mechanics, electronics, computer science, or telecommunications while 17.6 per cent studied other fields but had some contact with technological fields. Finally, 19 per cent stated that they had no specific training. These quantitative data will be discussed in further detail in the following section.

Table 2: Descriptive survey results (n = 290)

	in %
<b>Gender</b>	
Male	71.0
Female	20.7
Other genders	2.1
DK/NA	6.2
<b>Age</b>	
From 18 to 24	3.8
From 25 to 34	28.6
From 35 to 44	46.9
From 45 to 54	14.5
From 55 to 64	2.8
65 and over	0.0
DK/NA	3.4
<b>Educational level</b>	
	Less than five years of schooling 0.0
Basic education	Primary school 0.0
	Secondary school 0.7
	Post-secondary education 2.4
Intermediate education	Intermediate vocational training 0.7
	Higher vocational training 13.4
Higher education	Bachelor's degree 37.6
	Master's degree 26.9
	PhD 8.6
	Postgraduate studies 4.5
	Other 1.0
	DK/NA 4.1
<b>Techn. expertise</b>	
Yes	60.0
Some	17.6
No	19.0
DK/NA	3.4

## 4.2 The (In)visibility issue in free software communities

Regarding the qualitative interviews, a look is first taken at how the groups interpreted their internal composition based on the quantitative survey findings. Secondly, the focus is placed on the strategies that they implemented to foster greater diversity in their organisations. In the following, these issues are first addressed in terms of gender and then in terms of age, technological expertise, and education.

### 4.2.1 Gender

The interviewees generally identified with the description of an archetypal technopolitical profile: “I’m not surprised at all [about the quantitative survey results]. Unfortunately, I’m not surprised” (Interview 25); and “Yes, unfortunately, it reflects our case” (Interview 27). In terms of gender, some of the interviewees even interpreted the survey findings as a positive reflection of reality: “If you’d told me the proportion was 80 per cent, I wouldn’t have been surprised either” (Interview 1); and “In one event we had no women speakers. In software organisations, this percentage is very optimistic. [...] The situation of free software is critical” (Interview 4).

The interviewees pointed out that women access the field of technology from other areas such as law, cultural management, education, biology, geology, and business administration. “My impression is that when it hasn’t strictly to do with free software, the numbers change” (Interview 6). Although women are present in critical thinking spaces addressing social problems and the negative impact of technologies, their visibility in positions of representation is scarce:

The world of technology’s occupied by men, especially in certain projects. There’re very few women among the free software gurus. (Interview 24)

Some interviewees declared that women had had a greater presence in the movement during the 1990s and the early 21<sup>st</sup> century. At the same time, they felt that the proportion of women in computer sci-

ence had decreased as soon as it was considered to be an engineering degree:

In the 21<sup>st</sup> century because they tell us ‘There you go, women don’t want to be engineers!’ Yes, we do; we have always wanted to be [engineers]. (Interview 26)

The interviewees regretted that technopolitical participation reflected the bias in current university courses and the tech industry. Be that as it may, for some of the interviewees this inequality was more down to gender than culture:

Geeks tend to be always boys rather than girls, right? [...] They have less interest than men. (Interview 20)

In other cases, the interviewees held that gender inequalities in their communities were the result of schooling and pre-existing stereotypes, gender roles, and macho attitudes, for which reason they claimed that there was a need to generate safe spaces for women. They recognised that men sometimes monopolised debates and did not facilitate collaboration or offer assistance when addressing more technical issues. They also reported that there were incidents of symbolic violence and harassment against women that hindered their access to this type of community:

I’ve seen it in companies where the entire team of developers are men, and they interview a woman for any position. The answer is, ‘Hire that one because she’s hot.’ That’s commonplace. Women aren’t deaf and it’s not very motivating. (Interview 16)

Along with their self-critical stance, the interviewees also recognised that the feminist movement had recently pushed for promoting gender equality and the visibility of women in all social spaces. Sensitive to the new social context, communities have developed various practices to tackle this problem. Regarding strategies fostering greater diversity in their organisations, the interviewees hinted at various aspects. Some indicated that their communities

had internally assumed feminist principles to avoid the feminisation of specific group assignments, namely, those relating to community building tasks. For instance, they created temporary representation and decision-making positions or tried to ensure that women led public activities and media coverage.

Another standard method for fostering women's participation was the promotion of activities exclusively for them in order to provide them with their own spaces, thus highlighting their presence, insofar as they tended to be invisible in larger groups in which men made up the majority. Some events focused on schoolgirls with the mission of “awakening technological vocations” and “empowering girls so that later they feel like [...] so that they can opt for this type of career” (Interview 21). They also encouraged the participation of women in events, either prioritising their registrations or proposing them as participants:

We've organised some virtual webinars, and this year we've decided that the speakers should all be women. Although they are small activities, the idea is to give them visibility. (Interview 24)

Some communities collaborated with female-only groups, with the intention of appealing directly to female participants:

I realise that when you send them messages, the community responds very well. In other words, when you send things directly to women, they become a lot more involved. (Interview 2).

With a similar strategy, some communities had decided to generate parallel communities in which the proportion of women was above 50 per cent so as to create more diverse environments under the values of mediation and care:

A little bit of the atmosphere they [women] reject is sometimes generated in the more masculine communities, as they are more competitive than collaborative. So, a more

collaborative type of event seemed more welcoming to them. (Interview 2)

Communities also drafted codes of conduct aimed at eradicating sexist behaviour and, more generally, safeguarding the diversity of these spaces. These included a set of rules on acceptable and unacceptable conduct at meetings, conferences, workshops, and courses, such as respect for minority groups or the explicit prohibition of harassment. One code even set out the steps that should be taken in such an event:

It [the code of conduct] also states, 'If any of the people who are at this event or participating in the community display any of these behaviours, we shall notify the person in charge and take immediate action'. (Interview 4)

Even when they took a feminist stance, not all the interviewees confirmed that they carried out specific actions aimed at combating gender bias in their communities. At the same time, they recognised that some community members were reluctant to establish rules or to create technology-specific groups with an explicit gender standpoint. However, they declared that disseminating a discourse and values grounded in feminist principles in masculinised environments had a transforming impact on these communities.

