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How COVID-19 Displaced Climate Change: Mediated Climate Change Activism and Issue Attention in the Swiss Media and Online Sphere

Adrian Rauchfleisch [a*], Dario Siegen [b*] and Daniel Vogler [c]

aGraduate Institute of Journalism, National Taiwan University, Taiwan; bDepartment of Communication and Media Research, University of Zurich, Switzerland; cResearch Center for the Public Sphere and Society, University of Zurich, Switzerland

ABSTRACT
Issues continuously compete for attention in the news media and on social media. Climate change is one of the most urgent problems for society and (re)gained wide public attention in 2019 through the global climate strike protest movement. However, we hypothesize that the outbreak of the COVID-19 pandemic in early 2020 challenged the role of climate change as a routine issue. We use extensive news media and Twitter data to explore if and how the pandemic as a so-called killer issue has shifted public attention away from the issue of climate change in Switzerland. Results show that the climate debate fell victim to the impact of the COVID-19 pandemic in the news media and the Twitter-sphere. Given the vast dominance of the pandemic, there is a strong indication this finding applies similarly to various other issues. Additional hashtag co-occurrence analysis shows that some climate activists react to this development and try to connect the issue of climate change to the pandemic. We argue that suppression of climate change by the pandemic is a problem for its long-term resolution, as it seems to have turned climate change back into a struggling issue.

Introduction

For a long time, climate change activism has struggled to reach a broader audience (McAdam, 2017). This changed with the emergence of the *Fridays For Future* (FFF) movement in 2018 (Fisher & Nasrin, 2020; Olesen, 2020). The global movement of climate strikers also had its impact in Switzerland, as FFF mobilized students across the country, many of them participating in a political protest for the first time (Wahlström et al., 2019). As a consequence, the issue of climate change received high attention in news media in Switzerland (Siegen & Noailly, 2020). However, since spring 2020, the instant threat posed by the coronavirus has dominated the news media and the social media sphere, whereas the more abstract and remote threats of climate change seem to have faded into the background (Eisenegger et al., 2020). Although the two topics were also occasionally entwined in public discourse (e.g. the reduction of flight traffic as a positive side effect), we expect that the COVID-19 pandemic led to a suppression of climate change discussion in the public sphere and try to estimate the exact extent of this displacement. The current situation,

therefore, allows us to analyze how large and urgent issues interact and compete for public attention (see Zhu, 1992). In our study, we investigate how COVID-19 "killed" the issue of climate change in the news media and on Twitter in Switzerland (see Brosius & Kepplinger, 1995; Geiß, 2011). Furthermore, we assess how the topical connections with regard to climate change on Twitter changed due to the COVID-19 crisis.

Climate change and issue attention

Global issues like climate change receive much attention in the public and are highly debated in the news and on social media. However, such attention is not stable and varies over time (Schmidt et al., 2013; Thorson & Wang, 2020). Agenda setting theory argues that the capability of the news media to cover issues and the public's capacity to be concerned about issues is limited (Brosius & Kepplinger, 1995; Vargo et al., 2014). Therefore, issues constantly compete for attention on the media agenda and on the agenda of the public. Even though social media do not know the same restriction on the supply side, the attention space of the audience is limited as well (Schroeder, 2018). On social media, thus, issues similarly compete for attention of the audience.

After the enthusiasm of the Paris Agreement of December 2015 had gradually faded, climate change was no longer a prominent topic in the Swiss press (Siegen & Noailly, 2020). International climate movements also seemed to have slowed down somewhat during this period (de Moor et al., 2020). In summer 2018, however, 16-year-old Greta Thunberg started her school strike to draw attention to the issue of climate change in the run-up to the Swedish elections. Her persistent protest quickly grew into a global movement of teen protesters (Fisher & Nasrin, 2020), which also reached Switzerland in December 2018. Holding large demonstrations in numerous cities throughout the following months, the movement brought the issue of climate change back into the public arena.

The trajectory of an issue's coverage is not only determined by internal dynamics; external circumstances are just as influential. Zhu (1992) therefore posited the "Zero-Sum Theory": the media's and public's attention capacities are limited. When one issue flares up, it must be at the expense of other issues. Environmental issues, for instance, are shown to be "crowded-out by economic news and news on war and armed conflicts in times of crises" (Djerf-Pierre, 2012, p. 499). "Key events" like the 9/11 terrorist attack, the Fukushima disaster, and the COVID-19 pandemic concentrate media attention and launch news waves (Geiß, 2011). Consequently, even though they may not be resolved, *victim issue*s get less attention in the wake of new, immediate *killer issues* and are perceived as less urgent (Brosius & Kepplinger, 1995).

