COLLABORATING IN PUBLIC: HOW OPENNESS SHAPES GLOBAL WARMING ARTICLES IN *WIKIPEDIA*

by

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Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Rhetoric

Carnegie Mellon University

2018

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Prominent in its own right and also an exemplar of a growing trend of open collaborations, *Wikipedia* represents a shift in how the public *seeks* and *participates* in knowledge circulation around high-stakes issues. Wikipedians take up genres, they collaborate to represent "the facts" about public issues, and they do so in environments of ever-shifting texts and unstable rhetorical constraints. This dissertation takes a novel, diachronic approach to tracing these dynamics of textual uptake, genre enactment, collaboration, and instability. Specifically, I trace how the global warming-related articles in *Wikipedia* changed over time, particularly in the wake of the publication of the 2007 International Panel on Climate Change Fourth Assessment Report. In doing so, I explore the epistemic and rhetorical implications of what happens when the public collaborates to construct "the truth" about high-stakes issues.

I trace how Wikipedians enact genre in an unstable environment by analyzing how arguments unfold in *Wikipedia* talk pages, how the article text and citations change, as well as the larger network of global warming-related articles. This analysis yields several significant findings. In chapter 2, I find that Wikipedians' arguments create boundaries around the discursive spheres that can be cited within different articles, which suggests the significance of arguments not only about the topic but *about genre* as a deliberative resource in networked discourse. In chapter 3, I find that editors' work in enacting genre results in facts becoming more at issue, or destabilized, within articles through the course of 2007. This analysis suggests that arguments about genre, and the easy availability of circulating texts online, may challenge consensus about controversial issues. In chapter 4, I use argument and network analysis to trace both Article for Deletion discussions and also the larger ecosystem of articles about global warming. This analysis shows how the talk page and article editing practices that I trace in earlier chapters become sedimented within the site's information architecture, shaping what Internet users may learn about the issue. In aggregate, this dissertation contributes to understanding not only how the openness that characterizes online collaborative environments shapes public discourse around controversy, but also the dynamics of public uptake and discussion of texts in the networked era.

Committee Members
Dr. Chris Neuwirth (Chair)
Dr. Linda Flower
Dr. David Kaufer

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Acknowledgments

Invention, according to Karen Burke LeFevre, is an inherently social act. This holds true not only for obviously collaborative enterprises like *Wikipedia*, but also for works such as this one, the invention of which would not have been possible without the contributions of many individuals. I am deeply indebted to my advisor Chris Neuwirth and committee members Linda Flower and David Kaufer for their wise mentorship, their incisive feedback, and their unflagging support. I am particularly indebted to Chris for embodying the ideals of excellence as an intellectual mentor and advisor at all points, and for her unceasing generosity in sharing her time and feedback. I was humbled and grateful for Linda's steadfast willingness to collaboratively plan and question me out of muddled thinking, and for Dave's uncanny ability to help me see the forest when I was too caught up with trees.

Many others from CMU and beyond made invaluable contributions. Danielle Wetzel was a constant source of support and encouragement, and facilitated this project's completion by providing much-needed time to focus. The English graduate students provided a robust and inspirational intellectual community. Juliann Reineke, Ryan Mitchell, and my writing partner Will Penman were irreplaceable for their good humor and constant willingness to share ideas. I am also deeply indebted to Marilyn Moller and Susan Miller, whose professional and intellectual mentorship provided an incomparable introduction to rhetoric and composition.

I am most indebted to my family for their love and support, and for their commitment to communication, language, and the common good as an intellectual imperative and a lived activity. This work is dedicated to my parents, Ralph and Kathy Cooke, who taught me to love reading, ideas, and argument.

Chapter 1

Wikipedia, Global Warming, and the Problems of Open Texts

These days we look to Wikipedia for the truth.

—Dan O'Sullivan, *Wikipedia: A New Community of Practice?*

In August 2015, a featured article on *Wikipedia* in *The Atlantic* by Joe Pinsker opened with the following anecdote:[1]

> On January 11, 2013, James Heilman, an emergency-room physician and one of Wikipedia's most prolific medical editors, was standing watch over the online encyclopedia's entry for a back procedure called a kyphoplasty. The page originally suggested that the procedure's effectiveness was 'controversial,' and an unidentified Wikipedia user had proposed changing the text to 'well documented and studied' – a characterization that Heilman thought wasn't supported by the existing research. He rejected the change.

Pinsker goes on to explain that kyphoplasty, a surgical procedure designed to treat a broken spine, is an oft-conducted procedure for which Medicaid often pays millions of dollars, but which medical research suggests has little value greater than a placebo

[1] *A note on terms used in this work:* **Editors, users, and readers**: The terms "users" and "editors" are often used interchangeably to refer to those who make any contributions or changes to a *Wikipedia* page, as Pinsker does in this excerpt. For the purpose of distinguishing between those who "use" *Wikipedia* only by *reading* a page and those who contribute to it, in this project I will reserve the terms "editor" or "Wikipedian" to refer to those who contribute to a page, and will reserve the term "readers" or "users" for those who read or navigate a page but do not otherwise contribute to its contents. Note that those who are editors of one page may also be readers or users of another.

Articles and outside sources: This project refers repeatedly to the interactions of multiple different texts – most commonly, between *Wikipedia* texts and those texts that are *outside Wikipedia* (for example, a news report or journal article) that Wikipedians cite and write about. As a general convention, I try to use *articles* consistently to refer to specifically *Wikipedia articles* (which we might see as the corollary of an "entry" in a traditional print encyclopedia, such as about giraffes or the American Revolution). I also try to consistently refer to those texts that are cited and written about using the general term *sources*, or *outside sources* (outside here referring to "texts originating outside *Wikipedia* articles, or not native to *Wikipedia*"), although at times I necessarily refer to the specific *genres* of outside sources (e.g., "news articles" or "journal articles."). I have tried to consistently use a descriptive modifier when referring to such outside sources (*journal* articles) to avoid confusion. *Text* is used throughout as a generic term that may refer to either the text of *Wikipedia* articles or to other texts, although the specific referent is clarified in context. I use the word *page* also as a general term to refer generally to a separate "piece" of *Wikipedia*, roughly synonymous with the term "web page." *Page* is thus a broad term that encompasses multiple types of texts in *Wikipedia*, including articles, policy texts, Talk Pages, etc.

treatment. Moreover, and illustrating Pinsker's point, the edit from "controversial" to "well documented and studied" was made by an employee of a medical company that sells medical devices for the procedure in question – someone whose vested interest in the "facts" about this procedure seems difficult to deny.

I borrow this anecdote both for the dynamics it dramatizes and for what it helps illustrate about *Wikipedia*'s prominence in the contemporary information society: an emergency-room physician who "stands watch" over the *Wikipedia* article for a particular medical procedure because of the article's potential to influence not only patients, but healthcare organizations such as Medicaid;[2] two editors vying for control of the "truth" about kyphoplasty; the need to "stand watch" because *Wikipedia* pages can be edited at any time and are thus unstable; *Wikipedia* as a source of public information that's so significant that, as Pinsker goes on to explain, it now faces the challenge of addressing how (and whether) to guard against the myriad PR firms and funded initiatives who work to edit the *Wikipedia* pages of celebrities, companies, and products. These dynamics — of distributed and sometimes contentious writing practices over controversial issues, of the curation of public knowledge, of how openness and instability shape article texts, and the site's potential significance for public discourse — are the dynamics this dissertation takes up.

It is hardly an exaggeration to say that *Wikipedia* is one of the most prevalent and successful examples of what online technologies afford in terms of both *reach* and

[2] Pinsker (2009) explains that the medical company employee whose edits Heilman was rejecting in this anecdote complained to him in an email that "This site and the content on here is scaring prospective patients and insurance companies are not wanting to cover these procedures."

speed (Kaufer & Carley, 1993; Gurak, 2001); it is arguably the most significant single source of information for many Internet users. 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 et al., 2016). A 2012 study by the UK data analytics company PiDatametrics found that *Google* search results in the UK returned a *Wikipedia* page within the top five search results for 96% of randomly generated nouns, and the first search result for 56% of searches (Cope, 2012). Further, both scholarship and data from the website itself suggests that Internet readers not only use it for information about general research topics like popular culture or medicine, but also rely on it for news and current events. For example, the *Wikipedia* "Main Page" functions like a news feed to collect sections like "From today's featured article," "In the news," "Did you know…" and "On this day…". In January 2015, the total page-view traffic for the "Main Page" was over 378 million; during this same period, the "Total Digital Population" of individual readers of the top newspapers was less than 55 million for an individual newspaper. (For example, the total digital readers of the *New York Times* in January 2015 was just under 54 million [Barthel, 2015].) Indeed, Keegan, Gergle, and Contractor (2013) argue that the speedy creation of articles covering current events represents an emerging form of citizen journalism. For example, the *Wikipedia* article "2016 Orlando Nightclub Shooting," noted at the time as the deadliest mass shooting in America's history, was created at 8:52 a.m. on June 12, 2016, approximately seven hours after the shooting began in Orlando. The article received 284,565 page views on June 12 and 380,764 page views on June 13 — suggesting a high level of individual user traffic.

Between the speed with which articles are created and *Wikipedia's* high circulation and global use, it seems to serve the public in a manner similar not only to print resources like encyclopedias, but increasingly like traditional news outlets.

These statistics make a strong case for taking the genres, circulation, writing processes, and effects of *Wikipedia* seriously. But beyond the public significance of this site itself, *Wikipedia* represents a larger trend of open collaborations. Forte and Lampe (2013) define open collaborations as "online environments that a) support the collective production of an artifact b) through a technologically mediated communication platform c) that has low barriers to entry and exit and d) supports the emergence of persistent but malleable social structures" (p. 2). Open collaboration platforms and practices have become increasingly prevalent as significant sites for the creation and circulation of public discourse; examples range from news or information-oriented wiki-based environments such as *Citizendium*, *Rational Wiki*, and *WikiNews*, to collaborative book production (Glushko, 2015), to open source software collaborations (such as Mozilla), to open mapping projects and open government initiatives (such as *We the People* petitions). Increasingly, publicly circulating texts and artifacts are collaboratively produced artifacts.

Scholars in myriad fields have named and begun to document the dynamics of collaboration and collectivity afforded by new media spaces like *Wikipedia* and their implications for communication, knowledge, production, and social interactions. Terms like Benkler's "commons-based peer-production" (2006) and Bruns's "produsage" (2008) draw our attention to how collaborative dynamics in new media environments

like *Wikipedia* represent a departure from the top-down, centralized mass media environment of the twentieth century, in which publicly circulating texts were often generated by professionals or journalists whose role as author separated them from the users who read those texts. The networked, interactive affordances of Internet technologies have created opportunities for this uni-directional communication sphere to be replaced by intensely collaborative production environments in which non-state, non-corporate affiliated actors can coordinate in knowledge-production practices. Other scholarly lenses for describing *Wikipedia* focus less on its novel authorship and production dynamics and more on the dynamics of social organization; Joyce, Pike, and Butler (2012), for instance, refer to *Wikipedia* as a "deliberative mass collaboration system" that has grown increasingly bureaucratic, with an increasingly complex set of policies, rules, consensus-building practices and bureaucratic roles developing to help coordinate the otherwise complex and potentially unstructured work of millions of contributors.

Studies of *Wikipedia* in communication, composition, and rhetoric to date have tended to approach *Wikipedia* either through a process, pedagogy-oriented lens that wonders what wikis and *Wikipedia* mean for collaborative writing and authorship, or through a publics lens that interrogates its significance for participation in the networked public sphere. Scholarship grounded in writing processes and pedagogy questions how *Wikipedia* challenges or complicates traditional notions of authorship, research, writing, and revision (e.g., Jones, 2008; Purdy, 2009; Purdy, 2010; Kennedy, 2016). Purdy (2010), for example, refers to *Wikipedia* as a public space of knowledge

production, one among several examples of how Web 2.0 technologies challenge the tendency in composition classes to treat research and writing as distinct and separable processes. With a similar emphasis on process, Kennedy (2016) argues for *Wikipedia* as a form of emerging processes of "textual curation," a form of composing focused not simply on writing a single, final document, but that encompasses practices of "collaboratively collecting, filtering, recomposing, taxonomizing, and managing information" (p. 180). The lens of curation, Kennedy argues, helps draw attention to the multiple complex collaborative, distributed, and open writing processes and forms of information structure involved in contributing to sites like *Wikipedia*.

Such process-focused work, however, de-emphasizes some of the more compelling questions for scholars of rhetoric and communication raised by open collaborations. For example, documenting broad process practices in *Wikipedia* helps identify what skills it may require or foster, but leaves us to wonder how collectives negotiate exigence, audience, and genre — key elements of rhetorical goal-setting — in the first place. These questions are particularly compelling when we recognize *Wikipedia* as a site where members of the public converge to negotiate how to write about highly controversial topics, such as controversial medical procedures like kyphoplasty or (in the case of my study) global warming.

And when we imagine the complex rhetorical negotiations that may have to unfold in these spaces, we begin to take up questions more of concern to public sphere scholars, who often focus on whether *Wikipedia* functions as a site of democratic, deliberative, rational-critical debate. Barton (2005) and Hansen, Berente, and Lyytinen

(2009) echo Benkler's celebration of *Wikipedia's* emancipatory and democratic potential by arguing that wiki-based discourse environments offer the opportunity for the revival of traditional Habermasian rational discourse. Such celebrations are tempered, however, by communication research documenting the myriad barriers to access and participation that *Wikipedia* poses. Gruwell (2015) for example, points to *Wikipedia's* well-documented "gender gap" (editors are disproportionately male), arguing that *Wikipedia's* style and policies may marginalize feminist epistemologies and gendered forms of discourse. Others argue that, in contrast to the liberatory, democratic features that some scholars emphasize, *Wikipedia* is, in actuality, more oligarchic in structure, dominated by a small subset of users who develop leadership roles and disproportionately influence artifact creation (Shaw & Hill, 2014). Considering whether *Wikipedia is* in fact, open to anyone and *does or does not* foster rational-critical debate are crucial for identifying its boundaries and practices as a site of public debate. However, it is important to complement such work with scholarship particularly focused on what it is that Wikipedians are debating *about.* As I elaborate below, Wikipedians aren't *meant* to be expressing personal opinions and viewpoints, nor are they engaging in the kind of forensic or deliberative debate that aims toward legal decisions or policy-making. They're arguing about how to use outside texts to make an encyclopedia. When we focus on that purpose, we can shift to ask what *Wikipedia* affords, not simply as a site of general public rational-critical discourse in service of public opinion formation, but as a site where the public negotiates and interprets the meaning, relevance, and value of public texts. And when we pair this lens with analyses of the rhetorical and

genre dynamics of *Wikipedia*, we see another set of questions — questions that have significant implications for how we understand the role of open collaborations in public knowledge circulation and textuality.

In the remainder of this introduction, I first explain the basic technical affordances, editing policies, and collaborative dynamics that characterize *Wikipedia* as an open collaboration. I then draw on rhetorical and genre theory to explain how *Wikipedia's* open collaborative nature creates particular problems, and explain how investigating these problems can contribute to perennial questions in writing, rhetoric, and public sphere scholarship. Finally, I explain why considering these questions by focusing particularly on *Wikipedia* articles about global warming is valuable not only as a way to interrogate how we collaborate in public around texts that take up controversy, but because the history of this issue's treatment in mainstream media helps underscore the importance of understanding what kind of *truth* we, as a public, are getting from open collaborations like *Wikipedia*.

Wikipedia **as an Open Collaboration**

The particular questions of genre, collaboration, and public text circulation that I pursue in this project stem partly from *Wikipedia*'s technical affordances as a wiki-based collaborative environment and partly from the particular community policies and practices through which *Wikipedia* enacts its function as an encyclopedia that, as its tagline holds, "anyone can edit."

TECHNICAL AFFORDANCES | *Wikipedia*'s technical architecture is based on a wiki platform called MediaWiki, developed particularly for *Wikipedia* and now used by several of its related projects (such as *Wikibooks* and *Wiktionary*). Wikis function on a "space-based structure" (Bruns, 2008) that allows editors not only to edit, add, or delete existing webpages, but also to help build and edit components of the information architecture, such as navigational hyperlinks, redirects, glossaries, and so on. Page editing in *Wikipedia*'s early years required that editors learn and use a lightweight wikimarkup language, although in later years the site began to develop and integrate a more user-accessible visual editor with layout editing functionality more similar to that of "What You See Is What You Get" (WYSIWYG) text editor programs like Microsoft *Word*. A key functionality of the *Wikipedia* technical infrastructure is that the site automatically logs and stores a history of every saved edit made to every page and has since the site's inception; hence, editors can easily restore deleted pages or revert to earlier versions of an article. This history and revert functionality sometimes leads to what are commonly referred to as "edit wars," conflicts characterized by users reverting or revising edits made by other users which are under dispute.

Most *Wikipedia* pages can be edited by anyone with Internet access. *Wikipedia* encourages editors to register and create a username and login password, but many pages can be edited without one. Every edit made, regardless by whom, is recorded with some identifying information; for editors with usernames, edits are recorded by

their username. For edits made by unregistered editors, the site records the IP address[3] from which the changes originated. Some pages are subject to various levels of "page protection," which range from requiring that editors create a username and login (so their edits can be tracked to a user identity, which allows the site to track individuals' behavior and intervene in case of problems – for example, by revoking the users' editing privileges if they behave badly) to full protection, meaning pages can only be edited by administrators. Pages may be protected for a range of reasons, such as frequent vandalism, edit warring, or (in the case of some pages) because they are highly visible or necessary to the site's legal or technical functioning. Thus while *Wikipedia* bills itself as "the encyclopedia anyone can edit," a more accurate description of its current openness to users is something like, "The encyclopedia that anyone with Internet access and the ability to use markup can edit, in the case of most pages, most of the time."

EDITING AND CONDUCT POLICIES | While its technical affordances provide a basis for understanding the basic features of *Wikipedia* as a writing environment, its editing and conduct policies work to prescribe the parameters of its content and editor behavior. Joyce, Pike, and Butler's (2012) characterization of the site as an increasingly complex bureaucracy in regards to its policy environment is apt; policies are hierarchically tiered

[3] Internet Protocol address; this is a numerical identifier that is assigned to every computer or device that connects to the Internet. There is no one-to-one correlation between IP addresses and users (or machines), however; an individual user may edit from hundreds of different IP addresses. Logging them provides only a minimal identification measure.

in terms of how they communicate guidance to users. *Wikipedia*'s "Five Pillars" provide its most basic principles:[4]

- *Wikipedia* is an encyclopedia
- *Wikipedia* is written from a neutral point of view
- *Wikipedia* is free content that anyone can use, edit, and distribute
- Editors should treat each other with respect and civility
- *Wikipedia* has no firm rules (*Wikipedia*: Five Pillars)

In addition to the five pillars, the site maintains a set of core editing and conduct *policies*, which "have wide acceptance among editors and describe standards that all users should normally follow" (*Wikipedia*: Policies and Guidelines) along with sets of *guidelines* (which describe "best practices" for editing). There are also *essays* designed to communicate editors' advice. A comprehensive account of the history and complexity of these policies would be a separate (and worthwhile) project unto itself; for the purposes of this project, it is sufficient to be familiar with the three core content policies that form the basis of how *Wikipedia* articulates its content goals:

> **Neutral Point of View (NPOV):** This policy articulates *Wikipedia*'s effort to mitigate personal opinions and biases in editing. The following excerpt from the policy articulates its heart: "All encyclopedic content on *Wikipedia* must be written from a **neutral point of view** (**NPOV**), which means representing fairly, proportionately, and, as far as possible, without editorial bias, all of the significant views that have been published by reliable sources on a topic" (*Wikipedia*: Neutral Point of View).

[4]Note that, like any other *Wikipedia* page, the text of article policies has been developed and edited over time; hence the exact wording of policy text given in this introduction may not directly correspond with the wording of policy text as it existed in the time periods covered by my analysis within specific chapters. I have tried to explain the spirit of policies as they have stood throughout the site's history when possible, and default to including the most recent versions of policy text unless otherwise noted in the context of my analysis. See this project's Reference list for the access dates for particular quoted excerpts of policy texts.

> **Verifiability (VER):** This is the policy through which *Wikipedia* articulates its relationship to knowledge as stemming from published, reliable sources (RS) rather than from editors' personal experiences or subjective knowledge-making efforts: "**verifiability** means that anyone using the encyclopedia can check that the information comes from a reliable source. *Wikipedia* does not publish original research. Its content is determined by previously published information rather than the beliefs or experiences of its editors. Even if you're sure something is true, it must be verifiable before you can add it. When reliable sources disagree, present what the various sources say, give each side its due weight, and maintain a neutral point of view" (*Wikipedia*: Verifiability).
>
> **No Original Research (NOR):** Working in tandem with the Verifiability policy, NOR emphasizes that the encyclopedia is not meant to function as a publishing venue for novel research or analyses: "*Wikipedia* articles must not contain original research. The phrase "original research" (OR) is used on *Wikipedia* to refer to material—such as facts, allegations, and ideas—for which no reliable, published sources exist. This includes any analysis or synthesis of published material that serves to reach or imply a conclusion not stated by the sources" (*Wikipedia*: No Original Research).

Readers will note the dense interrelationship between these policies, each of which refers to the others, and each of which emphasizes the importance of relying on information taken from *reliable, published sources*. The essential gist of these policies is that information on *Wikipedia* is to be taken from reliable sources (i.e., you can't just make stuff up), cited, and represented in an unbiased, neutral manner. This is the heart of what *Wikipedia* articulates as its genre goals as an encyclopedia.

COORDINATION AND CONSENSUS | Scholars who study group behavior distinguish between explicit and implicit forms of coordinating work in collaborative tasks or group work. Explicit coordination relies on direct verbal communication such as discussions of planning and agenda-setting; implicit coordination, in contrast, is based on "workgroup structure, unspoken expectations, and share mental models of the task to be accomplished" (Kittur & Kraut, 2008). Insofar as "anyone can edit" any *Wikipedia* page, no individual editor is required or forced to coordinate work with any other editor explicitly; unless a page is protected, anyone can edit it. Such edits may rely on implicit coordination; for example, editors might share the expectation that texts should be edited for spelling and mechanics and take up the task without explicitly discussing it, or editors may simply have no intention to coordinate at all, and may make edits that range from potential improvements to vandalism.

Wikipedia describes its coordination and decision-making as occurring through a "consensus" process, a "natural process" that unfolds through editing and discussion; ideally this process involves addressing all editors' legitimate concerns through discussion and reference to the site's policies. *Wikipedia* assumes that silence equal consensus, which means that any unchallenged edit is agreed to have consensus among editors. For explicit coordination about article editing, every *Wikipedia* article includes a talk page, a space in which editors can propose changes, discuss problems, questions, or disagreements, or engage in agenda-setting for the article content. As with the articles themselves, anyone can contribute to a talk page. Talk page discussions are threaded, meaning they usually open with a title indicating the discussion topic, and contributions

by distinct editors are separated by the use of indentation. Each editor's contribution to a page is time-stamped with the editor identity (or an IP address, for editors who aren't logged in) and the contribution time. Talk page discussions can range from a single contribution to which no other editors respond, to discussions that span hundreds of editors and unfold over the course of weeks or months.

For escalating conflicts, *Wikipedia* has a dispute-resolution process that unfolds in a tiered structure, from requests for comments or intervention from other editors or administrators, to a more centralized arbitration committee (*Wikipedia*: Consensus). In addition to coordination about particular articles, *Wikipedia* has spaces and processes devoted to particular community issues and goals. Articles for Deletion (AfD) discussions are spaces in which editors discuss and vote on whether to keep or delete existing articles; I discuss these discussions at great length in chapter 4. WikiProjects are spaces where editors interested in particular topics or issues – such as environment-related articles – work to coordinate goals and agenda-setting, such as which articles require particular kinds of work (development, editing) or which topics should be added as new pages.

There is no shortage of research analyzing the often messy and complex group dynamics and social processes that characterize work in *Wikipedia* (e.g., Kriplean et al., 2007; Kittur & Kraut, 2008; O'Sullivan, 2009; Halfaker et al., 2011; Schneider et al., 2013). My project embraces an interdisciplinary ethos that assumes that scholarship from related fields such as sociology or human-computer interaction can augment and complement research in rhetoric and communication; hence, I draw on this research

periodically to help develop observations and arguments in this project. But valuable though such scholarship is, its inward-looking focus on editors' behavior tends to ignore the *rhetorical* dimensions and problems involved in what happens when tens and hundreds of editors try to collaborate to take up publicly circulating texts and represent them within the context of closure-resistant, ideally-neutral encyclopedia articles. The following section elaborates on these problems and explains how my inquiry investigates them.

Wikipedia, Collaborative Genre Enactment, and the Problem(s) of Open Texts

As an open collaboration with the broad goal of creating "encyclopedic," neutral articles with content drawn from published, reliable sources, *Wikipedia* partakes of both genre enactment and public discourse circulation. As Reiff and Bawarshi (2016) argue, genre can be a particularly valuable lens for understanding the kind of "public rhetorical performances" that public sphere scholars such as Hauser (1999) encourage our field to document and understand. In *Wikipedia*, the dynamics of genre involve both *uptake* (Freadman, 2002) of external genres (outside sources), and also *enactment* of novel genres through processes of deliberation and collaborative writing. Due to *Wikipedia*'s openness – both to hundreds of authors and to changes at any time – genre uptake and enactment in the article-creation process are inflected by two key problems: problems of dispersed collaborative authorship, and problems of instability. Freadman's concept of uptake helps account for the dynamics of meaning-making that occur as generic

action travels across texts and contexts, as it does when editors recontextualize and write about external sources. It also helps account for the challenges posed when many authors collectively try to engage in uptake, particularly of texts related to controversial issues such as global warming.

Uptake, in Freadman's view, is a name for the "bidirectional relations" *between* a pair of distinct genres; an uptake lens focuses on the "social action" (Miller, 1984) that genres accomplish — that is, "what [genre] gets people to do with one another, and what they do with it" (Freadman, 2002, p. 40). A simple example of uptake is a job application written in response to a job advertisement: the application takes up the generic action of the ad by responding to it. Focusing on uptake encourages us to attend to what Freadman calls the "translations" that occur between generic boundaries, or the way in which meaning or semiosis is effected when we translate between texts, taking them up in new contexts for distinct purposes. In an application that responds to a job ad, such translations might involve a candidate arguing that she holds particular qualifications called for by the ad, but also elaborating on how her additional qualifications (not necessarily mentioned in the ad) should also be viewed as desirable qualities.

Such intergeneric relations, Freadman asserts, are often political; the sequence of communicative action that unfolds across a series of uptakes can serve political and ideological functions. In the example of an application, a chain of uptake might involve an application being vetted by administrators or executives, the circulation of memos, an invitation for an in-person visit, followed by the performance of a series of genres

(interviews, presentations, and so forth). This intergeneric process of a job search might culminate in a job offer letter for a candidate. The legitimacy and function of an offer letter, and its ability to accomplish the social action of an offer, derive partly from its historic relation to the preceding set of genres, which serve the ideological function of ensuring that the offer is a legitimate and authentic offer on the part of a given company or institution. This example of an interrelated set of genres, involving multiple uptakes that together help structure how the social work of hiring a job candidate may unfold, illustrate Bawarshi's assertion that "[u]ptake helps us understand how systematic, normalized relations between genres coordinate complex forms of social action — how and why genres get taken up in certain ways and not others and what gets done and not done as a result" (2010, pp. 199-200). In other words, uptake provides a framework for identifying the habitualized relationships between genres that develop within social situations, and in turn, how these habitualized relationships between genres come to structure the way that actors recognize and respond to social situations with communicative action. "Knowledge of uptake," Bawarshi asserts, "is knowledge of what to take up, how, and when, including how to execute uptake tasks strategically and when to resist expected uptakes" (2010, p. 200).

Freadman is careful to emphasize that the translational processes of uptake are not causally determinate, one-to-one interactions; translations between genres involve an author of a new genre selecting an "object" or purpose for uptake among several possibilities. For example, the hoped-for uptake of an offer letter is a candidate's acceptance of the job; however, the candidate may instead have the object or purpose

of using the letter as leverage to negotiate a raise at a current job, effectively blocking one possible object (acceptance) in service of another. Hence *translation* partially involves selecting one "chain" or sequence of meanings out of several possibilities, and also often involves blocking other possibilities. Further, uptake processes also involve the potential for abuse — for example, a candidate might use the offer in a public op-ed about exploitative salaries offered by companies or institutions, or problems with their hiring practices.

Uptake provides a lens for understanding cross-genre relations, and is thus valuable for understanding how meaning and discursive interactions unfold within public spheres particularly, where the relations between genres may be less standardized or regulated by institutional forces, and where abuse may be easier and more prevalent (Reiff & Bawarshi, 2016). A recent example of the dynamics of cross-genre relations in public spheres might be the uptake and circulation of the phrase "black lives matter" as a public response to several incidents of police shootings of black civilians. The phrase originally appeared in July 2013 as a *Twitter* hashtag (#blacklivesmatter), after George Zimmerman was acquitted of murder in the death of Travon Martin. The hashtag gained popularity during the protests and riots in Ferguson, Missouri that erupted over the shooting death of Michael Brown by a white police officer; it was subsequently taken up as the name of an activist organization (Black Lives Matter) and the phrase became widely associated with public activism and public discourse surrounding the issue of racism and police brutality (Freelon et al., 2016).

The uptake and recirculation of the phrase thus served a constitutive function in the movement's public identity; at the same time, however, the phrase itself also became a flashpoint for racial tension and polarizing responses. For example, the phrase "All Lives Matter" (#alllivesmatter), an obvious iteration of the original phrase, began to circulate as a public counter-discourse and backlash against the Black Lives Matter movement; it was a reaction to and critique of the original phrase for suggesting that some lives matter more than others. Likewise, the phrase "blue lives matter" began to circulate as an effort to show solidarity with the police officers whose behavior and practices the movement criticized and demanded be reformed. In one particular example of uptake which Freadman might identify as "abusive," former New York City Mayor Rudolph Giuliani asserted that the phrase "black lives matter" was "inherently racist," and chastised the black community for what he framed as its hypocritical failure to address black-on-black crime:

> When there are 60 shootings in Chicago over the Fourth of July and 14 murders, and Black Lives Matter is nonexistent, and then there's one police murder of very questionable circumstances and we hear from Black Lives Matter, we wonder: Do black lives matter, or only the very few black lives that are killed by white policemen? (qtd. in Twohey, 2016)

Giuliani's uptake and reference to the phrase in the context of chastising a movement functions to shift the public's focus on the issue from problems surrounding policing to problems within black communities; indeed, Giuliani seems to be making a deliberate effort to shift the locus of responsibility for violent crime onto those whom the Black Lives Matter movement frames as its victims. In terms of relations between genres, Freadman's "translation" lens helps focus on the shifts in genre function and meaning involved when a slogan or hashtag (#blacklivesmatter) is taken up in the context of a

more extensive public speech. For example, the function and intended action of a hashtag or slogan might be to raise awareness, mobilize participation, or bolster solidarity behind action on an issue. What it clearly does *not* do is develop an argument about responsibility for crime with reasons, logic, and evidence. Giuliani's uptake of the phrase, however, seems to treat the slogan as an argument to be interrogated for its ideological coherence and logical consistency. His uptake of the phrase for the purpose of this critique helps illustrate Reiff and Bawarshi's point; the uptake of this phrase across a range of contexts and discourses helped both constitute the movement *as a public* and to shape public debate around the issue. This example also illustrates why studying intergeneric and intertextual relationships may be particularly significant in an era of networked discourse; new media scholars such as Warnick (2007) view intertextuality as one of the key dynamics of online public discourse — not only because hyperlinks alter the dynamics of how online texts are created and read (Landow, 2006), but because of the ease and speed with which texts can be recontextualized and "remixed" (Lessig, 2008).

Wikipedia as a site of public genre *uptake* and recirculation is undeniable;[5] uptake is built into and demanded by site policies requiring that content be drawn from reliable published sources. Insofar as *Wikipedia* in general seeks to achieve its encyclopedic function, we can view its purpose as expressly oriented toward uptake and recirculation of the facts or viewpoints relevant to any particular topics. Its content and

[5] The *Wikipedia* page for "Black Lives Matter," for example, came up within the top seven *Google* search results for the phrase, following only the movement's official home page, *Twitter* account, and several recent news articles about it.

editing policies are, in essence, broadly defined "genre rules" (Yates & Orlikowski, 1992) which prompt users on how to "associate appropriate elements of form and substance with recurrent situations" (302). We can view genre rules such as NPOV as prescribing rules or expectations for the appropriate textual form of uptake: for example, "fairly" and "proportionately" in the NPOV policy might direct us to treat two competing representations of an issue as "unbiased," giving each equal weight within article text. Such policies function as what group communication scholars would consider coordination mechanisms that help generate the plans for writing that editors may implicitly follow, and also to create the locus of shared (broad) goals and agendas that can be drawn on in explicit coordination. But Rhetorical Genre Studies holds that genre rules also have constitutive and regulative functions for how writers identify and respond to opportunities for communicative action —that is, to particular exigencies. In his articulation of the concept of the *genre function* (which correlates to and builds on Foucault's *author function*), Bawarshi (2003) elaborates on Miller's idea that exigencies are not external, extant, or objective, but are socially defined, partially *by* genre. "Genres," Bawarshi holds, "help organize and generate our social actions by rhetorically constituting the way we recognize situations within which we function. In short, genres maintain the desires they help fulfill" (2003, p. 25).

