

Public Spheres of Skepticism: Climate Skeptics' Online Comments in the German Networked Public Sphere

JONAS KAISER¹

Harvard University, USA

Zeppelin University, Germany

Alexander von Humboldt Institute for Internet and Society, Germany

Online comment sections can be considered a public battleground for contestation where members of mainstream publics and counterpublics meet. The case of the climate skeptic counterpublic in Germany was chosen to find out where and how members of the counterpublic are speaking out and how the mainstream responds to that. I conducted a hyperlink network analysis to identify potential battlegrounds, followed by a content analysis of 10,262 user comments from different publics (four news sites, six climate blogs). The results show that the skeptic counterpublic, albeit structurally excluded, is successful in brigading mainstream comment sections and countering the mainstream narrative. The conservative comment sections are especially dominated by counterpublic voices. Mainstream users, however, respond critically to them and challenge the skeptics within their own counterpublic.

Keywords: counterpublics, public sphere, online comments, climate change, climate skepticism, framing, content analysis, hyperlink network analysis

The idea of an online public sphere in which issues can be discussed freely and openly by citizens has been a constant topic of discussion in academia (e.g., Dahlberg, 2001, 2007; Gerhards & Schäfer, 2010). Based on the promise of a power-free, equal, open, more inclusive, and deliberative discourse, the Internet was supposed to strengthen the public sphere and democracy (Benkler, 2006; Papacharissi, 2002). Especially the potential for deliberation turned out to be a false hope, with several empirical studies stating an overall poor discourse quality on the Web (e.g., Freelon, 2013; Papacharissi, 2004) and with Sunstein (2001) even suggesting that deliberation among equally minded groups could lead to a more fragmented and radicalized public sphere.

Jonas Kaiser: j.kaiser@zeppelin-university.net

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Others, however, saw this fragmentation as an opportunity for minorities to create spaces in which they are able to speak freely and without fear of oppression: the so-called counterpublics (Downey & Fenton, 2003). These counterpublics can be best understood as places that are in opposition to the hegemony (Dahlberg, 2007) and/or perceive themselves as subordinate to or excluded from the mainstream public sphere (Asen, 2000). Although theoretically and empirically prominent, only a few studies have looked at the intersection of mainstream public and counterpublic (Dahlberg, 2007). By focusing on the discursive struggle between mainstream and counterpublic within the concept of the networked public sphere (Benkler, 2006), this study offers new perspectives on where and how counterpublics are using the Internet to make their voices heard, and where they are being excluded. I suggest that this struggle is likely to be visible not on the mass media sites, but rather in the comment sections (e.g., Toepfl & Piwoni, 2015). To analyze whether, and with which framing, counterpublics are trying to make their voices heard within these "battlegrounds of contestation," I present the case of climate skepticism in the German networked public sphere (NPS).

Indeed, few issues are as long-term, universal, complex, abstract, and important as climate change (Intergovernmental Panel on Climate Change [IPCC], 2013). Even though it is largely undisputed scientifically that climate change is happening and is caused by human activity (Cook et al., 2013), the discourse is fiercely polarized with the so-called skeptics rejecting this mainstream position and promoting their denial of climate change (Elgesem, Steskal, & Diakopoulos, 2015; Hobson & Niemeyer, 2013; Sharman, 2014). The rift between the mainstream and skeptics is especially visible in Germany, where the overwhelming majority accept the theory of anthropogenically induced climate change and where skeptical voices are rare in the media coverage and not represented by the political mainstream (Grundmann & Scott, 2014; Kaiser & Rhomberg, 2016; Metag, Fuchsli, & Schäfer, 2015). In this article, skeptics are understood as an online counterpublic. I am interested in the relationship between mainstream and counterpublic with regard to activity, how skeptics frame their messages, and how the mainstream reacts to them. In answering these questions, empirical as well as theoretical conclusions will be drawn. To understand how skeptics may try to influence the public online discourse, I conducted a qualitative-quantitative content analysis of 10,262 comments from four news sites (mainstream) and six climate blogs (four mainstream, two counterpublic).

This article adds to the existing literature by conceptualizing how counterpublics can be understood within the NPS, by highlighting the critical role of online comments within the NPS and as a means for counterargument, and how counterpublics can be identified with the help of digital methods. First, I outline how counterpublics and the NPS can be understood and conceptualized together, and what role online comments play within this concept. Then I describe the issue of the climate change skeptic counterpublic in Germany. The empirical section presents the methods and results and then connects them to the theoretical concept of the networked public sphere.

The Networked Public Sphere and Counterpublics

One prominent source of inspiration when talking about counterpublics and the public sphere in general is Habermas's (1996) work on the public sphere, which he defines as "a network for communicating information and points of view" (p. 360). By emphasizing both the communicative as well

as the network character of the public sphere, he foreclosed key aspects that scholars associate with today's NPS. These describe the interconnectedness of different online publics and the change of roles, information diffusion, coalition building, and political participation (Benkler, 2006; Benkler, Roberts, Faris, Solow-Niederman, & Etling, 2015). Indeed, the NPS can be described as "the range of practices, organizations, and technologies that have emerged from networked communication as an alternative arena for public discourse, political debate, and mobilization alongside, and in interaction with, traditional media" (Benkler et al., 2015, p. 596).

However, the Internet did not abolish the inequalities and oppression minorities faced in the real world but rather reproduced them online (Dahlberg, 2007; Downey & Fenton, 2003). Minorities and other marginalized or "problematic" groups, for example, are often excluded or perceive themselves as excluded from the mainstream discourse and may form a counterpublic as a reaction (Asen, 2000; Jackson & Foucault Welles, 2015).