#### 4.2.2 *Age, technological expertise, and education*

The quantitative results as regards age gave rise to more controversy than those regarding gender. Several interviewees did not identify with them since their communities were formed by adults or were more diverse:

It's quite heterogeneous. Some people aren't even 20, and others are over 55. Younger people are always joining. The young people we meet are already very aware and have a very critical point of view. We're thrilled with that. (Interview 27)

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ome interviewees also believed that there were fewer young people in their communities due to Spain's ageing population. For this reason, not so many young people participated in the survey. Similarly, key members completing the questionnaire tended to have belonged to their communities for longer, tended to play representative roles, and tended to be older. Furthermore, the interviewees felt that the organisation of political projects, whether technological or not, required more maturity. They also stated that political positioning resulted from having stronger ties with the social environment and from specific political experiences:

Because when you're under 24, rather than getting involved in activism, you want to have fun. When you're a few years older, you say, 'Holy shit, I'm sick of parties. I've had enough of being a drinking buddy. Come on, let's do other things'. (Interview 17)

Concerning the technological training of the younger generations, other respondents expressed their concern about the lack of interest in politics, warning that the knowledge and use of technological devices and social networking sites did not imply their critical questioning. In their view, even though young people believed that they knew the Internet inside out, they failed to identify the violation of their rights in the online environment through practices such as datafication or the use of decision-based algorithms:

The new generations have much more difficulty acquiring a critical awareness. Google was there before them, and then the online world was like that already, so, when no one challenges technologies in their educational system, there's no critical questioning. (Interview 8)

The generation born after the mid-1980s grew up with fast-paced technological development and experienced the boom of electronic devices for private use, the Internet, and the Web 2.0. Historically, the movement of free culture and free software was not a thing of millennials, but of

past generations. Therefore, this begs the question of whether or not this social activism has left a legacy to later generations:

Yes, they're movements that have been quite powerful in the past, but they are simply not engaging the next generations. There's something we haven't got right there. (Interview 20)

Accordingly, the interviewees declared that it was necessary to plan educational activities for children in order that they should be more aware of the uses to which they put technologies.

As to academic qualifications, the interviewees recognised that there was a tendency for people with higher education to run these projects. They understood that the training curve in some projects required a comprehensive understanding of free software and free culture movements. All of which meant that attracting people with lower qualifications was a challenge. At this point, the interviewees compared themselves with other movements, such as those relating to animal protection or ecology, in which technical skills were not a prerequisite for political participation. The complexity of the online environment and the social problems associated with it prevented larger sectors of society from becoming involved:

It's very easy to join a community aimed at promoting vegetable consumption. You join, buy your vegetables, and then you've saved the world. However, in our project, there're a thousand things that must be considered; some problems just freak you out. (Interview 17)

The interviewees were against this trend, recognising that establishing minimum academic requirements limited access to their communities. They understood that one of the aims of free culture was to break down educational barriers to knowledge sharing, while believing self-learning was a method that surpassed formal training. Notwithstanding the results of the quantitative survey, they felt that holding a diploma or not was a minor issue when it came

to the ability to code, digitally generate or publish copyleft content:

Academia doesn't recognise a certain type of knowledge, but we treat each other as equals, regardless of our educational level or profession. (Interview 21)

However, self-learning processes also implied prior empowerment, which could be a barrier for people with less technical knowledge and skills. Some interviewees also acknowledged that as it was often impossible for someone of the same sex to act as a mentor in the self-training process in masculinised communities, this might have led to there being fewer women:

I believe that it's even harder for a woman. Because when I say, 'It's okay' [understood here as an expression of encouragement], I get to create a stronger supportive relationship with a man than with a woman because I am a man. (Interview 17)

Once again, the lack of specific mediation processes for women contributed to their under-representation in technopolitical communities.

I don't know if we're missing someone or if there's a part of the population that isn't participating. Of course, that's a very classist viewpoint, so I shouldn't be saying things like that. (Interview 29)

Several interviewees pointed out that socioeconomic stability influenced the capacity for technopolitical positioning and participation in this type of movement (e.g., "We're talking about the middle class" [Interview 17]).

For this reason, they were concerned about their profile showing up in the results of the questionnaire. Although they explicitly praised the values of freedom, accessibility, and diversity, the online context affected them insofar as they connected with a uniform social base.

The interviewees recognised that the Internet reflected the contemporary social context. Even with a free licence, they be-

lieved that technology had to be accompanied by a desire for social change.

It's a pity because we're losing 50 per cent of the intellectual capacity of the planet [i.e. women]. If we rule out people of colour, immigrants, and so on, we're left with the usual arseholes. (Interview 16)

To their mind, racialisation, social origin, nationality, migratory status, functional diversity, sexual orientation, and gender identity reflected other inequalities that needed to be highlighted and addressed in technopolitical communities in order that they should become more diverse and more secure spaces for real social transformation.

## 5 Conclusions

Our aim has been to investigate the (in)visible internal barriers in free software and free culture communities and how they cope with them. This issue is especially relevant because it links to the core values of this movement. On the one hand, the importance of personal privacy and anonymity can contribute to the perception that these communities are not affected by the inequalities deriving from the identities of contributors (Collier & Bear, 2012; Nafus, 2012). On the other hand, the access barriers to these communities contradict their vindication of the free distribution of knowledge and universal access to technologies (Benkler, 2006; Ostrom, 1990).

The communities expressed concern about the exclusion of specific sectors of society, not only in connection with our study's variables. In the interviews, they showed that they were aware of the intersectionality of the diverse social struggles in technological production (Costanza-Chock, 2018; Milan & Treré, 2019), while also generally recognising the need to reflect on the inclusion of anti-racist, decolonial, LGBTQI, and class perspectives. Although online communities under-represent certain social groups, these inequalities are becoming an issue of visibility. This visibility is linked to the goals

of collective change and social justice that Spanish free software communities have derived from their political interpretation of technologies during the 15M protests and earlier developments (Postill, 2016).

While for some interviewees underrepresentation was as a natural concern in their projects (Reagle, 2013), most of them recognised that the influence of external social movements had contributed to highlight these issues and to the quest for solutions. The impetus of the feminist movement is unusually explicit in communities that identify themselves as cyberfeminist and in which gender struggles are as relevant as the vindication of free technology (e.g., *la\_bekka*, *Akelarre Ciberfeminista*).

The communities surveyed here show how (in)visibility is a valuable concept in analysing representation and its negotiation in social movements (Abdi & Van Gilder, 2016; Magnúsdóttir & Kronsell, 2015). However, strategies to achieve a broader diversity in their projects still have not been implemented. The interviewees proposed only partial solutions, such as the creation of codes of conduct to avoid situations of harassment or symbolic violence against women (e.g., concerning events open to the public such as *Python España*). As to gender, other collectives have created events and communities exclusively for women so as to highlight their contributions to free culture and free software.