The work that genre does to shape our recognition of and response to particular exigencies, however, is not deterministic. Rather, rhetorical *agency* adheres in a writer's ability to adapt the schemas taken from previous communicative acts (whether performed, observed, or mandated by policies) to novel, creative performances within

particular contexts. Indeed, Sewell (1992) articulates this from an anthropological perspective, asserting that, "Agency […] is the actor's capacity to reinterpret and mobilize an array of resources in terms of cultural schemas other than those that initially constituted the array" (p. 19). This work on the part of a rhetorical agent to "reinterpret and mobilize an array of resources" in enacting any genre is the same kind of constructive rhetorical work that Freadman refers to as "translations" from one genre to another. Whether we are focused on these "translations" between genres, as in Freadman's case, or on attending to how extant examples of genres serve to shape our recognition of particular exigencies (here we might imagine a writing student studying multiple examples of a proposal in order to learn how to write one), rhetorical agents (or, in our case, *Wikipedia* editors) must interpret and enact the exigencies for rhetorical action that genre prompts and shapes.

How, then, do *Wikipedia* editors interpret and enact the exigencies for rhetorical action created by the policies in the context of particular articles? For example, Bawarshi's emphasis on how genre functions to *maintain* and structure social motives — to both constitute and structure habitual responses to exigencies — draws our attention to the problem of what the phrase "all significant views that have been published by reliable sources" in the NPOV policy might generate as an *exigence* for writers composing articles: perhaps an endless search for every "significant" view on the part of editors, or the idea that *any* source might need to be examined as potentially reliable and significant enough to be represented. Finding and determining which sources are relevant and significant to cite can be a challenging interpretive act for a

single author, much less a group. Moreover, as scholars who analyze writing-from-sources practices maintain (e.g., Spivey, 1997), determining and representing "significant" sources is not a simple act of search and retrieval; it is a constructive act, one involving the generation of novel meanings as writers repurpose texts for novel contexts and goals. How does this act unfold in textual production when there is not one but potentially *tens* or *hundreds* of authors of a given text? How do editors develop shared understandings of what "fair" or "neutral" should look like in a text, or of which sources pose significant exigencies for uptake and inclusion and which do not? How (if at all) do they reach consensus about what texts mean as they are recontextualized within *Wikipedia* articles? Pursuing these questions is central to our efforts to account for what open collaborations like *Wikipedia* afford us as sites of rhetorical performance and public meaning-making; that is, of how *Wikipedia* invites and allows members of the public to function as what Eberly (2000) refers to as "citizen critics" whose interpretive practices generate shared public interests and problems.

In chapter 2, I pursue these questions through analyses of how Wikipedians negotiate the enactment of the NPOV and Verifiability / Reliable Sources rules as they edit articles related to global warming. More specifically, I analyze the arguments that editors make on talk pages, particularly during conflicts over whether outside sources should be included, and if so, how they should be represented. This analysis describes the particular types of arguments that editors make about sources, and how, as a collective, they try to develop stable approaches to taking up external sources about global warming and representing the "facts" about the issue in a neutral manner. It

describes how editors' reasoning, for example, works to *block* (in Freadman's terms) some directions for uptake and meaning at the same that it shapes and sanctions others. In chapter 3, I explain how this reasoning inflects changes to the texts of the corresponding articles, and in chapter 4, I analyze how editors' reasoning shapes the interrelationships of global warming articles in the site's larger ecosystem.

At the same time that these chapters address the challenge of collaborative authorship in genre enactment (obviously unique to neither *Wikipedia* nor open collaborations), they also address questions that are intertwined with collaboration in these environments — the dynamics of public genre performances in environments of textual instability. The concept of genre as a constitutive and regulative force in textual production is often understood and addressed in scholarship in terms of "stabilized for now" genres (Schryer, 1993). Few studies consider what happens to genre performance when texts never achieve stability or closure. But textual instability is often named among the key defining features of online discourse; scholars have posited that the ephemerality of web text (Warnick, 2007) and its editability, for example, may work against the typification of genre features (Starke-Meyyering, 2008). While we have studies that take comparative or corpus-based approaches to documenting common features of web genres (e.g., Miller & Shepherd, 2004; Emigh & Herring, 2005), less work takes a diachronic perspective that traces how generic action unfolds over time in texts such as *Wikipedia* articles. But in these texts, resistance to closure — to the stabilization of content and form afforded by print technology — is a significant feature of their openness, and, I argue, their character *as genres*.

One way to understand the challenge of openness and the potential problems it raises for how genre uptake occurs, and for how issues are represented in open collaborations, is through theories that are grounded in how traditional "closed" texts create meaning. In *Lingua Fracta* (2009), Collin Brooke argues that this resistance to closure in new media texts may significantly shape how we read and write texts, as well as the texts themselves. Brooke develops his argument though a focus on the rhetorical canon of *invention,* drawing a parallel between the types of closure-resistant dynamics of writing and reading in online media and Roland Barthes's concept of the "proairetic code" in literary texts. The "proairetic code," Brooke explains, is one of Barthes's two "irreversible" codes of literary narrative that contributes to orienting a reader to a narrative's "logico-temporal order." The proairetic functions to generate narrative actions, plot events, or "enigmas" (such as a door eerily creaking open in a mystery novel). This code, in Barthes's framework, works in concert with the "hermeneutic," which "marks the goal(s) toward which the reader (and the plot and the characters) are headed." Brooke explains,

> Within a particular texts, the hermeneutic combines with the proairetic to generate what we might call textual momentum, with the understanding that this momentum is directed at a specific end, the resolution of the enigma. (2009, pp. 75-77)

As Brooke emphasizes, this orientation toward the resolution of a narrative represents a reading practice oriented toward the hermeneutic, which "all but overwhelms" the proairetic; as readers we tend to dismiss or may be annoyed by actions, events, or enigmas that are introduced but remain unresolved.

While Barthes's original theory of these codes may be grounded particularly in literary and narrative genres, Brooke argues that the concept of proairetic invention is a useful lens for seeing novel dynamics of reading and writing in general in new media text. For example, he points to search engines like *Google* as sites that provide opportunities to resist hermeneutic closure if users treat search results not as final or "closed" resolution to a query, but as a "point of departure," giving access to pages and pages with endless intertextual links and a near-endless opportunity to continue to invent question or queries as one reads along novel paths.

Wikipedia's openness both to participation and to ongoing, temporally unbounded collaborative writing processes presents a kind of resistance to closure that Brooke describes in terms of proairetic invention, a resistance that raises questions not only about how we conceptualize the traditional rhetorical canons (as Brooke seeks to do in *Lingua Fracta)*, but about how we conceptualize and study the work of genres in such contexts. Genre, both as a theoretical concept and as an enacted practice, orients us to a particular hermeneutic resolution — the creation of a text that responds to a given situation, creating both movement and, insofar as it fulfils its responsive function — closure. A given instance of a genre (ideally) resolves or addresses its exigence. But, as I explain in the example above, any published text on a topic might be construed to represent an opportunity for response; we might view these circulating-but-as-yet-uncited-texts as the correlates to the unresolved "actions" or "events" of Barthes's proairetic code. As long as more texts are published, or more viewpoints become available, they represent an endless potential exigence for response through summary

and incorporation into an article, a need to resolve the exigence of an extant viewpoint by incorporating or acknowledging it. *Wikipedia*'s temporal openness to editing, in theory, thus gives editors leeway to identify and respond to these exigencies indefinitely. Both editors' inventional practices and also the texts themselves may thus be shaped by this openness. I explain above the possible challenge to uptake and genre enactment that *Wikipedia* poses as a collaborative authoring environment — that is, the challenge of getting many authors "on the same page" about what a given article should say. But this problem is compounded by *Wikipedia*'s *temporal* openness (its resistance to closure) and the potentially endless exigencies for writing and revising that outside sources can create. What (if any) stability develops in the article texts themselves, and how does it develop? Or, put in genre terms: how do *Wikipedia* articles (as genres of writing that take up outside sources, or genres) develop stabilized or habituated uptake relationships with those outside genres over time?

These questions are not merely theoretical, nor are they only *genre* questions, particularly when we're talking about publicly circulating texts. The enactment and circulation of genre shapes both public discourse and the characters of publics themselves. Indeed, while public sphere scholarship may not ground its discussions of genre in rhetoric's understandings of it, the function of texts in circulating information and providing a basis for uptake, recirculation, response, and opinion formation have long been assumed or asserted in public sphere scholarship. In Habermas's (1989) ideal bourgeois eighteenth century public sphere, the interpretation of circulating literary texts provided the basis for private individuals to discuss and develop a shared sense of

their subjectivity; similarly, Dewey (1927) holds that art's function in communicating the findings of inquiries into social conditions has a significant role in facilitating the public's development of shared problems and interests. For Warner (2002), textual circulation does not simply provide the *basis* for the development of common subjectivities, interests, or problems, but it constitutes and makes possible publics. Publics, that is, are inherently intertextual. Warner's definition of publics as inherently intertextual provides a complement and corrective to public sphere scholars' traditional reliance on a deliberative or conversational model of publics. That model, Warner asserts, may overlook the nature of public discourse itself, including its potential ramifications through texts. In contrast to models of the public sphere that focus on opportunities for deliberative discourse, Warner characterizes publics as "concatenations of texts through time" (p. 90). He asserts:

> In addressing a public[…] even texts of the most rigorously argumentative and dialogic genres also addresses onlookers, not just parties to argument.[…] The interactive relation postulated in public discourse, in other words, goes far beyond the scale of conversation or discussion to encompass a multigeneric lifeworld organized not just by a relational axis of utterance and response but by potentially infinite axes of citation and characterization. (pp. 90-91)

My characterization of problems related to *Wikipedia*'s *openness to anyone* might be viewed as another way of framing the nature of stranger addressivity (here "onlookers") that Warner asserts is an essential characteristic of all publics. Readers of *Wikipedia* articles *as written* are these potential public onlookers who, by virtue of the accessibility afforded by the wiki platform, can themselves become participants in the site-internal dialogue and writing practices about how public issues (or scientific propositions) are represented. They can read an article, and if they don't like how it's written, they can try

to revise it, given they can find a source that justifies what they think the article should say. The historicity of these onlookers' responses to externally circulating texts about this issue — that is, what they've read and thought, what texts they've found, what genres they encounter — can shape how they enter into these *Wikipedia*-internal dialogues, and (as I will show) can shape how these issues are represented in the site's articles. Further, the public availability of circulating genres and texts relevant to global warming that the Internet enables seems exactly Warner's "multigeneric lifeworld organized by […] potentially infinite axes of citation and characterization." This broader openness, and its nearly infinite potential for interactions surrounding responses to publicly circulating genres, may be said to characterize not only *Wikipedia*, but only discourse more broadly. Given *Wikipedia*'s public prominence, understanding how Wikipedians navigate openness can contribute to understanding not only how genre enactment and uptake work in collaborative environments, but also how the public may understand contemporary controversial issues.[6]

I have raised questions in the preceding pages about how Wikipedians negotiate genre enactment in a collaborative authoring environment, about how resistance to textual closure shapes these enactments, and what these enactments tell us about *Wikipedia* and similar open collaborations as sites of public interpretation and as public texts. Answering these questions requires an approach that traces and narrates

[6] *Wikipedia* is such a prominent source of medical information that the University of California, San Francisco recently offered course credit to fourth-year medical students for editing *Wikipedia* articles (see Beck, 2013). A health science professor interviewed for Beck's article explained that *Wikipedia* is a particularly significant source of medical information in developing countries, where cell phone use is more prominent than computer use. *Wikipedia* has partnered with cell-phone carriers in these areas to make *Wikipedia* pages available to users for free, without the requirement of paying for cellular data plans. Even people without computers look to *Wikipedia* for the truth.

relations among collaborative practices and their resultant texts as they develop through time. Thus each of my chapters take a diachronic view, tracing how Wikipedians' negotiations over articles, and the articles themselves, change over time. In chapter 2, I trace editors' arguments around source uptake in the "Global Warming" and "Global Warming Controversy" articles throughout 2007, the publication year of the International Panel on Climate Change Fourth Assessment Report. This analysis shows how editors engage in boundary work, how they argue about genres, and how their argumentation practices – and the work of long-term editors – shape how and where external sources are taken up within articles.

Likewise, in chapter 3 I analyze how the "facts" about global warming shift within particular articles through the course of 2007. This analysis speaks to what the open genre enactment that *Wikipedia* involves offers to the public; it also shows how Wikipedians' negotiations of uptake shape divergences in how different articles take up external genres. I expand on this focus in chapter 4, taking a broader lens to analyze how genre enactments unfold not only within particular articles, but across the system of global warming-related articles over time. This analysis gives a broader view of how discursive boundaries develop over time, and shows how inter-article relationships may shape what *Wikipedia* makes available to the public. Chapter 4, in other words, uses a systems lens to show how genre shapes larger-scale curational practices (Kennedy, 2016), arguing that "seeing" genre enactments in open collaborations ultimately demands that we see beyond individual texts to their place in the larger genre and textual system.

Before moving on to these analyses, however, it is important to understand the value of focusing on these questions particularly in relation to high-stakes public issues, issues that have both global significance and potential personal ramifications. Global warming is one such issue, one that has both prompted coordinated, intergovernmental efforts and policy-making and also has personal impact as we decide whether to make environmentally sustainable choices in our day-to-day lives. It stands with problems of intercultural conflict and global resource disparity as among the most pressing and difficult issues of our time. What we say about it publicly matters. And, as I explain below, the history of its circulation in public discourse – particularly in mainstream media outlets – provides a basis for questioning and comparing what, if anything, online discourse offers us as an alternate public information resource.

Global Warming's Public Genre Enactments

A burgeoning body of scholarship documents the myriad ways that global warming and climate science are shaped by the discourses, practices, argumentation techniques, and public genres through which they circulate. For those hoping for a Habermasian ideal of rational-critical debate around the issue, or even for media representations that improve public understanding of climate science, such studies often paint a grim picture. Multiple studies, for example, have documented how contrarian networks of scientists, think-tanks, and funding agencies influenced both public discourse and public climate policy by sowing doubt regarding climate science and arguing against policies to

combat climate change (Oreskes & Conway, 2010; Farrell, 2015). Findings from other studies are less Orwellian, but document similar barriers to dialogue or public understanding, from adversarial, pro-con discourse coalitions (Smart, 2016) to media representations that have historically represented climate findings with a greater level of uncertainty than exists within the scientific community (Boykoff & Boykoff, 2004; Zehr, 2000; Antilla, 2005; Painter, 2013). Public opinion polls speak to the effects of these media representations and discourse circulations. For example, one 2012 study of U.S. public opinion found that while 95% of climate scientists saw global warming as anthropogenic, only 54% of the public did at that time (Leiserowitz et al., 2012; see also Painter, 2015). To no one's surprise, what the media communicates to the public about climate science is what the public tends to believe.

Beyond simply documenting the complexity that inflects public discourse surrounding the issue, however, such studies speak specifically to how genre norms, discourse practices, and media affordances inflect how climate science circulates and is publicly represented. In news reports from traditional mass media outlets, for example, journalistic norms such as *balance* (Boykoff & Boykoff, 2004) and values such as *novelty and controversy* (Carvalho, 2007*)* lead journalists to shape news stories in ways that may distort the level of certainty, controversy, or significance of scientific findings. Boykoff and Boykoff (2004), for example, traced how reporters' enactments of the journalistic norm of *balance* in climate news coverage between 1988 and 2002 led paradoxically to biased representations — that is, to a tendency to over-represent the views of contrarian scientists, with the effect of over-representing the level of scientific

uncertainty about climate change's existence and causes. It is worth noting here that it is neither the political biases of *journalists* nor the oft-derided, sticky influence of policymakers or industry stakeholders that lead to these "biased" representations of the scientific consensus, but the enactment of close-held standards of journalistic norms and practices (Schudson, 2001) that become visible in textual instances of the news report genre. *Wikipedia*'s content policies such as Neutral Point of View and Verifiability can be seen in some ways as correlates to the journalistic norms that shape news reports, but their enactment is inflected by the distinctly collaborative and unstable nature of writing in *Wikipedia* that I explain above. How do these distinct community practices, genre enactments, and media affordances inflect how climate science circulates publicly?

What studies there are into public communication of science in new media environments have tended to focus on the recent phenomenon of science blogs as sites where experts communicate directly with the public, potentially circumventing the shaping and distortion that tends to characterize traditional media's science coverage (e.g., Blanchard, 2011; Luzón, 2013; Smart, 2016). Luzón (2013), for example, refers to science blogs as "spaces where the public can contribute to the collective construction of knowledge by discussing, supporting, or challenging claims" (p. 430). Similarly, Smart (2016) draws on an example of one climate science blogger to suggest that blogs are spaces that facilitate a "knowledge-coproduction" model of public communication of science, which contrasts the "deficit model" of science popularizations and its problematic assumptions that the public is an ignorant *tabula rasa* onto which scientists

can, should, and do deposit scientific facts (see also Bucchi, 2008). This potential for discussion, interactivity, and knowledge coproduction is made possible partly by the technical affordances of blogs themselves, which enable commenting, the creation of networks of discussion, easier, faster publishing times than more traditional outlets for commentary (such as journal letters or comments), and a potentially wider reach.

Wikipedia, I argue, has similar dynamics and opportunities to blogs as a space of public knowledge-making and discourse circulation about global warming, but with distinct affordances, practices, and genre goals. Examining it as a space of genre enactment and public discourse circulation thus contributes to a broader effort to understand how online genres and technological affordances shape climate science's publicity in the networked era. If we're looking to *Wikipedia* for "the truth" about global warming, what are we getting?

Chapter 2
Open to Debate: How Arguments Shape and Stabilize the Uptake of Texts

> *The main global warming article gets a lot of editing from people who read an article 'from our science correspondent' sandwiched between 'Elvis Prestly [sic] seen in Birmingham' and 'aliens made me fat' in a local newspaper and want to include the viewpoint.*[7]
>
> —*Wikipedia* editor BozMo, comment on "Global Warming Controversy" talk page, February 2007

Global warming was a hot topic in public discourse in 2007. In that year, the International Panel on Climate Change (IPCC) published its Fourth Assessment Report (IPCC AR4). The report was released in four sections over the course of 2007; the first section was the contribution of Working Group 1 "Climate Change 2007: The Physical Science Basis," which was published in March of 2007 and was preceded by a *Summary for Policymakers* (SPM), which was published in February 2007. The publication of IPCC AR4 represented a significant shift in the scientific consensus — and subsequent public discourse — about global warming at the time. The IPCC's report communicated an unprecedented level of certainty about the existence and anthropogenic causes of global warming; among its oft-quoted findings was that "warming of the climate is unequivocal" and that the IPCC expressed a greater than 90% certainty that the causes of warming are anthropogenic greenhouse gas emissions (IPCC 2007). In addition to the IPCC report, several significant events in public discourse around climate change

[7] In this and all other excerpts throughout the project, I have retained the original spelling and style of the excerpt as it occurred in the original talk page text. Henceforth I omit [sic] as an indicator of errors or typos in the original texts for examples analyzed within chapters.

unfolded in 2007; for example, then-President H.W. Bush publicly acknowledged the existence of climate change and referred to Americans' dependence on oil, and the IPCC and Al Gore were awarded the Nobel Peace Prize for their efforts to disseminate knowledge about the issue and contribute to efforts to mitigate its effects (Callison, 2014).

Indeed, media attention to climate change hit an all-time high in 2007 (Callison, 2014). 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. Such a massive number of circulating, potentially "reliable" sources of information about global warming itself could pose a tremendous challenge in terms of search, decision-making, and writing for *Wikipedia* editors seeking to enact the "reliable source" policy in writing articles. And this effort would be complicated not only by the quantity of sources, but also by the public circulation of highly conflicting and well-publicized contrarian viewpoints. For example, in March of 2007, a UK public-service broadcast channel released a documentary titled *The Great Global Warming Swindle* that challenged the legitimacy of scientific claims that global warming is caused by anthropogenic release of greenhouse gases. As its title predicts, the film suggests instead that global warming is a "swindle" perpetrated by climate scientists and environmentalists in an effort to drive public funding for climate research and costly mitigation efforts. The film features several prominent scientists who have publicly questioned the climate community's claims

about the issue, including Richard Lindzen, Frederick Singer, Patrick Michaels, Timothy Ball, and John Christy; it was the source of subsequent controversy within the British press, was released on television in several countries, was subsequently released as a DVD and (as of this writing) also circulated on the Internet.

In chapter 1, I elaborated on the twin problems of openness that *Wikipedia* involves: temporal openness (meaning no text is ever finished or "stable"), and openness to anyone. In such an open environment, the need to represent information "from all reliable sources" creates an exigence for editors to continually seek and incorporate new sources, such as the newly published IPCC AR4. The genre rules also create an exigence for them to find, evaluate, and decide whether to "take up" the thousands of other circulating texts related to global warming. At the same time, *Wikipedia*'s openness to *anyone* amplifies the potential sprawl and chaos of this writing endeavor, because even if editors coordinate their efforts for such tasks through talk pages, the arrival of a new editor – perhaps one with a different take on the IPCC report's veracity, or one who just saw *The Great Global Warming Swindle* and thinks it represents the truth about the issue – can argue for edits that overturn prior decisions. How, if at all, do editors maintain a stable, consensual approach to enacting the site's genre rules, particularly the site's emphasis on reliable sources?

Asking how Wikipedians enact genre under such open conditions is important not only because it can account for how genre "works" in open collaborations, but because it helps understand the dynamics of circulation, participation, meaning-making, and rationality that inflect how *Wikipedia* functions *in* public and *as a* public. Publics are

inherently intertextual, extant by virtue of their circulation (Warner, 2002); documenting the intertextual dynamics that unfold in open collaborations thus contributes an account of how open collaborations function in and as publics. Moreover, descriptive accounts of "what counts as reasonable" within the discursive spaces of a given public are crucial to non-prescriptive, empirical accounts of actual publics (Hauser, 1999). Accounting for how Wikipedians may argue about the representation of sources thus documents the criteria of rationality that characterize its publicness. It also helps account for how its discursive practices shape the boundaries of participation and access.

The following chapter thus documents how Wikipedians argue over enacting the site's genre rules in the wake of the publication of IPCC AR4 in 2007. To do so I draw on the concept of *genre uptake* (Freadman, 1994; Freadman, 2002; Bawarshi, 2006; Dryer, 2008; Reiff & Bawarshi, 2016), tracing how Wikipedians respond to the exigence created by circulating sources about global warming through processes of negotiation and boundary building. I describe how Wikipedians' arguments create discursive boundaries that shape how sources are taken up in articles, and how such boundaries become sedimented within the site's larger article ecosystem (an analysis which I elaborate in subsequent chapters). My analysis of how Wikipedians reason about source uptake and genre enactment also demonstrates how *argument* mediates and shapes genre uptake. The role of argument in genre uptake is a significant but oft-overlooked aspect of accounting for the intertextual dynamics in online discourse; my analysis of Wikipedians'

arguments thus contributes to scholarship interested in methods that account for genre interrelationships in online discourse, particularly in moments of public controversy.

Genre Uptake, Boundary Crossing, and Argument

Since her earlier articulations of it, Freadman's concept of *genre uptake* (1994; 2002) has been adopted and elaborated by scholars in Rhetorical Genre Studies as a productive framework for examining the generic, semiotic, and discursive relationships between genres (e.g., Bawarshi, 2006; Dryer, 2008; Emmons, 2009; Reiff & Bawarshi, 2016). Freadman's concept of uptake is grounded in an adaptation of Austin and Peirce's elaborations of speech act theory, and as I explain in chapter 1, refers to the relationship between a pair of texts, which she refers to as an antecedent genre and its interpretent. In my study, an antecedent genre would be the IPCC AR4 or the BBC documentary, and its interpretent the *Wikipedia* article in which such texts are taken up and in which information from them is represented. 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. An RSVP to a wedding, for instance, confirms the generic status of a wedding invitation *qua* invitation by accepting or rejecting it – rather than, say, writing a eulogy, bursting into song, or penning a rebuttal dismissing the value of matrimony. 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.[8] Insofar as an interpretent genre builds on or responds to the rhetorical action of a preceding genre, the relationship between two genres depends on memory – that is, 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. (61)

The process of uptake involved as one genre "takes up" the semiotic or rhetorical action of another, however, is not a simple, deterministic wholesale movement – it involves what Freadman (2002) calls "translations" that occur as rhetorical or semiotic action move across the boundaries between two genres. This involves both establishing an object or purpose for taking up a genre as well as translations that may "block" some potential directions for actions while selecting and maintain others. Thus inter-genre relationships can ramify in multiple ways. Examining uptake helps account for

[8] Freadman (2002) is careful to note that interpretent genres are not causally *constrained* to respond to antecdents 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.

circulatory or intergeneric dynamics in systems, ecologies, or networks, particularly how intergeneric relationships shape social action (e.g., Emmons, 2009; Tachino, 2016).

Many studies have examined how genre relationships structure action within social systems, but little work considers specifically the role of *argument* in shaping how inter-generic relationships are built or maintained. Smart (2016), for example, draws on genre uptake in his analysis of how arguments about climate science circulate in public science blogs, but he focuses on the genres *through which arguments move* rather than on how argument may (or may not) function to shape relationships between genres. Likewise, work in composition tends to focus on *argument uptake* as a component of a writing-from-sources framework (e.g., Spivey, 1997; Miller, Mitchell, & Pessoa, 2016. See Cumming, Conttia, & Cho, 2016 for a useful literature review of writing-from-sources literature), examining how writers draw on external genres or sources to build novel texts moreso than on how argument mediates the relationships that writers create between two distinct texts.[9]

As noted in chapter 1, Wikipedians coordinate how they write articles through talk page deliberations, which are sometimes quite heated and lengthy. While scholarship in human-computer interaction has begun to document how argument shapes collaborative writing in *Wikipedia* (e.g., Kriplean et al., 2007; Bender et al., 2011; Schneider et al., 2013), such scholarship tends to focus predominantly on how argument

[9] Wolfe's (2002) study on annotations does suggest that a student who reads another's – particularly an instructor's – annotations on a text may be prompted to address a writing-from-sources task as an *argument* task moreso than a *reporting* task. In this way, others' arguments about or around a text would mediate a student's uptake of that text. However, Wolfe's study is not focused on documenting the types of argumentation and reasoning made in these annotations as much as on how they shape the way student writers conceptualize a task space.

shapes social dynamics and collaborative work rather than specifically on how argument shapes the way Wikipedians *take up* genres and *enact genre* as they write articles. But taking up, arguing about, and representing information from sources is exactly what Wikipedians are doing – and they are doing it in some cases around highly controversial topics like global warming. More specifically, Wikipedians must decide together what "counts" as a legitimate and reliable source of global warming knowledge – including which genres "real" science circulates through, how science does and doesn't "work," and who the "real" legitimate climate scientists are that produce relevant knowledge. In this chapter, I thus analyze how Wikipedians' arguments around external sources unfold. I draw on Gieryn's (1999) concept of boundary-work and Walton's (1997) framework for appeals to expert opinion to trace how arguments shapes the inter-generic relationships in two articles during 2007; this analysis suggests how argument analysis can contribute to studies of genre uptake and enactment that arise in this and other open collaboration systems.

How Wikipedians' Arguments Over Genre Uptake Involve Boundary-Work

The talk pages of the "Global Warming" and "Global Warming Controversy" articles in 2007 illustrate how Wikipedians use argument and deliberation to coordinate the way they enact the Verifiability policy. Their deliberations, particularly those in the wake of the publication of IPCC AR4, demonstrate how Wikipedians respond to the exigence for uptake that external sources create. For example, in February of 2007, various editors

proposed updates to the "Global Warming" article to reflect information available from the newest pieces of the IPCC report. In the following example, the first editor asks whether images should be updated to reflect newer data updated since the previous report in 2001; the second editor asserts this has already been completed:[10]

> (A1) Are images like Image:IPCC Radiative Forcings.png being updated from the IPCC 2001 report to the 2007 report? I'm not sure about which other images can be updated also. —AySz88\^-^ 04:45, 3 February 2007 (UTC)
> (A2) An updated image using data from the 2007 report is at Image:Radiative-forcings.svg, and has been substituted in on the Global warming page. -- Leland McInnes 01:04, 4 February 2007 (UTC)

As an instance of genre uptake, the translation between genres here appears to be fairly straightforward; the editors agree to take up an informational image from the IPCC report and integrate it into the *Wikipedia* article, thereby "confirming" (in Freadman's terms) the generic status of the IPCC report as a source of reliable information and "translating" that informational work into the new context of a *Wikipedia* article. Editors similarly responded to the exigence to take up external sources as additional pieces of the IPCC report became available through 2007. For example, the following discussion

[10] *Wikipedia* talk page arguments generally begin with a thread title giving some discussion topic, followed by a series of turns from discussion participants. In general Wikipedians follow a practice of indenting turns to respond to one another, creating a visual outline, similar to the following:

> *Turn 1 by editor A*
> *Turn 2 (response to 1 by editor B)*
> *Turn 3(response to 1 and 2 by editor C)*
> *Turn 4 (response to editor A by editor D that ignores/does not engage or respond to B or C)*

For formatting purposes, I omit the threading indentations throughout this chapter, instead numbering turns in the sequence they occur on the original page: (1, 2). Numbering restarts with each sample. It should be noted that the number 1 does not necessarily designate that this was the first turn in any given discussion. In addition, each discrete stretch of example text is designated by a unique letter (A, B, C), included to aid cross-referencing in the document. Text samples with multiple turns thus have the same letter but a unique number for each turn (A1, A2, A3). I have retained the original spelling and style for all text from the original discussions. Unless otherwise indicated, all bold text throughout examples is mine, given to emphasize text most relevant to the discussion.

occurred in May 2007, following the publication of the IPCC AR4 Working Group 1 Report. In this discussion, editors notify one another of the report's publication and begin to discuss how to interpret and represent the relevant information from the report in the "Global Warming" article. This example also shows that editors construct an *object* (Freadman, 2002) or purpose for taking up this text as they plan (turn four: "This is where an easily-updatable, collaborative encyclopedia like ours can lend a hand"):

> **AR4 WGI full report now available**
>
> (B1) Just FYI, the full report of AR4 Working Group I is now available at http://ipcc-wg1.ucar.edu/wg1/wg1-report.html. PDF-only at this point. Raymond Arritt 00:53, 8 May 2007 (UTC)
>
> (B2) Yup. Been trying to scour through this. I think we should start referencing specific chapters rather than the SPM, to maybe help our readers (who actually look at the references). For the most part, we reference chapters for the TAR, so it shouldn't be much worse to do so with the AR4. But then again, maybe the summary is easier. We'll see. ~ UBeR
>
> (B3) It might be unnecessary from a scientific point of view, but we could reference both, the SPM for a quick statement and the full report for in-depth details. Possibly even in one reference (we can stick two {{cite }}templates into one <ref>). --Stephan Schulz 07:00, 8 May 2007 (UTC)
>
> (B4) I agree. it is outstanding, and it is the closest thing we currently have to an official world response. It is good to know these resources are out there, **though it's too bad the general public does not have an intuitive sense of its role. This is where an easily-updatable, collaborative encyclopedia like ours can lend a hand. So I agree it looks like a very good resource.** --Sm8900 13:40, 8 May 2007 (UTC)

While these examples show Wikipedians working to take up the IPCC report and translate its information into *Wikipedia* articles, the publication of the IPCC AR4 also generated commentary and response from a range of other outlets, including public scientists as well as the Wikipedians themselves. On the talk page of "Global Warming Controversy" article, several editors not only debated the validity of the IPCC findings, but also responded to and interpreted publicly circulating commentary about it. For

example, shortly after the publication of the IPCC AR4 *Summary for Policymakers* (SMP) in February, one editor cited and referred to an analysis by conservative UK public figure and climate change denier Christopher Monckton; editor RonCram summarized some of Monckton's analytic findings, which cast doubt on the validity and reliability of the computer modeling that the IPCC science relies on to project future temperature increases – Monckton's point being that the IPCC report's projections may be inaccurately alarmist. After RonCram posted his summary on the talk page, several editors jumped in to share publicly circulating rebuttals of Monckton's analysis and to delegitimize Monckton's critique as a valid source. The same editor shared another critique two weeks later and was met with a similar response from fellow editors:

> **Critique of AR4 SPM by Dr. Vincent Gray**
>
> (C1) Vincent Gray is a long-time reviewer of IPCC reports. He has published a critique of the AR4 SPM that has been accepted for publication in "Energy and Environment" and is available online. [29] I would suggest anyone interested in this controversy read Dr. Gray's critique. He says: "I will therefore confine these comments to the aspects of the "2007 Summary for Policymakers" which I find the most distasteful. They come under the headings of unreliable data, inadequate statistical treatment and gross exaggeration of model capacity." Enjoy! RonCram18:02, 15 February 2007 (UTC)
>
> (C2) Thank you for the link. Just read it, now I have to do cross-referencing between it and the Summary to parse the distortions and accuracies. Makes for a good bus ride home. -- Tony of Race to the Right 18:16, 15 February 2007 (UTC)
>
> (C3) **Grays ranting about the CO2 measurements is funny, and well worth a read. Just don't rely on** it William M. Connolley 18:29, 15 February 2007 (UTC)
>
> (C4) What a hoot! **I wouldn't be surprised if someone did aSCIgen on E&E**. Raymond Arritt 18:56, 15 February 2007 (UTC)

In the first turn of this example, RonCram quotes Gray directly, bolstering his stance that the IPCC report should be taken with a grain of salt. In the subsequent turns, three editors respond to his comment to quickly discredit the source. Raymond Arritt, for

example, suggests that "Energy and Environment," the source of Gray's critique, would be a likely candidate to accept "SCIgen" articles, which are "nonsense" articles that draw on grammar to automatically generate mock research articles. The editors' rapid-fire discussion of this source – the three responses to RonCram's post coming within only an hour – point to how quickly editors of the global warming-related articles responded to the circulation of other outside sources. This discussion also illustrates, in broad terms, how Wikipedians' talk page arguments use argument claims to "block" the generic status of particular sources. In this case, the editor RonCram suggests that the argumentative and informational value of Gray's public critique merits it being represented in the *Wikipedia* article alongside information from the IPCC report. By dismissing the source as unreliable ("just don't rely on it"; "I wouldn't be surprised if someone did aSCIgen on E&E"), subsequent editors undermine and thereby block the potential discursive work of Gray's critique, preventing its uptake and inclusion.

