

Civil society, the media and the Internet: Changing roles and challenging authorities in digital political communication ecologies

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The digital transformation has had a profound impact on political communication. It has lowered the access barrier for actors to become publicly visible and reconfigured predominantly vertical flows of information into horizontal communication networks. Media-centric studies hold that these ‘hybrid media systems’ do not subvert the analogue order tout court, as the media still occupy a central role in selection and distribution processes. In contrast to this, social movement scholars interested in digital forms of mobilization show that civil society actors can directly engage their base and the wider public. Because of this focus, the status and role of the media in these connective efforts has remained largely neglected. This study extends the view of both media-centric and social movement research by asking how the media are included in civil society mobilisation efforts online and what status and role they have. Analysing the online communication around the UK climate change debate over a 30-month period, we show that while the media account for a substantial amount of the actors in the networks generated by civil society actors and bloggers, they become more marginal with respect to the authority they command. Not only are they replaced by bloggers as focal points in these digital political communication ecologies, they become next to irrelevant in allocating visibility and attention to other actors. This has ambivalent consequences for democratic discourse, as online debates become more inclusive but also more fragmented, lacking common points of reference.

Keywords: Internet, blogs, civil society, authority, media hybridity

Political communication is undergoing profound transformations as the hitherto predominant ‘vertical’ model of information production and dissemination from political actors to the media and their audiences is radically altered through the digital revolution and the Internet. The ‘fourth age’ of political communication (Blumler, 2013) is marked by a ‘centrifugal diversification’ of actors, who shape the flow of information in horizontal communication networks. Chadwick (2013) coined the term of the ‘hybrid media system’ to capture this shift in political communication, in which the media still retain an important position, although it is challenged by new actors such as bloggers; the hybrid media system combines broadcast forms of news dissemination with social media platform dynamics; and sees the established media logics confronted with modes of information transmission geared towards virality.

The account that Chadwick develops is essentially media-centric as it is their role in the political communication process and their ability to control the information selection and distribution that are most visibly affected through the digital transformation. At the same time, the fundamental changes in how communication flows in a hybrid media system centrally relate to how ‘challengers’ (Kriesi, 2004), i.e. ordinary citizens, civil society organizations or bloggers intervene in political debates and affect how the trajectory of an issue such as the ‘Bullygate’ affair develops (Chadwick, 2013).

These changes in the communication environment have further consequences for civil society actors that are not covered by a media-centric focus. Above all, scholars in the tradition of social movement studies have shown that the Internet allows them to organize their mobilization efforts through ‘connective’ forms of action that directly engage the public (Bennett & Segerberg, 2013). However, because these studies are primarily interested in examining how civil society actors mobilize for their causes, the role of the media tends to remain somewhat

underexplored as a result. Therefore, how important the media still are in these settings is largely an open question, given that other actors have to rely on them less and less to make their voices heard and connect to their audiences. This article therefore seeks to complement and extend the existing perspectives towards a ‘digital political communication ecology’ by asking how the media are integrated into the connective networks of civil society actors and bloggers. More specifically, we are interested in their status as authorities in these networks, both as central points of reference in political discourses and as those actors who confer visibility to others in their role as gatekeepers.

Extending the dominant social movement perspective, we will examine how different actor groups collectively shape the public digital space by analysing the connective dynamics of 30 hyperlink networks collected on the ‘open Web’ on a monthly basis over two and a half years that have UK civil society actors and bloggers in the area of climate change as their seeds, but remain open with respect to the other actors included. We acknowledge that this offers a view that excludes the social media activities of the actors, but the results of the analysis should nevertheless reveal some of the main dynamics at work, particularly between challengers and the media. We equally note that the implications we draw from the analysis are limited to the role the media play in a digital social movement setting, and can therefore not be generalised or automatically extended to other, particularly media-centric contexts.

The study proceeds as follows. In the next section, we review the main changes brought about by the digital transformation of political communication and what they entail for the present study. From this, we derive our research questions, which address the status and role of the media in connective ‘challenger’ (Kriesi, 2004) networks. We then introduce the methodological approach, which details the case selection, explicates how we collected and

processed the hyperlink networks and describes the different measures employed, before we present the results of the analysis. As we will see, while the media still enjoy a considerable presence in the networks, their position as authorities is severely challenged, and they lose the power to allocate attention and importance.

The Internet, actor diversification and digital political communication ecologies

In the context of the present study, three interconnected shifts that outline some of the central changes in the political communication ecology appear to be particularly important. First, the digitalization of politics has lowered the access barriers to public communication and broadened the base of those actors who compete for gatekeeping positions and access to audiences (Anderson, Bell, & Shirky, 2015). Second, it has deeply affected how the media, political and social movement organizations are established and how they perform their roles, as they have extended and recombined their structures, functionalities, forms and formats, practices and repertoires, often borrowing from each other (Casero-Ripollés, Feenstra, & Tormey, 2016; Kavada, 2015; Mast, Coesemans, & Temmerman, 2017). Third, these changes ultimately affect the flow of political communication in digital networks that are constantly reconfigured by the connective interactions of the different actor groups (Thorson & Wells, 2015). Below, we review how these changes have been perceived from a media-centric and from a social movement perspective.