The idea of counterpublics emphasizes the public sphere's fragmented character and the existence of power relations and posits that there are marginalized alternative publics that are in opposition to the oppressing hegemonic discourse (Fraser, 1990). Counterpublics, in this sense, can be understood as a community of individuals who feel connected to one another via a collective identity and who can be identified online through websites and/or counterpublic messages (Asen, 2000; Fraser, 1990). Communicative spaces in which these counterpublic messages are predominant are, then, counterpublic spaces (Asen, 2000). Counterpublics usually form around complex social issues such as women's rights or social justice; they are a response to social exclusion and represent the group's struggle to find its place within the public sphere (Fraser, 1990; Nuernbergk, 2013; Toepfl & Piwoni, 2015). This exclusion, however, has ambivalent consequences, as Fraser (1990) remarks: "On the one hand, they function as spaces of withdrawal and regroupment; on the other hand, they also function as bases and training grounds for agitational activities directed toward wider publics" (p. 68).

In recent years, several authors have addressed the issue of how and where counterpublics make use of the Internet. Renninger (2015) examines how the asexual community makes use of Tumblr and how the platform's affordances support the formation of a counterpublic as they limit direct contact with the mainstream. At the same time, Toepfl and Piwoni (2015) highlight the importance of interactive features such as comment sections for counterpublics as they allow them to make their voices heard. Similarly, Jackson and Foucault Welles (2015) found that counterpublics can use Twitter to brigade and even hijack a specific hashtag in order to promote their messages. In their analysis, Jackson and Foucault Welles conclude "that networked counterpublics are more diverse and inclusive than the mainstream public sphere" (p. 948). These studies thus show how interactive features and platforms directly affect the activity of counterpublic actors and where, how, and with what goal they communicate.

A way to identify the spaces counterpublic actors withdraw to, which also considers the "blogosphere," is through hyperlink analysis (Benkler, 2006). Nuernbergk (2013), for example, identifies the leftist counterpublic surrounding German Indymedia and shows that it is not excluded from the broader NPS and proposes that counterpublics would not necessarily lead to a more fragmented public. He

thus demonstrates a good method to map counterpublic spaces (i.e., websites) in the NPS and how they are connected to the mainstream.

In general, it should be noted that the Internet offers counterpublic actors and spaces a variety of possibilities to form and organize themselves, to communicate with others, and to reach the broader public sphere and the mass media with their counterdiscourses. But this does not imply that they are also more visible in the mainstream public sphere, because the Internet also allows for new ways of exclusion.

However, assumptions and analyses of counterpublics often draw on a normative perspective and thus exclude problematic marginalized groups (e.g., right-wing extremists) that do not aim to strengthen democracy or fight for a more equal and inclusive discourse (Nuernbergk, 2013). Against this background, it is proposed to extend the term *counterpublic* in favor of a more inclusive understanding (see Downey & Fenton, 2003). A counterpublic is thus defined as (1) structured around a specific issue that is morally or politically polarizing, (2) opposed to the dominant hegemony within this discourse, (3) perceiving itself as excluded from the public discourse, and (4) having its own influential media outlets (e.g., blogs, forums).

The most prominent strategy of a counterpublic is to contest the hegemonic position, thus extending the public sphere (Dahlberg, 2007). This is mostly done through measures such as establishing new frames, reframing a story, or setting new topics (Toepfl & Piwoni, 2015). As Snow and Benford (1992) point out, framing is instrumental for a movement's collective identity formation. Framing in this context can be understood as "making sense of relevant events, suggesting what is at issue" (Gamson & Modigliani, 1989, p. 3) and is a widely used method for analyzing debates in the public sphere (e.g., Gerhards & Schäfer, 2010). The use of counterpublic frames is thus seen as a proxy for counterpublic actors.

In this sense, I propose that the concept of counterpublics can be conceptualized within the NPS. Because the NPS emphasizes the loose or even fragmented and yet existing connection of online publics that nevertheless can potentially influence one another, counterpublics can be thought of as a specific kind of public that is excluded by and in opposition to the mainstream and yet part of the broader network, albeit loosely. The NPS also includes different kinds of modes (e.g., comments, tweets) and types of communication (e.g., Web logs, news media sites, and the associated comment sections) that do not necessarily rely on the mass media as gatekeeper (Benkler, 2006) and are thus open for counterpublic communication. Comment sections are especially interesting because they are among the most popular forms of user-generated content (Friemel & Dötsch, 2015), and they illustrate how intertwined and connected different online publics are, because they are directly connected to more influential publics as, for example, mass media sites (Gerhards & Schäfer, 2010). In this article, comment sections are thus understood as *associated publics* that differ from the articles with regard to reach and access since they are read less frequently than the articles, although they are on the same page (Friemel & Dötsch, 2015).

Against this background, it is important to note that a growing body of research deals with the questions of who is writing these comments and what effects they may have. Friemel and Dötsch (2015) found through surveys that commenters on Swiss news sites tend to be more conservative than the average reader and suggest that this may lead to a distortion of the perceived public opinion. Anderson,

Brossard, Scheufele, Xenos, and Ladwig (2014) discovered that uncivil user comments had an influence on the way readers perceived an article's content—a finding that is in line with the impact of user comments on product evaluation (Flanagin, Metzger, Pure, Markov, & Hartsell, 2014). Toepfl and Piwoni (2015) found supporters of the right-wing party AfD to be very active within the comment sections of news sites and suggested that they transformed the comment sections into counterpublics.

In sum, it is obvious that online comments are an influential way to communicate one's ideas and that they are also used by counterpublics to counterargue the mainstream position—for example, in the climate change debate. Comment sections can thus be considered contested spaces that are open for members of both sides. Although contested, it can be assumed that counterpublic comment sections are also mostly used by counterpublic actors (e.g., for regroupment) and thus can be considered to be counterpublic. Comment sections on mainstream sites—especially news sites—however, attract a more diverse user base (Friemel & Dötsch, 2015). But because counterpublics are a marginalized minority in the mainstream, it still can be assumed that mainstream comment sections are initially used by mainstream users. But as Toepfl and Piwoni (2015) have shown, this can change from topic to topic due to the comment sections' openness for contestation and the counterpublic participants' activity.