These examples give a basic representation of how *Wikipedia*'s openness to editing and to anyone create a condition in which editors continually enact genre by responding to the exigence to represent "reliable sources" as they circulate in public. Their talk page deliberations enable them to coordinate how they take up external sources through processes of translation, purpose building, and (at times) blocking the uptake of sources. The Gray example, however, also points to the type of coordinative work required to enact the Reliable Sources rule in relation to the topic of global warming: editors must develop and maintain a consensual representation of what counts as "reliable" sources of information about global warming, and how the myriad

circulating viewpoints about climate science should (or should not) be taken up and represented within the article.

The challenge of coordinating this work given *Wikipedia*'s openness, and the complex argumentative tactics it involves, are evident in the myriad edit wars and talk page disagreements that unfolded through 2007, during which editors argued over how the assertions of the scientific community should be represented in the article lead. Particularly contentious were debates focused around a small stretch of text in the article's opening, which read as follows in January 2007 (prior to the publication of IPCC AR4):

> 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 (CO2), 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.

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. In chapter 3, I provide a detailed analysis of how this representation changes over time as conflicting voices enter the text from external sources, introducing uncertainty about how widely this assertion is shared. For the purposes of this chapter, it is sufficient to note that many debates throughout the year

focused around how best to include and represent views that conflicted with this assertion. 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 conflicting views to 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.

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:

> (D1) 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, 28 April 2007 (UTC)

Although this editor does not refer here to a specific external source or individual scientist, his argument illustrates how debates over enacting the site's genre rules involved adjudicating the boundaries of what counts as scientific knowledge and what does not. In scientific debate, "boundary-work is strategic practical action" (Gieryn, 1999, p. 23); that is, the policing of the boundaries of scientific knowledge serve functional purposes for scientists in relation to professional goals. More specifically, the stakes of policing the boundaries of scientific knowledge are linked both to how "pure" scientific findings are taken to be, as well as to how factors such as political or economic pressures are taken to influence scientific knowledge-making and thereby render it "impure." 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 non-climate 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 can be viewed as a form of boundary-work that Gieryn (1999) refers to as "expulsion," which seeks to legitimate "real science" and distinguish it from related "posers" such as pseudoscience or popular science (p. 16). By drawing an analogy between non-climate 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 asserting that failing to make such distinctions is "simple-minded" and ignorant – an assumption that involves a kind of "power play" that connects the value of a particular edit to the legitimacy of a particular contributor (Kriplean et al., 2007).

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 arise within disciplines, contexts, and communities and represent or encode particular sets of knowledge-making practices, actions, and values, then it stands to reason that *debating* how and whether to take up external genres or sources is likely to involve arguing over

whether genres appropriately represent or encode those 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 doesn't) 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.

My point is further illustrated by the following exchange from May 2007. It unfolded under the thread title "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 argues against these established boundaries in the first turn, following the assertion that the extent of consensus about AGW in "the scientific community" is not as widespread as the lead suggests:

(E1) 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, 21 May 2007 (UTC)

(E2) **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, 21 May 2007 (UTC)

(E3) 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, 21 May 2007 (UTC)

(E4) 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)

(E5) 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, 22 May 2007 (UTC)

(4, 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.

(E6) **Thanks for the objective, neutral and authoritative sources.** Raymond Arritt 03:16, 22 May 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?.."[11] 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

[11] 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).

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, 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*:

(F1) 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 CO2). 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, 19 November 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).

Uptake mediates between texts, genres, discourses, and publics (Bawarshi, 2016; Reiff & Bawarshi, 2016). My analysis shows how Wikipedians' arguments over external sources of information about climate science involve boundary work that mediates between the external genres and the *Wikipedia* article itself. It also shows how their deliberations take up the boundaries of external contexts, practices, and authors that create external genres. In constructing boundaries around what "counts" as legitimate science about global warming, they create a basis for maintaining and recreating those discursive boundaries within *Wikipedia* articles themselves.

This analysis also suggests that in high-stakes science controversy, *reasoning* around genre uptake is not simply a yes/no debate that takes the form "To cite or not to cite"? Editors' extensive reasoning about how to represent the scientific consensus about global warming suggests that arguing around uptake in open contexts marked by controversy also drives more elaborate reasoning around what genres are valid, how knowledge is distributed and aggregated across them, what actors can legitimately create them, and whether they represent the values and practices relevant to the purposes and texts that seek to take them up. In other words, in order to decide which external sources to take up into *Wikipedia* articles, Wikipedians must engage in boundary-work that delineates "reliable" genres and sources from the illegitimate or unreliable. *Wikipedia*'s open environment may necessitate these more complex and elaborate arguments; editors cannot simply dismiss suggestions, they must argue for

them, and in entertaining and rebutting arguments over whether the consensus is represented, Wikipedians develop complex reasoning to support and defend the boundaries around knowledge-making they seek to defend and perpetuate.

It is notable that this reasoning involves not simply boundary work, but arguments *about sources and genres.* As I note in chapter 1, not only collaborative environments but online discourse more broadly is often characterized by its intertextuality – texts circulate easily and quickly, are recontextualized, commented on, and taken up in diverse ways. Further, as collaborative writing environments become more common as sites of public discourse, the likelihood increases of similar contexts in which authors must publicly deliberate over the meaning, validity, and relevance of outside genres during their composing processes. Analyzing and describing this reasoning, then, is an important aspect of accounting for "what counts as reasonable" (Hauser, 1999) in contemporary networked public discourse. This is particularly significant in an era when the legitimacy and value of information is called into question in relation to high-stakes political issues, as with recent worries about the political impact of "fake news." How the public reasons about whether texts are authoritative, and worthy of recirculating, can shape how public discourse about significant issues such as global warming develop online as well as off.

Therefore, an important question — in addition to simply documenting boundary work — is how to fruitfully characterize the arguments about sources and genres that Wikipedians make. In the following section, I demonstrate how Walton's (1997) framework for appeals to expert opinion might be adapted as a baseline

framework for analyzing types of arguments about genre made in talk pages. In addition to demonstrating how argumentation mediates genre uptake in *Wikipedia*, this analysis provides a provisional framework for accounting for how genre and genre relationships may function as argument resources in other contexts.

Arguments About Genre and Sources: A Provisional Framework Based on Walton's Appeal to Expert Opinion

Full accounts of the reasoning involved in debates on the "Global Warming" talk pages over the course of 2007 is tricky: discussions often span several days or weeks, with hundreds of turns and tens of participants. The same argument may unfold over multiple topic threads in the same time span, and the organization of talk page arguments is generated only by the participants themselves – one discussion over whether the representation of AGW on the page is biased may be followed or interrupted by a debate over the appropriate text to explain an unrelated image source, or how to define "global warming." Further, large-scale corpus analyses of talk page arguments have mapped broad trends in reasoning across a range of arguments (Schneider et al., 2013; Bender et al., 2011), only some of which might be relevant or discussed here. Rather than focusing on dominant trends, however, my analysis focused particularly on how Wikipedians reason about sources as a component of how they reason about enacting genre by taking up external texts and representing them "neutrally."

Bender et al.'s (2011) analysis of broad trends in Wikipedians' reasoning suggested that arguments based on Walton's (1997) appeal to expert opinion are common in these arguments. My analysis of talk page arguments found a similar trend in the prevalence of these arguments. Given the documented prevalence of these arguments, I suggest that Walton's appeal to expert opinion may suggest a useful framework for analyzing how Wikipedians reason around taking up external genres and enacting the "reliable sources" genre rule. In the following analysis, I elaborate on how this framework can be brought in conversation with genre theory and genre uptake as a basis for accounting for how arguments over genre uptake unfold in comparable public spaces.

On the left below is the general form of Walton's *appeal to expert opinion* as he describes it. On the right is the form as it might be viewed in the context of arguments about the inclusion of sources in *Wikipedia* talk pages:

Walton's Appeal to Expert Opinion	**Argument Form Adapted for Source Inclusion in WP articles**
E is an expert in domain D *E asserts that A is known to be true.* *A is within D* *Therefor, A may (plausibly) be taken to be true. (Walton, 1997, p. 201)*	*S is a source in domain D* *S asserts that A is known to be true* *A is within D* *Therefor, A may (plausibly) be taken to be true (and should therefor be included in a WP article)*

Walton's framework for evaluating arguments would suggest that arguments of the form on the right above, if accepted by interlocutors, would motivate revisions to the article (or justify including certain assertions if supportable by S). Walton's "critical questions" that may be asked to challenge arguments of this form would also predict

that similar questions or assertions might be made in the context of disagreements over revisions to the articles that focus around external genres or source material. Walton's "critical questions" are as follows:

> *Expertise question:* How credible is E as an expert source?
> *Field question:* Is E an expert in the field that A is in?
> *Opinion* question: What did E assert that implies A?
> *Trustworthiness question:* Is E personally reliable as a source?
> *Consistency question: Is* A consistent with what other experts assert?
> *Backup evidence* question: Is A's assertion based on evidence?

If we adjust these questions to focus not on *experts* themselves but on the *sources* in which expert knowledge is at issue, we can reframe this set of questions as follows:

> *Expertise question:* How credible is S as a source of expertise? *OR* How credible as an expert is the author of S?
> *Field question:* Does S represent expertise in the field that A is in? *Or* is the author of S an expert in the field that A is in?
> *Opinion* question: What did S assert [or "what is said in S"] that implies A?
> *Trustworthiness question:* Is S individually reliable as a source? *Or* Is the author of S personally reliable as a source?
> *Consistency question: Is* A consistent with what other sources assert?
> *Backup evidence* question: Is A assertion based on evidence?

Reframed as arguments not about experts but about *sources,* Walton's "critical questions" involved in arguments from expert opinion begin to become recognizable as similar to those arguments I elaborate above that adjudicate source and genre uptake based on the contexts, actors, values, and knowledge-making practices that disciplinary and community-based genres represent. They do so partially through interrogating the relationships between texts, genres, contexts, and authors relevant to a given source and its purpose or object within the novel context of a new article. That is, in adjusting this framework to focus not on *experts* but on *sources*, we begin to see how reasoning around source legitimacy in this context is not limited to reasoning about *authorship*

and *expertise*, but rather that authority in texts is related to knowledge-making practices, contexts, intertextual relationships, and genres through which knowledge circulates. Indeed, sociocognitive theories of genre maintain that the production of professional genres is intricately interwoven with performances of expertise, professional conduct, and knowledge-making. Berkencotter and Huckin (1995), for example, assert:

> Knowledge production is carried out and codified largely through generic forms of writing: lab reports, working papers, reviews, grants proposals, technical reports, conference papers, journal articles, monographs, and so on. Genres are the media through which scholars and scientists communicate with their peers. Genres are intimately linked to a discipline's methodology, and they package information in ways that conform to a discipline's norms, values, and ideology. (p. 1)

Reasoning about knowledge production and the value of knowledge in texts, in other words, is often reasoning not just about *the authors of genres* but about the genres themselves – how they are produced, how they circulate, and what practices are involved in their creation.

The value of a modified version of Walton's framework for accounting for how Wikipedians reason about genres, texts, and their relationship to knowledge and "facts" in texts is evident throughout talk page arguments in 2007. For example, one particularly contentious edit war and debate in the "Global Warming" article occurred in March of 2007. This discussion, which was opened in early March and spanned several different topic threads and eventually resulted in a mediation case for the site, was opened with a thread titled "NPOV Dispute," and an assertion about the article as insufficiently representing a Neutral Point of View:

> (G1) This entire article is biased heavily toward the pro global warming viewpoint. **All opposing viewpoints** have been deliberately forked off to other pages - **contrary to Wikipedia policies and guidelines**. ~ Rameses 22:04, 9 March 2007 (UTC)

With this assertion, Rameses connects an assertion about the existence of "opposing viewpoints" to an invocation of the "Wikipedia policies and guidelines." This invocation helps establish the purpose of uptake (enacting the policies or genre rules) and connects it to an assertion similar to Walton's "Backup Evidence" question (Is A assertion based on evidence?). In this particular case, his point is that evidence ("opposing viewpoints") exists and, given the article's informational purpose, is therefore missing. This question points to how this critical question relates to the informational purposes and genre expectations of the uptake text (the *Wikipedia* article). In response to this assertion, the user Raymond Arritt responds with an argument that is grounded in Walton's "consistency" question, by suggesting that the article's assertions aren't sufficiently grounded in an equitable representation of the discourse in relation to "the scientific literature":

> (H1) The article has a section on solar variation which discusses the main mechanism that has been offered as an alternative to the influence of greenhouse gases. **The discussion of solar variation in the article is, if anything, more prominent than in the scientific literature.** Raymond Arritt 22:11, 9 March 2007 (UTC)

Notable here is Arritt's reference particularly to "the scientific literature"; he invokes both a discursive sphere (science) and the genres that encode its knowledge-making practices (literature). His consistency claim is thus not simply about whether other experts agree; it is about the relationship between the assertion made in the *Wikipedia* article and the relevant discursive spheres and genres it seeks to take up. The rhetorical

work of genres inheres not simply in their achievement of purpose in recurrent contexts, but in their relationship to preceding genres or signs in semiotic chains (Freadman, 2002, pp. 42–43). The claim takes up the question of the "Global Warming" article's intertextual relationship to other genres and texts whose informational assertions are the origins and legitimation of the knowledge and informational work that the *Wikipedia* article seeks to enact.

After another user chimes in to support Arritt, and elaborates on his point by adding a provision to follow *Wikipedia*'s Undue Weight[12] policy, a third editor chimes in to challenge the article's assertions based on Walton's "trustworthiness" question – here making a general challenge to the trustworthiness of the IPCC based on the assertion that their funding sources lead to biased representations of information:

> (I1) Mostlyharmless you are talking rubbish. **That 2000 people who get their grants from peddling global warming fear all agree their is global warming is hardly surprising** - what is surprising is that Wikipedia isn't reporting the many who think the evidence does not support manmade warming. The Article is not only clearly biased - it is peddling extremist nonsense! Mike 00:28, 11 March 2007 (UTC)

This criticism of the trustworthiness of the IPCC ("2000 people who get their grants from peddling global warming fear") takes issue with the contexts of knowledge-making assumed to have shaped the IPCC's report creation. More specifically, this editor challenges the trustworthiness of the report's authors based on the idea that their research is driven not by the purely truth-driven imperatives assumed of science, but by funding designed to spur public fear. In essence, Mike takes issue with the knowledge-

[12] The "Undue Weight" policy directs editors not to give "undue weight" or disproportionate representation to viewpoints that represent a minority viewpoint in relation to more widely held viewpoints on a topic.

disseminating genre (the IPCC report) by "moving backward" to interrogate the context, motivations, and imperatives that shaped it, thereby drawing into question its legitimacy to function as a reliable informational genre. We saw similar argumentative moves in the boundary-work I documented in preceding sections: editors work to *block* the potential generic function of an antecedent genre by taking issue with the context, actors, and motivations that shaped it as a genre.

Similar to the work of the "trustworthiness" claims above were claims made in the same debate later in March. Like Walton's "field" question, these claims worked to distinguish "scientific" claims from those embedded in other genres:

> (J1) I just checked. What little scientific literature is cited is overwhelmingly on the mainstream/IPCC side. Most of the rest is **fluff, opinion pieces, unreviewed reports, popular press articles, and so on**. **It's attributable, but it's not scientific literature.--**Stephan Schulz 00:17, 20 March 2007 (UTC)

Again referring to "scientific literature" as the appropriate source of information, Schulz distinguishes it from less reliable genres not located in the appropriate discourse. Maintaining this generic distinction argumentatively helps to delegitimize and block the potential connection between those less-reliable sources and the "Global Warming" article.

Although these examples are drawn from arguments in March, similar arguments that elaborate or reiterate these points re-emerge throughout the year in arguments related to the representation of scientific consensus, or the words "few" in the article lead. For example, in April, a discussion titled "almost all of whom are not

climate scientists" occurred, focusing on the question of how to define a "climate scientist" that takes issue based on the "field" question:

> (K1) This statement appears to be original research, perhaps based upon a personal analysis. **Climate science is a multidisciplinary field, with physicists, chemists, geologists, oceanography, astronomy, biologists, etc, all publishing research in the area**. What definition of "climate scientist" is being used? --Africangenesis 14:36, 30 April 2007 (UTC)
>
> **(K2) People who regularly publish articles on climate science in the leading peer reviewed journals.** If you had thirty or more dissenting climate scientists instead of the two or three, you would have a steady stream of skeptical peer reviewed articles in journals like Science and Nature. The study by Oreskes rules this out. Count Iblis 14:47, 30 April 2007 (UTC)

This discussion, Africangenesis challenges the article text's representation of "climate science" as a unified field; Count Iblis asserts its existence (and the validity of the field question) is established by reference to "people who regularly publish articles on climate science in the leading peer reviewed journals". As with preceding examples, editors' reasoning about whether a particular source should be cited is grounded within arguments over the fields in which climate science occurs that are tied to the genres in which they circulate knowledge. By delineating "climate scientists" as only those "who regularly publish articles on climate science in the leading peer reviewed journals," Count Iblis creates a boundary based around the circulation of specific types of scientific genres limited to a certain range of publishing contexts ("leading peer reviewed journals"). Editors' deployment of the "field" question as they argue over whether to take up external genres draws not only on delineation of knowledge fields, but also on the genres in which particular types of knowledge circulate.

In Walton's framework, the "opinion" critical question draws attention to the actual assertion or proposition made by an expert. An example of the use of the "opinion" critical question to disarm or undermine occurred later in April:

> (L1) All attempts to get "a few" replaced with something more descriptive of the linked article have been shot down based on reference #4[6] (http://www.agu.org/fora/eos/pdfs/2006EO360008.pdf). I would suggest that this reference be removed from its current location, on the grounds that the source is being improperly referenced to begin with. **The source reads *"Few credible scientists now doubt that humans have influenced the documented rise in global temperatures since the Indestrial Revolution"*, which is being used to justify the word "few" in the line *"...and a few individual scientists also disagree with parts of [the IPCC's conclusions]."*** The only connection between the source and the quote from the article is the word "few"; the source does not *list any names,* as the placement of reference #4, at the end of the sentence, implies that it should. **The article should be altered so that reference #4 is either removed,** or placed directly after #'s 2 and 3 (where it is actually somewhat relevant, in that it confirms the AAPG's stance on AGW). This would allow for "a few" to be finally (and appropriately) edited to reflect the link in question (I would again suggest "several"). --64.222.222.25 10:08, 27 April 2007 (UTC)
>
> (L2) Your premise, **"*the source does not list any names, as the placement of reference #4, at the end of the sentence, implies that it should.*" is unsupported**, hence I cannot embrace your conclusion or recommended course of action. --Skyemoor 11:15, 27 April 2007 (UTC)

These "opinion" type assertions involve interpreting specific text segments to support proposals for article revisions ("The article should be altered so that reference #4 is either removed…"). They are assertions grounded in a reasoning that treats published texts as ultimate authorities, the *sine qua non* of epistemic proof in academic argument. In this case, the editors' discussion suggests that, in a context in which the generic status of an external text is *not* in question, its relationship to the uptake text (the *Wikipedia* article) can be challenged on the basis of the similarity between related utterances – that is, how well and accurately a stretch of text "takes up" the informational work of the antecedent genre by representing its assertions accurately. Composition instructors

can quickly recognize this concern as a question that comes up time and again as students write from sources: are their quotations inappropriately decontextualized from the argument? Do their paraphrases misrepresent the original text? These questions become relevant only if a student has appropriately selected an external source to begin with.

Reframing Walton's arguments from expert opinion as a framework for analyzing how Wikipedians reason about sources and genres demonstrates a key insight about "what counts as reasonable" for these Wikipedians. That is, it suggests that they engage in fairly sophisticated and complex arguments about knowledge-making as it relates not only to *expertise*, but to knowledge-making *practices, contexts, genres,* and *intergeneric or intertextual relationships*. These arguments appear to involve fairly sophisticated meta-awareness about sources and genres as a basis for reasoning about the authority and validity of information circulating through outside sources. This sophisticated reasoning and metadiscourse about genre both supports and suggests the public significance of composition scholarship that increasingly emphasizes the importance of "meta-awareness" of genre as a crucial aspect of composition and rhetorical pedagogy (e.g., Beaufort, 1999; Devitt, 2007; Nowacek, 2011; Reiff & Bawarshi, 2011; Wolfe, Olson, & Wilder, 2014). Indeed, these analyses suggest that an ability to reason about genre and argue for how it relates to knowledge may be an important aspect of participating in contemporary online deliberations.

Of course, such arguments may be most salient in similar collaborative writing contexts, in which multiple authors may disagree about whether external sources

should be incorporated in a new text. Further, this framework may be particularly salient in comparable contexts marked by temporal openness and multiple authorship; the fact that the article can be edited at any time, and that arguments over a particular stretch of texts may be re-raised repeatedly over time, may drive the development of more complex and elaborate efforts to construct and maintain the boundaries and inter-genre relationships that editors deem important to maintain in service of their rhetorical purpose. Alternately, this analysis also points to the myriad points of dissension that are possible in such open contexts when editors are arguing about taking up genres and enacting them: about purpose or the enactment of rules, about the epistemic contexts, practices, and values involved in the creation of external genres, about authorship and trustworthiness, about whether quotations or paraphrases appropriately "translate" the generic action of a preceding text by representing it appropriately in a new one. Documenting this range of argumentative strategies can help chronicle how controversy is perpetuated in contexts that involve arguments over intertextual relations in public discourse. In chapter 5, I suggest additional contexts in which these types of arguments may be relevant, and also elaborate on how this project's pedagogical implications might be further explored.

Thus far I have discussed extensively how Wikipedians reason around taking up external genres. In the following section, I address the question of stability that I raise in the opening of this chapter: given the openness of *Wikipedia* articles, how (if at all) do stable approaches to enacting genre emerge and become sedimented within articles over time?

Stabilizing Genre Uptakes: Long-Term Editors and the Article Ecosystem

While the examples above illustrate how editors repeatedly build boundaries around genres and knowledge-making practices as they argue over how and whether to take up external texts, the fact that these arguments reoccur despite the elaboration and argumentation present in them points to how unstable *Wikipedia*'s consensus process can be. The examples above are taken from disparate points throughout the year – April, May, November – and involve new editors re-raising similar issues that must be re-defended or negotiated throughout the discussions. 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. For example, below are two examples of discussions in which the Oregon Petition[13] is given as evidence to support the assertion that alternative viewpoints to AGW exist; both times the evidence is dismissed as an unreliable source, partially based on the idea that signatories are not climate scientists:

> **March 2007:**
>
> (M1) What I'd love to know is why this entry, as Rameses said, can be chopped and changed against Wikipedia's own policies and be supported by legions of Wikipedians. I'd also love to know why any attempt at marking this article as not having a NPOV results in many unqualified

[13] The Oregon Petition was originally published in 1998 by the Oregon Institute for Science and Medicine (OISM); it included over 17,000 signatures to a document that urged the U.S. government to reject the 1997 Kyoto agreement limiting greenhouse gas emissions, arguing there was a lack of evidence to support the view that human activities were leading to global warming. The petition has been criticized for being misleading, for being supported by funding from the fossil fuel industry, for misrepresenting documents as appearing to come from the National Academy of Science (NAS), and for including many signatories that have little to no background in academic climate science. Subsequent to the petition's release, the NAS released a statement disavowing any connection to the petition, and asserting that the document did not represent the NAS's views. The petition continues to circulate online and collect signatures; see www.petitionproject.org. (See Dietz, R. [2007, June 6]. On Fox's Special Report, Hume debunked Oregon Petition on Global Warming. *Media Matters for America.* Retrieved from http://mediamatters.org/research/2007/06/06/on-foxs-special-report-hume-cited-debunked-oreg/139024).

editors reversing the change regardless of the thousands of PhD decorated scientists that have signed **the pproject petition in support of the alternative viewpoint that cannot even be mentioned or hinted at in passing without having the change reversed.** Jamieplucinski 04:33, 12 March 2007 (UTC)

(M2) **The Oregon petition is a a well-known scam.** Read the linked article. It's also ancient history. And many of the "unqualified editors" here do have Ph.D.s or equivalent doctorates, and at least two are actively working and/or teaching in the field of climate science.--Stephan Schulz 07:38, 12 March 2007 (UTC)

June 2007:

(M3) I object to this formulation in the intro, first of all because it is intended to disparage skeptics, secondly because it is inaccurate -- **there are upwards of 17K signators on the Oregon Petition**, and thirdly because it is a violation of WP:AWT. --Don't lose that number 21:28, 9 June 2007 (UTC)
(M4) This particular word has been discussed to death, and ended up as consensus though personally I am not very fussed. **However you implying that the signators of the Oregon Petition are "scientists" though is beyond wrong and in the realm of deserving disparagement**. --BozMo talk 21:32, 9 June 2007 (UTC)

These two examples illustrate a potentially significant aspect of the consensus process: the role of editors who consistently reiterate common arguments and also remind others of established consensus. In turn 2 of the June example above, BozMo asserts that “this particular word has been discussed to death, and ended up as a consensus”; similarly, Stephan Schulz (who also appears in examples B and J above) refers to the Oregon Petition as “ancient history.” This argument from precedent (Walton, 2010) in both examples relies on the legitimation of historic decisions as determinate of current ones; insofar as neither editor elaborates on those decisions, they both also appear to rely on their own authority in referring to those past decisions.

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 C, above), a published climate scientist whose controversial role in the *Wikipedia* global warming-related articles gained him the attention of popular media (see Schiff, 2006; Bolt, 2009). In examples N1 and N3 below, 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 N2, 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.

(N1) *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, 30 April 2007 (UTC)

(N2*) 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, 9 April 2007 (UTC)

(N3) *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, 27 September 2007 (UTC)

Other long-term editors make similar moves and play similar roles; in example H2 above, BozMo asserts that "This particular word has been discussed to death, and ended up as consensus." Then, in the example below, BozMo argues against an editor

who asserts that the article is biased in favor of the pro-AGW view by asking the editor to review previous, related discussions:

> (O1) Please see Project Steve for comparison and then just consider that you may just be talking about a tiny incoherent minority to anyone who is reasonable numerate. **The NPOV discussion has been discussed at length. I suggest you start by reviewing.** --BozMo talk 20:57, 20 May 2007 (UTC)

Similarly, Raymond Arritt (who also appears in preceding examples B, C, E, and H) appears here in November to remind editors that the debate over the use of "few" and "many" in the lead will inevitably come up again in discussion, sounding a note of exhaustion about the topic:

> (P1) This could work. Per that source we could state the "overwhelming majority" agree, which carries the natural implication that there are others (an underwhelming minority?) who disagree. **But whatever we do, it will be challenged all over again in a couple of months.** Raymond Arritt (talk) 21:02, 19 November 2007 (UTC)

According to *Wikipedia*'s Page History tool,[14] which calculates a range of statistics including ranking 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); Bozmo is ranked at 23. These editors, who appear frequently throughout the talk page debates, function to remind discussants of previously established consensus and to repeatedly help re-constitute shared constructions of the appropriate boundaries of published sources; Connolley's brief assertion at N2 above, for example, reiterates that a source should be "reputable sci" even as he suggests that any "its-not-anthro" source likely doesn't exist, as no one has found such a source. These contributions appear to do

[14] See https://tools.wmflabs.org/xtools-articleinfo/

important work in ensuring that genre rules about bias or reliable sources – which edit-warrers may invoke to justify proposals to cite sources such as the Oregon Petition – 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 suggest they may hold stable internal schemas that can help provide a measure of consistency through an otherwise shifting set of authors and external context. In this, they are Giddens's (1984) "knowledgeable human agents" enacting structures in their practices as well as helping to orient others' conduct through arguments about genre rules.

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

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. That is, the boundary-work that editors do when they argue doesn't simply result in a decision to take up, or not take up, some external source. In some cases, their reasoning about genre also leads to delineating which genres or sources should be included in which articles. In 2007, in reoccurring discussions over whether the "Global Warming" article sufficiently represented opposing viewpoints, long-term editors repeatedly maintained that non-scientific sources relevant to the public controversy over global warming could be directed to

other pages. 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**
>
> (Q1) 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 (talk • cont.) 05:44, 6 April 2007 (UTC)
>
> (Q2) **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, 6 April 2007 (UTC)

During the ensuing discussion, which reiterated similar arguments outlined in examples I've discussed in preceding sections, long-term editor William Connolley reiterated at multiple points that the "Global Warming" article was "about the science," and that non-scientific viewpoints belonged in other articles (if at all):

> (Q3) **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, 6 April 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"):

(Q4) **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, 6 April 2007 (UTC)

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

(Q5) 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, 7 April 2007 (UTC)

In these examples, both Connolley and Galahad functionally block the uptake 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:

(Q6) **There is no reason this article neeeds to only be about science. It can also be political and societal aspects of the issue,.** This constant repetition of the idea that only a few users know what this article should be "about" is what is creating this negative atmosphere. So I feel this should be an open topic of discussion. --Sm8900 13:28, 6 April 2007 (UTC)

(Q7) **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, 7 April 2007 (UTC)

Much like the recurring arguments I document above, 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:

> (R1) **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:

> (R2) 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, 20 May 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:

> (S1): *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, 14 August 2007 (UTC)
>
> (S2): *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, 18 August 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 above, 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 non-scientific or opinion-based and thus can be diverted to other articles, such as "Global Warming Controversy."

Wikipedians' creation of boundaries around the *place* that certain external genres can and cannot go within the article ecosystem points to the constitutive role of *place* in shaping genre uptake and classification (Freadman, 1994). In "Anyone for Tennis?", Freadman uses the example of physical libraries to point out how genre classification systems are tied together with the separation of genres into physical spaces within libraries. Indeed, Wikipedians' uptake and boundary-work can be viewed as a component of the larger curational processes that Kennedy (2016) identifies as crucial elements of the composing and rhetorical work that open collaborations entail. My analysis points to the crucial role that long-term editors play when they repeatedly articulate and defend these boundaries, helping them become habitual (Bawarshi, 2006) and, over time, sedimented within the ecosystem of the site. In chapters 3 and 4, I elaborate on how these boundaries and pathways shape the individual articles' citational field as well as the larger architecture of related pages.

Public Reasoning About Sources in *Wikipedia*

On a surface level, the extensive debates over representing sources that I document in this chapter might be said to illustrate how Wikipedia's openness allows it to function like a microcosm of the Internet as it is most negatively construed in contemporary discourse: it creates an endless breeding ground for argument, a venue for those most agonistically inclined or ideologically charged to vent their views about any given topic. But my analysis demonstrates how the controversies that unfold here also create

opportunities for complex reasoning around inter-generic relationships – that is, between *Wikipedia* articles and the informational sources they seek to represent. Editors are at pains to keep up with the ongoing exigence for writing, updating, and revision that newly available sources create; their arguments over how to take up these sources represent a form of public reasoning not only about the boundaries of scientific knowledge-making, but about the contexts, practices, values, and actors that shape how external genres are written. Despite the temporal and authorial openness of the writing environment, the boundaries they build and the genre reasoning they engage in begin to become stable. This habituated argument response shapes both *whether* external sources are taken up – or "blocked" – and also *where* in *Wikipedia* certain types of sources belong.

