Article

Journal of Technical Writing and Communication
2021, Vol. 51(2) 175–198

DOI: 10.1177/0047281620906150
journals.sagepub.com/home/jtw
SAGE

Genre Uptake as Boundary-Work: Reasoning About Uptake in *Wikipedia* Articles

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Abstract

The circulation of scientific and technical genres in online publics can shape both public opinion and policy deliberation about issues such as global warming. While rhetoric and professional writing scholarship has documented the myriad ways that genres are transformed as they circulate across discursive boundaries, few examine how argument shapes those transformation and circulations. Drawing on Gieryn's concept of boundary-work, this article analyzes arguments in the discussion pages of *Wikipedia* articles about global warming to document how editors argue about genre as they deliberate over what counts as reliable sources of global warming knowledge. This analysis demonstrates how argument mediates genre uptake and circulation. In doing so, it helps account for how technical and scientific genres circulate in contemporary online publics.

Keywords

genre uptake, boundary-work, argument, collaborative writing, Wikipedia, online writing, genre circulation

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Introduction: Genre Uptake and Public Discourse About Global Warming

How scientific knowledge about climate change circulates through genres in public shapes both public understanding and policy efforts. Decades of communication research has shown that news reports' representation of climate change led the public to believe that the scientific community is less certain about the existence and causes of climate science than it is (see Antilla, 2005; Boykoff & Boykoff, 2004; Painter, 2013; Zehr, 2000). Of course, scientific knowledge about global warming circulates through a range of public, technical, and policy genres. Whether or not publics, organizations, or governments understand *how knowledge circulates through these* genres shapes how and whether we address and mitigate the issue. Indeed, Bazerman (2010) summarizes how action on climate change requires coordination across disparate knowledge spheres from citizens to government to business. When such groups lack an understanding of how knowledge about climate change circulates through genres, it can undermine both coordination and action:

> Insofar as people are not skilled in engaging with these genres they are not able to build trust and engagement with the solutions, even if they accept general propositions on authority. It is only through these genres that we know, and it is only when we know that we act with energy and conviction. (Bazerman, 2010, p. 446)

Understanding how information about global warming circulates through genres in public can thus help account for barriers to mitigating it.

Among the places that the contemporary reading public seeks information relevant to scientific issues is *Wikipedia*; a 2016 Pew report found that "Wikipedia averages more than 18 billion page views per month, making it one of the most visited websites in the world" (Anderson, Hitlin, & Atkinson, 2016). *Wikipedia* functions as an information source not only for the global population at large but also for other historically well-reputed content creators, including journalists and news organizations (Messner & South, 2011) as well as academics; for example, a 2014 study of citations to *Wikipedia* in peer-reviewed health science literature found that since *Wikipedia* was created in 2001, it has been cited 2,049 times in publications ranging from *Science* to *Molecular Psychiatry* (Bould et al., 2014). Indeed, in an era marked by fractious debates over "fake news" and the reliability of publicly circulating information, sociologist Dan O'Sullivan's (2009) assertion that "[t]hese days we look to *Wikipedia* for the truth" (p. vii) seems both accurate and prescient.

Beyond its significance as a prominent public information source, *Wikipedia* presents a valuable opportunity to consider how information about global warming circulates through genres publicly because of its openness, its editing policies, and its collaborative writing and editing practices. As Kennedy (2016)

documents, *Wikipedia* involves processes of textual curation, a form of composing that encompasses practices of "collaboratively collecting, filtering, recomposing, taxonomizing, and managing information" (p. 180). Indeed, the core content policies that govern *Wikipedia* are Neutral Point of View (NPOV), Verifiability (Ver), and No Original Research. The Verifiability policy in particular is how *Wikipedia* articulates that the knowledge it represents must stem from published, reliable sources. Furthermore, articles are written collaboratively, and Wikipedians coordinate work through the use of discussion, or "talk" pages that accompany each article; talk page debates often involve complex and sophisticated reasoning over how to enact *Wikipedia* policies within articles (see Bender et al., 2011; Schneider, Samp, Passant, & Decker, 2013). This reasoning and coordination work occurs largely out of sight of *Wikipedia*'s reading public, however; although talk pages are accessible to any reader or potential editor, they tend to receive far less traffic than the articles themselves. For example, while the "Global Warming" article itself received over 4.5 million page views in 2019, its accompanying talk page received only a little over 22,000.[1] This suggests that *Wikipedia*'s representation of this issue is shaped by knowledge-mobilization practices of which readers may be largely unaware.

As a site in which information must, per the site's policy, be drawn from external sources, *Wikipedia* is an environment in which writers engage in genre uptake as recirculation as they write about global warming in *Wikipedia* articles. This study examines how Wikipedians engage in uptake by analyzing how Wikipedians *reason* about which types of publicly circulating genres—policy reports, news reports, public commentary by scientists, and others—are "reliable" sources of information about climate change, and which are not. In particular, it examines how Wikipedians' arguments over sources of global warming knowledge involve boundary-work (Gieryn, 1999). I find that boundary-work not only adjudicates scientific knowledge from nonscience, but it also results in observable boundaries of how and where information about global warming is curated within different articles in the *Wikipedia* ecosystem. Boundary-work thus mediates genre uptake. In doing so, it contributes to shaping not only how genres circulate but how discursive and rhetorical boundaries between knowledge spheres may take shape within contemporary online spaces.

In what follows, I elaborate on how genre uptake contributes to the construction of intergeneric relationships and connect this to the concept of boundary-work. I then analyze arguments from the talk pages of the *Wikipedia* "Global Warming" article through 2007 to show how Wikipedians engage in uptake and boundary-work. I then elaborate on the possible implications of this for understanding how professional and technical genres circulate (and relate to boundary-work) more broadly.