The digital transformation of the media

Against this backdrop, media-centric studies have documented the ambivalent effects of how journalism in the form of professional practices and organizations is affected by and responding to these transformation processes. First, while the *broader spectrum* of publicly visible actors has enlarged the diversity of sources of journalistic coverage (Lecheler &

Kruikemeier, 2016), traditional media have at the same time lost audiences (Brock, 2013), seen alternative, digital outlets such as Vice (Hamilton, 2016) emerge, while search engines and platforms such as Google and Facebook have become serious competitors in the (political) advertising market (Fletcher & Young, 2012; Kreiss & McGregor, 2017).

Second, adapting to these changes on an *organizational level*, the media have expanded digitally through their use of hyperlinks (Weber & Monge, 2017), promote their content on platforms such as Twitter, which have in turn become a new ‘beat’ for journalists (Broersma & Graham, 2012), but also confront their professional norms of objectivity and impartiality with expectations of the free expression of opinions (Lasorsa, Lewis, & Holton, 2012). At the same time, the media have integrated new forms and formats such as live-blogs (Thurman & Walters, 2013) and below-the-line comments (Graham & Wright, 2015) in a bid to link the primary gatekeeping of journalists with the ‘secondary gatekeeping’ through readers and users, whose digital engagement has become an important element of the dissemination of journalistic content (Singer, 2014).

This latter aspect points to the third shift, which challenges the status of the media in a networked flow of political information. While news-sharing practices mean that the distribution of media content increasingly includes non-media actors (for a comprehensive review, see Kümpel, Karnowski, & Keyling, 2015), the ‘produsage’ of curated and original content by (micro) bloggers (Bruns & Schmidt, 2011) threatens to undermine their control over the selection, production and distribution of political information. The media-centric perspective here highlights the fact that the sweeping changes in the *logic* of political information production and dissemination are only partly matched by a corresponding *dynamic*. Studies in this area have revealed complex interaction patterns between media and non-media actors such as news

aggregators (Weber & Monge, 2011), bloggers (Wallsten, 2013), and Twitter users (Chen, Tu, & Zheng, 2017), who at times can have decisive effects on how a particular news story develops (Chadwick, 2013). However, their connective mobilization efforts necessarily remain largely secondary to this research.

The digital transformation of social movements

From the social movement perspective, the digitalisation of political communication has been conceived of as process of further democratisation of political communication. First, the lower barriers to communication enlarge the actor groups who become publicly visible, particularly those whose efforts have been hampered by journalists' bias towards established actors (Gamson & Wolfsfeld, 1993) and their interpretative 'paradigms' (Chan & Lee, 1984). The 'centrifugal diversification' has disrupted communicative hierarchies and created a more *participative politics* by including a larger set of voices both in democracies and authoritarian regimes (Abbott, 2012; Fenton, 2016; Treré, 2015) that challenge the political status quo and the status of specific actor groups such as the media (Fischer, 2016).

Second, how social movements *constitute themselves* has radically changed. While classic organizations such as trade unions have integrated digital forms of communication in their mobilization efforts (Rego, Sprenger, Kirov, Thomson, & Nunzio, 2016), the *Indignados* in Spain (Anduiza, Cristancho, & Sabucedo, 2014), the *Occupy* (Agarwal, Bennett, Johnson, & Walker, 2014) and Ferguson protests in the US (Jackson & Foucault Welles, 2016), and parts of the revolutionary movements during the Arab Spring (Lim, 2012) were organized through what Bennett and Segerberg (2013) term 'crowd-enabled connective action', where personalized action frames are shared through the weak ties brokered by social media networks, email lists

and coordination platforms, which together take on the role of protest organizations without any central formal actors.

Third, the ‘produsage’ inscribed in horizontal mobilization networks has changed the *flow of information* as individuals and advocacy organizations use their digital communication repertoires to circumvent the media and bridge the gap to members, supporters and bystanders (Kharroub & Bas, 2016; Van Laer & Van Aelst, 2010). Particularly on social media platforms, ‘tiny acts of political participation’ (Margetts, John, Hale, & Yasseri, 2017) can quickly scale up and expand an issue beyond those immediately engaged and affected by it.

As a consequence of this development and the associated shift in scholarly interests, traditional media do not figure very prominently in these analyses, although their role forms part of the larger interpretative context (e.g., Hensby, 2017).

Extending the social movement perspective by bringing the media back in

This study seeks to provide a view that complements the two research strands. It explicitly takes on a social movement perspective but is primarily interested in how they integrate the media in their communication networks – more specifically, whether the media occupy a central position in them, the extent to which they retain their role as privileged communication authorities and whether their allocation of attention remains central in promoting the visibility of other actors. Although social movement organizations are less and less dependent on the media to mobilize for their causes and become publicly visible, media organizations can still be assumed to hold substantial influence in digital political communication ecologies. The next section further discusses these aspects. Given the explorative nature of the study, we develop a set of research questions that will guide the analysis.