By documenting and analyzing Wikipedians' reasoning *about sources and genres* in the context of writing about global warming knowledge, this chapter complements and expands on work interested in the dynamics of intertextuality and deliberation as they shape discourse around controversial issues in the networked public sphere. Scholarship in digital rhetoric has long been concerned with how digital technology enables and shapes novel relationships between texts, from Landow's (1992) early work on hypertext and Warnick's (2007) assertion that *intertextuality* is a key feature of online political rhetoric to Lessig's (2008) idea of *remix* as a core practice of hybrid digital culture. However, the role of argument in shaping how digital writers or online actors build relationships between texts is rarely considered. When argument is taken up, it is most often done as a component of the question of whether new media

environments enable the kind of broadly participatory rational-critical discourse that Habermas (1989) held involved the transformation of private interests into public issues (e.g., Barton, 2005; O'Sullivan, 2009). This is not to say no scholarship documents how writers *reason* about genre; myriad studies consider the often-solitary cognitive work writers do when they take up sources as they enact genres, drawing on or developing genre knowledge or mental schemas that provide a reasoning-through to shape a writing process.[15] The reasoning I document in this chapter is of a somewhat different vein: editors are reasoning about the relationship between knowledge-production practices, spheres of knowledge (i.e. science vs. non-science), and the genres and sources through which legitimate forms of knowledge can be said to circulate. As I document in detail in the next chapter, this reasoning shapes the way that they construct propositions about global warming — that is, the "facts" about it — within the texts of articles themselves. My adaptation of Walton's framework helps draw this phenomenon into view; like arguments from expert opinion, Wikipedians' argument from sources are directed toward the purpose of adjudicating the reliability and legitimacy of knowledge or propositions – particularly as this knowledge circulates in public texts.

Of course, analyses of explicit arguments about genre that I provide here may be most salient to documenting the reasoning that unfolds in comparable collaborative writing environments, when writers draw on argument to coordinate creating a

[15] Scholarship on how genre shapes academic and professional writing abounds; for a useful synthesis, see Bawarshi and Reiff (2010).

document. However, the prevalence of public reasoning about the legitimacy of texts and the value of knowledge from different genres is likely not limited to collaborative contexts; in chapter 5, I elaborate on how recent public controversies around texts — including the 2009 ClimateGate scandal, or recent accusations of the role of "fake news" in shaping the 2016 election — suggests that analyses of how we reason publicly about genres may have broader implications. Further developing this chapter's provisional framework for arguments about sources, considered not only as forms of *probabilistic* reasoning but as forms of *genre reasoning*, may contribute to efforts to account for "what counts as reasonable" in the mediated, intertextual publics of the digital era.

In addition to describing how arguments shape genre uptake and enactment in *Wikipedia*, my analysis also shows how long-term editors may shape boundaries of participation and agency in contributing to high-controversy *Wikipedia* articles. Through 2007, editors not only remind others of past decisions and argue(over and over again) to construct and protect the boundaries around what may be taken as valid science and what may not. Further, these editors also engage in what Kriplean et al. (2007) have called "power plays" – particularly those discourse moves that not only base responses on assertions about how science is constructed or what sources are valid, but attach those arguments to evaluative judgments of alternative viewpoints as ignorant or misinformed. This discursive analysis thus reinforces findings from Halfaker et al. (2011), who suggest that having edits reverted may decrease new editors' motivations to continue to contribute; likewise, the dismissals of editors' of suggestions as ignorant or

misinformed could create a hostile or intimidating work environment for aspiring contributors.

Further, the recurring presence of these editors in arguments throughout the year also points to how *time* may constrain participation in *Wikipedia*. "Anyone can edit" a page, or discuss revisions, but committing time and energy to reccurring debates all year (or through several) is likely limited to those with ample spare time. Perhaps anyone can edit or propose revisions, but not everyone can stick around to defend their position *ad nauseam*. But if, as I have argued, long-term editors shape and stabilize articles in the face of potentially high instability and fractiousness, then my analysis suggests that *commitment* may be a significant component of agency in comparable online communities. That is, it is not simply editors' ability to argue, write, or transform discursive resources that constitutes their impact on public texts, but whether they have the stamina and commitment to continue to do so repeatedly in the face of conflict.

Chapter 3

Opening the Facts: How Genre Uptake Shaped Global Warming Articles

> *The job of an encyclopaedia is to present the facts, not debate the issues. While it seems to me that human induced global warming is pretty much an open and such* [sic] *case, the fact is that there is debate over this issue*.
> —*Wikipedia* editor MarkAnthonyBoyle, September 2007

On February 21, 2017, the local Connecticut newspaper *The Register Citizen* ran an article by reporter Ben Lambert titled, "Torrington-Winsted Rotarians Take in Presentation on Global Warming" in its environmental science section. The article provided a brief synopsis of a presentation on global warming given to members of the local Rotary Club by Dr. James Barrante, "a former professor at Southern Connecticut State University." Barrante, as the article explained, had presented on historical temperature data showing periods of warming earlier in the Earth's history, supporting the argument that the current observed warming of the twenty-first century could therefore not be attributed to human causes such as increased fossil fuel emissions. Lambert quoted Barrante's assertion that, "The current consensus around the issue is driven primarily by the desire of scientists to obtain grants and other funding." Immediately following Lambert's synopsis of Barrante's presentation was an extensive quotation taken from the lead section of *Wikipedia*'s "Global Warming Controversy" article summarizing the nature of the topic as "an issue of widespread political debate."

Immediately following the *Wikipedia* quotation was a second quotation from NASA's website attributing global warming to anthropogenic causes. The article concluded with brief biographic details about Barrante and a throwaway quote from the Rotary Club president.

I draw on this example to reiterate two points relevant to this chapter: 1) that the way *Wikipedia* represents this issue shapes broader public discourse about it, and 2)that reporters who cover global warming face the daunting task of figuring out how to represent scientific information and "truth" about the issue (even in local newspapers). My first point is supported both by *Wikipedia*'s broad readership and by its use as a source of information by reporters themselves (see Messner & South, 2011). Between January 1 and June 30, 2017 alone, for example, the *Wikipedia* "Global Warming" article received over 1.3 million page views; in the same period, the "Global Warming Controversy" article received over 89,000 page views.[16] An analysis of how *Wikipedia* is taken up in mainstream news outlets found that between 2001 and 2007, instances of *Wikipedia* being used as an informational source increased in five national newspapers – the *New York Times,* for example, used *Wikipedia* as an information source 91 times in that period (Messner & South, 2011).

My second point has been well-documented by research into how global warming is and has been represented in media outlets (see chapter 1). As journalism professor Candis Callison argues in *How Climate Change Comes to Matter* (2014), "For

[16] Data extracted using *Wikipedia*'s "Pageviews Analysis" tool: https://tools.wmflabls.org/pageviews

journalists, climate change presents a conundrum both in terms of how its attendant facts are represented, stabilized, and mobilized (what 'the truth' is) *and* what and how implications and potential impacts should be considered (what 'the truth' means)" (p. 85). Research in communication studies has thoroughly documented how reporters' struggles with this conundrum — how to identify and represent "the truth" about this issue — has been shaped by the journalistic norms of objectivity and balance, with a tendency to over-represent the views of contrarian scientists in a way that suggests the level of certainty about global warming's existence and causes is lower in the scientific community than it actually is. Lambert's report of a local presentation on global warming illustrates this problem — on the one hand, a retired professor (of "physical chemistry," as Lambert notes) maintaining that global warming isn't anthropogenic (and therefore mitigating fossil fuel emissions is unnecessary). Lambert "balances" this presentation with *Wikipedia*'s representation of the issue as a political controversy, buttressing this with an alternate perspective taken from the NASA website. Readers of such an article — and the myriad similar articles that have circulated in mainstream press — are left with a collection of apparent authorities with conflicting stances on "the truth."

Given *Wikipedia*'s policies that articles must be written from a Neutral Point of View and be Verifiable (based on Reliable Sources), Wikipedians editing the global warming-related articles face a similar conundrum: how to identify, interpret, and represent "the truth" or "the facts" about this issue, given the myriad information sources that circulate in public about it. In chapter 2, I analyze how Wikipedians create

and maintain discursive boundaries around sources of information as they argue over how to enact the Reliable Sources policy during talk page arguments in the wake of the 2007 publication of IPCC AR4. As I note in the opening to chapter 2, 2007 was noteworthy in relation to global warming discourse for two key reasons: 1)the IPCC AR4, published in four parts starting in early February, articulated an unprecedently high level of certainty about global warming's existence and anthropogenic causes; and 2)media coverage of global warming as an issue hit an all-time high in that year. Data on the editing histories of the "Global Warming" and "Global Warming Controversy" articles indicate that the salience of global warming in public discourse that year correlated to an unusually high level of editing activity in both articles. The "Global Warming Controversy" article saw the highest number of edits in its history that year, receiving 2,698 edits.[17] The "Global Warming" article saw 4,949 edits that year, which was second only to the number of edits it received in 2006 (5,889), and more than twice the number of edits it received in the next-highest year (2005, which saw 2,141 edits).

What were the outcomes of all this editing activity on how global warming was represented in these articles? My analysis of Wikipedians' arguments about taking up sources demonstrated how they engaged in boundary-work that shaped the uptake of external sources — both "blocking" the uptake of some as well as shaping the location of others within the larger set of *Wikipedia* articles. The argument work that Wikipedians did through 2007 might lead us to expect that, for instance, the "facts"

[17] In comparison, the year with the next highest number of edits for the "Global Warming Controversy" article was 2006, when it saw 747 edits. Edit history data for both articles from *Wikipedia*'s Page History tool: https://xtools.wmflabs.org.

about global warming in the "Global Warming" article might become more settled, both because the IPCC report suggested that they were, and because editors appeared to be working to make the page more "about the science," which the IPCC is devoted to summarizing and reporting. At the same time, the high level of media attention to the issue and the high level of editing activity suggest that the articles were less stable in how they represented the issue in some way — perhaps relating to Wikipedians' struggles to coordinate how to enact the Verifiability policy in light of the swirl of discourse unfolding outside the site.

This chapter analyzes how the texts of these articles changed through 2007 as Wikipedians worked to enact the site genre rules during a year characterized by a high level of public controversy about the issue. I focus specifically on how the "referential intertextuality" (Devitt, 1991; see discussion below) of the "Global Warming" and "Global Warming Controversy" articles developed through the course of 2007, as Wikipedians negotiated how to take up circulating sources. In the first part of this chapter, I trace changes in the types of genres cited in these two articles through 2007; this analysis demonstrates how Wikipedians' efforts to construct discursive boundaries around sources translated into the two articles citing distinct epistemic lifeworlds. In tandem with my analysis in chapter 2, this analysis shows not only how openness shapes arguments about genre, but also how intertextual genre relationships change over time in open texts. In the second part of the chapter, I examine changes in how the scientific consensus about global warming was represented in important subsections of the two articles; this analysis demonstrates how the openness to editing and editors that

characterizes *Wikipedia* shaped the way Wikipedians represents facts about global warming's existence and causes. My analysis in this latter section draws on discourse analytic methods to point out how arguments *about genre* can be linked to sentence-level variations in reported speech as it appears within articles texts. These variations can draw article readers' attention not only to the social actors who produce instances of a genre, but the rhetorical contexts and social situations within and through which genres are created. This analytic approach contributes to understanding how controversies over uptake become manifested within open texts over time. Taken together, these analyses help account for how genre uptake in open texts is shaped by, and contributes to, public controversies and textual circulation in the public sphere.

Referential Intertextuality and the Genres Cited in *Wikipedia* Global Warming Articles

Within rhetorical genre studies, Bakhtin's work on speech genres (1986) and the concept of intertextuality (Kristeva, 1980; Allen, 2000) has shaped a wealth of scholarship interested in how intertextual relations shape power, authority, and knowledge-making. Scholars in Rhetorical Genre Studies, for example, maintain that intertextuality helps constitute relations of textual authority in professional contexts (Devitt, 1991; Bazerman, 1994). While we can analyze intertextuality in a range of ways, from its role in micro-level lexical relationships to how it shapes the "macro" relationships among genre systems, the most easily recognizable way that texts build relationships with prior texts may be practices of citation and explicit reference —what

Devitt (1991) refers to as "referential intertextuality." In academic work, disciplinary citation and references are key constitutive knowledge-making practices that manifest ideologies of textual authority and textual ownership (Connors 1998; Connors, 1999; Hyland, 1999). In scientific discourse, the representation of antecedent texts or scholarship both indexes communal memory and also functions to frame current issues, agendas, and community dynamics (Bazerman, 1994). Similarly, journalistic discourse relies on quotations, paraphrases, and references to external actors to communicate truth, objectivity, and textual authority (Van Dijk, 1988; Waugh, 1995).

Much like academic and journalistic discourse, *Wikipedia* articles rely on practices of citation and reference to achieve their communicative and authoritative function; the site's Verifiability policy demands that information in articles be taken from reliable sources that are cited within the articles themselves. *Wikipedia* does not mandate a single, uniform citation style (such as APA or MLA) but does require a two-part citation approach that includes both an inline citation (either as a parenthetical citation or a footnote) as well as a complete list of references. Editors are instructed to use a uniform style throughout an article, but the style varies across articles within the site as a whole. This "intertextual referentiality" is central to *Wikipedia*'s communicative function as a genre informing its audience about global warming knowledge. Thus, analyzing the references and citations within *Wikipedia* articles thus helps

account for the epistemic lifeworlds that articles draw on to position and validate the knowledge they include. It also helps account for how Wikipedians'

enactment of the Verifiability and Reliable Sources genre rule unfolds within specific articles over time.

To identify how Wikipedians enacted this genre rule in the “Global Warming” and “Global Warming Controversy" articles in 2007, I analyzed and coded each reference given in the Reference lists of both articles at one-month intervals throughout the year. Because I was interested in accounting for the trends in the types of sources cited, I developed coding categories to help account for the range of external genres and types of sources present in each text. I generated these codes through a two-step process; first, I performed open coding on the references for the first, second, and final month of each article. This initial open coding suggested the need for two broad categories (genre and authorship codes); I then used axial coding[18] to relate my initial code list to these two categories (Strauss & Corbin, 1998; see also Patton, 2002). I then coded the entire data set, which consisted of each reference in the Reference list as it stood on the last day of each month of the year; this round generated additional categories not identified in the initial coding rounds. After coding all references once, I re-checked all data to adjust and apply the final code list. The final code list is shown in Table 1.[19]

[18] “Open coding” and “axial coding” are two procedures for coding qualitative data that are based in a grounded theory approach to data analysis. “Open coding” refers to the initial process of identifying and labeling salient concepts in a data set; “axial coding” refers to a subsequent step in an analytic process whereby the subcategories of concepts identified through open coding are related to categories along an “axis” found to be relevant to distinguishing features in the data set (here, the difference between “authors” and “genres” as useful code categories).

[19] The Reference lists for both articles included multiple sources for which only links (or little to no identifying information) was provided. Any source that was not identifiable from a reference, and for which the external link was broken, was labeled “Unable to Identify.”

The results of this analysis document how editors' efforts to draw discursive boundaries around what types of sources could be cited in these two articles impacted the articles' citational fields. As I describe in chapter 2, long-term editors of the "Global Warming" article argued repeatedly that the article itself should be "about the science" of global warming, and that the article's information should therefore be drawn from the genres, sources, and authors legitimately grounded within science — namely, peer-reviewed articles and reports from legitimate scientific organizations (such as the IPCC AR4). These editors endeavored to divert all sources that represented *opinions* or were otherwise drawn from sources not legitimated within these boundaries to other articles, such as the "Global Warming Controversy" article.

Table 1: Types of Sources Cited in Global Warming Articles

Source Genre Codes	***Source Authorship Codes***
Annotated Bibliography	Academic
Blog or Blog Post	Independent Individuals
Book Review	International or National Government Body
Book, Book Chapter, or Book Excerpt	Non-Scientific Organization or Policy Institute
Broadcast Debate	Other News Outlet
Bulletin	Reporter/Mainstream Press
Commentary	Science News Bulletin/Aggregator
Court Ruling	Scientific Institute or Organization
Data Set	State Government
Documentary	Other
Email or Email Chain	
Essay	
Interview	
Journal Article	
Lecture	
Legislation	
Letter	
Letter to Journal	
Magazine Article	
Memo	
Online News article	
Op Ed	
Press Release	
Report	
Speech	
Statement	
Treaty	
Website	
White Paper	
Wikipedia Page (Internal Link)	
Other	

Over the course of 2007, the percent of citations to different spheres of discourse shifted significantly between the "Global Warming" article and the "Global Warming Controversy" article, with the former developing a higher percentage of sources grounded in the technical sphere of science, and the latter seeing a greater percentage of sources grounded in the public sphere. Figures 1 through 4 (below) show how the citational fields of the "Global Warming" and "Global Warming Controversy" articles shifted through the course of 2007; these figures show a marked divergence between the types of genres and authorships cited in the two articles. Figures 1 and 2, for example, show the relative percentages of each type of genre cited in the two articles as they developed throughout the year. In the "Global Warming" article (Figure 1), the types of genres cited shifted notably; for example, the percent of journal articles cited rose from 14% in January to 33% December and white papers from 0 to 8%. At the same time, the percent of news articles cited dropped from 23% in to 16% by December, and the percent of blogs dropped from 9% to 2% and websites from 9% to 2%. By December, the journal article citations in "Global Warming" were more than twice as prominent as those to news reports. Citations in the "Global Warming Controversy" article (Figure 2) saw an opposite shift; although the percentage of journal article citations also increased through the year (from 0% to 11%) and news article citations dropped slightly (from 21% to 18%), the percent of report citations dropped from 16% to 11% and blogs rose from 0% to 7%. By December, citations in the "Global Warming" article shifted from being dominated by news articles to being

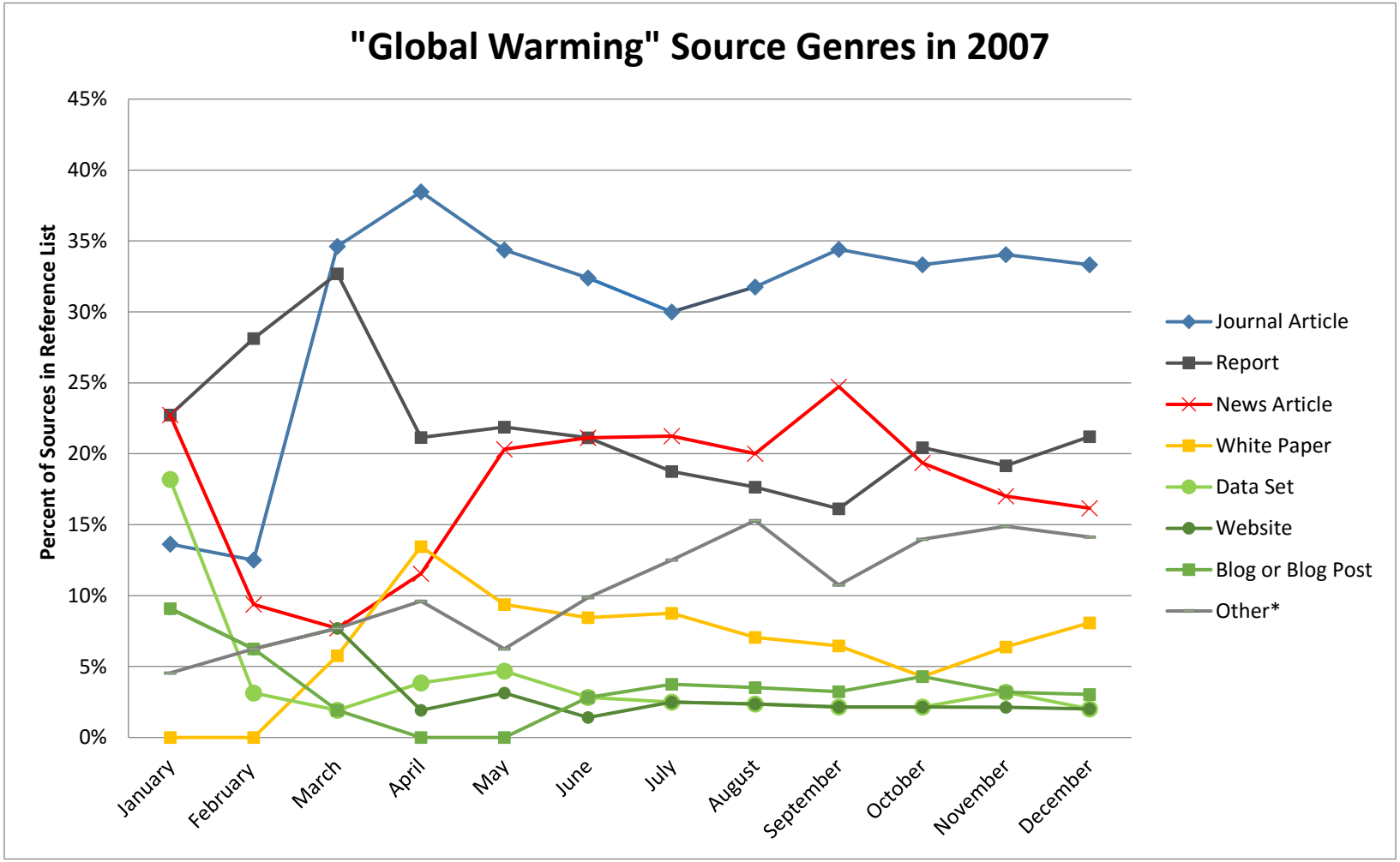


Figure 1. *The "Other" category is an aggregate category that includes all genres that occurred at least once in the data set but never represented greater than 5% of the total source in any given month. These include legislation; court rulings; book, book excerpts, or book chapters; magazine articles, bulletins, press releases, letters, and treaties.

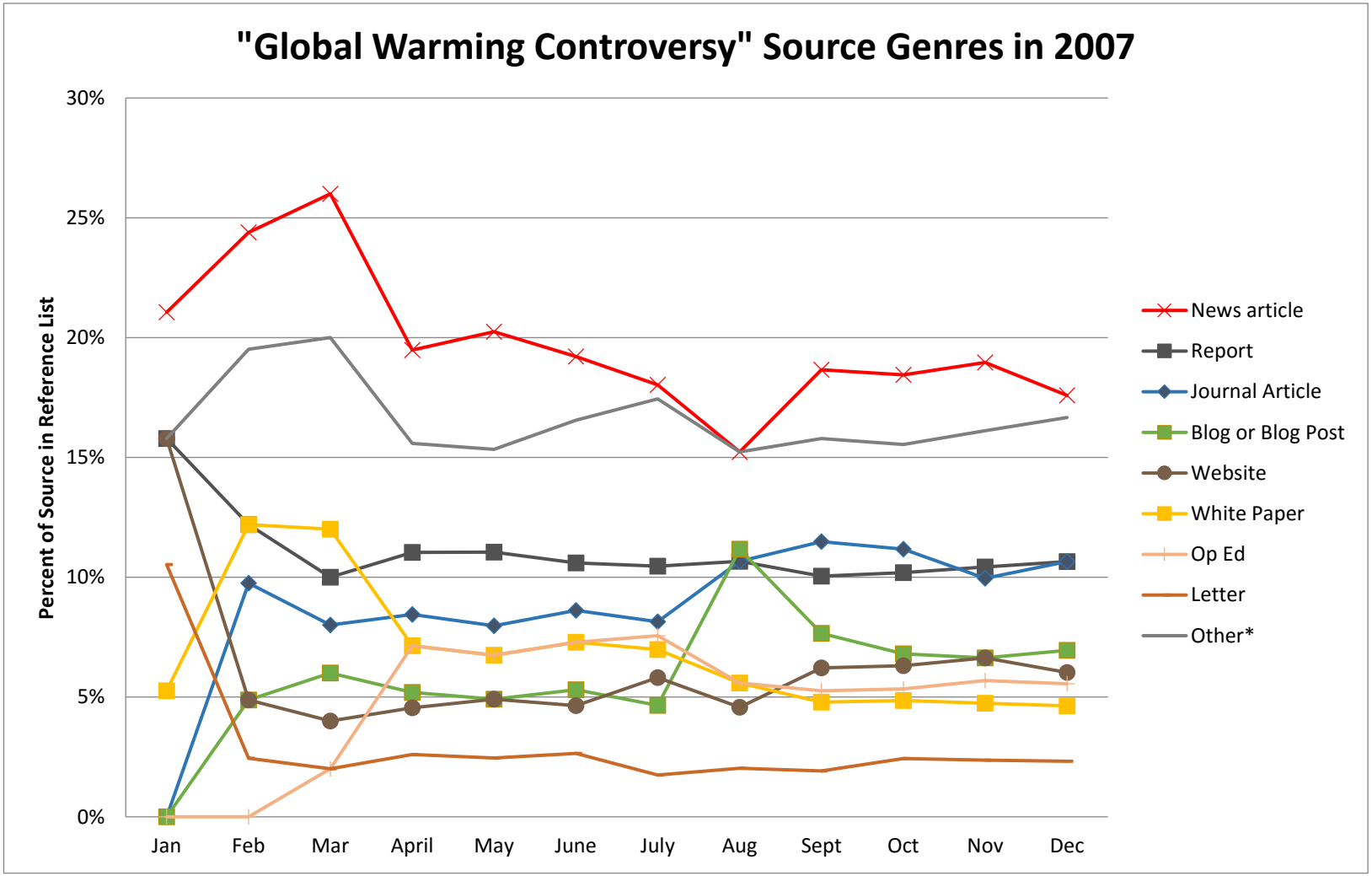


Figure 2. *The "Other" Category is an aggregate category that includes all genres that appeared at least once in the data set but never reached greater than 5% of the total sources listed in any given month. These include magazine articles; lectures; court rulings; book, book chapters, or book excerpts; bulletins, press releases, interviews, treaties, data sets, documentaries, annotated bibliographies, emails or email chains; statements, essays, speeches, broadcast debates, book reviews, memos, *Wikipedia* pages, and commentary.

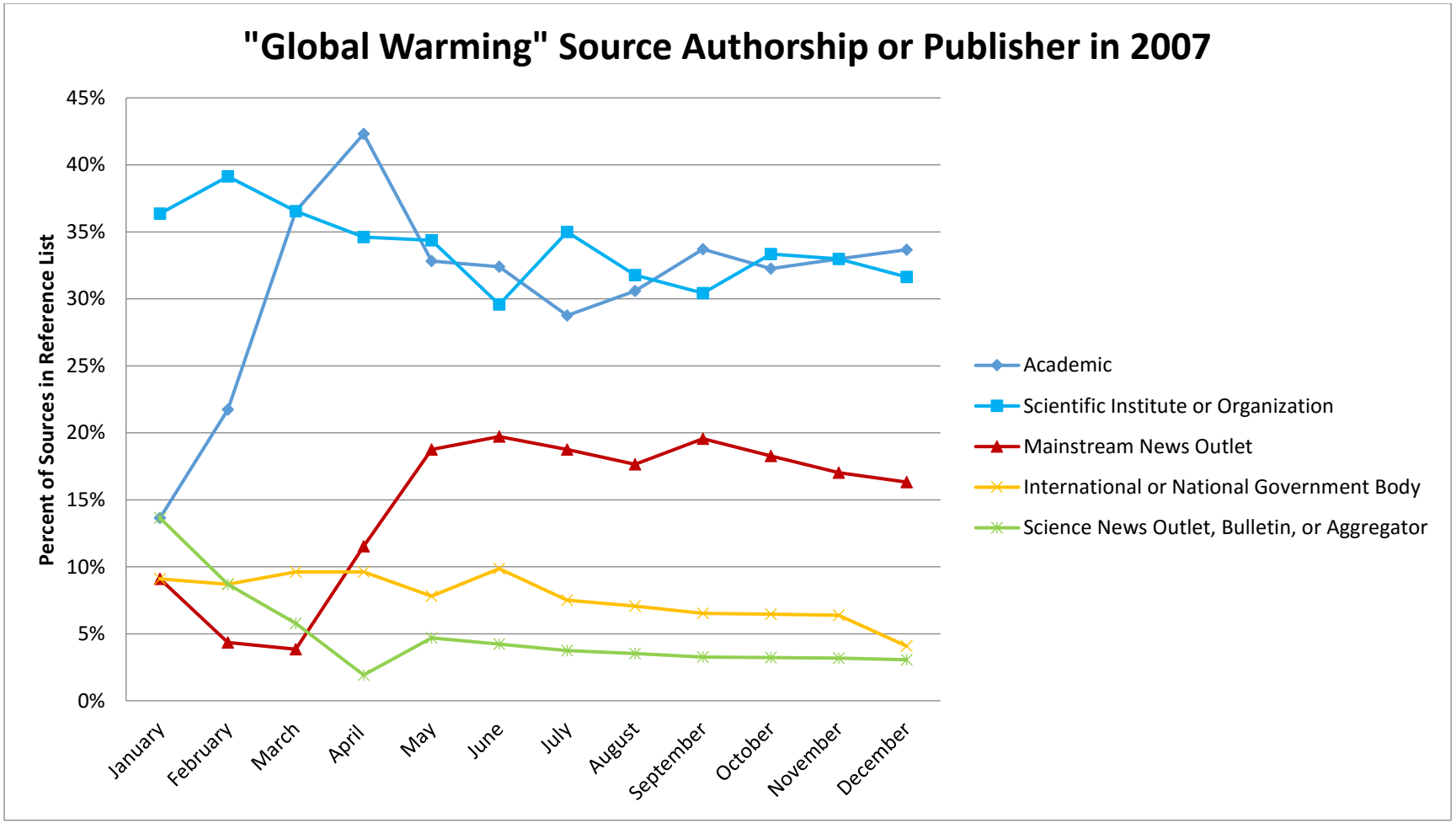

"Global Warming" Source Authorship or Publisher in 2007
Percent of Sources in Reference List
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
January
February
March
April
May
June
July
August
September
October
November
December
Academic
Scientific Institute or Organization
Mainstream News Outlet
International or National Government Body
Science News Outlet, Bulletin, or Aggregator

Figure 3

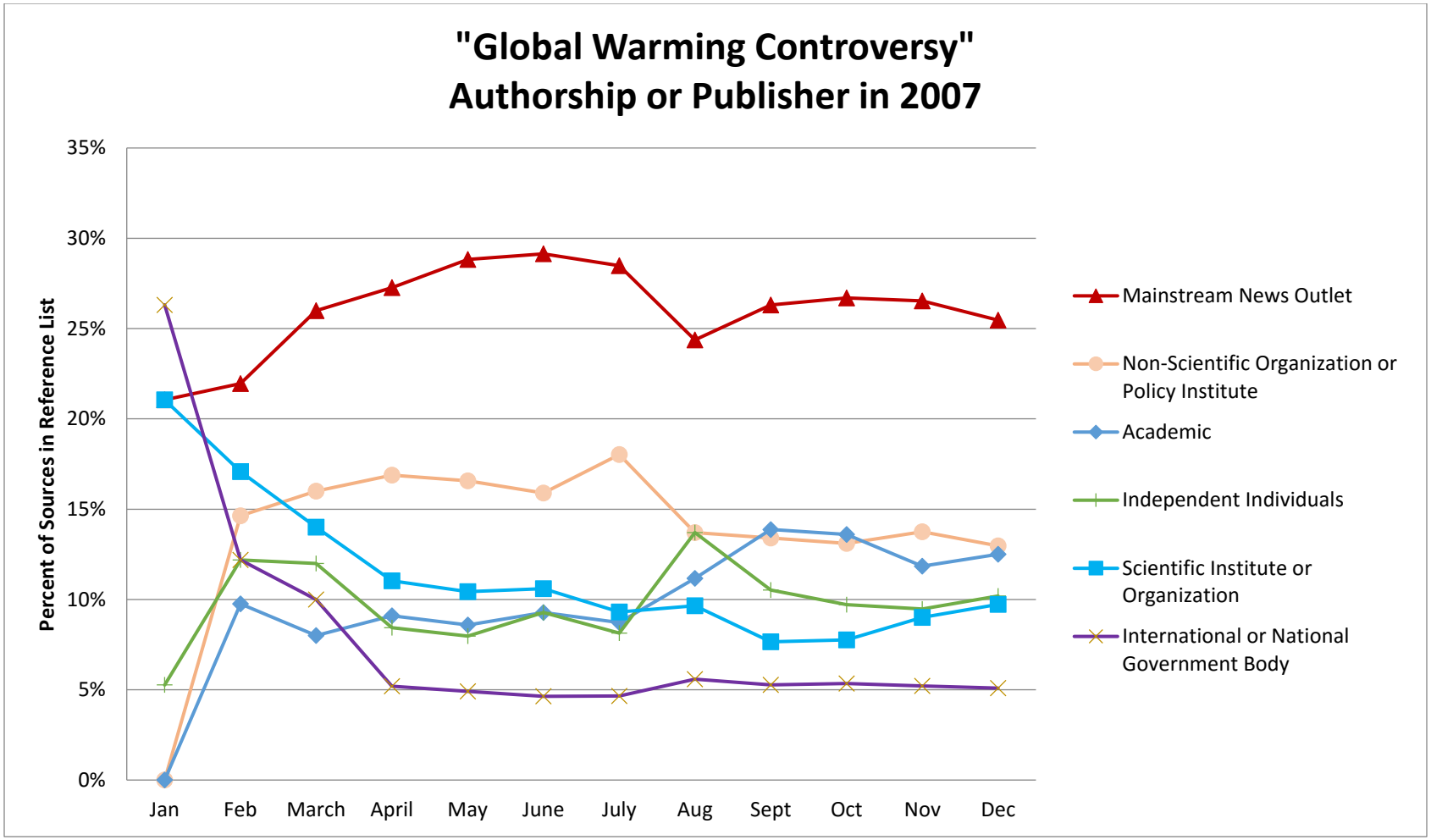

"Global Warming Controversy"
Authorship or Publisher in 2007
Percent of Sources in Reference List
35%
30%
25%
20%
15%
10%
5%
0%
Jan
Feb
March
April
May
June
July
Aug
Sept
Oct
Nov
Dec
Mainstream News Outlet
Non-Scientific Organization or Policy Institute
Academic
Independent Individuals
Scientific Institute or Organization
International or National Government Body

Figure 4

dominated by journal articles and reports (such as the IPCC report). “Global Warming Controversy” remained dominated by news articles throughout the year.