Climate Skeptics as a Counterpublic

Whereas in the United States climate change skepticism can be considered part of the public discourse on climate change, in Germany it is a fringe attitude. Engels, Hüther, Schäfer, and Held (2013) conclude in a representative survey that climate change is generally accepted in Germany by the majority and that climate change skepticism "has not spread widely across the population" (p. 1023). In addition, Metag, Fuchsli, and Schäfer (2015) find in a representative survey that 10% of Germans are "doubtful" about climate change. Media content analysis offers a similar picture: Grundmann and Scott (2014), for example, were not able to identify climate skeptic statements within the German media coverage on climate change, and Kaiser and Rhomberg (2016) found skeptic frames only in 7% of the German news coverage of the 2011 Climate Change Conference in Durban, South Africa. Among the general public as well as in the mass media, climate change skepticism is rare and unpopular. Online, however, climate skepticism seems to be more prevalent in comment sections and climate skeptic websites (Lörcher & Taddicken, 2015; Porten-Cheé & Eilders, 2015).

A lot of research has been dedicated to the subject of climate change skepticism to obtain a better idea of who is more likely to question climate change, and what frames are being used to do so. For example, studies point out that skeptics in the United States tend to be politically more conservative and are in favor of the free market (Cook & Lewandowsky, 2016; McCright & Dunlap, 2011). This is also to some extent true for European countries (McCright, Dunlap, & Marquart-Pyatt, 2016), where conservative news media tend to be more skeptical than liberal news media (Carvalho & Burgess, 2005), and skeptic think tanks have ties to the corporate sector (McCright & Dunlap, 2000). Skeptics question not only the phenomenon of climate change but also climate science; they adapt their framing to recent developments (Kaiser & Rhomberg, 2016) and are more open to conspiracy theories than others (Cook & Lewandowsky, 2016). Framing studies found that skeptics usually use two overarching frames when expressing their skepticism: doubt about climate change and doubt about climate science (Kaiser & Rhomberg, 2016).

Additionally, the question of how to label skeptics is a recurring topic not only in academia (Howarth & Sharman, 2015) but also in skeptic circles (Elgesem et al., 2015).²

Hypotheses

Based on these theoretical assumptions and findings, I propose five hypotheses about the counterpublic's exclusion and inclusion in comment sections of news sites and blogs. The lack of representation of counterpublic voices within the mass media is one of the main reasons for the creation of a counterpublic. Because the Internet offers counterpublics new forms of communication (e.g., online comments) to counter the mainstream narrative within the mainstream publics (Jackson & Foucault Welles, 2015; Toepfl & Piwoni, 2015), the question arises whether counterpublics chose to do so. Because climate change skeptics are a minority in Germany (Metag et al., 2015), they are rarely represented in the mass media (Kaiser & Rhomberg, 2016), but are more active online (e.g., in comment sections; see Lörcher & Taddicken, 2015). It can thus be assumed that:

H1a: Climate change skepticism is more prevalent in the comment sections of media outlets than it is among the general populace (where it is estimated that 10% are climate change skeptics).

Because some media outlets in the mainstream public sphere are closer and more open to counterpublic frames and topics than others, the mass media promise a wider reach for counterpublic arguments than blogs (e.g., Nuernbergk, 2013), and several studies from the United States have found a connection between skeptics and a conservative political stance (Carvalho & Burgess, 2005; McCright & Dunlap, 2011), I assume:

H1b: Counterpublic comments will be more frequent in the comment sections of media outlets—especially conservative media outlets—than in mainstream blogs.

The second set of hypotheses deals with the question of identity. As Fraser (1990) suggests, counterpublics are places for withdrawal, regroupment, and identity formation, and Snow and Benford (1992) demonstrate that framing is instrumental in identity formation. Thus, it can be assumed that there is a difference between how skeptics talk about climate change within their counterpublic and how they talk about it among the mainstream. Since Toepfl and Piwoni (2015) highlight that counterpublic comments can differ between media types, and Chávez (2011) points out that information production between counterpublic and mainstream public may differ, it is assumed that:

H2a: The framing of climate change and climate science will differ between counterpublic and mainstream comment sections.

² Even though it is a constant topic for discussion, the label *skeptic* is chosen over the less inclusive terms *deniers* or *contrarians* (Howarth & Sharman, 2015).

As some media outlets may be more open to counterpublic issues, similarly some counterpublic frames may be more accessible for the mainstream public sphere than others. While doubting the existence of climate change can be seen as a core value for skeptics, it is also highly refuted by the mainstream. However, studies suggest that there are different degrees of skepticism (Hobson & Niemeyer, 2013). Because being skeptical about climate science seems to be more popular than doubting the existence of climate change, I assume:

H2b: Climate change skeptics will be more critical of climate science in mainstream comment sections than in counterpublic comment sections.

The last hypothesis deals with acts of inclusion and exclusion. Because counterpublics are excluded from the mainstream public sphere, it can be assumed that the process of both exclusion and inclusion that constitute its state as counterpublic can be found in the online responses to comments by counterpublic actors.

H3: Skeptical comments will produce negative responses in mainstream comment sections and positive responses in counterpublic comment sections.

Methods

To test the hypotheses, I conducted a manual qualitative-quantitative content analysis of 10,262 comments from 10 comment sections. The comments were taken from the following German websites: the conservative news sites Bild.de (Bild) and Welt.de (Welt), the liberal news sites Spiegel.de (Spiegel) and Zeit.de (Zeit), the climate change skeptic blogs Eike-Klima-Energie.eu (Eike) and Science-Skeptical.de (Science Skeptical [ScS]), the climate "activist" blogs Klimaretter.info (Klimaretter [KR]) and Klima-der-Gerechtigkeit.de (Klima der Gerechtigkeit [KdG]), and the climate science blogs Scilogs.de/Klimalounge (Klimalounge [KL]) and Klimazwiebel.blogspot.de (Klimazwiebel [KZw]).³

The mass media outlets were chosen based on the literature and specific criteria; the blogs were identified with a hyperlink network analysis, thus combining digital with "classical" methods. The criteria for the news media outlets were reach,⁴ journalistic stance, and interactivity in the comment section so that a wide variety of opinions could be collected. These criteria were important because it can be assumed that some comment sections are more open to skeptic frames than others, and they may even occasionally have them in their coverage (Kaiser & Rhomberg, 2016; Toepfl & Piwoni, 2015).