Research questions: bystanders, authorities and kingmakers

The research questions below broadly follow the three shifts of political communication outlined above. Adopting and extending a social movement perspective, they address the *visibility* of different actor groups in horizontal network ecologies initiated by challengers, which actors are established as *authorities* through their connective dynamics, and the status of the media in *allocating public attention*.

Actor diversity

Social movement-oriented studies have shown that civil society actors use networked forms of communication to directly mobilize supporters and parts of the larger public, thereby reducing the need to integrate the media in their mobilization efforts (e.g., Bennett & Segerberg, 2013). From the perspective of the present study, we are therefore interested in whether political communication ecologies established through the connective actions of challengers include other actor types, particularly the media, and how visibility is spread between them. A strong media presence in these networks would be an indication that notwithstanding the digital revolution their position as the purveyor of political information has remained largely unaffected by the transformed communication environment. A stronger challenger presence in turn would suggest that the communication ecology has evolved even further towards a connective action logic. This is what the first research question addresses.

RQ1: How strongly are the media present in networks initiated by the connective actions of civil society actors?

Communicative roles and authority

The next aspect further elaborates on the previous one. One of the major changes in a networked political communication ecology that threatens the status of media organizations is related to their role as gatekeepers and the authority they derive from it. In the decentralized digital age, this source of authority can no longer be taken as a given. While in horizontal communication networks the status of an actor is still equated with their centrality in the communication flow, the position now depends on the connective choices of others. Media-centric studies (e.g., Suiter, Culloty, Greene, & Siapera, 2018) see the position of the media as largely intact, although it is changing in the face of an enlarged field of actors in the public sphere (Meraz, 2009). From the perspective of the present study, the question is whether the media retain this central role if we shift the focus to challengers and the communicative networks they establish.

RQ2: How central is the position of the media in networks initiated by the connective actions of civil society actors?

Purveyors of visibility

This aspect examines the influence the media have in networks generated by challengers with regard to allocating attention. In the traditional view, actors get access to the public sphere when the media respond to their contributions and confer visibility on them (Habermas, 1996). This is particularly true for social movements, which depend so fundamentally on the ‘oxygen of publicity’ that unless they make it into the media, they are non-existent to the wider public (Raschke, 1985, p. 343).

Research into how social movements, NGOs, bloggers and single citizens use the Internet to generate attention and mobilize for the causes here paints a different picture, one that sees them establishing new, ‘connective’ forms of organization through which they coordinate their activities and directly engage the public (Benkler, 2006; Bennett & Segerberg, 2013). In these decentralized settings of horizontal networked political communication, the media come to occupy a more peripheral position and may consequently lose some of their influence as the sole allocators of public attention. Nevertheless, research also shows that the media are still decisive in amplifying the voices of different actors and ranking them in their importance (Bonilla & Rosa, 2015; Mattoni & Treré, 2014). While their overall control of the allocation of attention might be decreasing, the media might still be able to tip the balance of public attention in favour of specific actors, thereby acting as ‘kingmakers’. This brings us to our last research question.

RQ3: What role do the media play in ranking the visibility of actors?

The next section details the case selection and explains the methods used to generate and analyse the data.

Approach and methods: Case selection, data collection and measures

Case selection: The UK climate change debate

We chose the climate change discourse in the UK as a setting to examine the digital political communication ecology generated by the connective choices of civil society actors based on two considerations. First, climate change is an ongoing debate that is largely uncoupled from election

cycles and allows us to investigate connective communication patterns in a day-to-day political setting.

Second, the debate pits climate advocates, who warn of the consequences of the anthropogenic contributions, against climate sceptics, who variously doubt the phenomenon, the human causes and/or the predicted consequences (Howarth & Sharman, 2015). In the UK, climate change has become more polarized over the last few years. The national press has given climate scepticism more visibility (Boykoff & Mansfield, 2008; Painter & Gavin, 2016) – a development that is paralleled by similar trends in public opinion (Capstick, Whitmarsh, Poortinga, Pidgeon, & Upham, 2015) and politics, where the green programme of the Conservative Party was soon scrapped after they came to power in 2010 (Carter & Clements, 2015). The debate thus allows us to analyse the role played by the media in larger mobilization-counter-mobilization dynamics, a setting structurally similar to the ‘Bullygate’ affair (Chadwick, 2011, 2013), but one that is often ignored by social movement scholars, whose analyses tend to focus on one side of the conflict.

Data collection and classification: Networks, actors, attributes

We base our analysis of the connective patterns that shape the digital political communication ecology of the UK climate change debate on 28 hyperlink networks collected over a period of 30 months starting in June 2012.¹ This increases the robustness of the results, as variations in the networks due to specific events such as the United Nations annual climate change conference are of less significance.