Figures 3 and 4 show changes in the five or six most prominent types of authors cited in each article, and their trendlines tell a similar story. In the “Global Warming” article (Figure 3), citations from academic authors more than doubled between January and December (from 14% to 34%), and, along with citations from Scientific Institutes or Organizations (such as the International Panel on Climate Change or National Science Foundation), were far more prominent than citations from mainstream news outlets, which stood at 16% by December. In “Global Warming Controversy” (Figure 4), the percent of mainstream news outlet citations increased from 21 to 25%, and citations from non-scientific organizations or policy institutes (such as the Heartland Institute) rose from 0% to 13% while citations from Scientific Institutes or Organizations dropped from 21% to 10%.

By the end of the year, the “Global Warming” article was dominated by citations from academics or from scientific institutes while “Global Warming Controversy” was dominated by citations from mainstream news outlets and non-scientific institutes. In short, through 2007, the two articles increasingly drew on two distinct epistemic spheres for sources of information: “Global Warming” drew on genres such as reports and journal articles from academic authors and scientific institutes such as the National Science Foundation — genres and authors more firmly grounded in what Goodnight (1982, 2012) might refer to as the technical sphere. It is a discursive arena in which arguments are grounded in specialized knowledge, scientific empirical knowledge-

making practices, and distinct disciplinary grounds for adjudicating the validity of statements.

"Global Warming Controversy," in contrast, increasingly drew on journalistic discourse and sources written by non-scientific organizations whose work aims to inflect public policy initiatives, such as the Heartland Institute — what Goodnight would identify as grounded more in the public sphere of argument, which allows more probabilistic reasoning practices in tandem with its future-oriented concern for action and policy. Divergence in the two articles' citational fields occurred in tandem with, and likely partially as an outcome of, editors' repeated deliberations on talk page arguments (see chapter 2), during which long-term editors repeatedly constructed discursive boundaries around the kinds of authors and genres that could validly be taken to represent knowledge about the issue. My analysis shows how these deliberations translated into observable difference in what got cited where in the two articles.

The shifts in the two articles' citational fields are significant not only for what they show about how *argument* connects to diverging *text content* in these two articles, but also because of what they suggest about how openness shapes open, collaborative articles *particularly* during times of public controversy. As I note in Chapter 2, media coverage of climate change hit an all-time high in 2007, and publicly circulating sources at the time included not only the IPCC AR4, but also oppositional texts such as *The Great Global Warming Swindle.* Such a flurry of controversy and media attention to the issue seemed to spur the community to incorporate these circulating texts. These changes are particularly notable in relation to the timing of the IPCC *Summary for Policymakers*,

which was released in early February of 2007. Figures 1 through 4 show a flurry of shifts in source percentages between the end of January and the subsequent two months, during and following the report's release. In "Global Warming," for example, the percentages of news reports dropped while citation to reports climbed; in "Global Warming Controversy," citations to *all* types of sources except reports, websites, and letters spiked before settling to more consistent levels later in the year. Further, Figure 5 (below) traces changes to how many different types of genres were cited in each article in 2007. It shows that the diversity of genres increased in *both* articles through the year. In "Global Warming," the number of different genres cited rose from 7 in January to 13 in December; in "Global Warming Controversy," the number of different genres more than tripled, from 8 in January to 25 in December. This increase in source diversity suggests that public attention to the issue, spurred partly by the new and alarming IPCC report, prompted both editing and development of the article and an effort to identify and incorporate a greater range of genre sources about the issue.

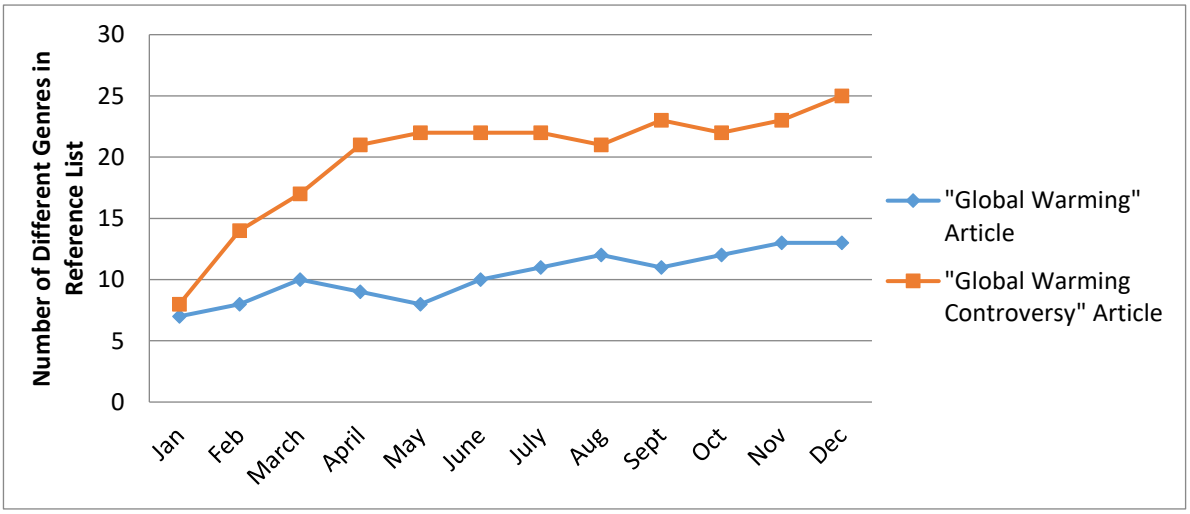


Figure 5

It is notable that, as Figure 5 shows, the number of different genres cited in "Global Warming Controversy" rose more than it did in "Global Warming." This difference also correlates to my earlier point: editors of the "Global Warming" article were more concerned with restricting the epistemic range of citable sources in an effort to makes it "about the science." "Controversy," in contrast, allows a greater range of diversity of sources.

These citational distinctions shed light on how genre uptake unfolds in open collaborations, particularly in terms of how editors' boundary-work translated into observable differences in the epistemic spheres of these two articles. *Wikipedia*'s editing policies encourage editors to draw information from reliable sources, ideally from "reliable, third-party published sources with a reputation for fact-checking and accuracy." While such provisions create an exigence for uptake, editors clearly interpret and enact these policies in divergent ways between articles, depending on their determinations of articles ideal scope and purpose. Over time, their efforts to construct boundaries around "what counts" as scientific knowledge appear to diverge and become sedimented in distinct ways between the articles. Indeed, scholars studying genre uptake maintain that over time, genre uptakes (the relations between genres that writers build) often become sedimented into what Dryer (2016) refers to as *uptake residues* — habitually enacted relations that develop their own life and sedimentary force shaping inter-generic relations. Bawarshi (2016), for example, documents how public responses to a report on the lobby for pro-Israeli foreign policy was taken up publicly as racist and anti-Semitic, despite the authors' having been at pains to avoid

communicating or re-instantiating racist stereotypes or anti-Semitic narratives. Bawarshi argues that the report's public reception was less an outcome of its content or an appropriate response to its purpose as a reporting genre than an outcome of historic responses to critiques of Israel as grounded in anti-Semitic views. "Uptakes have memories," he asserts, echoing Freadman's (2002) claim. "As much as genres shape our uptakes, our uptake memories and their residues shape our genre encounters, helping us to select from, define, and make sense of those encounters in ways that genre research has yet to fully acknowledge" (2016, p. 50).

In these *Wikipedia* articles, uptake of these external texts appear to sediment or become habitual in distinct ways that were related to editors' deliberate discursive efforts to argue for how outside sources should be taken up. While my analysis traces only one year in the life of these articles, the quantitative divergence in types of sources cited, and the fact that the "Global Warming" article saw less of an increase in different types of sources cited, suggests that editors' deliberations shaped diverging enactments that could become habitual —accepted and enacted *without argument* — over time.

While strong causal arguments are constrained within this data set, my analysis also suggests that the public controversy and media attention surrounding the IPCC AR4 publication also helped spur these diverging uptakes. The flurry of media sources and public attention may have spurned an impetus for more clearly delineating the epistemic lifeworlds of these articles – to make sure that "Global Warming" stayed within "the science" even while the site-external controversy fed into the "Controversy" article. In chapter 4, I elaborate on how the sedimentation of uptake in these two

articles connects with the larger information architecture of related articles over time. Before turning to this analysis, however, I return to the question of how openness shaped not only the uptake of texts, but how uptake related to how the "facts" about global warming were represented in these articles through 2007.

The "Facts" About Global Warming Consensus in *Wikipedia* Articles

As I note above, rhetorical scholars have long documented how intertextual relationships inflect the way facticity and knowledge are positioned within texts — often in vexed ways. While citation, for example, validates and authorizes assertions within academic texts, attributing statements to external sources at the same time increases texts' dialogicality, or the extent to which they engage alternate or prior utterances (Martin & White, 2005). For Latour and Woolgar (1979), this dialogicality is intertwined with the epistemic status of propositions. In their taxonomy of scientific statements, the extent to which a statement is represented as taken for granted within a text varies in relation to the extent to which dialogic alternatives are entertained via discursive elements such as hedges, modifiers, modality markers, citations, or attention to drawn to the context of a statement's production. In their ethnographic account of the process of fact-creation, the scientific process of knowledge creation involves the progressive "black boxing" of propositions, such that their facticity varies inversely with the extent to which attention is drawn to alternative or contrasting propositions, or the contexts of their production. Moves to authorize or validate statements through intertextual

reference, in other words, make those statements less "factual" (or taken for granted). Martin and White (2005) conceptualize the dynamics of how texts build relationships with alternate voices in terms of *dialogic expansion* (basically, letting in more voices) or dialogic contraction (reducing or restricting alternate voices):

> This distinction turns on the degree to which an utterance, by dint of one or more of these locutions, actively makes allowances for dialogically alternative positions and voices (dialogic expansion) or, alternatively, acts to challenge, fend off or restrict the scope of such (dialogic contraction). (p. 102)

Swartz (2009) has applied the concept of "black boxing" to catalogue how Wikipedians deploy a variety of "opening" and "closing" moves in the construction of facts in a *Wikipedia* article. As his analysis shows, Wikipedians at time engage in both types of "moves" – propositions may become more "factual" (or taken for granted) or more "at issue" as a page unfolds in relation to a particular controversial topic. Similarly, I draw on Latour and Woolgar's framework to analyze how what count as global warming "facts" shifted in these articles through 2007.

Outside voices (that is, those distinct from the authors') or alternate positions (or stances distinct from an authorial stance) are not only identifiable through citational moves or epistemic markers, however; they are also manifest in choices about how social actors are represented in texts (van Leeuwen, 1996). Choices such as whether social actors are represented as collectives ("scientists"), individuals ("Dr. Y"), or are represented as *objectivized* by referring only to their utterances (or what van Leeuwen calls "utterance automisation," as in "most studies suggest" or "the report indicates"),

are opportunities for *Wikipedia* editors to choose how relationships among actors in the external social worlds are represented. For instance, utterance automisation may "lend impersonal authority or force to an activity or quality of a social actor" (van Leeuwen, 1996, p. 20). In academic discourse, for instance, attributing claims or statements to "studies" rather than "researchers" foregrounds the authority of published scholarship over its creators' identities, and distances research from the human agents that conducted it. In relation to controversial political issues such as global warming, the choice of whether to refer to "the scientific community" vs. "most scientists" is a choice that might rhetorically facilitate (in the case of the former) a policy decision grounded in a scientific conclusion that is understood as "universal" vs. (in the case of the latter) the need for additional research on a topic prior to settling on a policy direction.

My analysis of how facts are represented in *Wikipedia* global warming articles focuses specifically on how the scientific consensus about global warming is represented in the lead section of the "Global Warming" and "Global Warming Controversy" articles. I focus on the lead sections as sites that provide summaries of the issue for article readers, and that in 2007, were often the focus of talk page debates through the year. I focus particularly on reported speech instances as well as the representation of social actors and epistemic modifiers to document how these articles represent the "facts" about global warming over time. Through analyses of these sentence-level variations, I show how uncertainty about global warming science crept into these articles, despite the fact that the 2007 IPCC AR4 had communicated an unprecedented level of certainty about global warming's existence and anthropogenic causes.

In the “Global Warming” article in 2007, the second paragraph of the lead section provided an overview of the concept of global warming, including a brief explanation of its causes (which are elaborated later in the article). Among the most controversial issues related to global warming is the question of whether it is caused by human actions such as the burning of fossil fuels (anthropogenic warming) or is attributable to natural phenomenon (such as variations in solar output and volcanic gases). The “facticity” of this issue, and the number of external voices that shaped how it was represented, shifted significantly in 2007. In January of 2007, the second paragraph of the lead (including its relevant citations) included only one instance of reported speech (shown in bold below), and only one reference to an outside source. The reported speech (in this case, a direct quotation) was attributed to “the prevailing opinion on climate change”; in van Leeuwen’s framework for social actors, this is an objectified agent (in this case, an autonomous utterance: “opinion”). The modifier “prevailing” emphasizes the opinion’s preeminent status. No alternative viewpoints regarding the cause of climate change are present in this paragraph; this early version thus suggests there is wide acceptance of the idea that global warming is caused by human activities.

Lead Excerpt / January 2007	**Corresponding Reference List Entry**
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 (CO2), which leads to warming of the surface and lower atmosphere by	1. "Climate Change 2001: Working Group I: The Scientific Basis, Part 7". Intergovernmental Panel on Climate Change. 2001. Retrieved 2007-01-18.

increasing the greenhouse effect. Greenhouse gases are released by activities such as the burning of fossil fuels, land clearing, and agriculture.

By February, however, the same paragraph has been revised to include additional voices:

Lead Excerpt / February 2007	**Corresponding Reference List Entries**
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.	1. "Climate Change 2007: The Physical Science Basis - Summary for Policymakers". Intergovernmental Panel on Climate Change. 2007. Retrieved 2007-02-02. 2. Jump up^ Fourth Assessment Report Summary for Policymakers, figure SPM-2

In the February excerpt, the 2001 IPCC quote that appeared in January is replaced by a quotation from the then-recently published 2007 Assessment Report. Unlike the earlier direct quotation, this new quote includes the hedge “very likely” regarding the attribution of climate change to human causes, which introduces doubt. Additionally, the text mentions “other phenomena” that have had “smaller but non-negligible” effects; this introduces the possibility that non-human factors have contributed to warming. Finally, the text now mentions “a small number of scientists” that disagree about the causes of warming. The quantifier “a small number,” paired with the quantifier of “smaller” regarding “other phenomenon,” diminishes the relevance and significance of these alternative viewpoints in comparison to the “prevailing opinion on

climate change." However, the reporting verb "disagrees" emphasizes the negative stance of this small number in relation to the established "opinion." Through these sentence-level revisions, controversy and uncertainty begin to creep further into the article's lead.

Comparable changes in the lead occurred as the year progressed. By the end of March, more external perspectives had been edited in:

Lead Excerpt, March 2007	**Corresponding Reference List Entries**
Global average air temperature near Earth's surface rose 0.74 ± 0.18 °Celsius (1.3 ± 0.32 °Fahrenheit) in the last century. **The Intergovernmental Panel on Climate Change (IPCC)** concludes **"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. Other phenomena such as solar variation and volcanoes have probably had a warming effect from pre-industrial times to 1950, but a cooling effect since 1950.[1] These conclusions have been endorsed by **at least 20 scientific societies and academies of science, including all of the national academies of science of the G8 states .**[2] **Some individual scientists disagree** with parts of this conclusion as does **the American Association of Petroleum Geologists.**[3]	1. "Climate Change 2007: The Physical Science Basis - Summary for Policymakers". Intergovernmental Panel on Climate Change. 2007. Retrieved 2007-02-02. 2. **Jump up^** [1] 3. **Jump up^** "Climate Change Policy" (cfm). American Association of Petroleum Geologists. Retrieved 2007-03-30.

While in January, the direct quote had been attributed to an autonomous utterance ("prevailing opinion"); in March, it had become a specific social collective — the International Panel on Climate Change (IPCC), author of the quoted report. This move to a named social actor as the source of the quote erases what was previously represented as a uniform "prevailing opinion" to the utterance of a single social body, which itself had (at the time) been subject to public critiques. This switch made the anthropogenic

nature of climate change seem less universally accepted. At the same time, that assertion is now bolstered by the statement "These conclusions have been endorsed by at least 20 scientific societies and academies of science, including all of the national academies of science of the G8 states." This aggregation of social actors ("20 scientific societies and academic of science, including all of the national academies of science") renders the "conclusions" that climate change is anthropogenic more widely shared (and therefore more credible) than the perspectives of "some individual scientists" and "the American Association of Petroleum Geologists," parties named as dissenters at the excerpt's end. Note, however, that the quantifier preceding social actors has changed; while previously referred to as "a small number," they are now "some." This is what Martin and White (2005) refer to as an "upscaling" in quantification that erases the relative size lexicalized by "a small number." By introducing a vaguer modifier ("some"), the assertion creates less specificity for the reader about how numerous these scientists are. At the same time, naming one of the dissenting actors (the "American Association of Petroleum Geologists") may simultaneously offset any beneficial effect this may have in suggesting support for the dissenting side by suggesting that those dissenters may be associated with the oil industry ("Petroleum Geologists").

It is notable that the number of social actors to whom stances are attributed here are both increasing as the article develops over time, and are also made more specific; "prevailing opinion" has become "The Intergovernmental Panel on Climate Change," and "20 scientific societies…," while the individual dissenting scientists are now joined by "the American Association of Petroleum Geologists." The entrance of this

last voice into the discursive scene is bolstered by the presence of an additional outside source cited, increasing the number of social actors and stances present in this section of the text overall. In terms of the rhetorical effect of these revisions (that is, what they suggest to the reader), it might seem that enumerating the large number of organizations that support anthropogenic global warming and lining these up against a comparable small number of scientists and organizations would help bolster the validity of the statement that global warming is anthropogenic. In Latourian terms, however, the effect here is somewhat paradoxical: specifying actors and including these citations draws attention to the context and authorship of the "facts" about global warming, thus rendering them less taken-for-granted — in essence, less "factual." In terms of genre uptake, this similarly draws greater attention to the specific rhetorical context of a fact's production by more deliberately and explicitly drawing those texts into the article itself.

Similar expansions in the presence of external voices in this section of the article lead occurred in the following months. By July, the number of "scientific societies and academies of science" endorsing anthropogenic climate change had increased from 20 to 30, several sources had been added which include direct quotes, and the representation of dissenting stances had been further modified:

Lead Excerpt, July 2007	**Corresponding Reference List Entries**
Global average air temperature near the Earth's surface rose 0.74 ± 0.18 °C (1.33 ± 0.32 °F) during the twentieth century. **The Intergovernmental Panel on Climate Change (IPCC)** concludes **"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**	1. "Summary for Policymakers" (PDF). *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Intergovernmental Panel on Climate Change. 2007-02-05. Retrieved 2007-02-02.

concentrations,"[1] which leads to warming of the surface and lower atmosphere by increasing the greenhouse effect. Natural phenomena such as solar variation combined with volcanoes have probably had a small warming effect from pre-industrial times to 1950, but a small cooling effect since 1950**.**[2][3]

These basic conclusions have been endorsed by at least **30 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries.The American Association of Petroleum Geologists** is the only scientific society that officially rejects these conclusions[4][5] (although it acknowledges that its skeptical viewpoint **"is not supported by a significant number of our members and prospective members")**[6]**.**

A few individual scientists disagree with some of the main conclusions of the IPCC**.**[7]

2. **Jump up^** Hegerl, Gabriele C.; *et al.* (2007-05-07). "Understanding and Attributing Climate Change" (PDF). *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Intergovernmental Panel on Climate Change. p. 690. Retrieved 2007-05-20. **"Recent estimates (Figure 9.9) indicate a relatively small combined effect of natural forcings on the global mean temperature evolution of the seconds half of the 20th century, with a small net cooling from the combined effects of solar and volcanic forcings"**
3. **Jump up^** Ammann, Caspar; *et al.* (2007-04-06). "Solar influence on climate during the past millennium: Results from ransient simulations with the NCAR Climate Simulation Model". *Proceedings of the National Academy of Sciences of the United States of America* **104**(10): 3713–3718. **"However, because of a lack of interactive ozone, the model cannot fully simulate features discussed in (44)."** [direct**] "While the NH temperatures of the high-scaled experiment are often colder than the lower bound from proxy data, the modeled decadal-scale NH surface temperature for the medium-scaled case falls within the uncertainty range of the available temperature reconstructions. The medium-scaled simulation also broadly reproduces the main features seen in the proxy records."** [direct] **"Without anthropogenic forcing, the 20th century warming is small. The simulations with only natural forcing components included yield an early 20th century peak warming of ≈0.2 °C (≈1950 AD), which is reduced to about half by the end of the century because of increased volcanism."**
4. **Jump up^** American Quaternary Association (2006-09-05). "Petroleum Geologists' Award to Novelist Crichton Is Inappropriate" (PDF).*Eos* **87** (3): 364. **"AAPG stands alone among scientific societies in its denial of human-induced effects on global warming."**
5. **Jump up^** "Climate Change Policy" (cfm). American Association of Petroleum Geologists. Retrieved 2007-03-30.
6. **Jump up^** American Association of Petroleum Geologists Explore magazine March 2007.
7. **Jump up^** American Quaternary Association (2006-09-05). "Petroleum Geologists' Award to Novelist

Crichton Is Inappropriate" (PDF).*Eos* **87** (3): 364. **"Few credible scientists now doubt that humans have influenced the documented rise in global temperatures since the Industrial Revolution."**

In the above excerpt, the American Association of Petroleum Geologists is represented not as simply one organization with a dissenting view, but as "the *only* scientific society that *officially* rejects these conclusions" [emphasis mine]; the modifier "only" highlights its stance as a lone wolf dissent among an increased number of confirming perspectives held by 30 collective organizations. Further, the modifier "officially" suggests dissensus among the AAPG's members; this dissensus is indicated by the reported speech now at the end of the sentence: "although it acknowledges that its skeptical viewpoint 'is not supported by a significant number of our members and prospective members'"). Further, what in March was "some" individual dissenting scientists is now "a few," a quantifier which diminishes the range of social actors articulated as taking this stance. In relation to the social actors represented on the page, what in January had been a discursive field of voices dominated by a prevailing opinion is, in July, one peopled with multiple organizations taking stances, some of which are internally fractured by dissenting individual viewpoints.

This revised version also includes multiple lengthy direct quotes. The direct quotation from a more specific section of IPCC AR4 (in footnote 2) provides textual evidence to support the assertion that solar variation and volcanoes have had a *cooling effect* since 1950. This statement is also bolstered with an additional scientific source

and several lengthy direct quotes in the footnote ("However…"). The technical register of this quotation is notable ("While the NH temperatures of the high-scaled experiment are often colder than the lower bound from proxy data…"); although it is relegated to a footnote, this quotation increases the presence of scientific discourse within the article text and requires a familiarity with technical scientific terms to interpret. These quotations also make external genres and texts more present in the article, further outsourcing the article's authority.

However, the expansion of the number of social actors and external discourse in this section did not expand indefinitely in the course of 2007. By November, the number of social actors, cited sources, and direct quotes had contracted (though not returned to the state of the page in January):

Lead Excerpt, November 2007

The global average air temperature near the Earth's surface rose 0.74 ± 0.18 °C (1.33 ± 0.32 °F) during the last 100 years. **The Intergovernmental Panel on Climate Change (IPCC)** concludes "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]** via the greenhouse effect. Natural phenomena such as solar variation combined with volcanoes probably had a small warming effect from pre-industrial times to 1950 and a small cooling effect from 1950 onward.**[2][3]**These basic conclusions have been endorsed by **at least 30 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. While individual scientists** have voiced disagreement with some of the main conclusions of the IPCC**, the overwhelming majority of**

Corresponding Reference List Entries

1. "Summary for Policymakers" (PDF). *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Intergovernmental Panel on Climate Change. 2007-02-05. Retrieved 2007-02-02.

2.Jump up^ Hegerl, Gabriele C.; *et al.* (2007-05-07). "Understanding and Attributing Climate Change" (PDF). *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Intergovernmental Panel on Climate Change. p. 690. Retrieved 2007-05-20. **"Recent estimates (Figure 9.9) indicate a relatively small combined effect of natural forcings on the global mean temperature evolution of the seconds half of the 20th century, with a small net cooling from the combined effects of solar and volcanic forcings"**

scientists working on climate change are in agreement with them.[4]

3. **Jump up^** Ammann, Caspar; *et al.* (2007-04-06). "Solar influence on climate during the past millennium: Results from ransient simulations with the NCAR Climate Simulation Model" (PDF). *Proceedings of the National Academy of Sciences of the United States of America* **104**(10): 3713–3718. **"However, because of a lack of interactive ozone, the model cannot fully simulate features discussed in (44)." "While the NH temperatures of the high-scaled experiment are often colder than the lower bound from proxy data, the modeled decadal-scale NH surface temperature for the medium-scaled case falls within the uncertainty range of the available temperature reconstructions. The medium-scaled simulation alsno broadly reproduces the main features seen in the proxy records." "Without anthropogenic forcing, the 20th century warming is small. The simulations with only natural forcing components included yield an early 20th century peak warming of ≈0.2 °C (≈1950 AD), which is reduced to about half by the end of the century because of increased volcanism."**
4. **Jump up^** "A guide to facts and fictions about climate change". Royal Society. March 2005. Retrieved 2007-11-18. **"However, the overwhelming majority of scientists who work on climate change agree on the main points."**

Perhaps most notable at this point in time is the deletion (or, as van Leeuwen would have it, suppression) of the reference to the American Association of Petroleum Geologists, both within the body of the text and also in the cited references. Additionally, the representation of voices that dissent from the conclusions of the IPCC has been changed to "individual scientists," who "have voiced disagreement" with those conclusions; the use of the present perfect in the reporting verb "have voiced" (rather than the present form, such as "disagree" in past instantiations) suggests that the individuals' disagreement may be temporally bounded (that is, that those scientists may

no longer adhere to dissenting views they had expressed in the past). Further, while previously the dissenting voices had been "the last word" in the paragraph, the section now ends by affirming the stance of "the overwhelming majority of scientists" as being in concert with that of the IPCC. In van Leeuwen's framework, the collective voices of an unnumbered amount of "individual scientists" is effectively overridden by the assertions of what is now represented as an "overwhelming majority" within the scientific community. The existence of this posited majority is supported by a new citation and a direct quote from the Royal Society, given in footnote four. But the additional sources given in support of the "majority" view remain, including several direct quotations.

Like the lead section of the "Global Warming" article, the lead section of the "Global Warming Controversy" article changed how it represented certainty about global warming, although it did so in notably distinct ways. (See next page for three excerpts from the lead showing changes through the year.) At the end of January, prior to IPCC AR4's publication, the lead section of "Global Warming Controversy" was four paragraphs long, the first two of which are shown on the left in the table below. In the January version, the lead emphasizes distinctions between *scientific* assertions about climate change and assertions made by non-scientists. "There is a strong consensus among climate scientists" that global warming is anthropogenic; "a few scientists disagree." These phrases echo the lead of the "Global Warming" article, presenting a field of voices dominated by the scientific consensus represented by the IPCC. This version pointedly mentions that this consensus is disputed "outside the scientific

Excerpts from "Global Warming Controversy" lead in 2007

At the end of January

The **global warming controversy** is a debate about the existence and causes of 20th and 21st century global warming, and what steps, if any, society should take in response.

There is a strong consensus among climate scientists that warming observed over the past 50 years was caused primarily by anthropogenic emissions of greenhouse gases, that warming will continue if emissions continue, and that consequences become increasingly serious as the amount of warming increases. **A few scientists disagree,** most commonly asserting that although warming is occurring its cause is either natural or unknown**. Outside the scientific community the consensus is disputed by some corporations, advocacy groups, politicians, and individuals (see global warming skeptics). However, among the governments of developed countries, there is little debate about attribution of global warming to human activities;** as of December 2006, 166 states have signed and ratified the Kyoto Protocol to the United Nations Framework Convention on Climate Change, whose stated aim is combating global warming. The United States and Australia have not ratified this Convention.

At the end of February

The **global warming controversy** is a debate about the causes of observed global warming since the mid-20th century, as well as the expected magnitude and consequences of future warming. A major part of the debate centers around what actions, if any, society should take in response to the prospect of future warming.

At the end of September

The **global warming controversy** is a dispute regarding the nature and consequences of global warming. **The disputed issues include** the causes of increased global average air temperature, especially since the mid-20th century; whether the increase is real or partially an artifact of poor measurements; whether this warming trend is unprecedented or within normal climatic variations; theories of climate sensitivity; predictions of additional warming; what the consequences are; and what action should be taken. **Individuals, corporations, and political organizations are involved**, **so the debate is vigorous in the popular media and on a policy level.**

community," drawing a clear science *vs.* non-science distinction. The *scientific* facts about global warming here are widely accepted.

By the end of February, however, the lead had been shortened to a single paragraph (shown in the middle column), and mentions of *science* are nowhere to be found. In fact, the lead mentions no specific stance-holding actors at all: it refers only to *controversy* and *debate* and defines the nature of them. Referring to only the discursive field is another instance of what van Leeuwen would refer to as "utterance autonomisation," which divorces utterances from the actors and contexts that created them. The use of these nouns represents the issue as a discursive field entirely marked by dissensus, in stark contrast to the consensus mentioned in the same lead in January. Fact-wise, the lead has moved from provisional consensus about global warming science to mentioning no shared perspectives among any part. This move, in essence, makes the lead more "about controversy" and less "about science," or the issue as it is taken up in science specifically, further solidifying the editors' boundary-work within the text of articles themselves.

As with the "Global Warming" article, revisions to the lead continued roughly until September (see far right column above); in the months after this, the only revisions were minor tweaks in wording. Like the January version, the September version mentions specific points of debate within the controversy ("the causes of increased global average air temperature"; "whether the increase is real"; "whether this warming trend is unprecedented," etc.). Elaborating these points of debate suggests that key questions that IPCC AR4 suggested were largely settled (such as that global warming *does exist* and *is caused by human activity*) are, in fact, still under debate. Unlike in January, however, the September version (as in February) makes no mention of *science*

in referring to these debated issues. Rather, the end of the lead paragraph asserts that "Individuals, corporations, and political organizations are involved, so the debate is vigorous in the popular media and on a policy level." By naming these specific debate participants and *not science*, the text effectively shifts the grounds of the controversy entirely to the realm of media and public policy and erases science as a participant altogether. In doing so, the lead of "Global Warming Controversy" manifests the same science/not science distinction that long-term editors had worked to maintain between the "Global Warming" article and the "Global Warming Controversy" article in their talk page arguments. All the most significant issues are under debate, just not *in science.* By the end of the year, readers skimming the lead of this article learn the issue is widely debated but get no *scientific facts* (taken-for-granted or no) at all.

Controversy within Texts: Reframing Genres to Question the Facts

My preceding discussion explains how *Wikipedia*'s openness shaped the "facts" about the scientific consensus. Not only did the facts become less certain, but the lead texts of both articles diverged to draw on distinct epistemic lifeworlds; in "Global Warming," scientific facts were represented though more *at issue.* Outside sources drawn more from the sphere of public discourse and policy were diverted into "Global Warming Controversy." In chapter 4, I elaborate on how these distinct lifeworlds were manifested not only in the *Wikipedia* article text, but in the interrelationship between articles in the larger system.