³ Both of the climate science blogs are written by (climate) scientists who are vocal proponents of anthropogenic climate change. Klimazwiebel is a special case because it views itself as an "honest broker" between climate skeptics and the mainstream. Its seemingly skeptic position within the network shown in Figure 1 is explained by the number of in-links by skeptic sites and no outgoing links.

⁴ Reach for each news outlet is measured in millions of unique viewers per month, according to Meedia.de (2016): Bild (19.16), Spiegel (18.46), Welt (16.39), and Zeit (9.91).

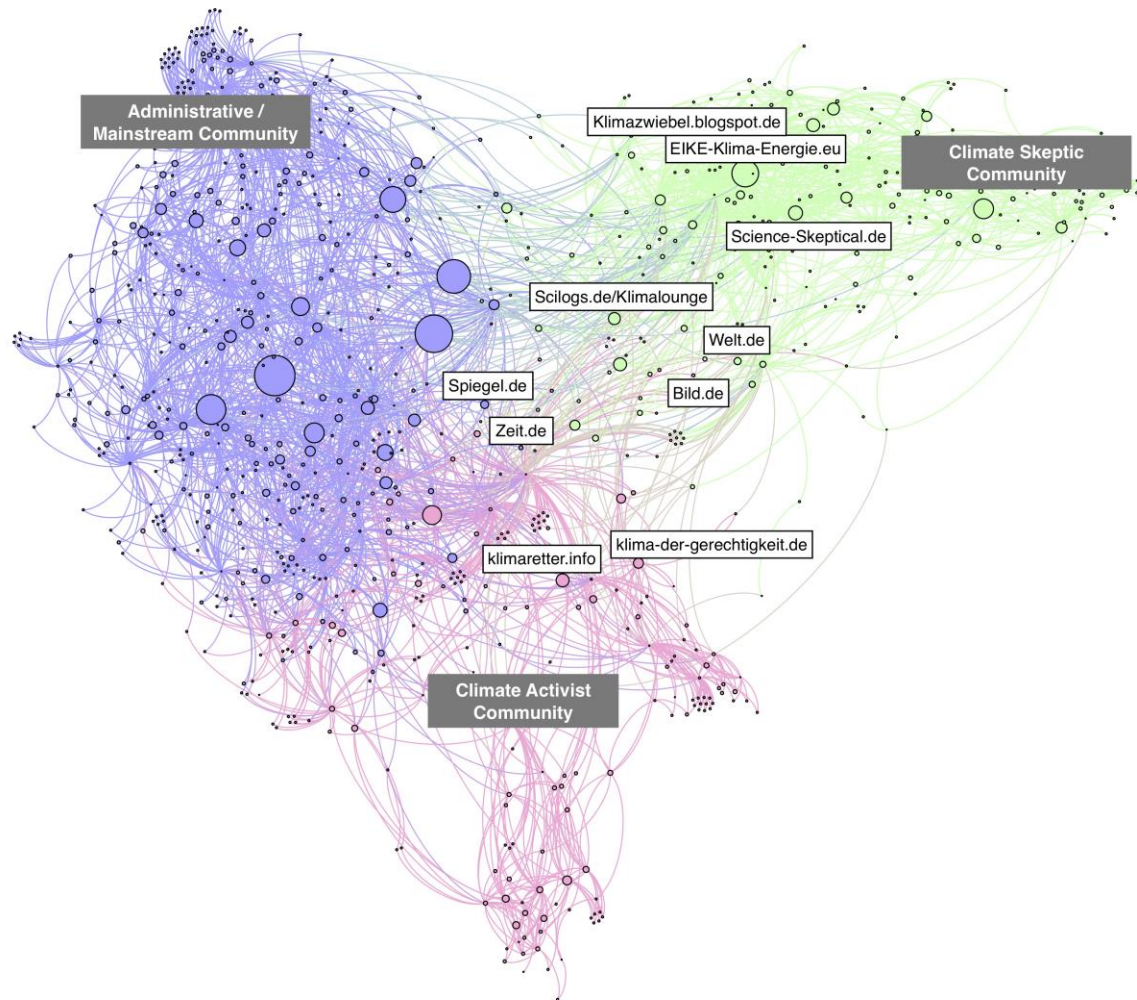


Figure 1. Hyperlink network of the German language climate discourse (communities identified with modularity; node size = indegree; layout algorithm = ForceAtlas2).

The blogs were selected based on a hyperlink study⁵ of the German language climate discourse (Figure 1). This method shows both the networked character of the public sphere as well as the network's polarization. A network analysis identified a large mainstream administrative community, one skeptic community, and one mainstream activist community. Since the most relevant websites from the mainstream administrative communities were sites by institutions that offer neither constant coverage nor

⁵ The hyperlink study was conducted in June 2014 and included all German language websites that dealt with climate issues. The crawl was done manually via snowball crawl that included blogrolls and linklists and started with the sites Science-Skeptical.de and Klima-der-Gerechtigkeit.de.

interaction via comments, I focused on the skeptic and the activist communities. The sites were then selected according to the following criteria: relevance (measured by indegree within the network), blog stance (activist, scientific, or skeptic), topic (it had to deal mainly with climate issues), language (mainly German), activity (recent news updates), and interactivity (comment sections). The case of KdG was problematic, because my network analysis showed it to be relevant within the German climate discourse but with a rather inactive community. Compared with other sites, however, it best fits the established criteria and was thus chosen. By selecting the sites inductively with hyperlink analysis, I was able to detect websites within the climate network that were considered relevant not by me but by the mainstream and counterpublic sites. The selected sites thus are the leading blogs in the climate networks, which are also the most likely to attract user attention, both from the mainstream public and the skeptic counterpublic.

The relevant time frame was one week before and one week after each IPCC working group's meeting and report publication in 2013 and 2014, which amounted to 36 days in total.⁶ The IPCC reports were chosen because they gave news outlets as well as blogs the opportunity to write about climate politics, climate science, and other related topics. To capture all relevant comments in these time frames, all mass media articles with the German versions of the search terms "climate*," "earth warming," "global warming," and "ipcc" were collected. In addition, all blog posts were included as the selected blogs are less active than the mass media and deal predominantly with climate change. This resulted in 382 articles.