In line with the research interest, the networks reflect a challenger perspective and were generated using a link-tracing procedure coupled with filtering and coding steps to ensure that the data represent the climate change debate. Figure 1 depicts the single stages of the process. As

a first step we selected eight challengers as seeds for a web crawler (*IssueCrawler*, Rogers, 2013) based on expert interviews, literature research, and above all Google searches with deleted histories and appropriate keywords ('climate change', 'global warming') to rank the most visible ones.² The networks thus embody a challenger view of the issue and the seeds were equally divided between the camps in the debate: the climate change-specific web pages of actors such as Greenpeace UK and Oxfam for the advocate side and Global Warming Hysteria and The Global Warming Policy Foundation for the sceptical side served as starting points for the crawler. In a second step, at the beginning of each month starting in June 2012, the crawler then followed the 'outlinks' of the seeds to other websites regardless of their country, type or position. The crawler then extracted all the links from these websites and checked through which links they were connected, after which the procedure stopped. This equals a network boundary specification of one step from the seeds and results in a design that gives preference to their connective choices, which mirrors the analytical perspective of the study.³ In a third step, we removed all boilerplate content from the web pages – blogrolls and navigation bars, ads, markups, etc. – and indexed the remaining text with the seed query terms, retaining only those with at least one match. This reduced the networks substantially and ensured that all of their actors were participants in the debate. As a fourth step, the remaining web pages and websites were aggregated to the level of the actor or organization. Here, we retained only those actors in the networks who had two links, one of which had to be an inlink, to ensure that all actors receive a minimum of attention from another one. Finally, we then manually coded the actors with their relevant attributes, that is, their position on the issue, the actor type and their country.⁴ We distinguished between political and economic actors, the media, civil society actors and bloggers. The decision whether an actor was classified as a blogger was not based on formal or

technical criteria, but taken from how they portrayed themselves. Bloggers who for instance identified themselves as journalists were coded as media, while MPs who ran a blog were classified as political actors, etc. The blog category thus retained only those who disclosed no explicit affiliation with any of the other actor type categories.⁵

The networks generated by this procedure have an explicit challenger bias built into them that reflects the research interest of this study. As such, the networks allow us to say something about the connective choices of challengers and the importance of other actor groups from their viewpoint. Broader conclusions about *general* transformations of the political communication ecology require a different methodological approach that integrates media-centric and social movement approaches. Here, we take a first step to extend the social movement perspective in direction of the media.

[Figure 1]

Measuring the media's role in digital political communication ecologies

We use different measures to assess the status of the media in the networks generated by civil society actors. The first research question examines the visibility of the different actor groups (RQ1), and we will compare their indegrees using a permutation test version of an analysis of variance (ANOVA). A permutation approach to the data is particularly useful since observations collected through link-tracing procedures violate the basic assumption of their independence underpinning traditional statistical tests. We will use the *coin* package (Hothorn, Hornik, van De Wiel, Winell, & Zeileis, 2017) in the statistical software suite R to compute the tests.

The second research question takes a more detailed look at the roles and the authority of the media in the networks (RQ2). We compare their status to the other actor groups using Kleinberg's (1999) authority measure, developed to examine the information flow in hyperlinked

environments. Kleinberg defines good authorities as those nodes in a network that are linked to by many good information hubs, and good hubs as those that link to many good authorities. The measure refines rankings that are purely based on the indegree; it is not only important how many links an actor receives, but also from whom. Authority scores have a minimum of 0 and a maximum of 1; the higher the score of a specific node, the higher its status. We will present the scores of the top ten actors and test the differences between the actor groups using the permutation test framework introduced above.

[Figure 2]

The third research question addresses the role of the media in contributing to the attention an actor receives from others in the network. Because here we are interested in the *effect* the media have on the collective allocation of attention – that is, their role as hubs in Kleinberg’s terminology –, the analysis needs to move beyond the comparison of measures between actor groups. Rather, we need to take more centrally into account which actors are linked by the media and how their overall status is affected by the media’s attention.

To understand how decisive the media’s role is in this process we recalculate the original authority scores of research question RQ2 while excluding the links from the media. In other words, we manipulate the network structure in such a way that the authority of the individual actor is generated without any contribution by the media, and test whether this results in any difference in terms of the overall authority scores of the actors. To assess these differences we use a paired permutation test, as in this setting we compare the same actors before (original scores) and after (recomputed scores) the ‘treatment’ (the removal of media links).

Findings

We first present the general descriptive statistics of the networks before proceeding to the results of the analysis proper. Typical of online communication networks, the density is rather low (Ackland, 2013), and they are characterized by a few very active nodes as suggested by the outdegree centralization measure. In contrast to this, the basic attention received by others as measured by the indegree appears to be spread more evenly.

Looking at the actor attributes, we can see that they come from different groups and that the media do indeed make up a substantial part of them, although bloggers and civil society actors are also well represented. By comparison, political actors as well as those from the economy occupy only marginal positions. Actors from the UK generally make up the majority in the networks, although US actors and global ones, mainly UN actors but also global media outlets, also have a substantial share. While the debate is clearly dominated by climate advocates, climate sceptics account for a sizeable minority.