Only larger communities have the wherewithal to create specific independent groups for women (e.g., *pyladies-BCN*). In line with studies such as those performed by Powell, Hunsinger, and Medlin (2010), the participants in these initiatives note that values such as collaboration and fostering personal ties are more developed in these specific spaces. They express a cultural dimension of women's presence in the collaborative creation of free code and copyleft content.

Some collectives have also modified their internal structure so as to be able to undertake different tasks, from press relations to mentoring newcomers, on a rotation basis. In this respect, the issue of (in)visibility, understood as the ability to

have a media impact on the public sphere (Koopmans, 2004) has also been raised by free software communities, which identify with the tendency towards specific socio-demographic profiles regarding positions of leadership and representation in the media (Rohlinger et al., 2019). Such a division of labour and self-awareness of media (in)visibility are also examples of the values that guide communities in their daily practice.

The high educational level necessary for accessing these groups is also a visible and recognised concern. The skills required can differ widely depending on the community. While some require web text editing skills (*Cuarto Propio en Wikipedia*), an understanding of network infrastructure is prerequisite for others (*Expansió de la Xarxa Oberta*). The interviewees admitted the difficulties in participating in certain technical processes and using specific tools without prior knowledge or training (Coleman & Golub, 2008; Jackson & Kuehn, 2016). Although they claimed that having higher education was not tantamount to possessing the right knowledge (Himanen, 2001), they associated technical skills with a degree in telecommunications or computing.

The quantitative data obtained in our study corroborates the findings of previous research that has indicated the archetypal member profile of these communities is a male with a high educational level and technological specialisation (Ghosh et al., 2002). As to age, however, our results contradict the common view that the young make a significant contribution to free software and free culture. Although for the interviewees there was no generational problem, it is interesting to note that, according to one of their number, the younger generations have been born into a media ecosystem in which corporate social networks are places for socialising. Therefore, the critical view of technology of young people using computers in the 1990s has since changed (Margolis et al., 1999). Thus, technological skills do not necessarily go hand in glove with a technopolitical interest in or critical use of electronic devices and platforms.

Further studies should inquire into the evolution of users' perceptions or social networking sites.

Our study has a number of limitations. As already noted, the interviewees mentioned additional (in)visibility issues (i.e., sexual orientation, ethnic background), which also defined the member profiles with access to the most innovative technologies. Furthermore, our results might have differed regarding gender (in)visibility if the interviewer had been a man. And, lastly, the different profiles of the respondents completing the quantitative questionnaire and those participating in the qualitative interviewees may have skewed our results.

The intersections that we have identified between technology and social struggles may also serve for analysing contemporary social movements, which have already been the object of study, as is the case with the research conducted by Toupin (2014, 2016) on the hacker movement. Regarding academic qualifications, future research should focus on the processes of prior empowerment and the planning of educational strategies that communities adopt to overcome the barriers to the participation of people with less formal education.

In the context of the identities that interact and participate in communities, (in)visibility is no minor issue in present-day society. The fast-paced development of technologies and the explosive growth of connectivity to the Internet are essential to understand how this new public sphere reflects dominant frameworks and agendas. Representativeness and visibility are relevant inasmuch as that they can include the demands of a wide range of contemporary social struggles, especially in communities seeking freedom and autonomy in technologically mediated spheres.

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# **SComS** Community

Volume 21 (2021), Issue 1



## Nachruf Dr. Jost Aregger (1960–2021)

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Foto: Anna Jegher (2020).

### Traurig nehmen wir Abschied von unserem SGKM-Mitglied Jost Aregger

Jost Aregger hat ab 1983 an der Universität Bern Germanistik, Staatsrecht und Medienwissenschaften studiert und mit einem Lizentiat in Neuerer deutscher Literatur abgeschlossen. Anschliessend hat er ein weiteres Lizentiat in Geschichte erworben und an der philosophisch-historischen Fakultät zu einem medienhistorischen Thema unter dem Titel «Presse, Geschlecht, Politik: Gleichstellungsdiskurs in der Schweizer Presse» (1998) promoviert.

Als Werkstudent war Jost Aregger als freier Musikjournalist bei der Berner Tageszeitung «Der Bund» tätig. Von 1986 bis 1993 hat er als wissenschaftlicher Assistent im damaligen Forschungsdienst der SRG gearbeitet und dort mehrere Studien zur Mediennutzung mitverfasst. Parallel zur Erarbeitung seiner Doktorarbeit wirkte Jost Aregger von 1993 bis 1998 als Lehr- und Forschungsassistent am Institut für Medienwissenschaft der Uni Bern, dem heutigen IKMB, bei Prof. Dr. Roger Blum.

1998 stiess Jost Aregger als Forschungsverantwortlicher zum Bundesamt

für Kommunikation (BAKOM). Nebst anderen Aufgaben war er in der Abteilung Medien in erster Linie für die Vergabe und Betreuung von medienwissenschaftlichen Forschungsprojekten zuständig. Darüber hinaus vertrat er das Amt auch in einem internationalen wissenschaftlichen Gremium, im Observatoire européen de l'audiovisuel. Zudem hat Jost Aregger das BAKOM während vieler Jahre – von 2010 bis 2019 – im Vorstand der Schweizerischen Gesellschaft für Kommunikations- und Medienwissenschaft (SGKM) vertreten.

Zur Überprüfung der Leistungsaufträge konzessionierter Veranstalter hat Jost Aregger ab 2008 ein umfassendes Forschungspaket initialisiert, dessen Ergebnisse seit 2012 vorliegen. Seither werden diese Programmanalysen der Radio-, Fernseh- und Onlineangebote der SRG sowie der konzessionierten Lokalradios und Regionalfernsehsender kontinuierlich erstellt. Teil des Forschungspakets ist auch eine repräsentative Publikumsbefragung zur Programmqualität des nationalen und regionalen Service public ([www.bakom.admin.ch](http://www.bakom.admin.ch)).

Aufgrund seiner beruflichen Funktion stand Jost Aregger über Jahre hinweg in regelmässigem Kontakt mit zahlreichen Medienwissenschaftlerinnen und Medienwissenschaftlern. Diese Fachkreise sahen ihn als prägende, inspirierende und hoch geschätzte Persönlichkeit. Sein Humor, sein Sachverstand und seine Verlässlichkeit wurden von vielen gelobt. Ebenso, dass er in beruflichen Kontakten hinter der Fachperson Aregger stets auch den feinen Menschen Aregger durchschimmern liess.