Stefan Geiß (2011, 2018) took up the subjects of media attention dynamics and issue competition as outlined by Brosius and Kepplinger (1995), developed them further theoretically, and tested them empirically. By analyzing the attention trajectories of various issues through a latent profile analysis, he found five typical profiles of issue dynamics (Geiß, 2018). Relevant for this study are *routine issues* that show a high baseline of coverage as well as *struggling issues* that tend to show some baseline coverage but depend on a higher proportion of attention spikes than *routine issues*. It is important to note that these five profiles are not meant to replace the aforementioned typology of *victim* and *killer issues*. While the former typology (Geiß, 2018) describes the typical trajectory of an issue over time, the latter expresses (Brosius & Kepplinger, 1995; Geiß, 2011) the relationships between issues.

Based on previous, we suggest that climate change has been a *struggling issue* for most of the last 20 years, permanently receiving some baseline attention, but always relying on mediatized events such as UN climate conferences or the publication of IPCC reports (Bonfadelli, 2016; Siegen & Noailly, 2020). However, the climate protests might have turned the issue into a *routine issue* from the end of 2018 onwards. It was no longer just the protests that were reported on; the topic of climate change found its way into a wide variety of contexts, which is likely to have led to high baseline coverage. That is, until the occurrence of the COVID-19 pandemic.

We hypothesize that the pandemic, as a particularly powerful *killer issue*, turned climate change into a *victim issue*. We, therefore, investigate if and how strongly the COVID-19 pandemic has

impacted public attention to the issue of climate change in Switzerland. For this purpose, we take a closer look at news media coverage and the Swiss Twitter-sphere. We analyze Twitter because many journalists, politicians, and activists use the platform (Rauchfleisch et al., 2021). We want to test whether the COVID-19 crisis led to a displacement of the climate change issue:

H1: The COVID-19 crisis had a negative impact on the attention for climate change in the Swiss news media.
H2: The COVID-19 crisis had a negative impact on the attention for climate change in the Swiss Twitter-sphere.

Furthermore, to better understand the impact of the pandemic and its consequences for the protest movement, we will also look at the Twitter debate in terms of content. We are particularly interested in whether users could successfully link, through co-occurring hashtags (Thorson et al., 2016), the issue of the pandemic with the issue of climate change in 2020 and thus weaken the expected displacement (Geiß, 2011) of climate change.

RQ1: What topical connections can be identified with regard to climate change in Twitter debates before and during the COVID-19 crisis?

Data and methods

To analyze the climate and COVID-19 debate in the news media, we rely on the full coverage of 34 news outlets (Online, Press, Radio & TV) from the German (22 outlets), French (9 outlets) and Italian speaking regions (3 outlets) of Switzerland, published between April 2019 and October 2020 (n = 580 days). Content from the news websites was accessed with a self-developed web scraping tool. Press coverage was accessed through the Swiss Media Database (SMD). For TV and Radio newscasts of the public broadcaster, the transcribed leads were downloaded from the websites. This resulted in a total of $n = 1,060,820$ media articles. With search queries in three different languages, articles with reference to the climate ($n = 56,128$) and the COVID-19 debate ($n = 174,407$) were identified. We also identified articles with reference to both debates ($n = 6,431$).

For the Twitter data, we rely on a tracker we developed that covers the entire Swiss Twitter-sphere (296,553 users, 92.7 million tweets) and records their whole Twitter activity from April 2019 until now. All tweets posted by the identified Swiss users were downloaded from the Twitter API. To identify relevant climate change tweets as well as COVID-19 tweets, we used various keywords and hashtags in three different languages.[1] We thus use two data sets: tweets that refer to climate change (407,626) and tweets that refer to COVID-19 (3,214,483).

To test our hypotheses, we first create a time series and then estimate the causal impact of COVID-19 on the attention of climate change. We use the news media and social media attention until the end of January 2020 to estimate a counterfactual trajectory for the future with a Bayesian structural time-series model (Brodersen et al., 2015; Jürgens & Stark, 2017). Thus, we can estimate how the attention for climate change would have most likely developed without COVID-19 and then compare this time series with the observed media attention after January 2020. The effect "is the difference between the observed series and the series that would have been observed" (Brodersen et al., 2015, p. 248) if COVID-19 had not taken place. We consider weekly seasonality in our time series models for all data types.