[Table 1]

The first research question examines whether in digital political communication ecologies initiated by civil society actors the media still occupy a visible position or whether the networked political space has rendered them more peripheral. The descriptive statistics indicate that the media still form an integral part of a digitally expanded public sphere, and the results of the permutation test of the indegrees of the most important actor groups reported in Table 2 lend some support to. Despite the different size of the actor groups, there is no significant difference between the visibility of the media and civil society actors, although we can see that bloggers as the smallest of the three groups command the highest degree of visibility. The digital transformation of the political space has evidently not led to the media being circumvented by

other actors in the wake of a weakening of their gatekeeping monopoly. At the same time, from the social movement perspective employed in this study their position is clearly less central than that of some other actor groups, particularly bloggers.

[Table 2]

The second research question builds on this finding and examines whether, regardless of their presence, the media retain their central status in the networked political space. We measure their status by applying Kleinberg's (1999) authority measure and test for differences between the actor groups using a permutation test. The table below give us an initial impression and reports the ten most central actors by authority across the networks together with their attributes.

[Table 3]

The results provide some interesting impressions of the climate debate. The top authority over all networks is the Intergovernmental Panel on Climate Change (IPCC), which is not surprising given that for both sides of the debate the IPCC and its reports provide the most central point of reference, but altogether advocates account for only three of the top ten authorities. As civil society actors and bloggers become important gatekeepers and experts in the debate, the digital political communication ecology moves away from the media as central authorities – only *The Guardian* and the *Daily Telegraph* figure among the top ten actors. The digitalization of politics particularly provides climate sceptics, who are mostly bloggers, with connective means to shape the public space that can compensate for a lack of other – above all organizational or financial – resources.

The results of the permutation test reported in Table 4 below confirm this view. It is indeed the bloggers whose authority score across the networks tops that of the media and civil society actors, despite the fact that they have the lowest overall presence of the three groups. By

comparison, civil society actors, who rank highest in terms of the number of actors in the networks, here come third, while the media are located in between.

[Table 4]

The third research question builds on these results. If the media partly lose their status as those actors to whom all others refer in a networked public sphere, do they perhaps retain some of their influence by playing a decisive role in whether other actors become visible or not? The allocation of attention by the media lends some support to this view. Figure 3 below plots the normalized links the actors receive from the media against their overall authority scores across the networks.

[Figure 3]

While the trend is not completely parallel, it is suggestive of a correlation between the media's links and the status of the actors in the networks. We examine this relationship more closely by recalculating the authority scores for the actors in the networks, while excluding the links from the media. We then compare both sets of scores using a paired permutation test, as reported in Table 5.

[Table 5]

As we can see, removing the links from the media has the effect that the actors in the alternative networks obtain higher scores. This implies that rather than making actors more visible, the media's influence points in the opposite direction: they are, adapting Kleinberg's terminology, 'bad' hubs. The media still play a role in the allocation of attention, but not the positive one traditionally associated with them; as their connective patterns do not point to many good authorities, their overall effect for other actors is a negative one, and excluding their ties therefore increases the authority of the actors

To provide a fuller picture, the table also reports the results when we exclude the links of bloggers from the original network. Applying the same permutation procedure reveals a remarkable effect, as the alternative networks in this case clearly display significantly lower authority scores and the overall mean is cut almost in half (.089 vs .183), which means that bloggers rather than the media play a decisive role in making other actors more visible. This result also suggests that bloggers profit from networked forms of political communication in a twofold manner: they use its connective properties to become central authorities in the flow of communication, but they do not rely on other actor groups – above all the media – to be granted visibility. Rather, they also act as important hubs and thus are able to contribute substantially in generating their own status.

Discussion

The present study has examined the changing political communication ecologies by extending the dominant social movement perspective to examine the role and status of the media in these networked issue spaces. Taking the UK climate change debate as a case to examine their role and status, the analysis has revealed the transformative dynamics that shape challenger induced digital networks, which mainly result in the media becoming more peripheral. While they are still included to a substantial degree as part of the networks generated by the connective choices of civil society actors and bloggers, their status is severely challenged by other actors. Bloggers in particular prove to be more central authorities in the discourses, although the media still occupy an important position. However, they become clearly marginal in the allocation of visibility and attention, since their connective contributions are entirely uncoupled from whether actors become more central points of reference in the debate or not.

Implications

From a social movement perspective, this development might be taken as a sign of further democratization of the political communication process. The ‘centrifugal diversification’ of actors clearly leads to roles formerly firmly in the hand of one actor group – in this study, the media – being shared, usurped, reconfigured and hybridized by others (Bruns, Highfield, & Lind, 2012). Habermas (1996) has a critical view of the media, which he sees as dominating the public flow of communication and contributing to the power-ridden structures of the public sphere. The ‘new sort of power’ (Habermas, 1996, p. 376) he attributes to them stems from their position in the communication process and the gatekeeping monopoly that results from it. The present study shows how the digital transformation of political communication allows civil society actors and bloggers to shape networked issues spaces more autonomously, as they take on similar roles to the media, thereby fracturing their status. Of course, this does not allow us to draw more general conclusions about the media’s status in other, above all media-centric settings, where their gatekeeping power might remain largely uncontested, allowing them to retain their central position in the digital communication flow