In the next step, all comments were scraped from the websites with the tools Import.io (e.g., Spiegel, Zeit, ScS) and DisqusScraper (Den Tex, 2015; e.g., Welt, KdG) and manually by scraping the HTML code (Bild, Eike). This resulted in 16,289 comments. Because this study's aim is to look for skeptical comments and how they were responded to, the first 100 comments were used. This was done for three reasons: (1) A random sample often lacks the context for an analysis of how users respond to one another; (2) late comments are often overlooked by other users (Ziegele, Breiner, & Quiring, 2014, p. 1123); and (3) few articles had more than 100 comments. Remaining within the data set, then, were 10,262 comments.

These comments were then coded by five coders according to a codebook that was based on prior research on skeptic frames (Hobson & Niemeyer, 2013; Kaiser & Rhomberg, 2016; Rahmstorf, 2005) from which the two overarching frames "skeptical of the phenomenon of climate change" and "skeptical of climate science" and their idea elements could be identified. Whereas *climate change* consists of the frames "existence" (questioning the existence of climate change), "cause" (e.g., mankind's role), and "impact" (climate change's consequences), *climate science* is about climate science's supposed "politicization," its "uncertainty" (e.g., suggesting scientists don't know everything), its "conspiracy" (e.g., suggesting scientists are part of a conspiracy), and its "alarmism" (e.g., suggesting that it is not that bad and that scientists are exaggerating; see Kaiser & Rhomberg, 2016). These frames, often called "emphasis frames" (Cacciatore, Scheufele, & Iyengar, 2016), consist of idea elements that can be considered directed statements that communicate a clear skeptical idea (e.g., "Climate change does not

⁶ The first time frame was between September 21 and October 2, 2013 (WG1); the second was between March 23 and April 2, 2014 (WG2); and the third was between April 6 and April 17, 2014 (WG3).

exist” or “Mankind is not to blame for climate change”) and thus define a frame’s core (Gerhards & Schäfer, 2010; Toepfl & Piwoni, 2015). Krippendorff’s α for this coding was deemed acceptable (>0.9 for formal variables and >0.7 for the content variables).

Results

Skeptic Comments in Different Comment Sections

In a first step, the coders differentiated between relevant and irrelevant comments (i.e., off-topic comments that did not deal with climate issues) to simplify the coding process and guarantee careful manual coding (Krippendorff’s $\alpha = 0.88$ for five coders). Due to this precaution, over 50% of the scraped comments had to be discarded.⁷ The rest ($n = 4,425$) remained in the sample (Table 1). More than 60% of the comments on Bild, Spiegel, and Zeit were irrelevant for this study, whereas the climate blogs had more relevant comments (except for ScS and Klimaretter) than the mass media outlets.

Table 1. Relevance of Comments per Outlet (N = 10,262).

Outlet	Irrelevant (%)	Relevant (%)	Total (%)
Bild ($n = 760$)	67.9	32.1	100.0
Spiegel ($n = 3,618$)	67.6	32.4	100.0
Welt ($n = 863$)	41.1	58.9	100.0
Zeit ($n = 1,948$)	61.2	38.8	100.0
Eike ($n = 1,311$)	23.7	76.3	100.0
ScS ($n = 789$)	57.9	42.1	100.0
Klimaretter ($n = 704$)	74.3	25.7	100.0
KdG ($n = 9$)	11.1	88.9	100.0
Klimalounge ($n = 79$)	11.4	88.6	100.0
Klimazwiebel ($n = 181$)	14.9	85.1	100.0
Total ($N = 10,262$)	56.9	43.1	100.0

However, this study’s main interest is on how and where the climate change skeptic counterpublic tries to make their voices heard. The results show that climate change skeptics utilize comment sections for their agenda: 42.8% of all relevant comments were skeptical of climate change or climate science, whereas only 25.0% promoted the mainstream perspective on climate change and climate science (see Table 2). When taking all 10,262 comments into consideration, 18.4% were skeptical and only 8.4% represented the mainstream position. Compared with the German populace,⁸ in which a vast majority (about 70%) is concerned about climate change and only 10% are doubtful (Metag et al., 2015), these results show how active the skeptic counterpublic is online. H1a can thus be confirmed.

⁷ One article, for example, was about Formula 1 but mentioned climate change in one paragraph. Because this might have led to conversations about the issue of climate change and racing, it was included.

⁸ It is not assumed that the people who write online comments are representative of the German populace (e.g., Friemel & Dötsch, 2015). However, the general populace is used here as a benchmark to contextualize the numbers.

H1b posited that the skeptic counterpublic would be more present in the comment sections of the mass media and especially in conservative news outlets. Indeed, skeptics are extremely active in the comment sections of the mass media and the conservative outlets Bild and Welt (see Table 2). Even though this was expected to some extent, the fact that roughly 75% of all relevant comments on both sites are from the counterpublic is surprising and shows how active skeptics are in associated mass media publics. When comparing these numbers to the skeptic blogs of Eike and ScS, it is noteworthy that most of the comments are unclear—that is, they were on-topic but could not be attributed to a mainstream, skeptic, or ambivalent position.⁹

Table 2. Position of Comments per Outlet (N = 4,425).

Type	Outlet	Position of comments (%)			
		Mainstream	Ambivalent	Skeptic	Unclear
Conservative media	Bild (<i>n</i> = 244)	15.6	0.0	74.6	9.8
	Welt (<i>n</i> = 508)	11.0	0.8	76.8	11.4
Liberal media	Spiegel (<i>n</i> = 1,173)	26.1	0.4	41.8	31.7
	Zeit (<i>n</i> = 755)	34.7	2.6	31.4	31.3
Counterpublic blogs	Eike (<i>n</i> = 1,000)	6.8	0.9	38.0	54.3
	ScS (<i>n</i> = 332)	4.8	2.1	46.1	47.0
Climate activist blogs	KR (<i>n</i> = 181)	37.6	1.1	17.7	43.6
	KdG (<i>n</i> = 8)	25.0	0.0	0.0	75.0
Climate science blogs	KL (<i>n</i> = 70)	42.9	0.0	15.7	41.4
	KZw (<i>n</i> = 154)	31.2	6.5	11.7	50.6
Total (<i>N</i> = 4,425)		20.2	1.3	42.8	35.7

Another interesting finding is that the liberal news media outlets, which seldom or never include skeptic voices (Kaiser & Rhomberg, 2016), have nevertheless a very active climate change skeptic user base. In the same vein, the climate activist as well as climate science blogs had fewer skeptics and a more vocal user base that defended the mainstream perspective. H1b can thus be confirmed.