Genre Uptake and Relationships Between Genres

As Rhetorical Genre Studies (RGS) have shifted from formalist approaches to an interest in how discourse achieves semiotic and rhetorical action through genre sets (Devitt, 1991), genre systems (Bazerman, 1994), and genre ecologies (Spinuzzi & Zachry, 2000), scholars have drawn on Freadman's (1994, 2002) concept of "genre uptake" to help elucidate how these genre relationships develop. Genre uptake theorizes the basis of how recurring relationships between texts become imbricated within social worlds to achieve rhetorical goals and structure social action.

Grounded in an adaptation of Austin and Peirce's elaborations of speech act theory, Freadman's (1994, 2002) genre uptake refers to the "bidirectional relations" between pairs of texts, or an antecedent and its interpretent (2002, p. 40). An interpretent genre, per Freadman, "confirms [the] generic status" of an antecedent genre by taking up that text in a way that recognizes, affirms and responds to the communicative function the antecedent genre was designed to serve (2002, p. 40). For the texts taken up in *Wikipedia* articles, the expected communicative function of most antecedent texts would likely be informational, designed to provide facts or assertions relevant to an article topic. An uptake that confirms the generic status of an external or antecedent informational genre would legitimate its informational (or reporting) function by taking the information contained therein as worthy of repeating or re-representing.[2]

Freadman holds that uptake depends partly on the historicity or habituation of genre interrelationships. The relationship between two genres depends on recognition and recall of the genre and function of antecedent genres, whose status as genres in turn depend on their relationship to other instances of the genre, on prior texts, as well as the contexts and actors who generate those texts and structure and maintain those interrelationships. As Dryer (2016) summarizes,

> The point is that the interplay affords generic status. [. . .] By this logic, only in their uptakes do genre sets, systems, colonies, and ecologies have (what we are pleased to call) their lives, their "ramifications" (Freadman, 2002), their modifications and hybridizations, their dissolution, and their otherwise inexplicable persistence. (p. 61)

Through this memory-dependent interrelationship, genre uptake accrues what Dryer (2016) refers to as uptake residues, or "incremental contributions to social formations" (p. 66). Uptake residues may constitute the metaphoric cohesive force through which genre systems, ecologies, or colonies become stabilized within larger social systems, conventions, and institutions.

Such habituation, or "contribution to social formations," have historically been more well-documented in "stabilized-for-now" (Schryer, 1993) genres, such

as those in professional discourse and academic writing. More recently, however, scholars have shifted to question how genre interrelationships develop and function in more public contexts (e.g., Mehlenbacher, 2019; Reiff & Bawarshi, 2016). In *Genre and the Performance of Publics*, Reiff and Bawarshi (2016) point out that in public discourse, "the relations that hold between genres are less enforced, where genre translations are more rhizomatic and more subject to mistake, abuse, and recontextualization" (p. 12). Public discursive spaces, particularly those of online discourse, may be less well-structured in terms of intergeneric relations. In online discourse, the ease with which genres may be circulated across institutional, organizational, or community boundaries raises the question of how intergeneric relations develop and change. This study interrogates how genre relationships may be negotiated explicitly through argument, and how boundary-work plays a role in that relationship-building.

Boundary-Work and Genre

Gieryn's (1999) concept of boundary-work has often been taken up in writing scholarship to document how scientific or technical fields make arguments that protect disciplinary knowledge-making boundaries and shore up scientific authority or expertise in the context of public debate (Carlson, 2016; Eden, Donaldson, & Walker, 2006; Holmquest, 1990; Scott, 2016). Boundary-work, in Gieryn's (1999) conception, is "strategic practical action" (p. 23), rhetorical action through which the epistemic authority of science is perpetuated and protected. The "boundaries" of science as an epistemic and professional activity, in other words, are constructed through discursive and rhetorical means, and such boundary-work constitutes sites of contestation in which different stakeholders may struggle for power.

Gieryn categories types of boundary-work as *expulsion*, *expansion*, and *protection of autonomy*. Expulsion involves a conflict between rival epistemic authorities that each seek primacy for the authority and validity of their claims *as scientific*; it involves an effort to distinguish and protect "real" science from potential rival epistemic authorities such as pseudoscience or popular science. Expansion, in contrast, involves a conflict with "two or more rival epistemic authorities square off for jurisdictional control over a contested ontological domain. Those speaking for science may seek to extend its frontiers, or alternatively, spokespersons for religion, politics, ethics, common sense, or folk knowledge may challenge the exclusive right of science to judge truths" (pp. 16–17). And finally, protection of autonomy involves an effort to prevent those outside science—such as politicians, the media, and business—from exploiting scientific knowledge or shaping its processes, practices, or material and symbolic resources in a way that undermines the autonomy of scientific knowledge-making. Protection of autonomy also occurs when scientists seek to

divorce their work or domain from its downstream ramifications, uses, or circulations.

Scholars in RGS and professional writing have a similar interest in boundaries between institutions and communities and have developed a range of frameworks for conceptualizing the discursive and rhetorical practices involved when genre uptake occurs in ways that cross institutional or community borders. Giltrow (2001), for example, suggested that "meta-genres" or "situated language about language" (such as guidelines for writing genres or academic talk about writing) may indicate sites of social contestation, or the presence of "deep socialization and isomorphism of practice and identity" (p. 199). Tachino (2012, 2016) argues that "intermediary genres" such as press releases may mediate intergeneric relationships. More recently, Bray (2019) suggests the ecological concept of an "ecotone" as a term to describe the boundary zones between institutions—in her case, between a research community and the news media—within which intermediary genres may develop to support knowledge mobilization. Popularization scholarship often focuses on how Internet discourse destabilizes traditional boundaries among discourses and institutions. For example, Mehlenbacher and Miller (2018) document the erosion of divisions between the scientific and public spheres in how information about the 2011 Fukushima Daiichi Nuclear Power station failure circulated through *Twitter*, science blogs, and *Wikipedia*. However, few studies specifically interrogate how argument—*debates* about genre relationships—may shape the development of intergeneric relationships within such boundaries, particularly in the complex public spaces of contemporary online discourse. This article documents how boundary-work in the form of argument and reasoning shaped both the development of relationships between genres and the habituation of those relationships within the ecosystem of *Wikipedia* global warming articles.