However, edits made to these pages are noteworthy not only for what they tell us about how genre rule enactment shapes the way facts are represented over time in these texts, but for what they suggest about how the dynamics of genre uptake unfold *within article texts* that are themselves sites of controversy. Latour and Woolgar's analysis of how scientific facts are manifested within published scientific texts and how they become "black-boxed" emphasizes that drawing attention to "an author's subjectivity as essentially linked to the production of a statement could be used to diminish" its factual status (p. 84). That is, in addition to drawing in epistemic markers of doubt and alternate positions, moves that point to the context in which a statement is produced inflect how taken-for-granted that statement is within a text. Without naming it explicitly, Latour and Woolgar's observation suggests that drawing attention to the context *of genre production* specifically also inflects the taken-for-grantedness of a statement. Indeed, Bawarshi (2003) defines genres as "discursive sites that coordinate the acquisition and production of motives by maintaining specific relations between scene, act, agent, agency, and purpose" (p. 17). If Latour and Woolgar's "author's subjectivity" can be correlated to Bawarshi's *agent, agency, and purpose* and their "production of a statement" to Bawarshi's *scene, act*, then modulations of a statement's facticity via reference to them can be viewed as reference particularly to *genre.* Indeed, we would expect that arguing *about genre* (which I discuss in chapter 2) might lead not only to references about contexts of *knowledge production*, which Latour documents in

relation to the production of scientific knowledge, but also to references to the contexts of *genre production* within the article text itself.[20]

In the *Wikipedia* articles I analyzed, this phenomena is perhaps most evident in a subsection from the "Global Warming Controversy" article. The subsection titled "Existence of a Consensus" specifically tackled the question of whether a scientific consensus existed about global warming's existence and causes. The excerpts below show parts this subsection in three snapshots, from January, June, and December of 2007. These excerpts demonstrate how controversy shapes the way relationships between genres become present within texts.

On the left, the excerpt as it stood in January refers to an essay published in the journal *Science* which represented a survey of literature on climate change; this survey (as indicated in this section) bolsters the assertion that a majority of climate science research indicates that global warming is anthropogenic (that is, that a "consensus" among scientists can be said to exist regarding issue).

[20] In chapter 2, I draw on a sociocognitive theory on genre (Berkencotter & Huckin, 1995) in the context of discussing how arguments about genre play a role in the way that Wikipedians adjudicate the "reliability" of sources – and thus, of the knowledge or propositions in them. From this same sociocognitive perspective, references to the practices, methodologies, and contexts of knowledge production are also ways of talking about the work of genre production in professional contexts.

"Existence of a Consensus" Section Excerpt / January 2007

A 2004 essay in the journal Science [16] reported a survey of abstracts of peer-reviewed, research articles related to global, climate change in the ISI database.

Of the 900+ such abstracts found, none contradicted **the view of the major scientific organizations that "the evidence for human modification of climate is compelling."**

June 2007

A 2004 essay by Naomi Oreskes in the journal Science reported a survey of abstracts of peer-reviewed papers related to global climate change in the ISI database.[21]. Oreskes said:

"Some corporations whose revenues might be adversely affected by controls on carbon dioxide emissions have also alleged major uncertainties in the science. Such statements suggest that there might be substantive disagreement in the scientific community about the reality of anthropogenic climate change. This is not the case. The scientific consensus is clearly expressed in the reports of the Intergovernmental Panel on Climate Change (IPCC)."

Oreskes stated that of the 928 abstracts analyzed, "Remarkably, none of the papers disagreed with the consensus position".

(9)Benny Peiser **claimed to have found flaws in her work**, writing

"Oreskes, **a professor of history**, claims to have analyzed 928 abstracts on global climate change, of which 75% either explicitly or implicitly accept the view that most of the recent warming trend is man-made. When I checked the same set of abstracts [plus an additional two hundred found in the same ISI data bank], I discovered that just over a dozen explicitly endorse the "consensus," while

December 2007

A 2004 essay by Naomi Oreskes in the journal Science reported a survey of 928 abstracts of peer-reviewed papers related to global climate change in the ISI database.[21]

Oreskes stated that "Remarkably, none of the papers disagreed with the consensus position. ... This analysis shows that scientists publishing in the peer-reviewed literature agree with IPCC, the National Academy of Sciences, and the public statements of their professional societies."

Benny Peiser claimed to have found flaws in Oreskes' work,[22] but his attempted refutation is disputed.[23][24][25]

Peiser later withdrew parts of his criticism, also commenting that "the overwhelming majority of climatologists is agreed that the current warming period is mostly due to human impact. However, this majority consensus is far from unanimous."[24]

> the vast majority of abstracts does not mention anthropogenic global warming."[22]
>
> (10) In order to include only "hard science" papers rather than opinion pieces or editorials, Oreskes excluded the Social Sciences Citation Index and the Arts & Humanities Citation Index and set the search to include only Articles, while Peiser searched for all document types in all indices,[23][24]
>
> (11) and the interpretation of the remaining parts of his attempted refutation is further disputed.[25]
>
> (12)In **a later op-ed piece in Canada's National Post**, Peiser makes no further reference to his review [26].
>
> (13) Peiser also stated:
> ...the overwhelming majority of climatologists is agreed that the current warming period is mostly due to human impact. However, this majority consensus is far from unanimous.[24]

Note particularly that the frame here refers to an *essay* and notes its context of production (2004; journal *Science*).

In van Leeuwen's framework, this reference to an essay is an "utterance autonomization" with the journal name only, which suggests that the authority of the source speaks for itself. In this frame, referring to the genre and epistemic sphere of the source (though not its author) works to legitimate the source, based on the assumption that the genre and its contexts are sufficiently authoritative in themselves.

By July, however, this section had been revised in several ways that draw attention to the context of production for the essay as well as its other components as an authorizing genre. First, the essay's author (Naomi Oreskes) is now named specifically, which re-focuses the authorship from the general authority attributed to the well-known journal *Science* to an isolated individual, who (elsewhere in the section), is identified as *a history professor*, which suggests her authority on the topic is questionable. (We question whether she is authorized to create the valid genres of *scientific* knowledge.) In addition, the *Wikipedia* editors have added an extensive quotation from Oreskes's article, one that emphasizes that "the scientific consensus is clearly expressed in the reports of the Intergovernmental Panel on Climate Change (IPCC)." This direction quotation transforms the previously summarized argument into the present by embedding it in the new text. This move facilitates a closer, more direct movement of the generic action (an assertion) from the prior text to the new one by incorporating it directly rather than summarizing it. While such a move validates the prior text, it also points to the way editors' summary of that text (which appeared in January) had become *at issue* within the article itself. That is, it suggests that textual evidence from the original text is required in order to bolster the validity of the text's propositions — the summary of that prior text can't stand for itself.

Most notable about the July version, however, is that it now includes a lengthy quotation from Benny Peisner that elaborates on the shortcomings of Oreskes's study by interrogating the *scene* and *act* of her research. He "claims to have found flaws," elaborating on how he re-did the research and derived different results; we are even

privy to a short narrative of his discovery ("When I checked the same set of abstracts, […] I discovered"). Far from a sentence that summarizes research about the scientific consensus (as in January), the July version provides a competing narrative that throws into question the *scene* and *act* (and possibly *motives*) that gave rise to Oreskes's original essay. Following Peisner's narrative is a clarification that gives the reason for the differences in their findings (Oreskes limited her corpus to science while Peisner did not.) Following is a statement delegimitating *Peisner's work* ("the interpretation of the remaining parts of his attempted refutation is further disputed") and also a contrasting quote from Peisner, made later, in which he asserts that "the overwhelming majority of climatologists is agreed that the current warming period is mostly due to human impact." This quotation is framed as an op-ed from Canada's *National Post*. This revised version includes multiple named *agents* (Oreskes, Peisner); direct quotations from those authors' texts, and details about the *scenes* and *acts* that shaped the production of those texts — including a historicizing of shifts in Peisner's public assertions about the consensus. More detail about the contexts that shaped the production of the cited genres flow into the text, rendering the strength of its propositions more at issue.

The December excerpt demonstrates the move in the opposite directions – facts becoming more "boxed" as details that elaborate how texts were produced are elided. In this version, the larger quotation from Peisner critiquing Oreskes has been edited out, with only a citation to his critique remaining: "Benny Peisner claimed to have found flaws in Oreskes' work [22], but his attempted refutation is disputed [23] [24] [25]." The specific external texts are no longer present, making their generic and rhetorical force in

the new text less immediate. Details about the two studies are available only if one checks the footnotes.

While this is only a single example, it suggests the value of a genre lens for identifying how sources' authority is represented in texts, particularly in texts that choreograph outside sources and in doing so, communicate controversy over an issue. This *Wikipedia* articles is one example of such a text; news reports (such as those I refer to in the introduction) may be another. In this instance, references to the relationships between the source's author and her background (Oreskes, the history professor) and the "scene" through which she produced the original genre (the essay) introduce doubt about Oreskes's original findings — and by extension, about the existence of a scientific consensus about global warming. In eliminating or eliding these references to how Oreskes produced her essay in the December version, the December version seems to relegate Peisner's perspective to a minor position, and to re-legitimate the authority of Oreskes's original findings. In my concluding section, I connect this analysis to my preceding chapters to suggest how it relates to genre uptake and controversy more broadly.

(Inter)textual Boundaries, Openness, and Public Controversy

This chapter's analysis reports what happened through the course of a year marked by a high level of public controversy about global warming as *Wikipedia* editors took up site-external sources and worked to incorporate them. It shows how editors' efforts to enact

the Verifiability policy as they edited pages shaped the representation of global warming in two distinct articles. This is a story of boundary-building made visible via how references to external sources appear in texts; over the course of the year, the two articles shifted significantly in how they represented the scientific consensus about the issue. In terms of both their citational fields as well as the references to external texts embedded in the lead sections, both articles became more dialogically expansive over time; they cited more sources from a broader range of genres and authors, and the certainty with which the scientific consensus was represented in *both* article leads decreased. This suggests that that the swirl of media coverage and public commentary about the issue inflected how the issues was taken up and addressed by *Wikipedia* editors — that the public media attention fueled editors to take up more and more diverse external sources, sucking them into the encyclopedia. Paradoxically, while the IPCC had expressed more certainty than ever before that global warming existed and was caused by human activity, the *Wikipedia* representation suggested, over time, that this was less the case and the issue was more controversial than it had been previously.

My analysis speaks to how *Wikipedia*'s openness shapes how genre is enacted over time, particularly in relation to controversial public issues and facts related to them. The site's openly editable nature (that is has no material or temporal stability) means that articles can be highly responsive to external, circulating discourse. Indeed, in Latour and Woolgar's (1979) work, the factual status of propositions is contingent on the material "life" of facts – previously published, materially stable texts contain assertions whose certainty can be modulated when they are recontextualized in new

texts. What was claimed and elaborated in a previous article can be removed from narratives about how a finding was created and thereby become more fact-like. The two *Wikipedia* articles I analyze in this chapter demonstrates what happens when highly visible public texts like *Wikipedia* articles have no such stability; the status of propositions within them can become at issue, resulting in texts that communicate less certainty about the facts related to an issue than the scientific community itself would maintain. This focus on what happens in unstable texts contributes to broader scholarship interested in how genre uptake shapes the circulation of public discourse. While scholars have documented how controversy unfolds through genre uptakes in public (e.g., Reiff and Bawarshi, 2016), no studies focus specifically on how controversy moves *into* and *through* openly editable public texts as a result of genre uptake over time. My analysis shows how specific discourse features, including the use of direct *vs*. indirect speech, reporting verbs, and the representation of social actors can be analyzed in openly editable texts as a method for detecting points of disagreement among editors in public texts that are collaboratively produced. As I have shown, these points of disagreement can be traced to the larger discourses surrounding controversial issues.

Beyond documenting the outcomes of genre uptake, this chapter also contributes to scholarship interested in how conflicts in argument spheres unfold in public texts. Multiple scholars have documented how the intersection of spheres of discourse have created problems for public discourse around climate change in particular; Paliewicz (2012), for example, draws on Goodnight's spheres framework to argue that the "usurpation" of technical discourse about global warming within the

public sphere has undermined the ability to reach sensible public solutions to the problem. Similarly, Ceccarelli (2011) points to the wealth of scholarship suggesting that global warming skeptics have exploited media norms of balance and objectivity to circulate doubt about the scientific consensus about the issue by funding scientific studies that challenge the consensus view — studies which are then picked up in media discourse in an effort to maintain "balance," a phenomenon I note earlier. This represents, for Ceccarelli, an effort to *manufacture* controversy by exploiting Western pro/con deliberative practices that may shape public discourse about the issue. In other words, when climate science moves from the technical to the public sphere, it tends to become distorted in a way that may undermine productive public decision-making and policy.

On the one hand, my analysis in this chapter suggests that a similar dynamic inflects *Wikipedia*'s representation of this issue; an openness to a panoply of external sources, matched with genre rules prompting editors to take such sources up, led to the issue being represented as *less certain* within the article texts than it had been prior to the publication of the IPCC report. Over time the controversy seeped further into these texts, visible in how the two represented more external voices (and less consensus) over time. At the same time, and possibly working against this pull toward more voices and more controversy, *Wikipedia* editors worked to build and maintain boundaries around knowledge sources as they struggled to "make sense" of circulating discourse.[21] Indeed,

[21] One way to view the tension between the influx of outside voices and the work to draw boundaries around which voices could enter or where they could go in articles is in terms of what Bakhtin might refer to as forces that broadly affect all language use; that is, the tension between *centripetal* forces that work toward centralization or unity of meaning (in this case, a "unitary"

in his introduction to the special issue of *Argumentation and Advocacy* focusing on the scholarly impact of Goodnight's concept of argument spheres, Rowland (2012) points to new media discourse an important site for future scholarship, noting that "the rise of new media […] has muddled the boundaries among the spheres" (p. 196). While Rowland is quiet on what specifically he means by "muddling," it might be an apt description of a range of phenomena, from the easy access we now have to genres ranging from Tweets to journal articles, to the kind of hybrid, interdiscursive "blending" of genres and discourses often said to characterize new media (Bawarshi, 2016). Such "muddling" of discursive spheres, as controversy scholars hold (Goodnight, 2012; Phillips, 1999), sets the stage for controversies to develop where those spheres intersect.

If new media (broadly construed) "muddles" the argument spheres, then the Wikipedians working to build and maintain epistemic boundaries between the "Global Warming" and "Global Warming Controversy" page appear to be trying to *unmuddle* them by portioning the spheres into distinct pages. This is evident both in the distinct epistemic lifeworlds cited in the two texts over time, as well as in the argumentative work I document in chapter 2, which helps to build and maintain those distinctions. These arguments, and the boundaries that are their outcomes, are heavily inflected not simply by argument practices, but particularly arguments that shape genre uptake from external sources via arguments *about* genre. That arguments about *genre* show up

representation of global warming knowledge controlled within the discourse of science) and the *centrifugal* forces that pull toward diversification, decentralization, and multiplicity of meaning (in this case, a mutiplicitous representation of global warming knowledge that draws on a range of discourses and voices, thereby complicating a unified representation of "the facts") (see Clark & Holquist, 1984).

when Wikipedians deliberate over sources is, in some ways, a corollary to how broader controversies work. Scholarship in rhetorical controversy maintains that public controversies involve conditions in which deliberative practices are undermined because the possibility for communicative consensus is challenged, blocked, or undermined (Doxtader, 1991; Olson & Goodnight, 1994; Phillips, 1999). Olson and Goodnight (1994), for example, assert that when parties lack a method of reaching consensus, "challenges are raised as to the acceptability of the communicative context within which the argument is offered as secured" (p. 251). In deliberative contexts, for example, parties may set aside a policy question and move to arguing over whether the conditions for deliberating are fair, participatory, or valid. Controversy is marked not only by dissensus, but by argument over the context, conditions, and discourse practices that shape participation in deliberative practices. Participation in the public sphere is shaped not only by *deliberative* practices, but by broader discursive norms such as genre, language, and means of circulation (Hauser, 1999; Warner, 2002). These norms both *constitute* publics and also shape the conditions for participating in them. While Wikipedians do argue about how to argue, their arguments about *how to enact genre* (by enacting the Verifiability policy) by *taking up* genres (or external sources) are also forms of controversy within the site – marked not solely by dissensus about deliberative practices, but by arguments over how genre interrelationships should be built, and should work. These arguments, as I have shown, take up the contexts, agents, epistemic practices, and authority of texts in order to challenge or debate the validity of propositions given within those texts, in a manner similar to arguments over

deliberative forums long documented as characteristic of public controversy. In other words, Wikipedians take issue with the genres in which propositions are cited in much the same way that participants in controversy might take issue with the deliberative practices in public forums. Taking issues with the genres that include propositions about global warming challenge efforts to synthesize and represent "the facts" coherently, much in the same way that challenging forum procedures might undermine the outcome of deliberative decisions. Drawing this comparison helps point the direction for further research that considers how genre uptake — built through argument, or visible in texts' intertexts — shapes how controversy unfolds in the networked public sphere.

Controversy scholarship can also elucidate the boundary-building I document in this and my preceding chapter. As I note in chapter 2, the boundaries that Wikipedians build are bound up with the material conditions of *Wikipedia* itself; editors divert sources to distinct *places* within the article ecosystem. This use of *space* to separate the boundaries of global warming as an issue is similar to how Phillips (1999) describes the dynamics of dissensus and resolution in public controversy. Seeking to pivot from a focus on normative evaluations of controversy as it is shaped by contemporary media dynamics, Phillips focuses attention on the role of *space* in controversy. Drawing on Foucault's concepts of discourse formation and spaces of dissension, he argues that spaces in which discursive formations struggle for power are "the precondition for controversy" (p. 493). This focus on *place* enables Phillips to elaborate on how *displacement* contributes to resolving controversy. He asserts:

> Controversies, thus, emanate from the internal contradictions created by the overlapping *dispersions* of regularized formations of discourse.[…] Displacement […] resolves the controversy either by resolving the contradiction or, at times, by binding the contradiction as 'intractable' and recreating boundaries. This final stage suggests a movement of *demarcation* whereby some partial fixation re-establishes a sense of propriety and regularity.

I take Phillips's observations about *spaces of dissension* and his observations about the role of *displacement* in resolving controversy useful for describing how editors utilize the space of *Wikipedia* articles to resolve the potential contradiction represented in the vying lifeworlds represented in the sources they seek to cite. To draw on Phillips's language, the different types of sources that Wikipedians may cite are drawn from different formations of discourse with their own epistemic assumptions, or potential contradictions, in how they approach validating knowledge-making. Diverting distinct types of sources into distinct articles — science in one, everything else in others – helps resolve this contradiction without having to deliberate or resolve the epistemic clashes these external genres represent. The actual boundaries of the pages *demarcate* those boundaries, and once established, they can be maintained through arguments from precedent that is bolstered by their fixity within the sociotechnical system.

Demarcating the boundaries of global warming as an issue into separate articles inflects how the public may view it. Readers landing on the "Global Warming" article get a highly distinct representation of the issue than those that land on "Global Warming Controversy" —which is confusing, given that a member of the public might reasonably assume these terms would index similar results. In the next chapter, I document how these distinctions shape not only the articles themselves, but how this issue plays out across *Wikipedia*'s larger sociotechnical ecosystem.

Chapter 4

Open Systems: How Genre Diverges and Sediments Across the *Wikipedia* System

> *The traces of power in the network society are equally located in the architecture of bricks and mortar and the architecture of information, the discursive practices that constitute the coding of network topologies.*
>
> —Michael Truscello, "The Architecture of Information: Open Source Software and Tactical Postructuralist Anarchism," p. 1

Recently I entered a small local bookstore and went in search of the section where I could find what has recently become my favorite escapist hobby: graphic novels. As a macro genre, their popularity and prevalence has exploded in recent decades, as the genre has developed and ramified from its antecedent in comic books, gaining recognition as literature within literary circles. The location of the graphic novels sections in bookstores, particularly independent ones, seems to vary considerably, and seems to suggest something about how bookstore owners conceptualize its status as a genre: inevitably, I have to meander the store in search of them. Will they be near prose fiction, suggesting graphic novels' status as literature? Near visual art, thereby emphasizing their visual aesthetics? In this particular store, I found a label for "graphic novels" in a corner bookshelf; the top three shelves were devoted to more literary and historic graphic novels, the last third to more traditionally adventure-hero type serials that some might identify as properly "comic books." Immediately beneath these shelves was a small section labeled "Young Adult Fiction," collecting novels aimed at young

adults. I found this noteworthy because across the store was a small, entirely separate room labeled “Children’s Books.” Yet “Young Adult Fiction” was here next to graphic novels. I couldn’t help but wonder whether this organization suggested something about how the owner of this particular bookstore imagined the relationship between likely readers of graphic novels (and comic books) and likely readers of Young Adult Fiction.

How texts are labeled, categorized, and organized in physical space shapes a great deal: how we locate them; how we interpret their relationships, meaning, and value as instances of a genre; how we navigate material space. The information architecture around texts, as this example also suggests, often communicate stances on controversies about those relationships — such as whether graphic novels are considered literary *high art* on par with other textual fiction, or not. In my preceding two chapters, I narrated the history of how controversy — both within *Wikipedia* and outside it — shaped the texts of two specific articles over the course of a year. As editors took up sources, argued about their status as genres communicating global warming knowledge, and incorporated them in articles, they created epistemic boundaries delineating the two articles’ citational fields; “Global Warming” increasingly drawing from the sphere of technical scientific knowledge, and “Global Warming Controversy” drawing a more diverse range of genres and discourses more heavily drawn from a public spheres of media discourse and policy. Over time, those boundaries became increasingly sedimented, shaping how editors were able to argue for taking up subsequent texts. Further, these boundaries were not simply abstract, discursive

constructs: they became sedimented within the *architectural* space of where information about global warming topics appeared within *Wikipedia*. These material boundaries between the articles helped demarcate the discursive boundaries between knowledge spheres. These discursive-to-material constructs seem to work as a bulwark against the potential chaos of *Wikipedia*'s openness.

This chapter examines how these dynamics of rhetorical boundary-building, openness, and sedimentation unfold on a more macroscopic scale. It traces how genre and textual uptake shape the way the controversy over global warming is represented in the larger information architecture of the system as it develops over time. In doing so, it provides a broader perspective on both how Wikipedians tackle the seemingly Herculean tasks of taking up and representing global warming and climate change as an issue, and also of the reasoning that shapes their decisions about this process in the face of openness and instability. "Seemingly Herculean" may seem exaggerated, but a simple Internet search suggests it may be apt; for example, a *Google Scholar* search of the number of articles with the term "global warming" published between 2001 and 2010 returned 442,000 results; a search for "climate change" returned 1,380,000 results. These numbers speak to how the openness of the Internet broadly as providing a massive number of potentially reliable sources of information about topics — that is, as a tremendous collection of "concatenations of texts through time" (Warner, 2002) — itself creates a challenge for *Wikipedia* editors in terms of how they enact the Verifiability policy not only in individual articles, but across the site's ecosystem. Analyzing how Wikipedians build the site's information architecture around these

controversial issues thus helps account for how processes of collaboration unfold in the face of instability and openness on a broader scale.

By *information architecture*, I mean particularly how Wikipedians organize, label, categorize, classify, and build navigational functionality across the site. Among Rosenfeld, Morville, & Arango's definitions of *information architecture* (2015) is the following: "The synthesis of organization, labeling, search, and navigation systems within digital, physical, and cross-channel ecosystems" (p. 24). They identify four primary categories that encompass the concerns involved in information architecture: 1)*organization systems* ("the main way of categorizing or grouping content" [p. 91]); 2)labeling systems ("how we represent information" [p. 90]); 3)*navigation systems* (for example, tables of contents, site maps, indices); and 4)*searching systems* ("how we search information", such as through a search interface, retrieval algorithms, or search results [pp. 90–92]). Scholarship in design and information science often focuses on information architecture as a professional activity that creates digital environments (such as websites and databases) that provide information to users (Rosenfeld, Morville, & Arango, 2015), and on articulating best practices for how to effectively build such environments.

Scholars in anthropology, communication, as well as rhetoric, however, have elaborated on how such acts of organization, labeling, categorization, and classification-building work to shape understanding, create discursive frame around content, and constitute membership and experience in professional and public life (e.g., Goodwin, 1994; Bowker & Star, 1999). Bowker and Star (1999), for example, document the

discursive and social development and consequences of classificatory systems in a range of public and professional realms. Classification systems, they argue, are political and ethical, "powerful technologies" (p. 320) that shape and intersect with situated practice and professional cognition; they become mediational tools within and through which actors develop membership in professional domains and help link experiences of information across the contexts in which they are used. Berkencotter and Ravotas (1997), for example, describe how mental health practitioners use the *Diagnostical and Statistical Manual IV* (DSM IV) (which Berkencotter and Ravotas refer to as a "classificatory genre") to classify patient's experiences. This classificatory genre shapes and enables the diagnostic activity involved in psychiatric work; thus, it both helps constitute psychiatrists' authority as medical professionals and also reifies patients' lived experiences. Organizing, categorizing, and labeling of knowledge don't only occur in professional contexts or through historically stabilized genres such as the *DSMIV;* scholarship in computers and composition, web design, and information architecture have long noted that interfaces, web pages, and web sites are not transparent, passive containers of content any more than printed media have been. Choices about design, the organization of information, usability, search, and navigation create experiences for users of digital media; they function as *contact zones* that can manifest particular linguistic or discursive ideologies (Selfe & Selfe, 1994); they may *interpellate* users into particular subject positions or communities (Hatter & Howard, 2013; see also Charland, 1987; Althusser, 1971). Scholars in persuasive design argue that the design of computer technologies can persuade insofar as they may change users' attitudes or beliefs (Fogg,

2002; see also Hasle, 2006). How authors label, organize, and distribute knowledge and activities across digital systems influences how we communicate, understand, and work.

As Kennedy (2016) argues, much of Wikipedians' composing work involves not only debating or writing articles, but practices of "textual curation," which include "filtration, recomposition, and designing structures for usability and navigation" (p. 177) — i.e., information architecture work. These practices involve collaborating to filter information and continually build and rebuild information structures — processes marked by the same instability that inflects how articles are written. Editors can not only create new articles, but they can argue for deleting existing ones through Articles for Deletion (AfD) proposals. They create hyperlinks to other texts within the site and outside it; they build navigational tools such as menus, templates, and content lists. This potential to rebuild or restructure the site's information architecture – to create new links, new menus, new pages, new content categories – complicates the problems of openness I discuss in preceding chapters. Editors can not only argue for changing an article at any time, but they can argue for creating or deleting existing articles at any time – or for restructuring how articles are labeled, categorized, and organized. Within the field of web design and information architecture, decisions about information architecture should be based on analysis of how readers or users might label, categorize, or search for information, in order to provide the best experience for users. While *Wikipedia* itself does collect data about the number of page views for articles, editors are neither required nor provided resources to engage in user testing of this kind. Given the potential for chaos in the system, as well as the fact that the site's genre

rules prompt editors to continually search for and integrate outside sources, how do editors reason about how to organize information in the site? What (if any) stability develops within the information architecture surrounding controversial issues? How does editors' work on the information architecture around articles shape the way complex issues like global warming are represented to the public?

Wikipedians' choices about how to organize the information it represents about global warming may have particular influence on public understanding of the issue. The simple choice of whether the issue is labelled "global warming" or "climate change," for example, has been found to influence the public's receptiveness to information about it. "Climate change" and "global warming" are often used interchangeably in public discourse, but research in the uses of the two terms in political websites and surveys finds that Republicans are more likely to acknowledge the phenomenon as real when it's referred to as "climate change" rather than "global warming." Further, conservative think-tanks use "global warming" more often whereas liberal think-tanks more frequently choose "climate change" (Schuldt, Konrath, & Schwarz, 2011; see also Whitmarsh, 2008). This chapter thus takes up the question of how the information architecture around global warming articles has developed over time, in light of the site's openness to circulating external sources and the complexity of this public issue. It thus contributes not only to understanding the dynamics of openness and stability in collaborative online environments, but also how controversial issues in new media environments are represented to the public not only *within texts* (like *Wikipedia* articles), but through the architecture of systems that house and organize those texts.

Genre Uptake and Genre Systems

In prior chapters, I framed the issue of how Wikipedians take up and enact genre in light of Freadman's concept of *genre uptake,* the bidirectional relationship between a pair of texts such as an invitation and RSVP. In rhetorical genre scholarship, this same interest in relationships between genres and how they interact has informed myriad work interested in not simply pairs of genres, but in genre sets (Devitt, 1991), genre systems (Yates, Orlikowski, & Rennecker, 1991; Bazerman, 1994; Berkencotter, 2001; Yates & Orlikowski, 2002), and more recently, genre ecologies (Spinuzzi & Zachry, 2000; Spinuzzi, 2003). Genre systems are interrelated genres that interact in patterned or habitual ways to achieve communicative action within settings; Bazerman (1994), for example, focused on how U.S. patent law involved interactions between genres such as applications, patents, and attendant legal documentation that together *constitute* and *structure* the activity of U.S. patent law. Genre system scholarship has often focused particularly on how communicative purposes are enacted within professional discourse, such as healthcare or business (e.g., Berkencotter, 2001; Yates & Orlikowski, 2002; Schryer & Spoel, 2005).

A key element of how uptake and genre systems function is the idea that uptakes between genres become habitual; over time, they create what Dryer (2016) refers to as *uptake residues,* or "incremental contributions to social formations" (p. 181). Yates and Orlikowski (2002) and Bazerman (1994) view these habitualized or

sedimented relationships as structuring (Giddens, 1984) social communication patterns.[22] While some studies historicize the development of genre systems (e.g., Bazerman, 1994), many studies of genre systems focus on interrelated "stabilized-for-now" (Schryer, 1993) genres with "stabilized for now" organizational contexts such as workplaces, legal discourse, or professions. As Reiff and Bawarshi (2016) note, there are few studies focusing particularly on *public genres* and even fewer that focus specifically on *public genre sets or genre systems* — particularly that focus not only on how public discourse moves through such systems, but particularly on how (and whether) dynamics of instability and sedimentation inflect those public systems.

One way to tackle the question of how openness inflects *Wikipedia as a genre system* would focus predominantly on the relationships between site-internal genres: articles, talk page articles, policy or editorial pages, and so forth. But among the most compelling challenges involved in conceptualizing *Wikipedia* as a specifically *public* genre system is not simply how these pieces work *internally*, but how it takes up and intersects with the *site-external* genres through which public discourse around controversial topics circulate. I've been arguing throughout this dissertation that *Wikipedia*'s *openness* to external genres is part of what makes it rhetorically compelling. This chapter thus takes a system-level view to examine what happens when Wikipedians

[22] A simple example of how this habitualized bidirectionality shapes social formations might again be a wedding invitation and its "uptake" genre, the RSVP. The RSVP is a habitualized uptake – a formal response to the invitation that guarantees you a seat and some free food. The practice of "RSVP'ing" in turn habituates the continued use of a formal invitation; if you want people to believe they're *formally* invited to an event and feel compelled to give you a response to tell you if they're coming, you should send a *formal* invitation requesting an RSVP. The habitualized bidirectional relationship structures not only how people do and don't respond to the invitation, but whether they respond at all (or feel invited) – creating a habitual need for formal invitations to be created in order for formal social invents to actually be attended by guests.

grapple with how to take up these external genres, and how those efforts shape the architecture of how information about global warming and climate change develop within the site over time. I focus particularly on examining two key aspects of how Wikipedians build information architecture about this topic: how they decide which articles to keep, delete, and merge, and how they build a network of interrelated topics about the issue over time. Building on the analyses of my preceding chapters, this chapter provides a systems-level view of how open collaborative systems may shape the public life of controversies.

From Textual Uptake to Textual Sediments

The processes through which *Wikipedia* articles are created or deleted is not controlled by a centralized editorial hand that sets an overarching content agenda. While there are WikiProject groups that collaborate to identify, develop, and maintain articles within specific topic areas, any registered *Wikipedia* user can create a new article. This means that in theory, neither rules of access nor space constraints prevent any given user from creating an article on any topic. Nor is there a *de facto* constraint that prevents a user who dislikes how information is presented in a given article ("Global Warming Controversy," for example) from simply creating a new one that includes different sources and their own preferred representation. This creates an opportunity for what Cap (2012) refers to as an "Every Point of View" architectural principle, one in which every point of view on a topic can have its own space on a separate page. *Wikipedia*'s

content guidelines prohibit this, however; in an effort to maintain the "Neutral Point of View" principle, the website expressly prohibits Point of View (POV) forking, or creating a new article with the intention of giving an alternate point of view on information already included in an article. Rather, editors are to reconcile any POV problems they see by negotiating and editing an existing article. This process becomes complicated, however, when creating a new article may be justified because an extant one is too long, or due to the notability of a new topic itself. Editors thus must weigh trade-offs among issues such as article length, topic notability, neutrality, and source use in considering when it's appropriate to create a new article or edit an existing one. Among the *Wikipedia* guidelines designed to constrain the range of topics that get covered is *notability*: *Wikipedia* articles are to focus on topics that have "significant coverage" in "reliable, independent sources."[23]

Once an article has been created, it can be nominated for deletion by any registered user through the site's Articles for Deletion (AfD) nomination process. Once an article is nominated for deletion, the community allows a one-week discussion period in which users can vote whether to "Delete" or "Keep" the article, or (in some cases) "Merge" with an existing article. In addition to indicating a "Keep" or "Delete" vote, discussion participants must provide reasons for their votes. Administrators who close and arbitrate discussions are instructed to consider reasons given, and not simply reason-less votes, and to default to keeping an article in cases in which there appears to

[23]So, for example, an article on your housecat is not likely a significantly "notable" topic, although an article on the President's dog may be, if the animal has gained significant media attention.

be inadequate consensus for its deletion. Every AfD discussion is archived; examining these discussions can thus yield insight into how *Wikipedia* editors reason about creating, organizing, and classifying content.