Furthermore, while being more inclusive, the digital political space generated by challengers is not necessarily more egalitarian. The allocation of attention is highly skewed, and the networked issue ecology is clearly structured by distinct uses of links as ‘connective public goods’ (Fu & Shumate, 2016) by the different actor groups, which raises the question of whether they – above all the media and bloggers – adhere to the same ‘rules of a *shared* practice of communication’ (Habermas, 1996, p. 362). The media’s marginal position in the digital issue space might partly be explained by the network generation process, which subordinates their connective choices to the preferences of the challenger seeds. However, media-centric studies

equally show that the media tend to keep traffic on their websites due to advertising revenue considerations (Barnhurst, 2010). Their reluctance to connect to other actors in the present study might therefore also partly be a result of their caution against undermining their own gatekeeping position. This puts them at a strategic disadvantage in settings such as the present one, as the networked political communication ecology no longer possesses a predetermined centre.

Bloggers, in turn, make full use of the connective resources provided by digital political communication environments and shape the topology of the mobilization-counter-mobilization networks in their favour. However, the fact that they provide both the most influential authorities and hubs points to an additional aspect. While their most prominent actors are also recognized by the media, the bloggers' dominance might be taken as an indication of a partly fragmenting challenger space, in which specific actors form more or less closed-off subgroups. Given also the fact that most bloggers are climate sceptics, we might indeed be witnessing signs of a development that is the opposite of what the actor diversification in the public sphere represents theoretically, namely exclusion rather than inclusion. The biggest challenge for civil society based digital political communication ecologies might therefore consist in providing an overarching frame of reference that connects the single subdiscourses, and actors that broker between them and are met with the necessary social trust to fulfil this role.

Limitations and future research

The study faces several limitations. First, it has extended the social movement perspective on the digital transformation of political communication, which needs to be complemented by corresponding media-centric studies to arrive at a fuller picture that allows drawing farther-reaching conclusions about the consequences of the ongoing digital revolution. Second, within the context of the present study, the media might still play a more prominent role than the results

suggest, as they might be the ones who first allocate visibility to other actors, including bloggers, while others follow the media's connective references. This is an important point that is not covered by the present analysis. Finally, the implications point to the possible fragmentation of the political communication ecology along actor lines but also with respect to different topics and frames that might be articulated in these communities. The relationships between these different, possibly interrelated forms of segregation need to be more centrally included in future research.

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Endnotes

¹ Of the original 30 networks, two had to be excluded from further analysis as the downloaded textual data proved to be incomplete.

² To balance the seeds in terms of their prominence we kept the total number to eight, as there was, in particular, a drop in the ranking of the Google searches regarding the climate sceptical side. The seeds and their mean geodesic distance are given in the Appendix.

³ For a more comprehensive and technical account, see Author (2016).

⁴ The coding in this step was done manually by two trained coders, who retrieved the information from the ‘About’ section on the websites of the actors. Their position sometimes had to be retrieved from posts in the case of bloggers and from editorials on the subject in the case of the media. In these instances we took at least three posts/articles during the period of the data collection and classified the actor with a position if all three displayed the same explicit stance – otherwise they were coded as ‘no position/ambivalent’. The inter-coder reliability was calculated by comparing 150 coded units with a master coding using Krippendorff’s alpha, which yielded good results: 0.891 (actor position), 0.898 (actor type) and 0.927 (actor country).

⁵ As a result of this decision, some actors are not classified as blogs although their names suggest it. ‘Roger Pielke Jr.’s Blog’, while technically falling into the blog category, explicitly states his affiliation with the University of Colorado, which was coded as a civil society actor.