Wir Kolleginnen und Kollegen der Abteilung Medien des BAKOM erinnern den spitzbübisch humorvollen Jost, den intelligenten und kritischen Geist, die treue



Seele, den diskursfreudigen Debattierer, oft dezidiert in der Sache und immer sanft im Ton. Wir vermissen unseren *Herr Doktor*, wie ihn einige von uns liebevoll-ironisch ansprachen, der mit uns über sich selber lachen konnte, wenn wir ihn, den fraglos sehr breit Gebildeten, mal wieder wegen seines bildungsbürgerlichen Dünkels hochnahmen. Wir vermissen den Kollegen Jost, der sich für unsere Arbeit, aber noch sehr viel mehr für uns als Menschen interessiert hat.

Die Familie, seine Frau Annina Jegher und die Kinder Anna und Jon, war für Jost Aregger das Wichtigste, nämlich «die Zentralsonne, um die mein Leben kreist», wie er selber so schön formulierte. Nebst der Familie waren das Schreiben und die Musik seit jeher zentrale Bestandteile seines Lebens ([www.jostaregger.ch](http://www.jostaregger.ch)). Sie gewannen in den letzten Jahren noch an Bedeutung. Jost hatte geplant, sein Ar-

beitspensum beim BAKOM zu reduzieren, um ein berufsbegleitendes Studium an der Jazzschule in Bern aufzunehmen. Diesen Herzensplan konnte er noch in Angriff nehmen, musste ihn aber nach der Krebsdiagnose schon frühzeitig wieder aufgeben.

In den letzten zwei Jahren, nach Ausbruch der Krankheit, stand der Bassist Jost noch wenige Male mit seinen Bands *Sister Moon* oder der *51BluesBand* auf der Bühne ([www.sistermoon.ch](http://www.sistermoon.ch); [www.51bluesband.ch](http://www.51bluesband.ch)).

Jost Aregger ist am 19. März 2021 im Alter von 60 Jahren gestorben. Seinen Lebenslauf, der anlässlich seiner Beerdigung vorgelesen wurde, hat Jost vor einem Jahr selber verfasst. Bezeichnenderweise schrieb er da: «Das Beste an meinem langen Studium war, dass ich in einer Uni-Bibliothek die Liebe meines Lebens getroffen habe.»

# **SComS**

## Reviews and Reports

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## Ingo von Münch. «Die Krise der Medien». Berlin: Duncker & Humblot, 2020, 140 S. ISBN 978-3-428-18017-2

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Seit einigen Jahren haben die aus den USA in den hiesigen Medien immer weitere Verbreitung findenden Prinzipien (wenn es denn solche sind!) der Political Correctness fast vollständig die sozialen Medien erreicht und greifen seit einiger Zeit auch in der Wissenschaft um sich. Laut Duden ist darunter «die von einer bestimmten Öffentlichkeit als richtig angesehene Gesinnung» zu verstehen. Selbsternannte Hüter (nach der Political Correctness richtig; und Hüterinnen) wachen über ihre favorisierte, vorgeblich richtige Gesinnung und die dabei verwendete Sprache.

So gut wie alle Bereiche des gesellschaftlichen Lebens seien, so die von dem Verfasser hier vielfach belegte, jedoch sicherlich auch Widerspruch hervorrufende Meinung, inzwischen innerhalb weniger Jahre unter die Herrschaft einer «Denk- und Sprachpolizei» geraten, wie von Münch solche Wächter nennt. Die sei gefährlich, denn die Sprache schafft und prägt Bewusstsein aus und wird irgendwann zur Selbstverständlichkeit, auch wenn ein Grossteil der Lesenden bzw. anderer medialer Konsumenten dies nicht versteht oder gar ablehnt. Allein die «Medien-Leute» bestimmen den Sprachgebrauch und so werden die Political-Correctness-Hüter zur Selbstverständlichkeit, die auf Ausgrenzung basiert. Mit so einem oder mit ähnlichem Verve vorgetragenen Eingriff in die Publikationspraxis mit den entsprechenden Folgen für die «Gemassregelten» hätten bislang nur die in autokratischen Regimen sozialisierten Vertreter der Medienbranche und der Wissenschaft Bekanntheit gemacht.

Zu dieser Thematik hat sich der Verfasser, emeritierter Professor des Öffentlichen Rechts an den Universitäten in

Bochum und Hamburg sowie ehemaliger Wissenschafts- und Kultursenator in der Hansestadt, bereits 2017 in demselben Verlag in einem vielbeachteten Buch unter dem Titel «Meinungsfreiheit gegen Political Correctness» geäußert. Da solche Eingriffe in Publizistik und Wissenschaft seitdem eher zugenommen, statt abgenommen haben, kritisiert von Münch diese Praxis mit spitzer Feder in seinem aktuellen Buch. Er möchte somit an die Verantwortung der Medien für eine freiheitliche demokratische Ordnung plädieren, jedoch auch auf die Gefahr hinweisen für das alltägliche Leben – so der Verfasser im Vorwort. Er tut dies auf der Grundlage von wissenschaftlichen Erkenntnissen und persönlichen Erfahrungen.

Ingo von Münch hat sich dieser Aufgabe gestellt, weil er schon seit einiger Zeit eine bedenkliche Entfremdung zwischen Medien und Rezipienten diagnostiziert habe, die man nach durchaus begründeter Auffassung, so hebt er explizit hervor, durchaus als Krise bezeichnen kann. Aber mehr noch: In dem vorliegenden Buch, welches man ohne Zweifel mit dem vorher genannten kombinieren könnte, geht der Verfasser einen Schritt weiter und benennt Schritt für Schritt seine Kritikpunkte, die für den Rezensenten und vermutlich ebenso für viele weitere sich vornehmlich mit Schrift und Wort beschäftigenden Geisteswissenschaftler sehr gut nachvollziehbar sind.

Wie von Münch im Vorwort des hier anzuzeigenden Buches hervorhebt, versteht er es als ein überzeugtes (und hoffentlich auch überzeugendes) «Plädoyer für die Existenz und für die Verbreitung von gut gemachten Medien» und appel-



liert bestimmt und eindrücklich an die Verantwortung der Medien für unsere Gesellschaft, denn die Instrumente der Medien stehen «in direktem Verhältnis zu ihrer Bedeutung» (S. 9).