The difference between the outlets is even more visible when comparing their skeptic means (see Table 3). The climate change skeptic blog ScS has the most skeptical comment section, closely followed by the conservative media outlet Welt, the skeptical blog Eike, and the tabloid Bild. Indeed, there is no significant difference between these four sites when comparing their means, thus suggesting that they form a skeptical “cluster” in which counterpublic members are equally vocal. This is also true for the mainstream position, where two closely connected clusters exist that consist of Zeit, Klimaretter, Klimalounge, and Klimazwiebel. Spiegel’s comment section (and, expectedly, KdG) differs significantly from all others, which most likely can be explained by its popularity and more diverse user base.

⁹ Comments were coded as ambivalent when they included both counterpublic and mainstream positions.

**Table 3. Mean Comparison of Skepticism in Each Outlet's Comment Section
(1 = Mainstream, 2 = Ambivalent, 3 = Skeptic).**

Outlet	Bild	Welt	Spiegel	Zeit	Eike	ScS	KR	KdG	KL	KZw
Bild (<i>M</i> = 2.65)		-0.09 †	0.43*	0.70*	-0.03 †	-0.12 †	1.01*	1.66*	1.12*	1.05*
Welt (<i>M</i> = 2.74)	0.09 †		0.51*	0.79*	0.06 †	-0.04 †	1.10*	1.74*	1.21*	1.14*
Spiegel (<i>M</i> = 2.23)	-0.43*	-0.51*		0.28*	-0.45*	-0.55*	0.58*	1.23*	0.69*	0.62*
Zeit (<i>M</i> = 1.95)	-0.70*	-0.79*	-0.28*		-0.73*	-0.83*	0.31 ‡	0.95*	0.42 ‡	0.35*
Eike (<i>M</i> = 2.68)	0.03 †	-0.06 †	0.45*	0.73*		-0.10 †	1.04*	1.68*	1.15*	1.08*
ScS (<i>M</i> = 2.78)	0.12 †	0.04 †	0.55*	0.83*	0.10 †		1.13*	1.78*	1.24*	1.17*
Klimaretter (<i>M</i> = 1.65)	-1.01*	-1.10*	-0.58*	-0.31 ‡	-1.04*	-1.13*		0.65*	0.11 ‡	0.04 ‡
KdG (<i>M</i> = 1.0)	-1.66*	-1.74*	-1.23*	-0.95*	-1.68*	-1.78*	-0.65*		-0.54*	-0.61*
Klimalounge (<i>M</i> = 1.54)	-1.12*	-1.21*	-0.69*	-0.42 ‡	-1.15*	-1.24*	-0.11 ‡	0.54*		-0.07 ‡
Klimazwiebel (<i>M</i> = 1.1)	-1.05*	-1.14*	-0.62*	-0.35*	-1.08*	-1.17*	-0.04 ‡	0.61*	0.07 ‡	

* Represents significant differences between means (<0.05). Significance was calculated with the Games-Howell test. Similar means are in bold; † represents skeptic and ‡ mainstream positions, respectively. All unclear comments have been discarded.

Climate Skeptic Frames

To answer H2a and H2b, which deal with the counterpublic's identity, it is important to look at the frames that are used in the comment sections and whether these comment sections differ notably from one another. It was assumed that the counterpublic comment sections will differ from the mainstream ones.

Based on this assumption, the similarities between the mass media and skeptic blogs are noteworthy (see Table 4). Only on Zeit (52.8%) and ScS (56.3%) is doubting climate science more prevalent than questioning climate change. On Bild (52.8%), Welt (54.2%), Spiegel (53.8%), and Eike (62.5%), skeptics were more dismissive of climate change.

Table 4. Skeptical Frames per Comment Section (N = 2,945).

Outlet	Climate change frames (%)			Climate science frames (%)				Other (%)	Total (%)
	Exis- tence	Causes	Impact	Politici- zation	Uncer- tainty	Conspi- racy	Alarm- ism		
Bild (n = 272)	10.7	33.5	8.7	5.9	16.2	18.0	7.0	0.0	100.0
		52.9			47.1				
Welt (n = 603)	14.4	31.2	8.6	8.1	20.7	11.4	5.6	0.0	100.0
		54.2			45.8				
Spiegel (n = 759)	11.1	33.7	9.0	5.4	22.3	10.7	7.8	0.0	100.0
		53.8			46.2				
Zeit (n = 381)	14.2	27.8	5.2	9.2	24.4	10.0	9.2	0.0	100.0
		47.2			52.8				
Eike (n = 604)	13.1	40.1	9.3	3.6	18.7	9.1	6.1	0.0	100.0
		62.5			37.5				
ScS (n = 229)	9.2	26.6	7.9	7.9	23.1	17.9	5.7	1.7	100.0
		43.7			54.6				
KR (n = 56)	12.5	16.1	16.1	7.1	28.6	12.5	7.1	0.0	100.0
		44.7			55.3				
KL (n = 16)	6.3	18.8	18.8	0.0	37.5	18.8	0.0	0.0	100.0
		43.9			56.3				
KZw (n = 25)	24.0	16.0	16.0	4.0	32.0	4.0	4.0	0.0	100.0
		56.0			44.0				
Total	12.5	32.6	8.6	6.3	21.3	11.7	6.9	0.1	100.0
		53.7			46.2				

Note. Bold values are combined percentages by outlet for each frame type. Total refers to how often the frames were used in general.