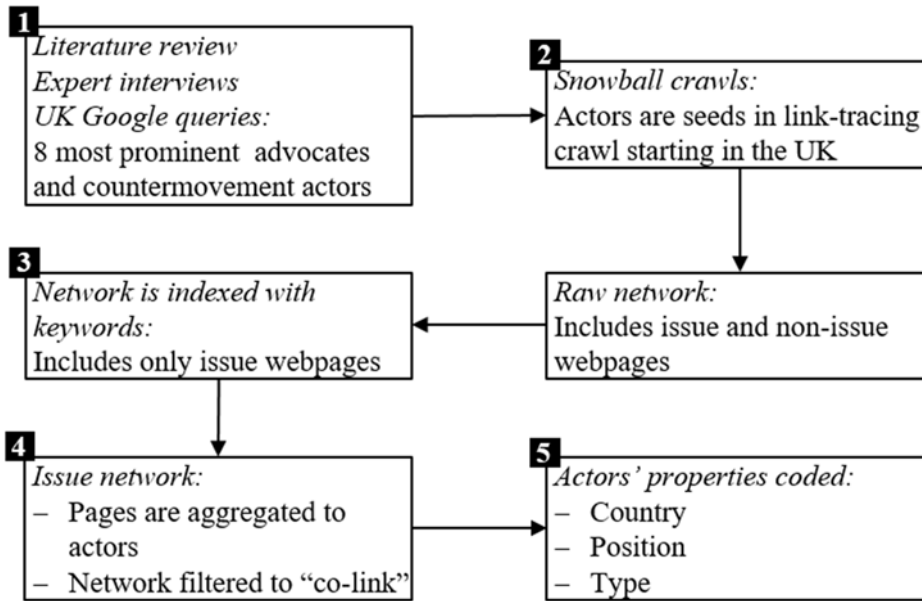


Figure 1. Network collection procedure

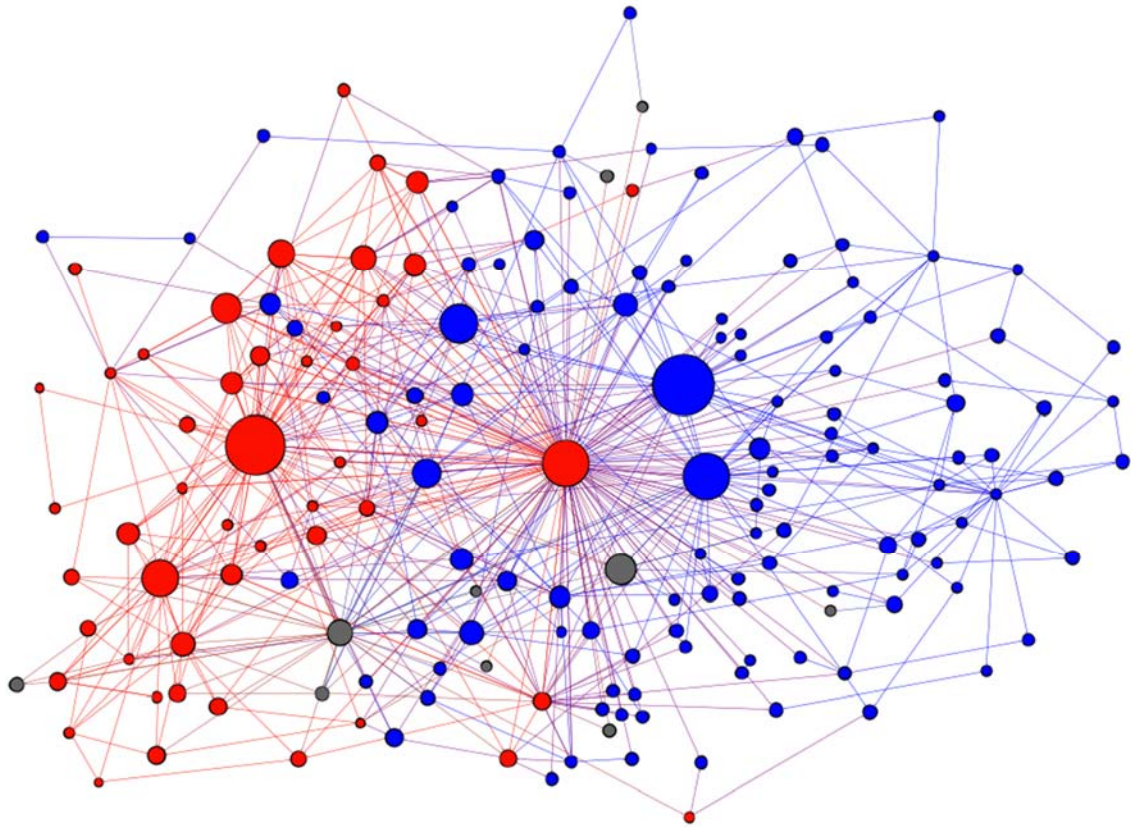


Figure 2. UK climate change network from May 2013.

Note. Node size proportional to indegree. Colours: red = climate sceptics, blue = climate advocates, grey = no position/ambivalent.