For RQ1, we rely on a hashtag co-occurrence analysis as used by Thorson et al. (2016) and combine this with a backbone extraction method developed by Serrano et al. (2009). This approach allows us to check how users on Twitter try to connect different issues with climate change, especially whether climate change was actively connected with COVID-19 as an issue. We extract all hashtags from climate change tweets, transform all letters to lowercase and focus on the top 100

hashtags. We check how often they appear together in the same tweet (edge weight). As co-occurrence networks are extremely dense when not filtered (Thorson et al., 2016), we use backbone extraction that only keeps edges between hashtags that are significant ($p < 0.05$) and cluster the hashtags of this filtered network with the Louvain algorithm implemented in igraph in R. We use the Louvain algorithm as we are interested in broad topical connections.

Results

The analysis of the news media as well as the Twitter-sphere show similar patterns over time. After February 2020, the number of news articles and tweets related to COVID-19 clearly increased. At the same time, the number of news articles and tweets related to climate change decreased (see Figure 1). Swiss news media attention on climate change and the Swiss climate debate on Twitter correlate strongly (see Figure 1, $r(578) = .66$, $p < .001$; both time series are stationary - Augmented Dickey Fuller Test: Twitter: -5.36, $p < .05$; Media: -4.02, $p < .05$). It is striking that many of the peaks in media coverage are also accompanied by a peak in the Twitter discussion (see Figures 1 and 2). The events that the peaks relate to were the following: In September 2019, Greta Thunberg attended the UN climate summit in New York, and