To examine how *Wikipedia* editors reason about content surrounding the issue of global warming, I examined the archive of AfD discussions about articles related to global warming and climate change. To provide a macroscopic view of trends in reasoning, I examined all 41 AfD discussions about articles that included the phrase "global warming" in the title that have been archived; the earliest discussion occurred in 2004, and the most recent in 2016. (Sample article titles range from "Aliens Cause Global Warming" and "Polar Bears and Global Warming" to "Global Warming Conspiracy Theory" and "Global Warming Alarmist.") Of the 41 articles discussed, 22 were deleted, 13 were kept, and 6 were merged with or redirected to existing articles.

The reasons that editors give for nominating articles to be deleted, and the reasons they give for votes, suggest that Wikipedians are often trying to balance the *salience* of a topic based on its treatment in external sources with how the topic is already covered in existing articles. Of course, many of the site's genre rules are invoked during these discussions; for example, editors deleted the article "How the World Will Change – With Global Warming" because the article was about a book of the same name, and was viewed as "blatant promotion" by the book's author, which is a violation of *Wikipedia* policy. Likewise, the article "How to Stop Global Warming" was deleted because *Wikipedia* policies expressly state that the site is not designed for "How To" procedural articles. But many of the discussions were dominated by a similar basic set of

concerns: whether external sources merited creating and maintaining a separate article, and whether a topic was already covered in an existing article. These reasons were given to justify deleting 17 of the 22 articles that were deleted. For example, editors voted to delete "Ethanol in Global Warming" as a separate article because its content was largely based on only one journal article, and editors decided that it could be merged into other existing articles, such as "Ethanol" or "Global Warming." Likewise, "Polar Bears and Global Warming" was deleted because editors decided it was a POV fork of information given in the "Global Warming" article, and that sources cited in the article were insufficient to merit its treatment as a separate topic. Likewise, the article "Global Warming in Japan" was kept, with several editors referring to the existence of extensive outside sources as a rationale for an article on this as a separate topic. Similarly, editors decided to merge or re-direct articles largely based on whether or not the content of the articles was considered to be a POV fork or was redundant to existing articles. For example, editors merged the articles "Global Warming Skepticism" and "Global Warming Alarmist" into the article "Global Warming Controversy" because both articles were deemed to be POV forks that repeated or reiterated existing content covered in the "Controversy" article.

These discussions suggest that editors' work in organizing and labeling what they take up from external sources involves constantly negotiating a trade-off between how salient topics are in outside sources, on the one hand, and whether ideas distributed in outside sources can be subsumed within the existing organization of content, on the other. As this trade-off plays out in AfD discussions, the pull of what Dryer refers to as

uptake residues, or the influence of prior histories of how sources have been treated, becomes evident in how frequently editors decide to delete or merge new articles because their content is poorly sourced, covered elsewhere, or both. The implications of these trade-offs for how global warming is represented as an issue is more evident if we examine the reasoning around specific articles with an obvious ideological charge that met opposite fates during AfD discussions: "Climate Change Alarmism" and "Climate Change Denial."

CLIMATE CHANGE ALARMISM | Created in June 2010, "Climate Change Alarmism" began as a stub that provided a brief definition of the term, what Wikipedians call a "dicdef" (dictionary definition). By July 2010, the article had grown to several paragraphs; its content focused on defining and providing examples of "climate change alarmism," which it explained was "a rhetorical style which stresses the potentially catastrophic effects of global warming as a technique for motivating public action." The article drew from policy reports, journal articles, and mainstream media sources to explain these "alarmist" rhetorical strategies by the press; it also had a small section reporting on scientists who had condemned "alarmist" rhetoric for exaggerating or distorting scientists' views in order to galvanize public response to climate change. It cited eight total sources at this time, including two books, three journal articles, two BBC articles, and one link to a publication by the American Physical Society.

In July 2010, the article was nominated for deletion; the nominator's given reason for the proposal was, "This article is original research and a POV fork for Global warming controversy." He elaborated on this reason in a comment; this comment

emphasized that the article was out of sync with the topic's treatment in external sources:

> There is no evidence that there is an agreed definition of the term or a body of literature that has developed. […] **Not one of the 13 Google scholar hits uses the term in its title or is specifically about alarmism,** except perhaps a book by Iain Murray from the *Competitive Enterprise Institute.* **Alarmism also forms only part of the discussion** in the articles supporting the article. Mostly they are about how global warming is communicated, of which alarmism is identified as a poor communications method.

This editor's *reasoning* about how and whether to take up the term "climate change alarmism" focuses on the term's prevalence in outside sources ("Not one of the 13 Google scholar hits uses the term") and whether or not the articles themselves use the term ("alarmism forms only part of the discussion in the articles").

Despite this nominator's assertion that the article violated two core *Wikipedia* policies (No Original Research and Neutral Point of View), the vote and discussion resulted in a *Keep* – a unanimous vote by six voters. Many of the reasons voters gave for their "Keep" vote focused around the article's general value, or the fact that it was based on sources that were *reliable* ("it's based primarily on scholarly sources") and that there were enough sources to merit an article on the topic ("enough notable content to be sustained as its own article").

The community's choice about the notability of this topic, and its place in the ecosystem of global warming articles, shifted the following year, however. When the article was again nominated for deletion in November 2011, the community decided to merge the article's contents with the "Global Warming Controversy" article. By this time, the article had been expanded to include sections discussing "alarmism as a

pejorative" and "alarmism as an extreme position"; it included 24 references, with many of the new references providing examples of use of the term "alarm" in discussions of global warming in mainstream media sources. The editor who proposed the article be deleted emphasized that a similar topic was covered elsewhere, and that sources cited in the article didn't merit covering the topic separately as its own article:

> **We already have two big articles on the subject - Global warming controversy and Climate change denialism, besides Global warming and a host of others.** This article brings nothing whatsoever new to the table, and is pretty much a WP:DICDEF with a little added, but redundant, content**. To give some numbers to show the term is not widely used, 78,800 ghits, 2 news hits, and 29 google scholar. These numbers are not so large that they justify an article on the term itself** - and that's presuming they all use the same definition, which is doubtful. All other content beyond the definition (and mentioning it's used to attack people) is either questionably sourced, synthesis, or redundant to the big three articles. There are secondary issues: this is (arguably) a WP:POVFORK, and the text appears to be WP:SYNTH, mixed in with some dodgy sources. **I'd suggest it be deleted and redirected to global warming controversy.**

This AfD discussion included more votes than the 2010 decisions; twelve editors voted to "Keep" the article while twelve voted to "Delete" or "Delete/Merge" it; the ultimate decision was made by the administrator who closed the discussion, who gave the following explanation for the decision:

> While the general **topic is notable**, there are **hardly any reliable sources supporting the use of the term "climate change alarmism." There is significant opinion that this is a POV fork of Global Warming Controversy**, so cautious merge to that article is in order.[24]

Many of the reasons given on both sides (for both "Keep" and "Merge") again focused around editors' assessments of the prevalence of the term "climate change" alarmism" in reliable sources. One supported keeping the article by emphasizing that, in addition to the sources referred to by the editor who proposed deleting it, it cited "Plus 14

[24] This administrator acknowledges overriding *Wikipedia*'s policy advice regarding defaulting to "Keep" an article in which no consensus exists for its deletion by explaining it is a "cautious merge" based on heavily weighting POV problems as a justificatory reason.

books." Another noted that, "It should be renamed climate alarmism, which gets 301 this on Google news." A third voted to keep, saying the article was, "Sufficiently notable '350,000 hits for 'climate alarmism.'" Several others voting to keep the article emphasized that it cited sufficient external sources. A similar kind of quantitative reasoning was also used by editors voting to delete the article; one noted, "It doesn't appear to be notable as a term. Do any of the sources even use the term?" Another said, "Just a quick check of the references from the article indicate that the term "Climate Change Alarmist" is not widely used, even in the article's sources." These editors focused on whether the term itself was used within the articles.

Contrasting arguments again focused around the idea that this was a tendentious "POV fork," and that any useful or relevant information currently in the article could be subsumed under pages that already covered the topic. The reasons given by voters in the latter AfD discussion thus drew heavily on the same "genre rules" and site policies that had previously justified retaining a shorter article with fewer sources cited; the difference in the decision in this particular case appeared to hinge predominantly on how many editors showed up to voice their perspectives, and on how the deciding administrator weighed and interpreted their arguments. Notably, the admin's reason for the decision focused on the idea that the "Global Warming Controversy" article already covered similar content, so the new article could be construed as a POV fork of that article, which merited merging the content into it despite the significant number of sources cited in the article.

CLIMATE CHANGE DENIAL | The history of AfD nominations for the "Climate Change Denial" article has a similar history in terms of how Wikipedians reason about sorting information, although it has had the opposite fate. The article focuses on explaining and providing historical accounts of *denial* about climate change as skepticism or unwarranted doubt about the existence or anthropogenic causes of climate change. In some ways we can view it as covering the *opposite* topic as "Climate Change Alarmism"; whereas the "Alarmism" documented references to exaggeratedly fearful representations of climate change, the "Denialism" article documents "unwarranted" doubt about it, including the "denial" industry, which is often attributed to efforts on the part of the fossil-fuel industry to downplay or discredit the attribution of climate change to anthropogenic fossil fuel emissions (e.g., Oreskes & Conway, 2010).

"Climate Change Denial" has been nominated for deletion four times (in July 2007, March 2008, August 2008, and March 2010) and was nominated to be merged with the "Global Warming Controversy" article in December 2009. In each instance, nominators asserted that the article was, like "Climate Change Alarmism," a POV fork or in violation of the NPOV policy. But in each instance, the article was kept. In the 2007 discussion, those in favor of keeping the article often emphasized the high number of external sources that used the term "denial" to refer to the concept under discussion, such as in the following comment by the article's original author:

> This article--of which I am the primary author--**documents an organized effort to promote controversy over climate change. The bulk of citations come from major periodicals *The Guardian*, *New York Times*, *Washington Post*, *Vanity Fair*, and *Mother Jones*. These sources**

> **chiefly refer to their subject as "denial."** If these periodicals' allegations of funding a denial effort are false or otherwise contestable, I think it would be preferable for both sides of the present debate to answer them within the framework of the article.

In subsequent discussions when the article was again nominated for deletion, editors often mentioned both the prior decision to keep the article, and also the large number of external sources in which the term itself was used. In 2010, for example, one editor voted to keep based on the reasons that, "The industry-funded denial of climate change has been documented both in the popular press and in academic studies" and that "Simply clicking on the Google Scholar link reveals a wealth of publications on this topic."

These two conflicting AfD discussions suggest that the way information is distributed in external sources heavily influences Wikipedians' *architectural* choices. In the case of "Alarmism," the editors decided to subsume it to "Controversy" because the term itself was deemed insufficiently prevalent in outside sources; in the case of "Denial," the prevalence of the term "Denial" in mainstream media sources legitimated keeping the article. In these discussions, editors use a kind of quantitative reasoning to determine whether or not there are sufficient external sources to merit retaining a new article; this quantitative reasoning is weighed against how a topic is covered in existing articles. This is notable as an account of the way that arguments inflect not only how external genres are taken up within articles, but how argument shapes the larger structure of the site's informational ecosystem. In chapter 2, I argued that Wikipedians rely on arguments that take a modified form of Walton's *argument from expert opinion,* including reasoning about *consistency*: whether information in a cited source is

consistent with what other sources assert. These arguments often draw on the prevalence of a viewpoint and its distribution in outside sources: how many external sources support a claim, assertion, or concept given within an article.

My analysis of AfD discussions suggests that a similar kind of quantitative analysis may significantly shape what gets covered as a separate article in the site, and what does not. In multiple discussions, editors reasoned around keeping an article based not only on whether the article as written had sufficient sources, but whether the topic was treated separately within outside sources (whether they were cited in the article or not). In several instances, Wikipedians drew specifically on numbers of *Google* results, suggesting that their quantitative reasoning efforts were aided by the quantitative data about *how many sources exist* that the *Google* search engine makes possible; this reasoning is complemented and bolstered by references to the specific types of genres cited (journal articles, books, news hits) and media sources (*New York Times*). In these arguments, the names of these genres function as a kind of stand-in for assertions of source credibility: in the calculus of whether a topic is sufficiently notable or not, numbers of journal articles, books, or news articles provide evidence to support claims that a topic should be covered. In this way, the arguments over expert opinion seem to blend with what Walton (1999) might refer to as an *appeal to popular opinion*: an argument that draws its validity based on the prevalence of an opinion within the larger majority, with the existence of sources discoverable by *Google* here standing in for an actual living, speaking, majority (or for the representation of that opinion as collected through traditional means such as public opinion polling). In terms of how

openness shapes the larger architecture of information about global warming in *Wikipedia*, this analysis suggests that topical coverage within the site is influenced by the quantity of how sources circulate in the outside world. Editors' quantitative reasoning about how prevalent topics are in external sources influences whether they believe there is sufficient exigence for creating or keeping a given article.

At the same time, the effects of this openness are mediated by the process of sedimentation that occurs as sources are taken up over time. In multiple instances, new articles were deleted or merged to existing ones; in the case of "Alarmism," the existence of the "Global Warming Controversy" article justified deleting the newer article — as it did for several others. As I note above, this process speaks to the force of *uptake residues* — the habitual uptake of outside sources becomes sedimented within existing articles. That is, editors have already added similar sources on similar topics to other existing articles, as occurred in the "Global Warming Controversy" article. Those prior decisions and history of determining which sources should be diverted to which articles then function as a constraint on how new information is taken up and represented from outside sources. Because of previous editorial decisions about which sources belong with which macro-level topics, new topics can be deleted or subsumed. Bowker and Star (1999) refer to this aspect of classificatory work as *erasure*, which inflects all classificatory organizational systems (p. 279). They assert that, "Classificatory systems subtending information infrastructures operate as tools of forgetting" (p. 280) as well as tools for "delegating attention"; they provide examples of how rearrangement or revisions of classificatory systems in the history of science enabled moving away from

outmoded systems. In my analysis, the article (and the separate topic) "Climate Change Alarmist" was effectively *erased* as an independent topic when it was subsumed into the "Global Warming Controversy" article.

While erasing the existence of the concept of alarmism may be celebrated by supporters of global warming, doing so inflects the range of topics easily available to the public about the issue. In this way, Wikipedians' genre enactment and *architectural* choices come to impact how the controversy over global warming is represented within public discourse over time. Page view traffic data for the "Climate Change Alarmism" page,[25] for example, indicates that the article was viewed 545 times in November 2011, the year and month it was merged and deleted. Despite this traffic, discussions over deleting this article never mention the data, nor do these discussions focus around questions of readers' possible interests, search practices, or information-seeking behaviors. In place of discussing audience, Wikipedian editors in this content area use the content policies and their own reasoning about topics' notability to guide decisions over how to organize content across articles; the genre rules thus become a stand-in for in-situ reasoning about the site's readers. The outcomes of Wikipedians' decisions nonetheless interpellate (Althusser, 1971; Charland, 1987) readers into particular subject positions *vis-à-vis* the particular knowledge and discourses the articles aim to aggregate and represent. For example, a current *Google* search for the term "climate change alarmism" delivers the *Wikipedia* topic "Climate Change Alarmism" as the first search result, but clicking on this link leads readers to a subsection of the site's current

[25] http://stats.grok.se/en/201011/climate%20change%20alarmism

"Media coverage of climate change" article titled "Claims of alarmism," which itself is a subsection of the article section titled "Distortions of balance." A reader encountering this page learns that "alarmism" is just one of many ways in which media representations of the topic have distorted it; the use of the epistemic discourse marker "claims of" introduces uncertainty about whether "alarmism" is a factual, extant phenomenon or something that some people claim exists – a different representation than that available to users who searched for the term prior to the article's deletion in 2011. In this way, the architecture of *Wikipedia* – working in tandem with *Google* – positions a reader to understand "alarmism" through an ideological position that frames it as a media distortion rather than a potentially legitimate characterization of the phenomenon.

From Hypertext to Hierarchy: How Organizing Articles Shapes Public Discourse

Choices over whether to keep, merge, or delete existing articles are not the only way that Wikipedians organization global warming information, however; the use of hypertext, menus, and navigation tools also function to organize information and shape readers' experiences. To identify how Wikipedians build relationships among related articles over time, I analyzed the use of "See Also" links in the "Global Warming," "Global Warming Controversy," and "Climate Change" articles over a ten-year period, from their creation through 2010. This analysis provides a more systemic, macro-level view of how Wikipedians' work in labeling, classifying, and organizing information shapes how the global warming controversy is represented in the site. As I mention

above, *Wikipedia* has no single, centralized web designer who determines the content and organization of *Wikipedia* articles. Given the genre rules that call for editors to create articles on "notable" topics based on "all significant views published in reliable sources," we might broadly assume that an analysis of the history of its topic organization is a history of how Wikipedians grapple with the work of curating global warming knowledge over time. Given the site's openness and the complexity of global warming as an issue, this history might be as equally fraught with instability, conflict, and decentralization as the articles themselves. Yet my preceding chapters document how a provisional stability developed through boundary work, argument, and habitualized uptake of sources into distinct locations in articles. This analysis helps document how Wikipedians manage and represent controversy that circulates through outside sources by demonstrating how they built relationships across the issue's topics over time.

In the field of information architecture, organization structures "define the types of relationships between content items and groups" (Rosenfeld, Morville, & Arango 2015). Such structures include top-down, hierarchical approaches, in which users might begin with a centralized set of top categories and navigate to sub-topics or pages; "bottom-up" database models that are optimized or organized to allow quick search and retrieval (such as the organization of many academic journal databases); as well as hypertext and "social classification" models. The strength of hypertext models is their flexibility; hypertext allows content to be linked or related to other pages, page sections, websites, and so on according to authors' decisions about what's relevant, important, or

necessary. Their flexibility, however, is offset by their potential for complexity, lack of consistency, and a situation in which whatever organizational logic may motivate an authors' choices about what's linked may be difficult for a reader or user to identify (Rosenfeld, Morville, & Arango, 2015).

At its highest organizational level, for example, *Wikipedia* is heavily reliant on a database organizational model with allows for users to search and retrieve information on particular topics. The site's current homepage allows users to choose among language versions, but otherwise prioritizes its search bar (see Figure 6). But throughout its history *Wikipedia* has also developed a range of both top-down, hierarchical organizational structures such as content indices and macro topical categories, as well as the use of hypertext links within articles themselves to link to related pages. These article-specific navigational and organizational structures include hypertext links embedded within the article text, which are conventionally indicated visually by blue text, as well as article content menus and sets of links at the ends of articles. These collections of links may include "References" or "Notes," (comparable to traditional academic Reference lists); "External Links" (to websites or resources outside of *Wikipedia*); "Further Reading" (which may embed .pdf files or link to particular books or articles). The "See Also" links at the end of articles are where *Wikipedia* editors of particular pages embed hyperlinks to other *Wikipedia* articles they deem relevant to the article's topic. This analysis

Figure 6. Screenshot of Wikipedia homepage, April 2016.

focuses particularly on the kinds of boundaries and relationships between global-warming related topics through these site-internal "See Also" type links in the "Global Warming," "Climate Change," and "Global Warming Controversy" pages from their creation through the development of higher-level indexing in the articles' later life.

The "See Also" links during the early years of these articles, prior to 2005, suggests that Wikipedians lacked a shared conception of how to identify and organize related pages in the topic area. For example, Figure 7 to the right shows a visualization of the "See Also" links from the "Global Warming" article in January 2003.

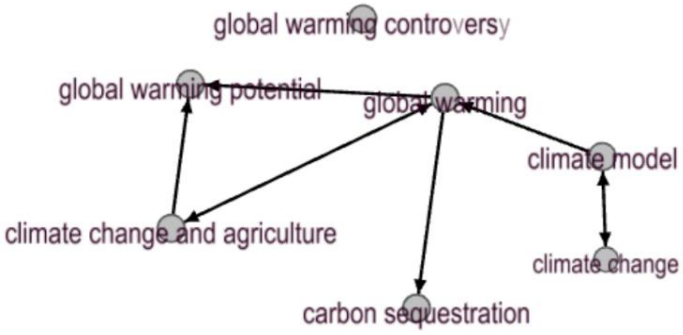


Figure 7. "See also" network of "Global Warming" article, January 2003.

In this visualization, constructed with the network visualization tool Gephi, individual articles appear as nodes, and directional arrows between nodes indicate hyperlinks to other articles. To construct this graph, I identified each article to which the three major articles ("Global Warming," "Climate Change," and "Global Warming Controversy") linked, and then which articles those individual articles linked to in turn. Although both the "Climate Change" and "Global Warming Controversy" pages existed at that time, "Global Warming" directly links to neither of them. Further, the directional arrows in this diagram show that the three pages to which is *does* link ("Global Warming Potential," "Climate Change and Agriculture," and "Carbon Sequestration") do not consistently link back to "Global Warming"; only "Climate Change and Agriculture" does.

Likewise, while “Climate Model” links to “Global Warming,” the inverse is not true, and “Global Warming Controversy” isn’t linked to any other pages at all. Insofar as the “See Also” create an organizational logic of content relevance, “Climate Change” and “Global Warming” appear from these links to be separate and unrelated topics. This is a hypertext logic often described in early scholarship of the web, which noted the potential for a connected set of resources that lacked “any overall perspective to unite them” (Manovich, 2001, p. 257; see also Warnick, 2007). This logic creates a reading experience that leaves the reader to wander in pursuit of subjective lines of interest – but a reader looking to the “See Also” links on this page as an indication of relevance would not find “Climate Change” as a related topic, and a reader at “Global Warming Potential” wouldn’t either.

Further, an analysis of the “See Also” links in the three articles two years later, in January 2005 (see Figure 8, immediately below), suggests that the three articles were beginning to diverge into linking to articles that focused around distinct topical foci within the larger issue. In this visualization, node size is proportional to degree centrality (which is a measure of the number of links of a given node). The “Global Warming,” “Climate Change,” and “Global Warming

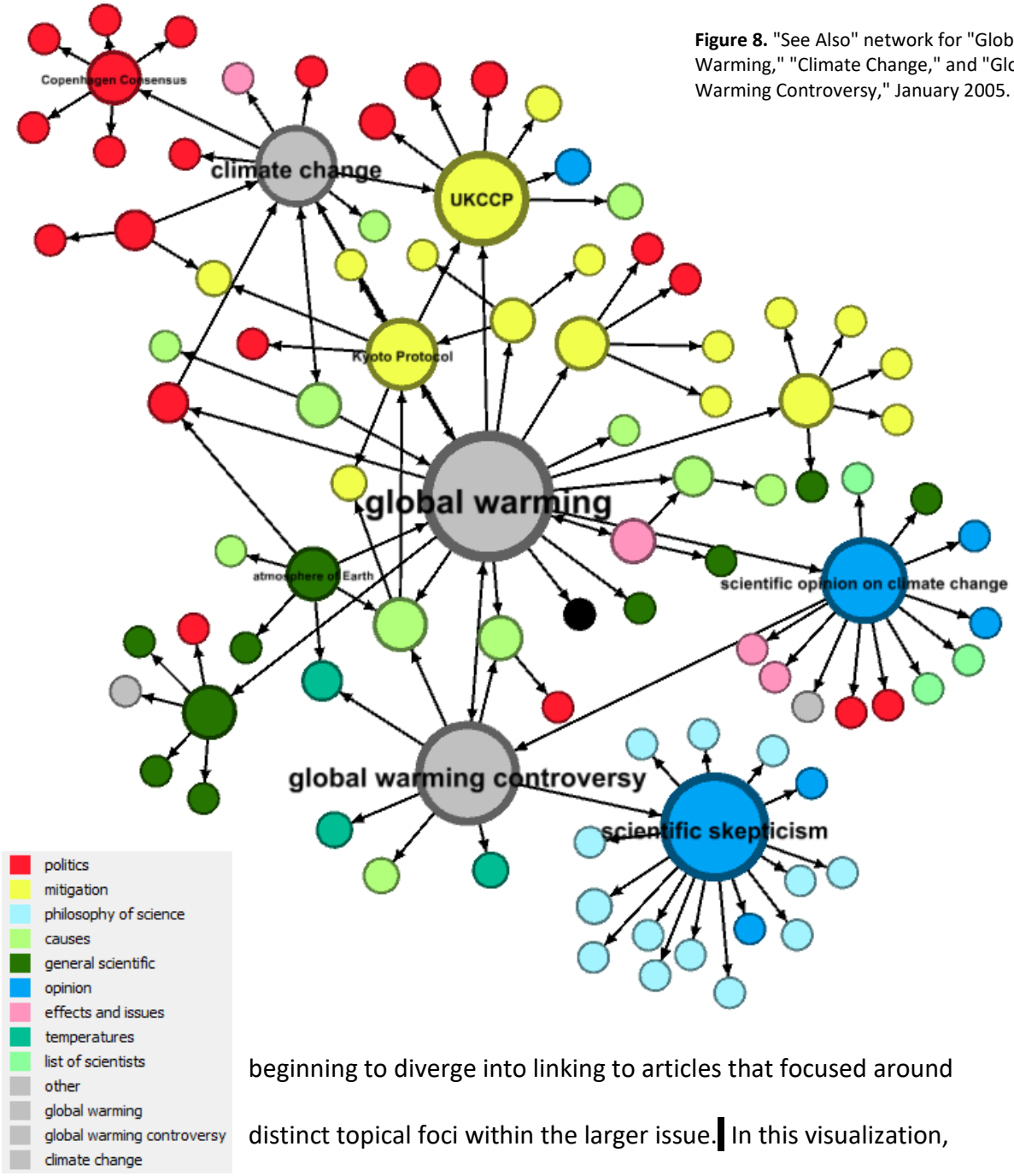


Figure 8. "See Also" network for "Global Warming," "Climate Change," and "Global Warming Controversy," January 2005.

Controversy" articles appear in grey; other nodes are color-coded according to the category label under which they were subsequently categorized in the "Global Warming Template," (see discussion below), thus representing Wikipedians' own categorization of this article topics. These codes appear in the key attached to Figure 3; they include *politics, mitigation, causes, opinion, effects and issues,* and *temperatures.* To these Wikipedian-generated categories, I added *general scientific*, *list of scientists*, and *philosophy of science,* because these articles were not subsequently included in the template and could not be assigned Wikipedians' own categorizations relevant to the topic area.

The color-coding in Figure 8 makes visible how the topics of linked-to articles diverged at this time. "Climate Change," in the upper-left corner, is predominantly linked to articles related to *politics* (red; examples include "Copenhagen Consensus" and the "United Nations Framework Convention on Climate Change"); *effects and issues (*pink; e.g., "sea level change")*,* and *mitigation* (yellow; e.g., "United Nations Climate Change Programme,"[UKCCP] "Kyoto Protocol")*.* These topical concerns are all related to global warming's *effects* and heavily concerned with political and governmental responses. In contrast, "Global Warming" (in the center of the graph) also links to mitigation, but also has more links to *causes* (lime green; e.g., "Greenhouse Effect"), *general scientific concepts* (dark green; e.g., "phenology," "atmosphere of earth"), and to *opinion* (royal blue; e.g., "Scientific Opinion on Climate Change" at the lower right of the graph.) The "Global Warming Controversy" article is similarly more heavily linked to *causes*, *temperatures* (blue-green; e.g., "historical temperature record"), *opinion*, and

philosophy of science (light blue; e.g., "scientific revolutions"; "protoscience." *Philosophy of science* nodes in this graph are attached to the "Scientific Skepticism" article in the lower right of the graph.) In contrast to the focus on effects, politics, and policy and governmental response, "Global Warming" and "Global Warming Controversy" are more heavily linked to pages concerned with describing scientific causes, providing concepts and data, and communicating knowledge grounded specifically within traditionally scientific bounds. A reader landing on the "Climate Change" article in 2005 and looking to relevant articles navigates through a space in which the phenomenon of climate change is predominantly a social and political issue; a reader navigating from "See Also" links in the other two articles, in contrast, can go more deeply into a technical world of causes, facts, data, and scientific knowledge-making. While the pages remained housed within the same sociotechnical system, accessible by the same material search tools, the conceptual worlds they link to at this time had begun to diverge into distinct areas. At the macro-level, this divergence represents a similar kind of *material displacement* of controversy that I discuss in preceding chapters. Much in the same way that the "Global Warming" and "Global Warming Controversy" articles diverged into citing different sets of external genres, these pages also linked to distinct spheres of information about the topic.

Following this early period of disparate uses of "See Also" links and resulting divergences in topical clusters, however, the community began to develop and integrate more hierarchically organized structures; these structures involved both developing classification schemes in a communally shared navigational template, as well as

integrating links to centralized indices, menus, and glossaries. While these organizational structures and navigational links helped bridge potentially divergent topical realms, their development *followed* rather than drove the organization of information across existing articles, and the development of overlapping and sometimes redundant structures created an increasingly complex discursive environment.

In 2006, an editor created a navigational template that could be easily inserted into articles in place of, or to supplement, "See Also" links; it aggregated topics related to the global warming content area. The original version, shown in Figure 9 to the left, was created for use in the "Global Warming" and related articles; it creates two simple categories of "Subtopics" and "Related Topics." All these categories were article-driven; each of the 12 links connect to an article extant at the time. This article-driven division into categories, however, conveys a counterintuitive logic to the would-be reader: "Greenhouse Effect," for example, is unrelated in this template to "Scientific Opinion," although scientists certainly had stances on its existence and relevance. Likewise, "Kyoto Protocol," the 1992 international treaty designed to create global standards for reducing greenhouse gas emissions, is "Related" to "Global Warming" whereas the category "Mitigation" (of which the Kyoto Protocol was then arguably the most widely-known example) is a "Subtopic," and no relation between the two is indicated in the template. Further, there is notably still no

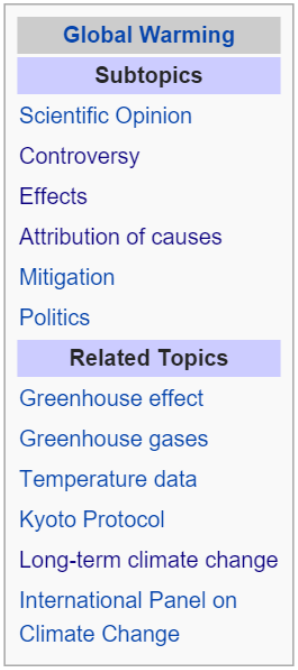
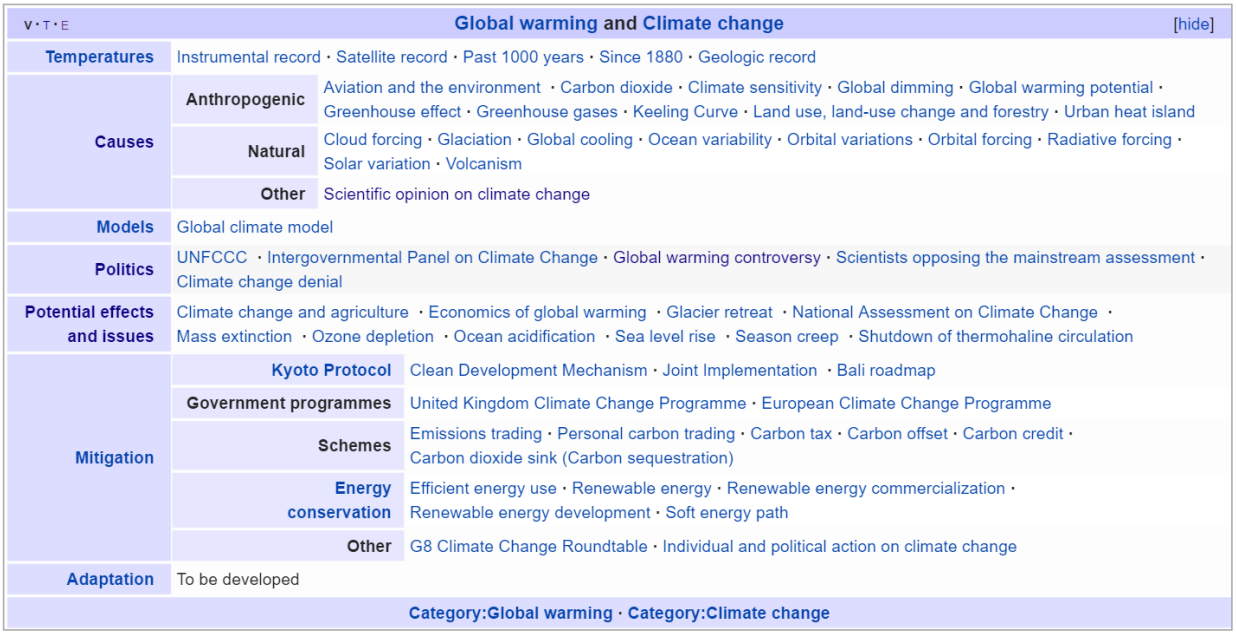


Figure 9. Original "Global Warming Template" in 2006.

link to the “Climate Change” article; this template thus neither acknowledges it as a relevant topic or considers the confusion it might communicate to readers in not doing so. This original version of the “Global Warming Template,” driven as it was by the existence of articles already written, unfortunately creates categories that risked confusing rather than illuminating relations in the topic area.