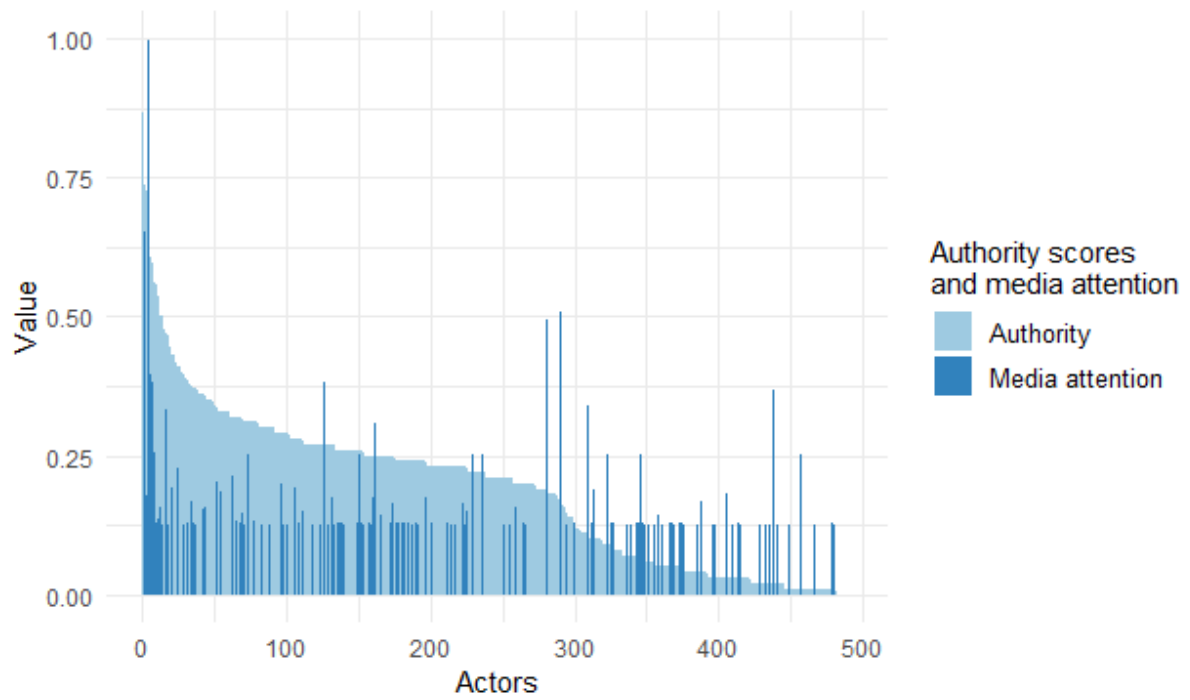


Figure 3. Mean authority scores and links from media per actor ($n=492$) across all networks ($N=28$). The mean media attention has been normalised between 0 and 1.

Table 1

Distribution of general network measures and actor attributes

Network Measures and nodal attributes	Min.	Max.	<i>M</i>	<i>SD</i>
<i>Structural properties</i>				
Nodes	137	178	156.18	10.14
Edges	485	736	586.39	65.30
Diameter	5	11	8	1.72
Density	0.022	0.03	0.024	0.002
In-centralization	0.11	0.25	0.18	0.03
Out-centralization	0.62	0.81	0.70	0.05
Jaccard index	0.51	0.82	0.69	0.07
<i>Topic distribution (probabilities)</i>	0	0.79	0.03	0.06
<i>Actor type</i>				
Political	5	14	8.2	2.3
Economic	2	5	3.1	0.9
Media	32	50	41.8	3.8
Civil society	57	77	68	5.5
Bloggers	26	38	32.3	3.0
Other/n.a.	1	7	2.9	1.4
<i>Actor country</i>				
UK	45	75	61.7	7.7
US	35	54	44.1	5.0
Global	24	41	30.3	4.3
Other/n.a.	1	6	3.4	1.3
<i>Actor position</i>				
Advocate	85	117	99.6	9.1
Skeptics	35	56	44.3	4.8
No position/ambivalent	5	21	12.4	3.7

Note. For the actors' country only the three highest values are reported.

Table 2

Permutation test for differences in actor type visibility (n= 3978) across all networks (N=28)

Pairing	Z-value	p-value
Civil society vs Media	-1.2424	0.107
Civil society vs Bloggers	-10.78	2.2e-16
Media vs Bloggers	-8.4202	2.2e-16

Note. For all three tests, the alternative hypothesis states that the actor group to the left hand side has a greater visibility than that to the right.

Table 3

Top ten actors by largest mean authority score

Actor	<i>M</i>	<i>SD</i>	Type	Country	Position
Intergovernmental Panel on Climate Change	24.42	15.2	Pol.	Global	Adv.
Watts Up With That?	23.75	8.52	Blog	US	Scp.
Climate Resistance	20.86	2.81	Blog	UK	Scp.
The Guardian	18.61	4.12	Media	UK	Adv.
Climate Audit	18.27	12.54	Blog	US	Scp.
Skeptical Science	16.56	6.38	Civ.	AU	Adv.
Roger Pielke Jr.'s Blog	13.64	2.61	Civ.	US	Scp.
Committee For A Constructive Tomorrow	12.89	2.79	Civ.	US	Scp.
The Daily Telegraph	10.14	2.66	Media	UK	Scp.
The View from Here	9.9	2.05	Blog	CD	Scp.

Note. Only those actors were considered who appeared at least in half of the networks. Abbreviations: Type: Pol. = Political, Civ. = Civil society; Country: CD = Canada, UK = United Kingdom, US = United States; Position: Adv. = Climate advocate, Scp. = Climate sceptic.

Table 4

Permutation test for difference in mean authority scores per actor type (N=3978) across all networks (N=28)

Pairing	Z-value	p-value
Civil society vs Media	-12.104	2.2e-16
Civil society vs Bloggers	-7.6721	8.458e-15
Media vs Bloggers	-17.299	2.2e-16

Note. For all three tests, the alternative hypothesis states that the actor group to the left hand side has a lower authority than that to the right.

Table 5

Paired sample permutation test comparing original authority scores to those without media as senders and bloggers as senders

Links excluded from actor group	Z-value	p-value	Mean overall authority
Media	-14.835	< 2.2e-16	.216
Bloggers	11.884	< 2.2e-16	.089

Note. For the media, the alternative hypothesis is “less”, for bloggers the alternative hypothesis is “greater”. The mean overall authority of the original networks is .183.