There are, nevertheless, differences between the comment sections: There are only three comment sections (Klimaretter, Klimalounge, Klimazwiebel) in which the *climate change's causes* frame (e.g., users voiced their doubts about mankind's influence or claimed that CO₂ is not harmful) is not the most popular one. On these three sites, *climate science's uncertainty* (e.g., users claimed that climate science was not a "real" science or that the data are not reliable) was more often used, which may be explained by the focus the three blogs place on climate science and/or politics.

In comparison, the skeptic users on Zeit are more critical of *climate science's uncertainty* but also its *alarmism*. Because Zeit is also the only news media comment section that had more mainstream than skeptic comments, this might suggest that the skeptics on Zeit try to be subtler in questioning climate science. Another explanation could be that Zeit is a rather elite and liberal magazine as well as news site and thus may attract subtler or "light" skeptics.

When comparing the mass media with skeptic blogs, some differences are obvious: On Eike, the users are very skeptical about the causes of climate change and especially about CO₂, which they often label as good for the planet. In comparison, the users of ScS tend to question mainstream climate science. This is not surprising as the blog's focus is on science (the others being on politics, climate, and energy).

In general, H2a and H2b must be discarded. Although there are differences between Eike and the rest of the outlets, ScS is similar to the mainstream comment sections. However, on Zeit, KR, and KL, skeptics tend to be more critical of climate science than of climate change.

Exclusion and Inclusion of Skeptics

To investigate possible exclusion and inclusion effects within the comment sections, one has to look at not only what skeptics are saying but how other users respond to it and how the comments are liked by other users. The first important thing to note is that, of the 4,425 relevant comments in the sample, 2,504 were a direct reply to another comment, and roughly half of them ($n = 1,378$) were a direct response to a skeptic comment. In general, the responses were mostly either corrective (i.e., the users corrected the skeptics and often went into great detail as to why they were wrong) and less so critical (i.e., the users dismissed the skeptics' comments or made fun of them).¹⁰

As shown in Table 5, there is a difference between each site's comment section. This is obvious when looking at the sites that have a lot of skeptic comments, such as Bild, Welt, Eike, and ScS. On all four sites, users are supportive of skeptics. ScS, even though a skeptic blog, is the least friendly of the sites. In fact, 22% of all responses across all sites were comments of agreement. Naturally, only a few of those (3.6%) were also written by users from the mainstream faction who, for example, agreed sarcastically with the skeptic user, tried to build a bridge for further discourse, or misread the skeptical comment.

It is noteworthy how different Eike and ScS are when it comes to more negative responses to skeptic comments. Whereas on Eike few comments are critical of other skeptics, users on ScS are more negative about other users. The negative comments, however, are not from mainstream users but from other skeptics. In general, 25% of all responses on Eike were from mainstream users, whereas on ScS only 11.3% of responses were written by mainstream users. This shows that, even in their own echo chamber, skeptics are confronted with criticism and tough questions both from mainstream users and other skeptics.

¹⁰ The response types were inductively extracted and discussed during the coder schools and had a Krippendorff's $\alpha > 0.7$.

Table 5. Responses to Skeptic Comments per Comment Section (N= 1,377).

Outlet	Response to skeptical comments (%)						Total (%)
	Critical	Correcting	Appealing to authority	Questioning	Consensual	Agreeing	
Bild (n = 108)	38.9	13.0	0.0	3.7	0.9	43.5	100.0
Welt (n = 144)	30.6	24.3	0.0	7.6	1.4	36.1	100.0
Spiegel (n = 500)	38.4	37.0	0.6	4.6	5.3	14.1	100.0
Zeit (n = 226)	10.4	59.5	11.3	6.3	4.5	8.1	100.0
Eike (n = 234)	11.1	41.9	0.0	8.5	6.0	32.5	100.0
ScS (n = 134)	30.6	24.6	3.7	3.7	9.0	28.4	100.0
KR (n = 24)	25.0	37.5	0.0	29.2	4.2	4.2	100.0
KL (n = 4)	0.0	100.0	0.0	0.0	0.0	0.0	100.0
KZw (n = 12)	33.3	41.7	0.0	16.7	0.0	8.3	100.0
Total	27.4	37.2	2.4	6.2	4.8	22.0	100.0

Note. *Critical* was coded when users were doubtful about other users or criticized them; *correcting* when users corrected other users; *appealing to authority* when users pointed out that scientists had, unlike the users, years of training and expertise; *questioning* when users asked other users further questions; *consensual* when users tried to find a consensus (e.g., by emphasizing common points); and *agreeing* when users agreed with other users or accepted their arguments.

As noted, Bild and Welt are very similar to the skeptic blogs, and this similarity is also evident in the way users respond to skeptic comments. In fact, users on the two sites agree the most with skeptic users. On Bild, 81% of the responses were written by skeptics; on Welt, 75% of the responses were written by skeptics. This is in contrast to the liberal news media comment sections of Zeit and Spiegel, where the mainstream factions are more prominent and vocal. Mainstream users wrote 78% of the responses on Zeit and 49% of the responses on Spiegel. Consequently, the comments are more critical as well as corrective, and there is very little agreement. This also is true for the climate activist and science blogs, where only a few comments were skeptical in the first place and most users ignored them.

In general, even though skeptics are in their supposed "echo chamber" (Sunstein, 2001), some users from the mainstream appear to be on a mission to counter the skeptic myths and talking points.

However, this phenomenon pales in comparison to the counterpublic's activity in mainstream comment sections. The hypothesis that skeptics' comments will be more welcome on skeptic than on mainstream sites thus has to be discarded.

Discussion

This article examines the relationship between the mainstream public sphere and the climate change skeptic counterpublic in Germany. The selection and analysis of 10,262 online comments of four major news sites and the six most relevant blogs within the German climate blogosphere led to four noteworthy results.

First, counterpublic voices are very visible in all comment sections. Indeed, roughly 40% of all relevant comments about climate issues were skeptical. Surprisingly, skeptics were the dominant voice not only within their counterpublic but more so in the comment sections of conservative media *Welt* and *Bild*. This not only adds to the literature that connects climate change skepticism with a conservative mind-set (McCright & Dunlap, 2011) but is also in line with research that suggests that minorities are more likely to speak out in places where there are like-minded people (Porten-Cheé & Eilders, 2015). At the same time, this finding adds to counterpublic literature and emphasizes the point Toepfl and Piwoni (2015) made, because these results show that counterpublic members make use of comment sections to establish their counternarrative and thus become more visible for the mainstream. Because counterpublic actors were especially active in the comment sections of the mass media and less so on mainstream blogs, it can be assumed that they want to make use of the mass media's wide reach to promote their messages.