simultaneously, the revision of the CO2 Act was discussed in the Swiss parliament. In addition, leading up to the Swiss national elections in October, a large climate demonstration took place in the de-facto capital city of Bern. In December 2019, the UN Climate Change Conference was held in Madrid. In January 2020, the climate issue received a lot of attention in the news media and the Twitter-sphere in connection with the WEF summit in Davos and the visit of Greta Thunberg to a climate action demonstration in Lausanne, as well as an unprecedented acquittal of climate activists at a municipal court in Lausanne and intense bushfires in Australia. Most recently, and for the first time since the outbreak of the pandemic, climate
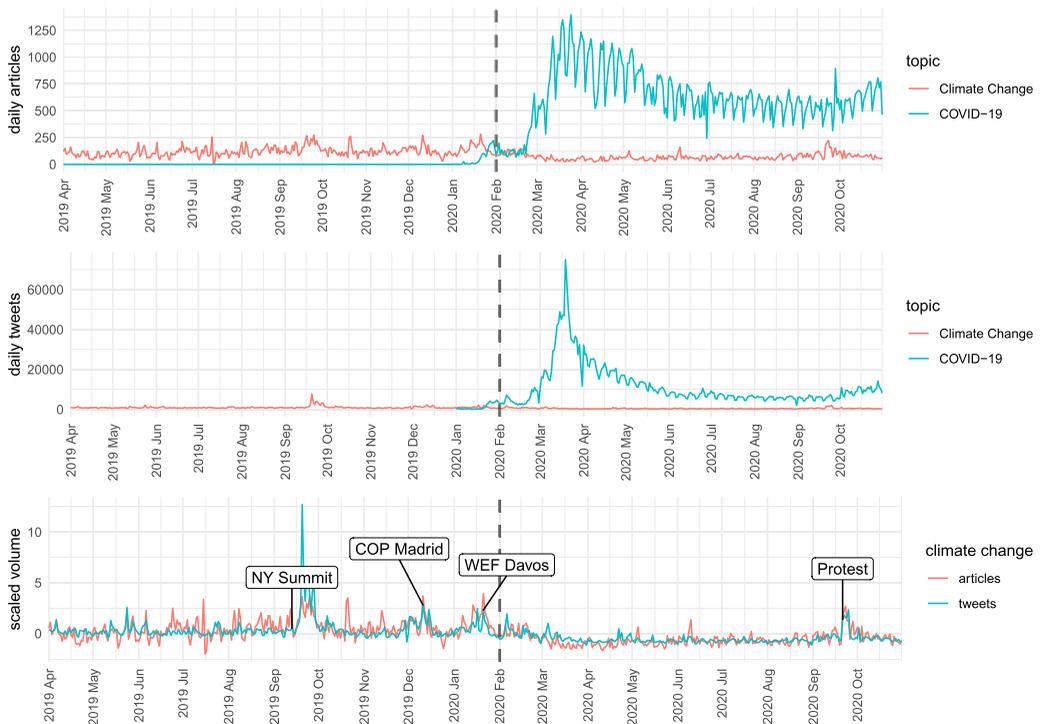
Figure 1. Top: Daily number of articles in the Swiss news media about COVID-19 and climate change. Middle: Daily number of tweets in the Swiss Twitter-sphere about COVID-19 and climate change. Bottom: Scaled volume for daily volume of articles and tweets about climate change
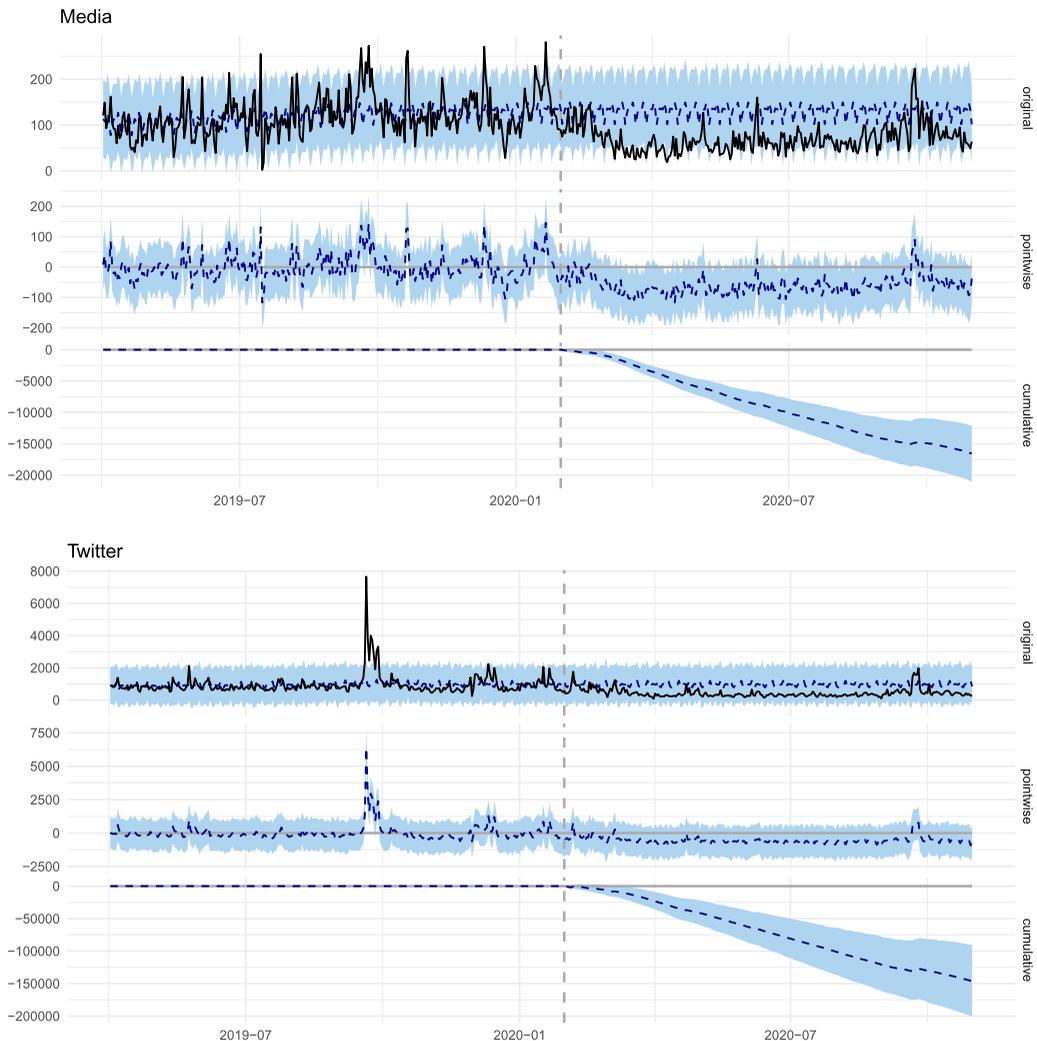
Figure 2: Attention analysis of climate change in the news media (top) and on Twitter (bottom). Dashed vertical line indicates the beginning of the COVID-19 crisis. original: daily news articles/tweets about climate change. The dotted line shows the predicted counterfactual time series for daily volume. pointwise: difference between observed data and counterfactual predictions - centered around 0 which indicates the average daily volume before the start of the crisis. cumulative: cumulative effect of the COVID-19 crisis.

activists received substantial attention in September 2020 for their protest action on the Government Plaza during the parliamentary session in Bern.