Wenn sich der Verfasser auch vornehmlich auf die selektive Auswertung von Artikeln aus der Frankfurter Allgemeinen Zeitung und der Neuen Zürcher Zeitung stützt, lassen sich doch viele weitere Printmedien – die hier ausdrücklich im Mittelpunkt stehen – benennen, in denen ähnliche zu kritisierende Sachverhalte wie die in den 13 Kapiteln genannten, festzustellen sind. Mit besonderem Verve setzt sich der Verfasser unter anderem mit dem «Wut- und Hassjournalismus», der gerade im Kontext der Erstarkung der rechtsorientierten politischen Kräfte in Deutschland zu beobachten sei (wobei er für eine Unterscheidung zwischen «rechts» und «rechtsextrem» plädiert), mit Übertreibungen und Untertreibungen in der Berichterstattung, einem prognostizierten angeblichen Untergang des Rechtsstaates, dem «Meinungskorridor», dem «Geeiere um Ortsnamen» und einigen weiteren Themen auseinander.

Für einen Historiker dürfte insbesondere das Kapitel über die «dürftigen Geschichtskennntnisse» interessant sein, wo ein «Minimum an Geschichtskennntnissen» der Journalisten und Redakteure angemahnt wird (S. 65). Wie in anderen vom Verfasser analysierten Beispielen ebenso, auf die er in seiner Kritik, die zuweilen an Polemik erinnert, unterschiedlich intensiv eingeht, werden unter der jeweiligen Kapitelüberschrift eine Reihe von Fällen angeführt, die wohl fast jeder Fachwissenschaftler, vor allem Zeithistoriker, in anderer Weise und an anderen Stellen belegen und sogar ergänzen könnte.

Wie gefährlich solche Eingriffe in die wissenschaftliche Freiheit sind, zeigt das Ergebnis einer Allensbach-Studie aus dem Jahr 2019, die auf Befragungen unter mehr als eintausend Hochschullehrern beruht. Sie zeigte, dass sich 30 Prozent durch «politische Korrektheit» sowohl in der Forschung als auch in der Lehre eingeschränkt fühlten; in den Geisteswissenschaften waren es 36 Prozent. Diese

Prozentzahl stellt schon ein Warnsignal an sich dar, selbst wenn die Studie ebenfalls besagt, dass lediglich 13 Prozent der befragten Hochschullehrer beklagten, dass es die Political Correctness verhindere, dass man bestimmten Forschungsfragen nachgehen könne (vgl. Petersen, 2020). Diese aktuellen Untersuchungen, die in dem Buch nicht mehr berücksichtigt werden konnten, bestätigen indirekt die Notwendigkeit der kritischen Auseinandersetzung des Verfassers mit der heutigen Verfasstheit der Medien, zumindest in Deutschland.

Eine andere Studie, vornehmlich an der Goethe Universität in Frankfurt am Main durchgeführt, belegte, dass nicht wenige Studierende nicht bereit sind, abweichende Meinungen zu akzeptieren und mit verschiedenen Methoden die Meinungs- und Redefreiheit versuchen, einzuschränken. Die Forscher haben feststellen müssen, dass ein Drittel der mehr als 900 befragten Studierenden der Sozialwissenschaften Bücher konservativer Meinungsvertreter aus den Bibliotheken entfernen wollen, bis zur Hälfte der Befragten möchten Wissenschaftler, die von den von ihnen vertretenen Positionen abweichen, nicht an ihrer Universität zulassen. (vgl. Krumm, 13.11.2020).

Eigentlich bestätigt dies nicht nur eine Krise, sondern eine deutliche Gefahr für die Demokratie.

Das Buch sei nicht nur Lehrenden und Studierenden der Journalistik und Kommunikationswissenschaft anempfohlen, sondern auch denen der Politik- und Geschichtswissenschaft.

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## “Public communication science in times of the Covid-19 crisis”: DACH 21 preconference

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What is public science? What can communication science scholars contribute to society, especially in times of crisis? What are the challenges and limitations of such engagement? These questions were addressed at a recent preconference held on April 7, 2021, titled “Public communication science in times of the Covid-19 crisis”. The preconference was organized as part of the DACH 21 conference (the first three-country conference on communication science) and was held online with more than 50 participants. It was an excellent opportunity to stimulate discussion among Swiss, Austrian, and German scholars regarding the self-understanding and societal role of the discipline. The preconference was hosted by the association *Öffentliche Medien- und Kommunikationswissenschaft* (Public Media and Communication Science, PMCS), which aims to establish, promote, and further develop the concept of public science in the field.<sup>1</sup>

The co-presidents of the PMCS association, Prof. Dr. Marlis Prinzing (Hochschule Macromedia Köln) and Prof. Dr. Mark Eisenegger (University of Zurich), welcomed all participants to the preconference. They emphasized that the preconference aimed to bring together diverse perspectives and to reflect on principles as laid out in the charter of the association (<https://oeffentliche-kowi.org/charta/>). This charter consists of fifteen principles and was signed by more than 250 scholars.

### 1 What is public science?

The preconference opened with a talk on the topic “What is public science?” by Prof. Dr. Caroline Robertson-von Trotha, sociologist, emeritus director of the *Zentrum für Angewandte Kulturwissenschaft und Studium Generale am Karlsruher Institut für Technologie* (KIT), and board member of the PMCS association. Robertson-von Trotha established the concept of “public science” in the German-speaking area of the field (see, e.g., Robertson-von Trotha & Muñoz Morcillo, 2012, 2018). In her presentation, she gave a brief historical overview of the emergence and development of public science since the 1980s. In particular, she focused on three milestones that stimulated the concept and practice of public science: the Bodmer Report published by The Royal Society in 1985; the OECD symposium “Promoting public understanding of science and technology”, held in 1996; and the UNESCO “World conference on science for the twenty-first century” in 1999. All events highlighted the importance of scientific knowledge and stressed the need to strengthen the communication of such knowledge to and with the public, in order to foster democracy, address the pressing problems of the times, and legitimize science itself.

Over time, the idea that the public and citizens have a right to be involved in information and dialogues about science became increasingly dominant. Allowing citizens’ participation and addressing social and global problems was increasingly considered as a responsibility of sciences in general, including the humanities and the social sciences. Robertson-von Trotha emphasized the “participatory turn” in public science that took shape before the

1 For more information, see the website of *Öffentliche Medien- und Kommunikationswissenschaft*: <https://oeffentliche-kowi.org/ueber-uns/>. The author of this report is a founding and board member of the PMCS association.



widespread diffusion of the Internet. However, digitization brought new opportunities and challenges for participation in science, such as more and new communication and information channels that might broaden participation but also lower standards of accuracy and transparency. Moreover, she conceptualized the idea of public science as distinct from public relations efforts often conducted by universities or science journals. Accordingly, public science is not about strategic communication but rather about producing and mediating scientific knowledge that is useful for citizens and society, stimulating a critical reception of science, and valuing feedback from diverse publics.