Case and Methods

My guiding research questions for this study were as follows:

- How do Wikipedians decide what types of genres are "reliable" sources of information?
- How do their debates shape the relationships between site-external genres (such as journal articles, reports, and news articles) and the *Wikipedia* articles themselves?

To pursue these questions, I analyzed debates that occurred on the "Global Warming" talk pages from January through December of 2007. I focused on 2007 because it was a particularly controversial year for discourse about global warming in the public as well as in *Wikipedia* itself; this was partly because in 2007, the International Panel on Climate Change (IPCC) published its Fourth

Assessment Report (IPCC AR4). The IPCC's Fourth report communicated an unprecedently high level of certainty about global warming's existence and anthropogenic causes; among the report's oft-quoted findings was the "warming of the climate is unequivocal" and that the IPCC expressed greater than 90% certainty that the causes of warming are greenhouse gas emissions (IPCC, 2007). Media attention to the issue hit an all-time high in 2007 (Callison, 2014). Indeed, a *Lexis Nexis* search for newspaper articles containing the terms "climate change" or "global warming" that were published between January 1 and December 31 of 2007 yielded 966 results; likewise, a *Google Scholar* search for the same two terms for the date range of 2007 yielded over 17,000 results. The public's attention to the issue mirrored a flurry of editing activity in the global warming- and climate change-related *Wikipedia* articles during 2007; the "Global Warming" article saw the second-highest level of editing activity in 2007, receiving 4,949 edits that year. Similarly, the "Global Warming Controversy" article received the highest number of edits in its history, receiving 2,698 edits.

My analysis focused particularly on debates that occurred over how to represent the scientific consensus (or lack thereof) about global warming in the article's lead section. One particular section of the article's lead was highly contentious because of how it generalized about the scientific consensus about global warming. In January 2007, prior to the publication of IPCC AR4, this section read as follows:

> Global average near-surface atmospheric temperature rose 0.6 ± 0.2°Celsius (1.1 ± 0.4°Fahrenheit) in the 20th century. **The prevailing scientific opinion on climate change is that "most of the warming observed over the last 50 years is attributable to human activities**."[1] The main cause of the human-induced component of warming is the increased atmospheric concentration of greenhouse gases (GHGs) such as carbon dioxide (CO_2), which leads to warming of the surface and lower atmosphere by increasing the greenhouse effect. Greenhouse gases are released by activities such as the burning of fossil fuels, land clearing, and agriculture.[3]

In this excerpt, the perspective of science on the question of global warming is represented as a universalized, "prevailing scientific opinion," an assertion that suggests that the attribution of global warming to anthropogenic causes is dominant and potentially universal within science broadly conceived; no alternative or negative views are represented here. Because the article's lead is a visibly prominent summary of the article's main content, its accuracy in representing global warming knowledge was particularly important to the editorial community. This section was particularly fractious because it focuses on the question of whether there are legitimate sources of information that contradict the consensus that global warming exists *and is anthropogenic*. This section was thus the source of many edit wars and talk page arguments. For example, by the end of

February 2007, the lead had been edited to the following. Note that this version refers to "a small number of scientists" who hold views that conflict with the "prevailing scientific opinion."

> Global average near-surface atmospheric temperature rose 0.74 ± 0.18°Celsius (1.3 ± 0.32°Fahrenheit) in the last century. **The prevailing scientific opinion on climate change is that "most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations**,"[1] which leads to warming of the surface and lower atmosphere by increasing the greenhouse effect. Greenhouse gases are released by activities such as the burning of fossil fuels, land clearing, and agriculture. Other phenomena such as solar variation and volcanoes have had smaller but non-negligible effects on global mean temperature since 1950.[2] **A small number of scientists disagree** about the primary causes of the observed warming.

Many debates throughout the year focused around how to accurately represent such conflicting views, such as via the use of quantifiers such as "a small number," "few," or "several," or by elaborating on specific names of dissenting scientists or organizations.

Wikipedia talk page arguments present methodological challenges for analysis due to their complexity and organization. Talk page discussions begin with a thread title created by the contributor and can span a single response with one contributor to threads that involve hundreds of discussions and unfold over weeks or months. Topics reappear or can be reraised at any time by any page editor. To identify debates focused particularly around this section of the article lead, I read through the full 2007 talk page archive to identify discussions focused particularly around this section of the article lead in which editors particularly debated the existence or reliability of sources (of any kind) that might merit citing in the article or justify revisions to the article text. I then used a generative method of rhetorical analysis (Foss, 2018; see also Scott, 2016) to identify patterns in arguments over which sources editors should (or should not) consider "reliable" and sought an explanatory schema for explaining those patterns. This analysis indicated that editors' arguments over which sources should be cited in articles frequently involved boundary-work.

Analysis: How Wikipedians' Arguments Over Genre Uptake Involve Boundary-Work

The debates that unfolded on the talk pages of the "Global Warming" article through the course of 2007 illustrate how Wikipedians engaged in boundary-work as they argued over how to represent the scientific consensus (or lack thereof) about global warming. For example, in May 2007, in a debate over

whether using the terms "few" or "many" in the same section of article lead is biased (and therefor a violation of *Wikipedia*'s NPOV policy), one editor made the following argument[4]:

> (A1)A couple of things seem to have been neglected in this debate. **It is important to make a distinction between "scientists", who come in all shapes and sizes, and "climate scientists", of whom the vast majority regards the evidence for anthropogenic climate change as highly likely.** There are indeed a few climate scientists who are skeptics, and this is legitimate to note**. However, I would suggest that first of all, this fact should be viewed in the context of how science works (X and Z battle it out and one or the other eventually proves their case [i.e. successfully refutes the claims/objections of the other]), which is different than how, for example, a policy discussion works (X and Z battle it out for a "truth" Y that lies in the middle).** There are still a few (otherwise legitimate) physicians and medical researchers who dispute the fact that HIV causes AIDS—does this skeptical view merit the same weight as the consensus position on HIV that is surely correct (especially given that lives are literally at stake)? Surely not. **Second, many of the skeptics brought out in the media to challenge the climate consensus are not actually climate scientists, but rather geologists, meteorologists (some of whom only hold a certificate in meteorology, not even an academic degree), paleontologists, and the like. They are certainly entitled to hold their views, and the fact that they are not climate scientists does not mean thay may not have valid points. But the view that simply "as scientists" their skepticism is of equal merit to the professional assessments of researchers who specialize in climate topics is simple minded and does a disservice to an understanding of how science properly works.** Anyhow—my two cents. Arjuna 01:32, April 28, 2007 (UTC)

This editor's argument involves several boundary-creating moves: first, Arjuna distinguishes "scientists" and "climate scientists," the latter whose viewpoints are taken to be valid and relevant to the debate, and the former who "are certainly entitled to hold their views" but whose points may not be considered valid in the context of climate science debates. By distinguishing "climate scientists" from other types of scientists, Arjuna maintains the legitimacy of assertions made by the IPCC as relevant and valuable over possible assertions made by nonclimate scientists who may have published contrarian views.

Second, Arjuna also distinguishes the context of discourse relevant to scientific knowledge by making assertions about "how science works" as distinct from how "a policy discussion works." Arjuna's construction of such epistemic boundaries is what Gieryn (1999) would call *expulsion*. By drawing an analogy between nonclimate scientists, the conduct of knowledge in "policy discussions," and medical researchers who reject the hypothesis that HIV causes AIDS, Arjuna moves those perspectives into the realm of invalid and epistemically illegitimate as relevant to the debate. This boundary-work is underscored at

the end of the turn by the dismissive assertion that failing to make such distinctions is "simple-minded" and ignorant.

This example thus points to the type of boundary-enacting work involved in how Wikipedians reason around what constitutes reliability in the context of the article. But it also suggests the types of claims and assertions that Wikipedians may make (or need to make) particularly as they coordinate how they take up *genres*. Beyond arising from responses to recurrent rhetorical situations (Miller, 1984), genres that arise in particular contexts and communities are forms of situated cognition that both embody and structure social situations and relationships, actions, values, and forms of being and knowledge-making (Bazerman, 1988; Berkencotter & Huckin, 1993). If genres encode particular sets of knowledge-making practices, actions, and values, then *debating* whether to take up external genres is likely to involve arguing over whether antecedent genres appropriately represent or encode the knowledge-making practices, values, and actions relevant to the purpose and goals of the interpretent genre. If Wikipedians' goals are to represent "the science" of global warming as it is construed in circulating sources, they need to have a shared representation of which genres represent "science" and which do not. Arguing over *who* counts as a climate scientist, for example, can be viewed as an argument over who has been trained in the appropriate knowledge-making practices of particularly *climate science* and thus who is legitimated to speak publicly about it. Likewise, arguing about how and whether to represent minority viewpoints in circulating sources can take issue with "how science works" (or does not) because *how science works* (its knowledge-making practices) is constitutive and regulative of its genres, how they circulate, and who has the standing to create them—and thus whether or not they should be taken up and cited within a *Wikipedia* article.

The following example demonstrates how boundary moves particularly related to *genres* and *sources* developed out of discussions over the extent of the scientific consensus about global warming. It unfolded under a talk page thread titled "Biased or Lacking Evidence in Article." In it, other editors express similar arguments to Arjuna in an effort to demarcate the boundary of "scientific" sources and separate opposing views as ignorant. The editor Joshic Shin[5] argues against these established boundaries in the first turn, following the assertion that the extent of consensus about anthropogenic global warming (AGW) in "the scientific community" is not as widespread as the lead suggests:

> (B1) I am more then sure that a few of the posters here have a zealous desire for proving Global Warming as being through and through fact, but there are just to many flaws right now for it to be considered as such. With that in mind I tried to read this whole article without trying to express my own opinion but when I see right off the bat that it is stated that only a few scientists, most being un-credible, think that it is false is just outright false and more annoying then anything else.

A large number of scientist (mainly prior supporters or (in some cases) some of the origional founders of the theory) have now left the alarmist camp and are now saying that Global Warming has now been greatly exagerated. It is not just a 95% majority in the scientific community that believes in Global Warming, it is closer to 60%–75%. Saying things like "a few" and "uncredited" scientists gives the impression that if you believe Global Warming is a misinterpentation of the facts then you must either be on your own or stupid, or both. To say such things is not only ignorant, but biased. Joshic Shin 21:24, May 21, 2007 (UTC)

(B2) **I suggest you re-read it and pay special attention to the *sources* used.** Also check scientific opinion on climate change. This article is well-supported, while your claims seem to be without any source. **And scientific theories are not "proven" is a strict sense, although many may well be considered "fact" in an every day meaning.** Stephan Schulz 21:49, May 21, 2007 (UTC)

(B3) With all due respect Joshic, your statements are vastly exaggerated, incorrect, and contrived beyond belief. A strong and notable majority of the relevant scientific community firmly believe that global warming is real and that humans are an integral part of why it is happening. UberCryxic 22:28, May 21, 2007 (UTC)

(B4) Very well, I shall cite sources for you to read.

http://www.cnsnews.com/ViewCulture.asp?Page=/Culture/archive/200702/CUL20070208c.html has an article talking about how many climatoligists are having their jobs threatened if they do not go with the consensus.

http://epw.senate.gov/public/index.cfm?FuseAction=Minority.Blogs&ContentRecord_id=927b9303-802a-23ad-494b-dccb00b51a12&Region_id=&Issue_id= talks about several prominit scientists who were once alarmist and are now critics. A very intresting person to note in this article is Dr. Claude Allegre, one of the first to sound off on Global Warming. (The person I was refrering to earlier) [*B4 cont'd below*]