Our model estimates a substantial effect (posterior tail-area probability $p = .0011$) of the COVID-19 crisis on the news media attention about climate change of 46% ($SD = 6.3\%$), which translates into 60 articles fewer on average per day than before February 2020 or as cumulative absolute effect into 16,523 ($SD = 2244.1$) articles less overall (see Figure 2). For Twitter, we identified a substantial effect (posterior tail-area probability $p = .0012$) as well with on average 55% ($SD = 11\%$) fewer tweets, which translates into 534 ($SD = 102$) fewer tweets on average per day than before February 2020 or as cumulative absolute effect into 146,446 ($SD = 28,024$) tweets less overall (see Figure 2). We thus reject the null hypothesis for H1 and H2.

For our research question, we analyze hashtag co-occurrence on Twitter in order to identify what topics dominated in the debate on climate change in 2019 (259,979 tweets) and 2020 (147,647 tweets) and how they are connected (see Figure 3).[2] Findings show a relatively broad range of topics
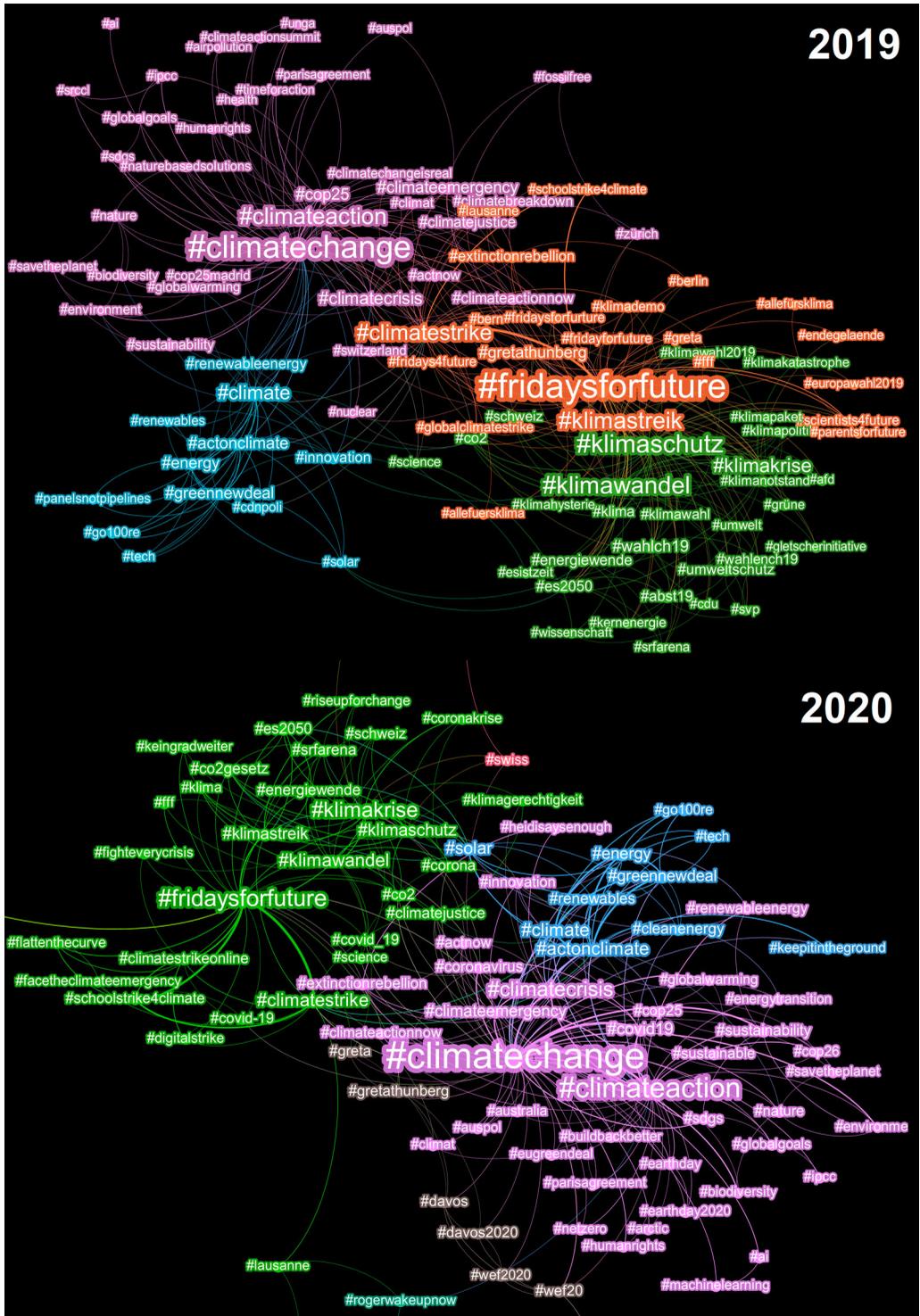
Figure 3: Hashtag co-occurrence networks (Yifan Hu layout) for 2019 and 2020 for the 100 most used hashtags. Color indicates cluster (separate analysis in each year). Very small clusters are cut away (e.g. two specific Swiss politics clusters) in 2020.