In Robertson-von Trotha's view, this idea of public science can only be fully realized if the reputation mechanisms in science itself value scientists' engagement in public science (see charter, § 14). In many disciplines, however, this is not the case; so far, such engagement most often does not benefit a career in science. Changing these reputation mechanisms is important, especially in light of the diverse forms of science communication that are needed to enable citizens' participation and to mediate knowledge that is crucial for society. The Covid-19 pandemic has shown the pressing need for a constant exchange between science and diverse publics – one that could not be sufficiently realized under the current conditions, especially since many disciplines were largely absent from discussions and public discourses.

## 2 Expectations of and from science during the Covid-19 pandemic

After the talk by Robertson-von Trotha, two speakers took on the topic of Covid-19 from different perspectives and outlined expectations of and from science. First, Beat Glogger offered a critical reflection on the role and the communication of science during the pandemic, stating that science still has to learn that both the pandemic and politics are a “marathon”. Glogger is a natural scientist, science journalist, and founder of the online science maga-

zine *higgs.ch*. In his talk, he focused on how science and scientists in Switzerland largely disappointed the expectations held by journalists and the public. Glogger observed that Swiss scientists were very visible and active in public discourse at the beginning of the pandemic; later on, however, they “ran out of steam”. Many scientists underestimated the duration of the pandemic and the need for steady, regular communication and discussion of scientific findings and uncertainties. Some scientists dropped out of the public eye after being criticized for their communication of pandemic scenarios. Others, such as scientists in the *Swiss National Covid-19 Science Task Force*, including its former head Prof. Dr. Matthias Egger, withdrew from their positions and from public discussion without giving reasons for doing so. Few scientists are left who communicate accurately and regularly. Moreover, journalists also prominently give a voice to scientists who seek to provoke and polarize discussions. Overall, Glogger felt that during the Covid-19 pandemic, the voice of science as a solid knowledge provider was missing – i. e., the regular mediation and discussion of up-to-date knowledge and scientific uncertainties in order to be able to handle the enormous problems and challenges of the pandemic (see charter, § 5, § 7). This is even more crucial in light of increases in disinformation, conspiracy narratives, polarization, and hate speech. Vaccine skeptics and Covid deniers spread disinformation widely, also with the help of so-called “social bots” (see, e. g., Broniatowski et al., 2018).

Beat Glogger drew three conclusions from his observations. First, it is essential to ensure that public discourse around scientific issues is based on scientific evidence (see charter, § 4). Not only the quality but also the quantity and reach of communication is important. As one solution, social bots could be used to disseminate scientific evidence, thereby fighting disinformation bots with information bots. Second, the public is searching for reliable information and needs journalism, as recently illustrated by an increased demand for news on the coronavirus crisis. There-

fore, the Covid-19 pandemic is not only a challenge but also an opportunity for journalism to demonstrate and maintain its societal importance and its role in the daily lives of users. Third, science must look for partners who understand the business and practices of news media. Glogger considered his online science magazine *higgs.ch* as such a partner but also generally highlighted the need for infrastructures that enable independent science journalism. Instead of putting more and more resources into the public relations of universities as is currently the case (Vogler & Schäfer, 2020), it is important to financially support those actors who mediate scientific knowledge in an independent and critical way. Glogger here referenced communication scholar Otfried Jarren, who made clear that while university communication of knowledge is important, it produces self-representations and self-references, while journalism – with its distinct selection and presentation criteria – provides external references (Fremdreferenz) that are necessary for public discourse (see, e.g., Jarren, 2019). Since resources for science journalism are dwindling in Switzerland as well as in many other countries (Kristiansen, Schäfer, & Lorencez, 2016), Glogger suggested building a foundation that is supported and financed by numerous stakeholders, including the public sector, corporations, private actors, and universities. This foundation would enable the financing of independent production and dissemination of reports on science and scientific knowledge.

Prof. Dr. Matthias Egger contributed to this discussion by shedding light on what science expects from itself as well as from society. Egger is an epidemiologist at the University of Bern and the president of the SNSF National Research Council. Moreover, he was head of the Swiss National Covid-19 Science Task Force, which advises public authorities. From his perspective, the public communication of science during the first months of the Covid-19 pandemic did not have as great an impact as Glogger has observed. Scientists, including Egger himself, were proactive in setting up a Covid-19 Science

Task Force in April 2020; however, the influence of this task force on political decisions was rather low. For the relationship among science, politics, and the public to be fruitful, it is crucial that all participants are engaged, interested, and open-minded. The concept of public science can only become a reality when scientists are willing to engage with different actors from society and when these other actors are interested in hearing and discussing the expertise offered by science and scientists.

As Glogger stated, Matthias Egger withdrew from his position as head of the task force without publicly communicating his reasons; however, the withdrawal was necessary, due to a role conflict. As head of the task force, it is very important to take a prominent place in public discourse and invest time. It is not possible to do this when also holding the position of president of the SNSF National Research Council. As to his experience in the latter, Egger expressed concern about a potential “Covidization of research” (Pai, 2020). We must prevent every scientist from now on thinking that it is their duty to conduct Covid-19-related research. For one thing, only some scientists work in research areas that offer the expertise to carry out studies that help society deal with the pandemic; for another thing, a wide range of pressing problems in science and society that are not related to the Covid-19 pandemic still exist, and it is crucial for such research to continue to be conducted. A “Covidization of research” would not improve research and public science but instead would create “instant experts”, reflecting the increasing influence of third-party funding and the growing opportunism among scientists to select research questions and topics according to the likelihood of receiving money.

In Egger's view, scientists should not become activists. They best carry out their specific role in society when they conduct research according to scientific norms and standards and then communicate and discuss the findings, implications, and uncertainties of their research with relevant actors in society. The communication of scientific uncertainty, the critical discus-

sion of scientific evidence, and the countering of disinformation are key for public science (see charter, § 5).

### 3 Communication research on Covid-19 coverage and its public response

In the last speaker slot, communication and media scholars from Germany, Austria, and Switzerland talked about the public response to their research. Together with their colleagues, Prof. Dr. Thorsten Quandt (University of Münster), Prof. Dr. Josef Trappel (University of Salzburg, board member of the PMCS association), and Dr. Linards Udriš (University of Zurich) examined the role of news media in the Covid-19 crisis.