(B5) You do realize that this article was authored by Marc Morano and posted to the blog of James "Global warming is the greatest hoax ever perpetrated on the American people" Inhofe, right? **And that those two people don't exactly make the most objective sources of Global-warming related information.** Raul654 03:16, May 22, 2007 (UTC)

(B4, cont'd) And lastly, a very long series of articles by the National Post, http://www.canada.com/nationalpost/story.html?id=156df7e6-d490-41c9-8b1f-106fef8763c6&k=0, talked about how Global Warming is not happening in the way it is currently describe, if at all. [Joshic Shin]

(B6) **Thanks for the objective, neutral and authoritative sources.** Raymond Arritt 03:16, May 22, 2007 (UTC)

The trajectory of this discussion and the responses of editors Stephan Schulz, Uber Cryxic, Raul654, and Raymond Arritt to Joshic Shin's opening argument demonstrate a close connection between assertions about the scientific consensus, about how science "works," and arguments over the types of genres in which global warming science does and does not appear. When Joshic Shin provides links to sources after they are requested to support the claim that many scientists have altered their views on global warming ("several prominit [*sic*] scientists who were once alarmist and are now critics,") Raul654 and Raymond Arritt jump in to question the reliability of the sources presented—"You do realize that this article was authored by Marc Morano and posted on the blog of James "Global Warming is the greatest hoax ever perpetrated on the American people" Inhofe, right?."[6] The sarcastic tone of the editors' responses functions to dismiss the validity of the sources ("Thanks for the objective, neutral, and authoritative sources") with little to no debate over their actual merit, suggesting the extent to which they take for granted the particular kinds of values and knowledge-making practices ("objective," "neutral", "authoritative") that specific genres do and do not represent. In this case, blogs and *National Post* articles are *blocked* from having their discursive or rhetorical action taken up in the "Global Warming" article based on assertions about their genre and authorship.

Furthermore, at turn 2, Stephan Schulz makes an assertion designed to establish the epistemic practices of science and in doing so reject the basis of Joshic's objections: "And scientific theories are not "proven" is a strict sense, although many may well be considered fact in an everyday meaning." This type of boundary move uses assertions about how scientific theories are developed to distinguish the context of scientific knowledge as distinct from "facts" as they are understood in "everyday meaning." This distinction of the concept of "fact" as it is understood in science from the "everyday meaning" of the term enacts what Goodnight (1982) identifies as a difference in grounding between types of spheres (personal, public, and private); by grounding the term's definition in the technical, scientific realm, Schulz brackets the kind of epistemic assumptions or reasoning about "facts" that may characterize public reason or private understandings. Indeed, genre uptake and intergeneric relationships are not simply about relationships between *genres* and *texts* but also about *interdiscursive* relationships (Bhatia, 2016). In this case, Schulz's bracketing of public reason from the discourse of the technical, scientific sphere blocks potentially blending the public or private with the technical.

Throughout 2007, similar arguments occurred in which editors constructed boundaries around the discourses, knowledge-making practices, and genres that could be taken up in articles. In November, a similar discussion arose, this time initiated by an editor who proposed that even referring to a "few" dissenting

scientists who disagree with AGW misrepresented the nature of science itself as being inherently *skeptical*:

> (C1) I can't help but see an problem in the way the last part of the intro flows. **Suggesting that it is even relevant that "a few" of scientists disagree with the mainstream assessment of global warming only feeds the misconception that scientific consensus is based on the subjective opinion of scientists and not on a convergence of many empirical (and otherwise), peer reviewed studies that converge on a given conclusion (recent warming trends can ONLY be explained with recent increases of CO_2). I believe the inclusion of this sentence PERIOD is inappropriate for encouraging the reader's understanding of the topic. I recommend it be replaced with something more relevant to the scientific method, like "and to date, there exists not a single prevailing alternative hypothesis to contradict the IPCC's assessment of recent warming trends**."
>
> **Much of the skepticism around global warming seems to be borne of a misunderstanding, and therefore lack of confidence, in the scientific method. Skepticism is built into the scientific method. We are talking about science here, and let's be sure the article itself in confident in saying this.**
>
> I know the editors are trying to maintain neutrality here. It may be relevant that there are dissenting points of view among scientists. **But among these scientists, there exists not a single published, peer reviewed theory that "debunks" the AGCC theory**. I believe this is what is important, not their respective opinions (some of which are based on unfounded scientific "ideas" (global warming comes from the sun), or belief that the IPCC is "politicized" (see John Christy's opinion article published by the BCC)).
>
> I won't post the edit myself, I merely suggest this be discussed and considered. Preceding unsigned comment added by Veloce (talk • contribs) 15:00, November 19, 2007 (UTC)

Similar boundary-building moves to those I discuss in preceding examples are in abundance here: there is an assertion of the epistemic practices of science ("Skepticism is built into the scientific method"); an affirmation of science as the relevant sphere of knowledge ("We are talking about science here"); and a rejection of alternate perspectives as misinformed, or ignorant ("Much of the skepticism around global warming seems to be borne of a misunderstanding"). These assertions are closely linked to a reiteration of the genres in which scientific knowledge can be represented, as distinct from other genres ("many [and other] peer-reviewed studies"; "among these scientists, there exists not a single, published, peer-reviewed theory that 'debunks' the AGCC theory"). Furthermore, this editor links these objections to an assertion about the

audience's needs, which are assumed to be "understanding" ("I believe the inclusion of this sentence PERIOD is inappropriate for encouraging the reader's understanding of the topic.") In doing so, Veloce creates boundaries around the kinds of knowledge-making practices, spheres, and genres that *Wikipedia* editors can take up within the article and ties it to the audience's needs. He thus legitimates the uptake of particular genre forms (peer-reviewed articles) while dismissing others, in service of Wikipedians' ostensive genre goals (for the audience to "understand" global warming).