Second, it was hypothesized that counterpublic and mainstream comment sections would differ in their framing and that skepticism of climate science may be more mainstream-friendly and thus more prominent in the mainstream comment sections. This hypothesis had to be discarded. This could signal that the climate change skeptic counterpublic is consistent in its beliefs and values a frontal approach more than a timid, persuasive one. This is also in line with Porten-Cheé and Eilders's (2015) finding that German skeptics are more vocal than their social standing may suggest. Because frames are closely connected with identity, this may be understood not only as using the same frames but as a means for counterpublic members to (1) make their counterpublic identity more visible and (2) potentially recruit new members in mainstream spaces by connecting old arguments with new events. By using the same frames throughout all comment sections, the counterpublic messages may appear more consistent to nonmembers and thus as a potentially persuasive counternarrative to the mainstream one.

Third, although skeptics are very active, most responses to their comments are critical. Even within their own counterpublic spaces, skeptics and users from the mainstream attack skeptic users. A reason for the challenging environment in the counterpublic may be that there is no clear skeptic common ground. Whereas some users are vocally against the "climate church" and deny climate change altogether, others admit that climate change is happening but posit that the consequences will be good for humankind (Rahmstorf, 2005). In this sense, their identity seems to form around an antagonistic position, their feeling of being excluded, and that something is up with climate change. Another possibility could be that

skeptics try to counter one another in their own space to test and strengthen their own arguments (e.g., Fraser, 1990).

Finally, the high number of unclear comments in the comment sections that could be identified as neither skeptic nor mainstream may be indicative of a "silent consensus." In my opinion, this consensus shows the public's differing identities. While the mainstream public does not deem it necessary to repeatedly state that anthropogenic climate change is happening, the same seems to apply for the counterpublic's skeptical stance. Except where on the mainstream sites the users seem to take climate change for granted, on skeptic sites the users seem to take climate change denial as the bottom line. This explicit lack of stating one's allegiance may also explain the number of skeptics within the media publics since skeptic users may perceive this general neutrality or indifference as an invitation for stating their opinions.

From a theoretical point of view this article contributes to the literature on the NPS and counterpublics in four ways: By conceptualizing counterpublics within the NPS, digital methods can increase our understanding of the relationship between mainstream and counterpublic. Indeed, by combining digital and classical methods, I identified the skeptic counterpublic empirically and added theoretical context to the network through the frame analysis, which allowed me to highlight the struggle between mainstream and counterpublics online. In doing so, it becomes clear that, although counterpublics can clearly be identified through network analysis and may even seem detached, their point of reference remains the mainstream, and it is there where they want to voice their opinions, be heard, and persuade others (Nuernbergk, 2013). This awareness of two different layers of connections has two consequences for research: (1) It shows that counterpublics are very much aware of how to make use of the new modes of communication online and establish their counternarratives in the mainstream (e.g., Jackson & Foucault Welles, 2015), and (2) researchers should be wary of calling publics "echo chambers" based on only one level of analysis (e.g., hyperlinks, followers).

Second, we find that comment sections are places of contestation. The results show that some publics are closer to counterpublics than others (e.g., politically) and that members of the counterpublic seem to be aware of this fact and are especially active on the sites that are ideologically closer (Kaiser & Rhomberg, 2016) to them and have a wide reach. Although studies such as this one show that counterpublics do avoid the mass media to regroup and counterargue the mainstream (e.g., Jackson & Foucault Welles, 2015; Renninger, 2015), it is evident that the mainstream media sites and their reach and inclusive power are important for counterpublics, even in the NPS.

Furthermore, and taking into consideration previous findings as well as the literature (Fraser, 1990; Renninger, 2015), it can be assumed that counterpublics are going through different stages that are closely connected with their identity (shared frames) and their environment (e.g., number of counterpublic websites, members but also off-line events or alternative media outlets). It seems that the more they are aware of these factors and feel the support of their community, the more likely it could be for them to enter or brigade mainstream spaces and counterargue the hegemonic narrative without fearing repercussions. The climate change skeptic counterpublic, then, seems to be rather self-aware of its position within the NPS and is pushing into the mainstream to establish its framing. Since the climate

change skeptic party AfD is gaining popularity in Germany, there may be a connection between political popularity and counterpublic activity similar to social movements (e.g., Chávez, 2011).

Finally, I agree with Downey and Fenton (2003) that counterpublics should not be idealized as a progressive grassroots movement that necessarily aims to improve democracy and the societal discourse. By looking at a somewhat problematic public that negates the scientific consensus and is prone to conspiracy theories, it can be shown that these publics need to be included in counterpublic theory as well to fully analyze exclusion and inclusion processes in the NPS. Indeed, by using counterpublic theory, the struggle between skeptics and mainstream can be understood against a larger and more meaningful background that helps us understand online comment sections as places not only for discussion and potential deliberation but as places of contestation, identity formation, and the clash of counterpublic and mainstream (e.g., Toepfl & Piwoni, 2015).

In this context, more research on online as well as off-line counterpublics is needed. And although this article adds to the literature, it also has limitations: For instance, by doing a manual content analysis, I had to limit the sample size. Although this allowed for the analysis of skeptical frames and responses, future studies should make use of computer-assisted methods such as Latent Dirichlet Allocation for a broader analysis. Additionally, climate skepticism is a peculiar case for studying counterpublics, which cannot be extended to, for example, the United States, where a climate change skeptic was elected president. Future studies could closely examine other more international topics such as right-wing populism. Finally, the NPS theory is a very useful framework; however, there is a need for more theoretical as well as empirical research regarding the integration of counterpublics within this concept. Pursuing this line of research would add to the literature on counterpublics and contribute to the combination of digital methods and social theory.

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