Thorsten Quandt and his colleagues were some of the first to publish research on this issue. In the early months of 2020, they observed a flourishing of opinions regarding the news media coverage of Covid-19, when facts and data were largely absent. This gave rise to a study that addressed this topic and analyzed a broad sample of German news media and alternative news media through computational content analysis. The project started in March 2020 and was quite intense; white papers were already published in April and May 2020 (Boberg, Quandt, Schatto-Eckrodt, & Frischlich, 2020; Quandt, Boberg, Schatto-Eckrodt, & Frischlich, 2020). For instance, the researchers found that the coverage of established news media provided a broad range of positions and concerns but was considerably less negative in tone than articles in alternative news media, which disseminated overly critical messages and opinions. The study attracted a large response from news organizations around the world, including *The Washington Post* and CNN. Large parts of the coverage were neutral, but there were also critical reports with inaccurate statements about the study, providing Covid deniers and conspiracy believers with rhetorical material for personal attacks on the authors. Consequently, Quandt argued that public science comes with opportuni-

ties and challenges. Especially in democracies, science has a duty to serve society and to communicate important findings to concerned publics. This communication contributes to the social impact of science. However, scholars must keep in mind that studies addressing urgent societal problems can entail great stress, due to the need to ensure high scientific quality while working under significant time pressure. Such studies also tend to provoke more public response and potentially personal attacks on researchers. The latter are a particular challenge, considering that many higher education institutions lack structures of support or resources to protect and advise their researchers in such cases. In general, incentives to engage in public science are lacking, resulting in the current, rather insufficient fulfillment of public science.

From an Austrian perspective, Josef Trappel supported these observations. He is the head of an international research group that is conducting a longitudinal analysis of media performance in 18 democracies around the globe and ongoing changes in media systems. In September 2020, the researchers presented their latest findings, which shed light on the role of news media during the Covid-19 crisis and the changes in newsrooms and media policies due to the pandemic. “The Media for Democracy Monitor” (2020a, 2020b) showed a significant increase in news usage and trust in news media, while media organizations experienced drastic cuts in advertising revenues at the same time. With this loss of resources, the media performance in many countries is decreasing at a time when disinformation is flourishing and accurate information and critical contextualization of knowledge is needed more than ever. These developments instigated media policies to reconsider direct subsidies for media organizations, in some countries in return for providing space for public advertising campaigns. Ahead of the presentation of the results of this cross-national research project in April 2021, extracts of specific findings were communicated via three press releases and attracted broad media interest;

news media in the 18 participating countries reported on the research results, most of them in a neutral tone. In contrast to what Thorsten Quandt and his colleagues experienced, no heated controversies or personal attacks arose.

Finally, Linards Udris provided insights into Swiss research on the role of news media during the Covid-19 pandemic. Most recently, scholars have shown that media and communication research rarely contributes to public debates and the broad dissemination of knowledge (Fürst, Vogler, Sörensen, Schäfer, & Eisenegger, 2020; Nielsen, 2020). However, the work of the *Forschungszentrum Öffentlichkeit und Gesellschaft (fög)* of the University of Zurich is dedicated to analyzing socially relevant problems and communicating their findings to diverse publics and the news media (see, e.g., fög, 2020). At the beginning of the corona crisis, the *fög* received several media requests – quicker than it could actually conduct studies and provide scientific findings. However, a few months later, the *fög* was able to publish studies that received a substantial response in news media and on social media (Eisenegger, Oehmer, Udris, & Vogler, 2020; Rauchfleisch, Vogler, & Eisenegger, 2020). Their findings indicated that traditional opinion leaders, such as leading news media and journalists, also influence debates on Twitter to a large extent. Moreover, news coverage in the Swiss media was highly dominated by reports on the Covid-19 pandemic. The *fög* found a generally high quality of the Covid-19 news media coverage but also identified certain deficiencies, such as common lack of contextualization of issues, data, and scientific findings. Linards Udris concluded that public science is indispensable for society; that scientists have a duty to produce and publicly provide knowledge and empirical evidence; and that public science requires courage, time, and resources. Moreover, Udris argued that public science needs to follow certain rules, as laid out in the charter mentioned above.

All three scholars who shortly presented research projects from DACH countries aimed to address urgent societal problems

and questions. They publicly communicated their research findings as promptly as possible in order to inform debates on news quality, dissemination of disinformation, and media policy measures (see charter, preamble, § 11), and they received broad public interest.

#### 4 Discussion

The discussion with all participants of the preconference first focused on questions of complexity, accuracy, and comprehensibility. Mark Eisenegger and Linards Udris emphasized that research projects aiming to address urgent social problems need to be conducted in a timely manner; however, it is even more important that such studies have a high scientific quality and generate sound evidence. Dr. Katharina Hajek (University of Koblenz · Landau) asked whether we should communicate complex knowledge and insist on using accurate and precise terms, or if this would hinder the attention paid to science and the communication of knowledge altogether. For instance, scientists could contribute to the use of accurate terms in public discourse, such as “conspiracy myths” or “conspiracy narratives” (instead of “conspiracy theories”) and “variant B.1.1.7” (instead of “British mutant”), thereby reducing the dissemination of misleading ideas. Generally, Beat Glogger thought this is a good idea; however, at the beginning of an emergent problem or topic, one cannot aim for accuracy and completeness of all terms and their definitions. During this phase, he argued, it is more important to publicly communicate basic insights into a phenomenon instead of provoking information overload or disinterest.

While the preconference mainly focused on communicating empirical findings, Prof. Dr. Klaus Meier (Katholische Universität Eichstätt-Ingolstadt) raised the question of how scholars should deal with normative questions and discussions. Mark Eisenegger agreed that this is an important part of public communication science. Certain norms and perspectives no longer need to be argued about, such as

the importance of human rights, freedom of speech, and democratic participation. Communication scholars must defend and strengthen these values, rights, and norms. Moreover, they can take normative positions and communicate normative evidence derived from the field of communication and media ethics (see charter, §4).

Additionally, the participants were interested in how scientists can and should deal with public criticism as well as personal attacks. Matthias Egger said that intense public criticism can be indeed upsetting and could endanger mental health. Therefore, it is important to retain one's composure and to focus on other activities, including leisure time for physical activity. Beat Glogger stated that resilience comes not only from getting used to criticism but also from avoiding reading too much of it. For instance, it is unnecessary to read all the comments on social media, especially when they include lots of hate speech. Furthermore, it helps to get support from others or to put one's energy into preparing well for public appearances and statements. In terms of supportive structures, Thorsten Quandt observed that universities and colleges are often unable to cope with hate speech and personal insults and need to do more to protect and support their employees. Moreover, researchers should intensify discussion about these issues, share experiences, develop strategies for coping with public criticism and incivility, and support one another. The PMCS association has already taken on this issue, as it organized a workshop on "Communication science under public pressure" in November 2020. Marlis Prinzing said that follow-ups will ensue, with the aim of developing guidelines.