within the climate change issue. It is apparent that national (e.g. #Klimawahl19 for the national elections) and supranational topics (e.g. #Europawahl for the European elections) are discussed. In both years, also issues related to North America (e.g. #greennewdeal) were relevant, even though they were more disconnected from the broader discourse. Climate protests (e.g. #fridaysforfuture or #extinctionrebellion) take a central position in the Twitter discourse in 2019 but become more peripheral in 2020. The pandemic does not affect all topics equally: some remain (e.g. #cop25 or #renewables), others are pushed aside (e.g. #Klimanotstand, concerning the calls for the recognition of the climate emergency). Some hashtags reveal the direct or indirect link between the pandemic and climate change or climate activism (e.g. #fighteverycrisis or #climatestrikeonline). Such direct links, however, remain scarce in the discourse. While climate change tweets did not play an important role within the COVID-19 debate on Twitter in 2020 (only 0.5% with reference), 11% of the climate change tweets referred to COVID-19. This effect can also be seen from the hashtags within the climate community. The use of hashtags such as #flattenthecurve or #COVID-19 shows that the climate community also took up the issue but mostly in connection with the hashtags #digitalstrike or #climatestrikeonline that indicate the activists' attempts to adapt to the new circumstances.

Discussion

Our study contributes to research on climate change in two ways. First, it provides more general insights into the Swiss case of climate communication, which is still not very well investigated (Bonfadelli, 2016). Second, regarding issue attention over time, it shows how the COVID-19 pandemic as a key event turned the *routine issue* (Geiß, 2018) climate change back into a *struggling issue* with a lower baseline. In the news media as well as on Twitter, the attention over time shows a very similar pattern. As our analysis shows, the coronavirus pandemic has attracted more attention in the news media and on Twitter than the climate issue ever even came close to. During certain periods, coronavirus-related articles covered up to 70% of the media coverage (Eisenegger et al., 2020). COVID-19 can thus be best described as an exceptionally strong *killer issue* (Geiß, 2011), which climate change fell victim to. Because the attention space of audiences is limited (Brosius & Kepplinger, 1995; Schroeder, 2018), we have good reason to believe this victim role goes much beyond the issue of climate change, such as for the issue of Brexit (see Appendix 2 of the Supplementary Material) and presumably for many others (e.g. gender equality or EU-Swiss relations). Further, the two issues were connected by Twitter users but substantially only in one direction. While activists connected climate change with the impact of the COVID-19 crisis, climate change only played an extremely small role in the overall COVID-19 debates on Twitter.

The new circumstances have deprived climate activists of their momentum and pose a great challenge to the movement itself (de Moor et al., 2020) and to the awareness for the issue in the public. Even with the vaccination campaign progressing, the pandemic and related issues (e.g. long-term health, social, and economic consequences) are likely to continue dominating the media for some time. Under such circumstances, putting the issue of climate change back on the public agenda requires great efforts. Mobilization through controversial actions, such as protests during the parliamentary session in September 2020, might enforce a gap between dedicated climate change communities and the population at large. This is a problem, as climate change will remain a major challenge beyond the COVID-19 pandemic and can only be tackled through the inclusion of large parts of society. Thus, the suppression of the climate issue through the overlarge attention for the pandemic represents an unhealthy and dysfunctional development of public attention structures.

Notes

1. See Appendix 1 of the Supplementary Material for Twitter and media search terms.
2. See Appendix 3 of the Supplementary Material for a table with the top 100 hashtags for 2019 and 2020

ORCID

Adrian Rauchfleisch 🄳 http://orcid.org/0000-0003-1232-083X
Dario Siegen 🄳 http://orcid.org/0000-0002-4454-5999
Daniel Vogler 🄳 http://orcid.org/0000-0002-0211-7574

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