Which Genres With Which Articles? How Boundaries in Arguments Become Boundaries Between Articles

In constructing boundaries around what "counts" as legitimate science about global warming, Wikipedians create a basis for maintaining and recreating those discursive boundaries between *Wikipedia* articles themselves. While my analysis thus far has focused on how Wikipedians' debates over genre uptake shape how, and whether, site-external genres are represented within articles, their talk page arguments also shape *where* global warming-related sources are cited within the larger ecosystem of related articles. Throughout 2007, in reoccurring discussions over whether the "Global Warming" article sufficiently represented opposing viewpoints, long-term editors repeatedly maintained that nonscientific sources relevant to the public controversy over global warming could be directed to other articles. For example, in the following exchange in April, long-term editor Raymond Arritt responded to an editor who suggested the article failed to represent the views of global warming skeptics by pointing to the "Global Warming Controversy" article, and challenging the editor to prove the skeptic views were legitimately scientific:

Neutrality

(D1) While this article is well written, I find that it is very superficial and biased in that **it omits important information about those scientists and intellectuals who are skeptical of global warming.** I expected to find even a small section discussing this issue; however, only a few sentences are attributed. There is a wealth of information that would cast doubt on the issue of global warming, and I think that whether the writers of this article agrees with these skeptics or not, we still need to report on them. Orane 05:44, April 6, 2007 (UTC)

(D2) **There's a whole article on Global warming controversy that is linked from here**. I'd be curious to see the "wealth of information that would cast doubt on the issue of global warming"; **how much is published in the scientific literature rather than the popular media**? Raymond Arritt 05:59, April 6, 2007 (UTC)

During the ensuing discussion, long-term editor William Connolley reiterated at multiple points that the "Global Warming" article was "about the science," and that nonscientific viewpoints belonged in other articles (if at all):

> (D3) **This article is about science**. It already discusses the important "alternatives" - well there is only one, really, the solar stuff. Which has its own section. What other bits of science would you want to import from the GWC page? BTW, its really boring to have people keep saying that the page sez: "Global warming is happening, we are all gonna die". It sez nothing of the kind. William M. Connolley 09:59, April 6, 2007 (UTC)

When another editor attempted to provide evidence of the existence of scientists skeptical of global warming by pointing to the "Scientific Opinion on Climate Change" *Wikipedia* article, Connolley rebutted by reiterating the purpose of the "Global Warming" article in terms of its genre ("reporting") as well as the genres it should appropriately take up ("peer-reviewed research"):

> (D4) **You're making the mistake of thinking this page is about opinion. It isn't. Its about reporting peer reviewed reseach.** So you only have to look at the papers to see that no-one at all says (c) or (d). You missed out "rise" with no mention of consequences which is what the article is mostly about. William M. Connolley 10:54, April 6, 2007 (UTC)

The editor Galahad quickly stepped in to support Connolley's position:

> (D5) I concur. **Nobody cares about anybody's opinion here.** We care about references. If the opinion of even the most reputable scientist is not supported by the litterature, one is free to "believe" him, but it's all but science. **If a scientist has a serious point against the AGW, he will publish it in the scientific litterature (and no, an interview published in "New Scientists" is not scientific litterature . . .). For now, there is an overwhelming scientific litterature acknowledging GW, and its anthropogenic nature. The most prestigious science academies of the world and the most prestigious scientific instituions have endorsed the AGW. 1, 2 or more dozen of scientist's opinion, relying or extremely rare, if any, publications will not change anything to the matter.** Galahaad 00:05, April 7, 2007 (UTC)

In these examples, both Connolley and Galahad functionally block the uptake of a particular type of genre (opinion polls) as inappropriate to contributing to the sphere of science about global warming, suggesting instead that such genres can or are more appropriately taken up in other articles. When another editor attempted to challenge the idea that the "Global Warming" article should focus entirely "on the science," Galahad pointed to the existence of

other *Wikipedia* articles as appropriate sites for such perspectives to be represented:

> (D7) **Global warming is a scientific concept. It certainly has political, economical, societal, etc. . . . implications, but the process itself deals with science. For all these other topics connected to GW, there is a series of other article linked in "Subtopics" and "Related articles"**. Galahaad 00:15, April 7, 2007 (UTC)

Much like the recurring arguments I document earlier, these arguments were not isolated to a single discussion or period. They arose repeatedly when an editor would point to some external source that seemingly challenged how the *Wikipedia* article portrayed the scientific consensus. These potential challenges to a stable or consistent approach to taking up external genres were met with similar responses in which editors maintained that information represented in genres that were not peer-reviewed literature should (or could) be represented in alternate related articles. In June, for example, one editor cited a *Wall Street Journal* article by a prominent global warming skeptic as evidence of a lack of scientific consensus:

> (E1) **Many eminent scientists have disagreed with the "consensus" about global warming. For example, read this article in the Wall Street Journal by Richard Lindzen** (Alfred Sloane Professor of Atmospheric Science at the Massachussetts Institute of Technology, one of the world's most prestigious scientific universities) in which he most strongly disagrees with the scientific underpinnings of the so-called global warming.