As to the status quo of public communication science, Thorsten Quandt argued that the diverse inputs of the preconference have shown a public interest in communication and media research. Thus, the problem is not that "No one cares what we know" (Nielsen, 2018), but rather that we need to take initiative and that we should not expect journalists to knock on our doors. This engagement is very important for the discipline's social impact and

contribution to society, although is hardly beneficial for the individual career, as Quandt and Robertson-von Trotha agreed. Careers still largely depend on the impact factor and the quantity of journal articles. Matthias Egger made very similar observations. Many scientists in Switzerland do not take the time to publicly communicate their findings but rather quickly move on to work on their next research proposal, in order to receive funding for a new project and publish journal articles. This is why, generally, only few proposals are seen for "Agora" projects, which are funded by the SNSF to stimulate dialogue between science and society (<https://tinyurl.com/SNSF-Agora>). Josef Trappel wondered whether scientists are sometimes motivated but lack the skills to communicate their research findings in sophisticated ways, such as informative movies. In general, however, he agreed that many people talk about the "third mission" of science and universities, despite the fact that in practice this engagement is rarely considered in the evaluation of scientists. Instead of complaining about it, we should contribute to changing these rules: As Trappel put it, it is also up to us to consider public engagement when it comes to evaluating scientists and scientific work. Overall, the preconference highlighted the importance of and need for further exchange on issues of public communication science.

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## Conference report “#Communication #(R)Evolution Changing Communication in a Digital Society”: DACH 21 – Three-Country Conference on Communication Science (DGPuK, ÖGK, and SGKM)

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In recent years, there has hardly been a conference in communication science without the buzzwords of *digitization* and *transformation* in its title. In an effort to stand out from the crowd, conference titles end up adorned with complementary buzzwords like “disruption,” “datafication,” “platformization,” and “artificial intelligence.”

These conferences frequently follow the same pattern: Papers and presentations are packed into individual panels by way of abstracts and keywords. Researchers then present their more or less elaborate empirical analyses to one other – usually involving a great deal of statistics. Since these papers and presentations are based on a variety of theoretical foundations, methodologies, and statistical analyses, the level of mutual knowledge acquisition is often negligible. There are no common pillars – be they theoretical or empirical.

The Three-Country Conference hosted by Deutsche Gesellschaft für Publizistik- und Kommunikationswissenschaft (DGPuK), Österreichische Gesellschaft für Kommunikationswissenschaft (ÖGK), and Schweizerische Gesellschaft für Kommunikations- und Medienwissenschaft (SGKM) in Zurich from 7 to 9 April 2021 made an effort to counterbalance that trend.

The call for papers itself reflected on how society's digital transformation cannot – as is often attempted – be described by looking in from the outside. That is because communication science itself comprises part of society. To put this in other words: Since communication science is carried out in (digital) so-

ciety, digital transformation also affects communication science itself. Against this background, the conference was entitled “#Communication #(R)Evolution Changing Communication in a Digital Society” and the topics addressed were defined in four key points: Theory (topic 1); methodology (topic 2); empirical research (topic 3); and self-reflection, i. e., the significance of self-comprehension and the role of our discipline (topic 4).

The insight that digital transformation also affects communication science itself was demonstrated not least by the fact that – due to the Corona pandemic – the conference could not be held in Zurich as had been planned, but rather took place via a virtual platform. In this context, the organizers Mark Eisenegger, Thomas N. Friemel, Mike S. Schäfer, and Thomas Zerback (Scientific Steering Committee) as well as Bettina Lennström and Olga Tartakovski (Conference Coordination) deserve a great deal of recognition for not simply doing a 1:1 transition of the originally planned analog conference into the digital realm. Instead, they leveraged the many opportunities that a digital conference has to offer.

One example to that end is how participants pre-recorded their presentations and uploaded them to the platform. Doing so made it possible for the presentations to be viewed in advance. Thus, all 31 panels were able to make better use of their time together. This worked extremely well in the panels which I personally attended. The platform was designed with great attention to detail. The organizers created brief videos to illustrate how to do a check-in or enter a conference room. In other words:



Having experienced a little over one year of teaching online, the organizers drew the proper conclusions on how an online event should be implemented.

The organizers likewise also displayed dexterity with the selection of the keynote speaker. Dietram Scheufele of the University of Wisconsin-Madison and Morgridge Institute for Research got to the heart of the conference's theme in his keynote address. The title of the lecture was: "New instruments, paradigms, and information ecologies: the (ongoing) growing pains of our discipline." Scheufele, too, believes that communication science is facing a fundamental social transformation. In contrast to past advents such as radio or television, the Internet is not merely another new medium, but rather a new media environment which is hyper-selective and algorithm-driven. One consequence being: "Paper newspaper will die. Period. Algorithmic free press is dying out." He also cited how digital transformation is turning communication science itself into a "discipline in flux". Accordingly, "computational social sciences" are going to become more important across all disciplines. He noted how communication science still has room for improvement here as compared to other disciplines. He further postulated that open science is going to grow in relevance, as has also been illustrated in the "Agenda for Open Science in Communication" (Dienlin et al., 2021).

Somewhat neglected, however, was the question of how qualitative approaches align with Scheufele's vision of computational and open communication science.

In summary, the organizers did a fantastic job in establishing common ground far beyond theoretical and methodological issues, and well beyond the professional societies of DGPuK, ÖGK, and SGKM. In addition to Scheufele's keynote, the conference dinner will also be held in fond memory by the more than 500 participants from 16 countries. In advance, the organizers had sent out small packages to attendees featuring a fondue set with cheese, baby pickles, and Linzer tarts. Because despite all the digitalization and transformation going on out there – when it comes to eating and drinking, the analog and classic choices do continue to be the best. Thus, DACH 21 has succeeded in standing out from the crowd of online conferences without having to make any mention of "disruption," "datafication," "platformization," or "artificial intelligence."

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### **Aims and Scope**

By virtue of the prevailing multilingualism of both the Editorial Team and the Advisory Board, SComS provides a unique forum for exchange among media and communication scientists in English, German, French and Italian. As SComS is based in Switzerland at the German-, French- and Italian-speaking intersections of the world, the journal's mission is to showcase the developments in communication sciences in these language areas. The platinum open access journal proposes a multidisciplinary approach to communication sciences that is quite unique. SComS is becoming a home to different traditions, disciplines, contexts and methodologies, all dealing with communication in its different facets.

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The first page should include an abstract (between 150 and 200 words) and selected keywords (e.g., social media, spiral of silence). Please remove all author names and institutional information from manuscripts, so as to enable blind peer review.

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