This editor continued by citing a long list of scientists who have publicly dissented from the consensus. Among the editors who dismissed this assertion was long-time editor Stephan Schulz, who connected his dismissal of the Lindzen citation ("His article is a year old") with a reminder of past consensus decisions ("There is nothing in your contribution that has not already been discussed to death and back again") and a redirect to the "Global Warming Controversy" article as the appropriate location for this and similar topics:

> (E2) See scientific opinion on climate change for an overview of who supports the consensus and how few disagree. Lindzen is one of the very few competent scientists to question significant parts of the consensus. **His article is a year old**, as is the source of your list (which, moreover, is a political, not a scientifc one). Christy is at best a lukewarm sceptic. **There is nothing in your contribution that has not already been discussed to death and back again.** This article is the result, and is a reasonably fair representation of the state of science. **We discuss the controversy in global warming controversy**. Stephan Schulz 21:19, May 20, 2007 (UTC)

Stephan Schulz makes similar moves repeatedly through the year in response to repeated assertions that "Global Warming" inadequately represented skeptics, directing other editors to the "Global Warming Controversy" article:

> (F1): Responding to an editor who complained the article didn't represent opposing viewpoints:
>
> Every Wikipedia article is supposed to be written from a Neutral Point of View. See WP:NPOV. This article is. It gives a description of the scientific consensus, the remaining open points, and significant differing opinions. **There just are not many serious disputing voices that have reasonable scientific standing. See also scientific opinion on climate change and, for the popular debate, global warming controversy.** Stephan Schulz 19:30, August 14, 2007 (UTC)
>
> (G1): Responding to a suggestion that a "Controversies" section be added:
>
> We discuss the science here. **For the public controversy, there is a sub-article at global warming controversy**. Stephan Schulz 18:10, August 18, 2007 (UTC)

These examples illustrate a key component of the uptake and translation that occurs as Wikipedians coordinate to enact the site's genre rules: in addition to erecting boundaries that shape how and whether semiotic and rhetorical action is taken up from external sources, Wikipedians' arguments also shape how sources are divided and filtered into different *locations* in the larger article ecosystem. In the examples described earlier, long-term editors connect their articulation of knowledge boundaries around which types of genres communicate true scientific knowledge to site-internal boundaries between distinct articles: *real* science gets published in peer-reviewed journals and thus belongs in the "Global Warming" article, whereas assertions gathered from scientists in other types of genres (op-eds, opinion polls) are nonscientific or opinion-based and thus can be diverted to other articles, such as "Global Warming Controversy."

These examples also illustrate the crucial role of long-term editors in creating and maintaining these article boundaries. Throughout the year, as similar discussions reoccurred or as similar issues were reraised by new or simply persistent editors, particular long-term editors repeatedly appeared to defend prior decisions or argue for the maintenance of these discursively constructed boundaries. Common topics within these discussions include the argument that there can be no "consensus" over scientific opinion when any dissension in published sources exists, which are often premised on similar assertions about the existence of sources that oppose AGW. Stability about how to take up genre and create boundaries around sources develops partly through the work of these highly active editors, who remind participants of past discussions and reiterate key elements of the scientific boundary-work, such as the need to base information

on authoritative scientific sources. One such editor is William M. Connolley (see also example D earlier), a published climate scientist whose controversial role in the *Wikipedia* global warming-related articles gained him the attention of popular media (see Bolt, 2009; Schiff, 2006). In examples H1 and I1 given here, Connolley shows up in discussions over the representation of scientific consensus in the article lead to emphasize that the issue has been discussed and settled before—making the same moves in April and September. In example I1, he reiterates that no one has been able to locate authoritative scientific sources to support the non-AGW viewpoint, helping to maintain the boundaries of the context of scientific sources.

(H1) April 2007, in debate over the use of "Few" in the article lead:

As far as repeating previous discussion goes, that was a good start. **Anyone else want to say the same things all over again?** William M. Connolley 13:35, April 30, 2007 (UTC)

(I1) April 2007, Final assertion in a debate over whether the article is NPOV based on how the spread of scientific knowledge is represented in the lead:

If you can find any **reputable sci inst that support its-not-anthro, do please list them and do us all a favour, as no one else has been able to find them** William M. Connolley 20:43, April 9, 2007 (UTC)

(J1) September 2007, during another discussion over the use of "few" vs. other quantifiers in the lead:

"Many" isn't misleading, its vandalism/POV-pushing. As for "a few" . . . **we've done all this before. Unless anyone is going to change their minds, or has any new arguments (none so far), this discussion is going nowhere, probably at great length:)** William M. Connolley 17:44, September 27, 2007 (UTC)

Other long-term editors make similar moves and play similar roles; according to *Wikipedia*'s Page History tool,[7] which ranks which editors have made the most page edits for any given article, William Connolley, Stephan Schulz, and Raymond Arritt are all in the top four contributors to the "Global Warming" article for its history (out of 4,769 total editors).These editors, who appear frequently throughout the talk page debates, function to remind discussants of previously established consensus and to repeatedly help reconstitute shared constructions of the appropriate boundaries of published sources; Connolley's brief assertion at I1 mentioned earlier, for example, reiterates that a source should be "reputable sci" even as he suggests that any "its-not-anthro" source likely does not exist, as no one has found such a source. These contributions

appear to do important work in ensuring that genre rules about bias or reliable sources continue to be enacted consistently over time. While analyses of verbal data alone may not illuminate the individual, internal cognitive schemas or structures guiding these editors, the similarity in their assertions across different debates suggests that they may hold stable internal schemas that can help provide a measure of consistency through an otherwise shifting set of authors and external context.

Discussion

My analysis demonstrates one way that the relationship between argument and genre intersect to shape public discourse; that is, that arguments *about genre uptake* involve boundary-work that shapes how genres about global warming science circulate. These arguments not only mediate *whether* uptake occurs but also shape *how* and *where Wikipedia* articles build relationships with distinct types of genres that circulate global warming knowledge. In essence, by using discursive boundaries to delineate "scientific" genres from nonscientific ones, Wikipedians reinscribe divisions between technical and nontechnical knowledge spheres and build them into the site's ecosystem of global warming articles. While my analysis is limited by its focus on one particular case, the process it documents may have implications both for how genre relationships develop in public discourse, and also for how this and other scientific or technical controversies may circulate publicly. In particular, this analysis demonstrates the role of arguments *about* genre in shaping how genre relationships develop and become habituated in online publics. It also suggests that knowledge-mobilization communities *in online publics* may engage in boundary-work in a manner that reinscribes distinctions between discursive spheres, even as the communities themselves may be said to blur or erode boundaries between technical and public discourse.

As a form of boundary-work, Wikipedians' arguments over the legitimacy of certain genres as sources of global warming knowledge involve processes of both adjudication and curation that shape the topic's epistemic representation in the site. In *Arguing Over Texts: The Rhetoric of Interpretation,* Camper (2018) draws on the traditional rhetorical stases to catalogue types of arguments made about texts; arguments about genres are what he would call "jurisdictional" disputes that involve questions of legitimacy: "Like a textual boundary, the presumed genre of a text can be pointed to in order to qualify or disqualify it in a particular context" (p. 153). While we might consider *Wikipedia* editors as part of the same editorial community, their arguments index distinct epistemic and ideological beliefs about how and by whom science is created, and which genres "count" as valid sources of global warming knowledge, and which do not. In this, their boundary-work and genre organizing can be viewed as part of larger knowledge mobilization processes that shape the relationships among public

genres and public genre ecologies. As these arguments reoccur over time, long-term editors help to reiterate and maintain distinctions in how different genres are taken up; their arguments contribute to creating habitualized relationships between site-external genres (such as journal articles) and site-internal articles; that is, habitualized uptakes occur not only through recurring responses to contextual demands or the social situations but also through "meta-generic" talk that helps shape those relationships through boundary-work and maintain them through participation in community argument.

This work thus speaks to recent scholarship in scientific and technical communication focused on how Internet discourse changes the emergence and circulation of scientific genres—and, more broadly, muddles or erodes boundaries between spheres of discourse. On one hand, my analysis documents a similar "erosion" of traditional divisions between science and the public insofar as it documents how science and its genres are deliberated about in a public forum by (some) nonscientists; it thus partakes of circulatory practices similar to those well documented in public or citizen science forums (Mehlenbacher & Miller, 2018). On the other hand, this analysis suggests that such "erosion" is far from linear; rather, some Wikipedians are working hard to build and maintain traditional boundaries between "science" and "nonscience" by adjudicating its genres. Thus, while "erosion" between traditional spheres may be occurring at the broad level of online communities and forums that enable their breakdown, this analysis suggests that boundary-work nonetheless shapes knowledge circulation within those communities and how they curate and represent knowledge. This suggests the need for further work that interrogates boundary-work (or boundary erosion) not at the level of *spheres* or *fields* but as an enacted practice that can shape epistemic divisions and knowledge circulation within and through distinct online communities or forums and their local writing and curational practices.

Of course, the extended debates over genre that I document here may be particularly common to open collaborative environments like *Wikipedia* in which coordination and discussion are a necessary aspect of the composing process—particularly when writing about controversial topics such as climate change. Future work is needed to understand whether such arguments and boundary-work occur in other collaborative environments, or noncollaborative contexts, and whether it is more prevalent when discussing controversial technical topics. Given the potential for boundary-building arguments to shape how knowledge about global warming circulates publicly, such research is worth pursuing. In this case, demarcating the boundaries between "the science" of global warming and how the topic is represented in "nonscientific" genres may help shore up the epistemic grounding of the "Global Warming" *Wikipedia* article, but it also distances the knowledge within that article from representations of its public understanding or literature about policy efforts. How the public reasons about whether texts are authoritative, and worthy of

recirculating, and how relationships between genres are shaped within public genre ecologies, can shape how public discourse about significant issues such as global warming develops online as well as off.

My analysis also suggests that deliberating about genre may be a significant component of how publics enact genre and build genre relationships in the messy space of online discourse. As Reiff and Bawarshi (2016) point out in the *Genre and the Performance of Publics*, RGS and public sphere scholarship share an interest in accounting for how public discursive performances shape public problems but often draw on distinct analytic or methodological frameworks for inquiry—broadly construed, genre analysis and debate, argument, or deliberation frameworks are often taken up distinctly in accounts of how discourse circulates publicly. Understanding how genre uptake occurs in collaborative online environments, where argument inflects genre enactment, requires theorizing the relationships between these oft-distinct methodological lenses. By describing how boundary-work and debate mediate genre uptake, this argument contributes to that end.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Notes

1. Pageview data provided by *Wikipedia's* Pageviews Analysis tool at https://tools.wmflabs.org/pageviews/
2. Freadman (2002) is careful to note that interpretent genres are not causally *constrained* to respond to antecedents in one particular way. Uptake of an antecedent genre begins with identifying an object or goal for uptake, which may involve various ways of constructing the function of, or modifying the "generic status" of the interpretent genre. This is the process of "translation" I refer to below.
3. In this and all excerpts from *Wikipedia* throughout this article, all boldface is mine unless indicated, which I include to highlight the sections most relevant to my discussion. I have otherwise retained original spelling and style for all text from the original articles and discussions. Bracketed numbers in these excerpts [1] indicate an in-text reference for which a full citation is provided in the article's "References" section.

4. I have labeled each discussion excerpt in this article with a distinct letter for ease of reference; excerpts are labeled sequentially through the article (A, B, C . . .). Some discussion excerpts contain multiple authors; to indicate turns from distinct authors, each turn is numbered sequentially for clarity (A1, A2, A3). Note that the number 1 does not indicate this was the first contribution to the original discussion.
5. In this excerpt, Joshic Shin is the author of turns B1 and B4; in the original post, B4 did not include the usual username and timestamp. This excerpt represents the order of turns in the original post, in which turn 5 (B5) was inserted into the middle of turn 4 (Joshic Shin's turn), which is atypical for turn sequences in talk pages. For clarity, I have inserted Joshic Shin's name at the end of his turn as it is shown in this excerpt.
6. James Inhofe is a Republican U.S. senator from Oklahoma, well known for his vocal opposition to climate change policy. He is the author of *The Greatest Hoax: How the Global Warming Conspiracy Threatens Your Future* (WND Books, 2012).
7. https://tools.wmflabs.org/xtools-articleinfo/

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