In subsequent years, however, as the template came to be integrated into the article ecosystem, it become increasingly complex. It developed its own organizational logic that began to be divorced from the bottom-up architecture of what articles existed and more hierarchically organized, with more links across the existing topic domains. By January 2009, the template had grown considerably, with some higher-level categories subdivided into subtopics (see Figure 10 below). For example, “Causes” was subdivided into “Anthropogenic,” “Natural,” and “Other”; “Mitigation” was divided into “Kyoto Protocol,” “Government Programmes,” “Schemes,” “Energy Conservation,” and “Other.” The navigational template thus came to look more like an index of related topics than a simple navigational menu. As in earlier versions, however, these categories were at times confusing or counterintuitive; for example, “Scientific opinion on climate change” is listed as an “Other” cause of global warming and climate change, suggesting to the reader that scientific opinion on the phenomenon somehow creates or influences it. Most notably, the highest-level heading for this template in 2009 includes both “Global



v · t · e	Global warming and Climate change	[hide]
Temperatures	Instrumental record · Satellite record · Past 1000 years · Since 1880 · Geologic record	
Causes	Anthropogenic	Aviation and the environment · Carbon dioxide · Climate sensitivity · Global dimming · Global warming potential · Greenhouse effect · Greenhouse gases · Keeling Curve · Land use, land-use change and forestry · Urban heat island
	Natural	Cloud forcing · Glaciation · Global cooling · Ocean variability · Orbital variations · Orbital forcing · Radiative forcing · Solar variation · Volcanism
	Other	Scientific opinion on climate change
Models	Global climate model	
Politics	UNFCCC · Intergovernmental Panel on Climate Change · Global warming controversy · Scientists opposing the mainstream assessment · Climate change denial	
Potential effects and issues	Climate change and agriculture · Economics of global warming · Glacier retreat · National Assessment on Climate Change · Mass extinction · Ozone depletion · Ocean acidification · Sea level rise · Season creep · Shutdown of thermohaline circulation	
Mitigation	Kyoto Protocol	Clean Development Mechanism · Joint Implementation · Bali roadmap
	Government programmes	United Kingdom Climate Change Programme · European Climate Change Programme
	Schemes	Emissions trading · Personal carbon trading · Carbon tax · Carbon offset · Carbon credit · Carbon dioxide sink (Carbon sequestration)
	Energy conservation	Efficient energy use · Renewable energy · Renewable energy commercialization · Renewable energy development · Soft energy path
	Other	G8 Climate Change Roundtable · Individual and political action on climate change
Adaptation	To be developed	
Category:Global warming · Category:Climate change		

Figure 10. "Global Warming Template" in January 2009.

warming" and "Climate Change" as the topics for which it aggregates links. The dispersal into separate areas of relevance that the earlier, ground-up development of "See Also" links is thus overcome by linking all the relevant sets of articles into one large indexical space that names both topics, although it maintains the two separate labels (and articles) as distinct rather than synonymous.

In moving to a more comprehensive, hierarchically organized approach, this template thus began to function as a "boundary object," an information object shared across different social worlds or communities of practice that allows coherence or communication across these disparate worlds without necessarily requiring that users resolve local differences in interpretive practices or information needs (Star & Griesemer, 1989; Bowker & Star, 1999; see also Star, 2010). As Bowker and Star explain:

> Boundary objects are those objects that inhabit several communities of practice and satisfy the information requirements of each of them. Boundary objects are thus both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use and become strongly structured in individual-site use. These objects may be abstract or concrete. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting communities. (1999, p. 297)

Berkencotter and Ravotas (1997) describe the *DSMIV* as a kind of boundary object insofar as it mediates between and across distinct mental health activities, such as diagnosing patients or discussing professional practice in professional journals or conferences. While the articles indexed by the "Global Warming Template" may all be edited by members of the same community, my earlier analyses of how "Global Warming" and "Global Warming Controversy" articles diverge (see chapters 2 and 3) suggests that editors enact site policies in different ways in different articles. Thus similar to the medical forms that Popham (2005) refers to as "boundary genres," the "Global Warming Template" functions to "satisfy the information requirements" of the disparate articles, bringing together links to potentially relevant articles without attempting to reconcile the divergent approaches to source-based knowledge that those distinct pages may have. As Bowker and Star explain, they "resolve anomalies of naturalization without imposing a naturalization of categories from one community or from an outside source of standardization" (1999, p. 297). These objects, classificatory systems that come to function as communication, thus allow a rapprochement between otherwise potentially divergent epistemic and discursive lifeworlds; for example, here "Climate Change" and "Global Warming" seem to have the same set of relevant pages, although the articles themselves may continue to link to divergent sets of articles.

Indeed, in 2009, the "Global Warming" article, in addition to embedding this template at the end of its article, also had "See Also" links to the "Glossary of Climate Change," "the List of Climate Change Topics," and "Paleoclimatology." The "Climate Change" article, in contrast, also linked to the "Glossary of Climate Change," the "List of Climate Change Topics," and to "Geoengineering," as well as to the "Environmental Portal." They template is *plastic enough* to be adapted to the needs of specific articles, but *robust enough* to be used across different articles.

In addition to functioning as a boundary object across potentially disparate article ecosystems, the "Global Warming Template" also structures and instantiates conflicts within the larger controversy. As a separate and portable text that indexes particular articles, this menu functions as what Giltrow (2001; see also Schryer & Spoel, 2005) refers to as a *meta-genre:* situated, potentially habitual language and activity that surrounds genres and may shape the genres themselves, such as teachers' talk about student essays or guidelines that regulate genre production. Such meta-genres, Giltrow observers, may "implicate writers in the struggles and conflicts of institutional systems" (2001, p. 91). Aside from maintaining "Global Warming" and "Climate Change" as separate topics and articles, the 2009 version of the template, through its visible structure, communicates a certain interpretation of the issue particularly in relation to what it indexes in the "Causes" section via the representation of *Anthropogenic* and *Natural* causes as separate-but-equal categories. The scientific community, in particularly the IPCC, by this point had reached a high level of consensus on the idea that global warming/climate change, as it is understood and discussed a political issue, is

anthropogenic — largely caused by human fossil-fuel emissions. Central in public and scientific debates, and often the source of confusion and doubt in public opinion is the question of whether the observed increase in global temperatures might be attributable to *natural* causes, such as variations in solar radiation or outputs of volcanic activity — those causes listed under this template's "Natural" heading. By putting these two categories side-by-side, with a nearly equal number of linked articles within each (ten articles under "Anthropogenic," nine articles under "Natural,") and no comment on the validity or viewpoints it indexes (though that may occur in the articles themselves), the 2009 "Global Warming Template" suggests that natural and anthropogenic causes are equivalently extant, valid, and acceptable. In doing so, it echoes the *slant* that various scholars attribute to representations of the issue given in the mainstream media who, in striving for fairness and balance, sought out scientists who disagreed with the scientific consensus on global warming and gave their views equal weight to that of organizations such as the IPCC in news coverage (Boykoff & Boykoff, 2004). A reader might easily infer from this template that there are as many natural causes of global warming as there are human-created ones. And this division into *anthropogenic*, *natural*, and *other*, created in the template's early history, remains in the template as it stands in 2016, although the categories now index some different articles. Editors seeking to update this template or add a newly created article about climate change causes are thus *implicated* into a choice over whether a cause is "Natural," "Anthropogenic," or "Other." Or they can seek to change the categorization itself.

Further, and notably in comparison to the endless, complex, and multi-party discussions that often characterize discussions in article talk pages and in AfD discussions, this template was developed with comparably little discussion from the community and few references to concerns over bias or the representation of viewpoints — that is, to significant community genre rules. Since its creation in 2006, only 26 separate discussion threads have occurred regarding the template, several of which are suggestions to include a topic that are floated and may be integrated but never extensively debated or discussed. One exception included an extensive debate over the appropriateness of including a link to the "Climate Research Unit e-mail hacking incident" in 2009, in which debate focused around whether such an article was too specific and "news-like" to include in a "high-level template." The only discussion regarding the anthropogenic *vs*. natural categories was a comment that these two were a false dichotomy, with the logic that human activity is "natural" too; this was settled by explaining that the articles themselves being indexed maintained the distinction, and no question of bias or neutrality was raised. This discussion thus further suggests how the existing articles function as a constraint in how information is categorized and organized in the evolving system.

There may be several reasons for the lack of discussion in the history of the template's development; in contrast to its extensive guidelines for editing article content, *Wikipedia*'s guidelines regarding the use of templates, lists, and indices are predominantly procedural and technical guidelines: suggestions for when and how to include them, provisions regarding legibility, but little related to bias or the need to

reference external or extant sets of menus or indices. The site seems to assume that its information architecture regarding the use of such organizing and navigational tools will be outgrowths of the organizational demands created by its articles and the communities that tend them. The navigational and sites indices related in the global warming and climate change-related articles that have bloomed inside this ecosystem are complex, and sometimes contradictory and overlapping; in addition to the "Global Warming Template," there are several other organizational tools and indices that serve comparable and potentially conflicting functions. Among them are a "Glossary of Climate Change," created in 2004, which is a list of article-linked terms and brief definitions, which aggregates terms ranging from the accessible ("aviation and climate change") to the highly specific and technical (e.g., "Heiligendamm Process" and "Maunder Minimum"); the "Index of Climate Change Articles," which is an alphabetized list of links to relevant global warming and climate change articles created in 2008; and a global warming Portal.[26] Any individual article may link to some or all of these indices; in 2010, the "Global Warming" article included links to all of these navigational pages, in addition to embedding the "Global Warming Template." Readers looking for relevant articles in the "See Also" section thus encountered a welter of navigational options with little visible clue or explanation to their utility or difference.

[26] Portals are article-like landing pages in *Wikipedia* that, as the site explains, "complement main topics in Wikipedia, and expound upon topics by introducing the reader to key articles, images, and categories that further describe the subject and its related topics." ("Portal: Content/Portals.")

Information Architecture, Genre Systems, and Global Warming's Publicity

I opened this chapter with an anecdote about wandering through a "bricks and mortar" bookstore looking for navigational cues about paths to take toward what I wanted, and making inferences about information based on how texts were labeled and organized. I invite you now to imagine for a moment a *Wikipedia* reader as what Warnick (2007; see also Manovich, 2001) refers to as a "spatial wanderer" in the site's global warming articles, and to consider what paths for reading and understanding they may be encouraged to take. If they landed on the "Global Warming Controversy" article in 2005, for example, the "See Also" links seem more likely to have led them to articles grounded in scientific discourse or scientific opinion, whereas landing on "Climate Change" might take them more toward information about climate change mitigation efforts. And if they looked to the "Global Warming" navigational template in 2009, they might easily infer that global warming has as many natural causes as human ones. These reading experiences, I have argued, are an outcome partially of how Wikipedians *take up texts* and *enact genre* across not only within individual articles, but across the larger sociotechnical system over time. These findings tell a significant story about how practices of textual uptake and genre enactment in systems develop and come to shape public discourse. They also point to important considerations regarding "what counts as reasonable" (Hauser, 1999) in contemporary publics.

First, AfD discussions show that uptake *residues* (Dryer, 2016) may heavily influence how new outside sources are taken up, and how topics are treated within the system of related articles. In the AfD discussions I examine, editors' arguments often

involve weighing the notability or importance of a new article against the content of an existing one; over time, previously written or well-established articles can subsume or obviate new ones. Although new articles may cite distinct sources, the sedimentation of uptake of previous texts — that is, that editors have already taken up, filtered, and written about source texts in other pages — shapes and constrains new uptake. This is, I argue, an aspect of the same structuring process that previous genre scholars (e.g., Yates & Orlikowski, 1992; Schryer, 1993; Yates & Orlikowski, 2002) attribute to how "stabilized-for-now" genre systems function. Over time, the interrelationship of texts itself structures the potential for novel articles, novel topics, or novel representation of sources. Through this process, the way controversy is handled – in this case, the global warming controversy – itself becomes "sedimented" inside this system. Insofar as *Wikipedia* articles themselves are significant sites of public discourse *because of how they take up and treat circulating texts*, this analysis tells us something important about how open systems can shape public issues: they can structure and influence the paths that texts take as they circulate publicly, and in doing so they can influence how issues discussed in those texts are perceived, represented, and understood by the public. And insofar as the public may treat *Wikipedia* as "curated" (Kennedy, 2016) collection of information sources about global warming, these paths can shape how those texts circulate and are taken up in the future.

In the conclusion to chapter 3, I referred to Phillips's (2009) argument that scholars of controversy should attend not only to how deliberative norms shape the public life of contemporary issues, but how dynamics of *space* and *displacement* may

shape them. My findings in the second half of this chapter further underscore this need: over time, the network of global warming articles seemed to diverge into distinct topical clusters. These clusters were connected by navigational templates that enable this divergence to be "bridged" but nonetheless remain in place. As I have argued, this displacement, as Phillips would have it, "bind[s] the contradiction as 'intractable' and recreat[es] boundaries" (1999, p. 495) around different problems within the larger issue. By entextualizing this displacement, these indices and templates may shape how subsequent editors choose to organize information, or take up and represent external sources that are circulating and relevant to the whole. And these navigational templates, unlike article content (or whether articles are kept or deleted), appear *not* to be discussed much; they appear to be *post hoc* efforts by individuals to help readers navigate the articles that exist. Nevertheless, these templates and indices create categories that can shape how readers interpret and navigate content. As my epigraph to this chapter suggests, these aspects of the *information architecture* that develops in online or open systems can be loci of influence in networked discourse, and examining their relationship to deliberative and discursive practices and textual circulation is an important aspect of inquiry into the lives of contemporary controversy.

At the same time, however, my analysis of editors' arguments in AfD discussions also contributes a notable phenomenon to studies interested in "what counts as reasonable" (Hauser, 1999) in networked public forms. While *Wikipedia* is not a strong, policy-making public, its public presence and its openness to public discourse nonetheless can shape how important issues like global warming circulate. In addition to

arguments that refer to site policies and genre rules, "what counts as reasonable" within arguments about which pages to keep, merge, or delete appears to be a kind of blended reasoning about outside sources, one in which genre names (*news reports*, *journal articles*, *books*) are used within a kind of *Google*-shaped quantitative reasoning about source numbers, reasoning that motivates decision-making in arguments. My previous chapters elaborated on how reasoning *about* genres shaped how sources are taken up. This chapter adds a new observation to the question of how argument shapes the way sources get taken up: that editors' reasoning about how to represent global warming as a topic, across different articles, is inflected by analyses of how many sources come up in *Google* search results. In recent years, scholars have devoted increased attention to how algorithms (such as those that govern *Google* search results) influence contemporary communication and knowledge-making practices (e.g., Goldman, 2006; Beer, 2009; Ingraham, 2014). Ingraham, for example, asserts that algorithms, "exert a persuasive influence upon what is held to be important or true in our social, cultural, political, and economic interactions" (63). This phenomenon is certainly evident in Wikipedians' reasoning over which articles to keep or delete, and it is perhaps most notable in light of the fact that editors appear *not* to be heavily influenced by available data about page readership during these interactions. *Wikipedia* pages all track the number of views that individual pages get; in the case of the "Climate Change Alarmism" article, the page had clearly been visited by a fair number of readers, but editors rarely or never mentioned this. Wikipedians' decisions about what topics are worth covering, and how they should be treated, are focused heavily on how they

"curate" the knowledge circulating in outside sources, but not on what the public audience may want, or on how their choices may influence that audience and its reasoning. Both their use of *Google* search algorithm results in their reasoning and their lack of attention to audience point scholars interested in the dynamics of participation and reasoning in the public sphere toward a compelling question: how does the data available through algorithms shape the way public rhetors reason about controversial issues? How does it shape the way they represent them? My analysis provides a provisional answer, but it also suggests that further studies are needed of this question to account for the reasoning that characterizes argument in networked publics.

Chapter 5
Openness and Genre in the Era of Networked Publics

In chapter 1, I argue that the dynamics that characterize *Wikipedia* raise compelling questions for rhetoric and communication scholars, not only about its dynamics as an "open collaboration," but more broadly about how writing in *Wikipedia* calls for taking up and writing about externally circulating texts about controversial issues. Its openness to both *time* and to *anyone* lead us to wonder what happens to scientific controversy online when (ostensibly) anyone "gets a hold of it" and writes about it – and does so in conditions of perpetual open-endedness.

The problem of perpetual openness to *anyone* is often framed, in commentary about *Wikipedia* as well as online discourse more broadly, as a problem of *expertise* – particularly the expertise of those writing articles (or more broadly, making some public assertion online). Few have articulated this problem with as much angst as Tom Nichols, author of *The Death of Expertise* (2017). In a *Federalist* article of the same name that preceded his book, Nichols wrote, "I fear we are witnessing the 'death of expertise': a *Google*-fueled, *Wikipedia*-based, blog-sodden collapse of any division between professionals and laymen, students and teachers, knowers and wonderers – in other words, between those of any achievement in an area and those with none at all." Nichols worries that the easy availability of information made possible by the Internet has created a paradigm in which expert knowledge is too often rejected, challenged, or

ignored by the less knowledgeable – a trend he refers to as both "silly" and "dangerous" (2014, para. 4-6). Others have raised similar concerns about the role of expertise in the *Wikipedia* era, though in less dramatic and dichotomizing terms. *Wikipedia* co-founder Larry Sanger, for example, has repeatedly challenged or critiqued *Wikipedia*'s relationship to experts.[27] For example, in a 2009 article in *Episteme,* Sanger acknowledges that *Wikipedia*'s success as an online resource and the generally strong quality of articles[28] attest to the value of *Wikipedia*'s openness, which grants access to a maximal number of workers worldwide who can help improve it. He argues, however, that certain trends in community dynamics suggest that experts can and do have crucial roles in *Wikipedia*. Specifically, Sanger argues that a)many experts do still contribute to *Wikipedia* articles, which may partially bolster their quality; b)that article quality is sometimes eroded by non-expert contributors who aggressively edit and exert control over some articles, to the detriment of article quality; c)that *Wikipedia* policies are ill-equipped to address these situations, because the consensus-based model of decision-making in the site refuses to attribute greater epistemic authority to some editors over others based on their background (for example, by saying that someone with a doctorate should have more say in such disputes than someone without one); and

[27] Sanger's position on expertise in *Wikipedia* also characterized his involvement as a co-founder. *Wikipedia* grew from a predecessor site the two created named *Nupedia*; Sanger originally envisioned *Nupedia* as an online encyclopedia entirely written by experts and involving a review process. When progress on *Nupedia* was slow at its outset, the project moved to Wikipedia with the expectation of a model in which members of the public would write articles that would then be reviewed by experts; however, few experts were interested in participating and the number of non-expert writers and contributors soon outstripped the number of experts available to review or contribute. After working for a period to edit and coordinate editors of articles, Sanger eventually left the project partly due to the degree to which it marginalized or abandoned the role of experts he had originally envisioned. Sanger has often voiced criticism of *Wikipedia* since leaving the project.

[28] An oft-cited study published in *Nature* in 2005 compared the number of factual errors in *Wikipedia* to those of *Encyclopedia Brittanica* articles; based on a review of 42 articles, *Nature* found that "the difference in accuracy was not particularly great: the average science entry in Wikipedia contained around four inaccuracies; Britannica, about three" (Giles, 2005, p. 900).

consequently, that d)a model that enabled subject-matter experts to arbitrate such disputes would help ameliorate the resulting detriment to article quality. In this way, Sanger holds that *Wikipedia*'s success *doesn't* support the idea that experts are no longer necessary or valued in an era of open-source knowledge production, but rather that they *can* and *do* have crucial roles in maintaining the validity and reliability of knowledge.

Other scholarship focused on expertise sometimes suggests that *Wikipedia*'s success in knowledge production represents a move away from epistemic models that focus on expertise as an attribute of *individuals*. For example, Hartelius (2010) argues that *Wikipedia*'s success despite its openness – that is, despite not being written entirely by experts – suggests that *Wikipedia* represents what she refers to as *dialogic expertise* in which knowledge is produced through an ongoing process of dialogue: "its dialogic form of expert epistemology facilitates an ongoing and 'unfinalizable' interaction, a process whose product remains open and 'live'" (p. 516). This openness, as she points out, nonetheless allows for the maintenance or development of hierarchy or power structures, including variations in participation related to gender, race, and class. Being open to "non-expert" contributors, in other words, does not automatically mean that *Wikipedia* has inaugurated an era in which pure egalitarianism has replaced the unequal power dynamics that may have historically inflected knowledge production and circulation.

This dissertation approached the problem of openness in *Wikipedia* with a similar interest in how it may shape public discourse and knowledge particularly around

high-stakes public issues, but from a different lens. It focused not on how openness to anyone may lead to troublesome outcomes when "non-expert" authors get to write about scientific or technical knowledge in public, but rather on how the particular dynamics of genre enactment and source uptake are inflected by *Wikipedia*'s openness, and how those dynamics specifically shape the "truth" or knowledge it makes available to the public. This is not to ignore or side-step the question of expertise, or to suggest that considering the kind of "truth" *Wikipedia* makes available to the public can be easily divorced from an analysis of the background or credentials of article authors. Rather, this lens helps draw into focus different aspects of the rhetorical and composing dynamics of *Wikipedia*, and how they shape the work of representing knowledge about global warming for the reading public. In doing so, this project helps document what *Wikipedia* and its openness might suggest about processes of knowledge-circulation, deliberation, and facticity around controversy – both in open collaborations and possibly in networked discourse more broadly.

In chapter 1, I explained that the *Wikipedia* genre rules of "Verifiability" and "Neutral Point of View" create a particularly tricky exigence for writing, given *Wikipedia*'s openness: editors face the task of finding, evaluating, and writing about the plethora of sources about global warming information that circulate publicly. This task is complicated not only by the fact that new sources may become available at any time, but also by the fact that *Wikipedia*'s temporal openness means that editors may engage in these research and writing practices on differing, or un-coordinated timescales. So, for example, a new editor may encounter an article online that the editing community

had previously dismissed or discussed, and try to write about it, or argue it should be included. Such efforts can disrupt previously-established consensus, and can (and do) lead to talk page conflicts and edit-warring. This process is further complicated for a topic area such as global warming, which is both highly controversial and broadly draws on discourse from virtually every field, from scientific knowledge, to policy and media discourse, to personal or local decision-making.

In subsequent chapters, I traced how editors respond to this exigence and enact genre by tracing talk page arguments (chapter 2), the text of articles themselves (chapter 3), as well as the larger ecosystem of global warming-related articles in the site (chapter 4). In chapter 2, I document how Wikipedians' arguments on talk pages about how to take up and represent externally circulating sources about global warming unfold through 2007, in the wake of the publication of the International Panel on Climate Change's Fourth Assessment Report (IPCC AR4). These arguments involve not only *boundary work* that distinguishes between legitimate and illegitimate sources of global warming knowledge, but also – and importantly – arguments *about* genres and how to negotiate relationships between them. That is, in debating the neutrality of propositions about global warming that are represented in the corresponding articles, Wikipedians are not simply engaged in rational-critical debate aimed at reaching argumentative consensus about the validity of these propositions. They are arguing about the legitimacy and value of *the genres through which* these argumentative propositions circulate – news articles, journal articles, technical reports, and so on. These arguments *about genre relationships* shape how genre uptake occurs within

articles. Thus, this chapter contributes to scholarship that investigates how argumentation practices shape discourse in the public sphere.

In chapter 3, I showed how openness shapes the text of articles by tracing how *Wikipedia*'s representation of the scientific consensus about global warming shifts through the course of 2007, in the months following the publication of IPCC AR4. This analysis demonstrates how the arguments I trace in chapter 2 translate into observable changes in article texts. Over and over, editors appear on talk pages and disrupt previously settled editorial decisions by arguing that particular external genres – such as a news article, or a text such as the Oregon Petition – suggest that a proposition about global warming's existence and causes as it appears in the articles' lead sections needs to be revised. As a result of these arguments about genre, the facticity or certainty of these propositions as they appear in articles was reduced through the course of the year. Specifically, I drew on discourse analysis to demonstrate how the incursion of multiple voices into statements reduced their facticity, and rendered the consensus about global warming's existence and causes less certain for readers of both the "Global Warming" article and also the "Global Warming Controversy" article. Arguments about genre thus contributed to undermining or challenging both the editorial consensus in talk pages about how to represent global warming knowledge, and also the degree to which propositions *about global warming* as represented within the articles themselves were represented as having broad consensus within the scientific community.

In addition to demonstrating how boundary work and arguments about genre and circulating sources affected the way global warming facts were represented in

article leads, I also addressed the question of how, and whether, any stability develops in how these topics are treated, despite the potential for instability. Through chapters 2 and 3, I documented how, in a fairly short time (the space of one year), boundaries develop between the types of sources cited between the "Global Warming" and the "Global Warming Controversy" article, with "Global Warming" becoming increasingly "about" *the science* of global warming, by virtue of both the texts it cited and also the way information was represented in the article itself. At the same time, "Global Warming Controversy" became more about public, media, and policy discourse about the topic, and less "about" the science itself. As I emphasize, the two articles came to draw on and represent distinct epistemic spheres or lifeworlds. These divisions arose through, and in tandem with, editors' arguments that did boundary-work to divide science from non-science, arguments that they had to make repeatedly through the year. As time passed, this interplay of argument and writing-from-sources became more settled, partly because editors could draw on arguments from precedent (that decisions had been previously settled, and the articles had already been written in a particular way) to rebut future threats to this provisional stability in how these two articles were written. Long-term editors, who showed up repeatedly to make similar arguments, appeared to play a key role in this structuring process. Further, chapter 4 provides an expanded view that documents a similar process, in which the articles themselves (and their established content) came to function as constraints on how new articles were written. I show how boundaries in these two articles were also increasingly structured and stabilized as they became entrenched in the larger information architecture of the

article ecosystem. In the following sections, I elaborate on how these findings contribute to scholarship in the public sphere, argumentation, and genre, and I suggest potential future research directions that build on this work.

Future Directions: Genre Arguments in Networked Public Discourse

While it is tempting to suggest that arguments about genre interrelationships are most likely to arise in similar collaborative writing contexts, ones in which multiple editors must collaborate over how to write from sources, *Wikipedia*'s openness and responsiveness to circulating texts are features that can be said to characterize networked discourse more broadly. In drawing on a genre lens to analyze how the work of taking up and writing about external sources shapes *Wikipedia*, this work has contributed to scholarship that considers how genre uptake, genre enactment, and intertextuality may intersect with deliberative practices to shape public discourse. As I point out in chapter 1, theories of the public sphere have long pointed to the constitutive role of circulating sources and intertextuality in publics and public discourse. Wikipedians' arguments *about genre* that I document in chapters 2 and 4 suggest that such analyses of how public discourse involves argument and discourse *about genre interrelationships* is likely to be an important component of tracing the discursive resources that public actors use as they participate in both consensus-building and controversy online.

Several recent controversies provide examples of the potential future directions of this focus on genre uptake, genre argument, and its relationship to public discourse and controversy. The "Climategate" scandal is one such example. In 2009, hackers released over 1,000 emails, 2,000 documents, and other material taken from a server at the Climatic Research Unit (CRU) at the University of East Anglia and published them on various online public forums. According to climate skeptics, these emails purportedly showed that researchers' findings were biased or politically motivated, and that climate researchers had deliberately skewed or manipulated data that might otherwise have undermined the scientific consensus about global warming. The emails were widely recirculated, and multiple quotations from the emails were publicly recontextualized by controversy participants ranging from online bloggers to U.S. senators who have historically been skeptical of climate science. The validity of the scientists' findings, their authority and legitimacy, and the larger consensus about global warming were called into question by the incident. In response to the leak and the subsequent public discourse, multiple scientific societies released statements reiterating the validity of the findings of the climate community, defending the scientists' practices, and in some cases, dismissing characterizations of the emails as inappropriately decontextualized and as misunderstanding the nature of how scientific discourse circulates in academic discourse and through academic genres such as journal articles. Multiple organizations conducted inquiries into the incident, all ultimately finding that no misconduct or fraud had occurred amongst the researchers whose emails had been leaked. However, the

incident did involve calls for greater transparency and accessibility in scientific documents.

This incident — involving the "making public" of genres that had previously circulated within closed professional and technical circles — prompted public controversy and debate over the validity of professional knowledge-making practices and, in tandem, the knowledge purportedly produced through those practices. Similar dynamics have shaped more recent controversies, such as the publication of the grand jury documents in the Michael Brown shooting case. As with the "Climategate" controversy, this incident involved public responsiveness and discourse about particular professional genres in a manner that drew into question the professional legitimacy of, in this case, legal institutions and their deliberative outcomes. And, of course, in recent years, discussions over "fake news" and public circulation of faked or fraudulent news reports have contributed to public debate over what genres and practices actually constitute legitimate journalism, and how the public should respond to or interpret knowledge disseminated through potentially fake news sources.

All of these incidents involve "concatenations of texts through time" (Warner, 2002) that create opportunities for the public to negotiate questions of professional or disciplinary legitimacy, potentially involving public analyses and interpretation of *genres.* Indeed, Knievel (2008) might point to the Climategate scandal or the Michael Brown controversy as *focusing events* in which public incidents translate into public pressure to revise or revisit genres that have traditionally circulated within institutions rather than publicly.

The analyses of arguments about genre in this dissertation contribute to scholarship that seeks to document how genres shape public controversy. In chapter 2, I demonstrate how Walton's (1997) argument from expert opinion, particularly his framework of critical questions for interrogating arguments from authority, might be adapted as a baseline framework for analyzing arguments *about genre,* particularly during controversies in which textual authority is an issue. Based on a single case of arguments about global warming in *Wikipedia*, this framework is necessarily provisional. Future work might build on this preliminary framework to further explore the types of argumentative resources deployed by members of the public as they take up and argue not just about *propositions made in texts,* but about how the genres within and through which propositions circulate shape how the public can and should interpret them. Such inquiry would contribute not only to scholarship in controversy and boundary-building in the public sphere, but also to scholarship interested in scientific popularizations (e.g., Fahnestock, 1986; 2004; Myers, 2003). Such scholarship has long documented how propositions – including their levels of certainty and facticity – are reshaped as they are recontextualized from scientific, technical, or expert-oriented genres (like journal articles) to more popular genres (such as news articles, magazines, or blogs) (e.g., Fahnestock, 1986; 2004; Luzón, 2013). In an environment like networked discourse, in which practices of uptake and recontextualization are often accompanied by comment or commentary (such as in social media or through social networking tools), analyzing how arguments about genre shape these popularizations or their reception can help

account for the interstitial spaces between texts, and how intertextual or intergeneric relationships are shaped and unfold.

Boundaries and Structures in (Open) Systems

This dissertation also demonstrates how analyses of rhetoric, argumentation, and genre interrelationships can contribute to understanding how symbolic boundaries and structures may develop in similar open collaborative systems, as well as genre systems more broadly. Among the defining components of open collaborations, according to Forte and Lampe (2013), is that they "support the emergence of persistent but malleable social structures"; they elaborate that "participants define and maintain these structures and collective goals in an ongoing fashion" (p. 2). "Social structures" may incorporate a range of practices; Forte and Lampe give the example of centralized administrative or governance structures, such as the myriad *Wikipedia* policies that outline not only goals for article content, but also guidelines for editor behavior and collaborative practices. My analysis of the development of boundaries within the ecosystem of articles related to the global warming topic suggests that a rhetorical view of how argument and boundary-work shape the way information is presented in the site may complement efforts to account for how structures in open systems are developed and maintained. For example, in chapter 4, I showed how the existence of older articles function as a constraint on what new articles are kept or developed; these structures of information and writing shape not only the information that is available to readers, but

also what editors can contribute or work on. Further, this project demonstrated particularly how a *genre* lens can help account for how editors may approach the task of writing and editing *Wikipedia* articles, and how they engage in collaborative goal-setting or consensus building, or how and why controversies develop among editors within the site itself. Future work might investigate whether the processes that I document within the global warming articles in *Wikipedia* also shapes similarly controversial topic areas within *Wikipedia*. Future work might also draw on a similar combination of argument analysis and network analysis to trace the relationship between argument and the development of informational structures and information architecture in similar open collaborative systems, such as open-source software development (e.g., *Firefox*); open - mapping systems (e.g., *OpenStreetMap*); collaborative, "citizen science" initiatives (e.g., *Naturewatch*); and collaborative journalism initiatives such as the Panama Papers project (https://www.icij.org/investigations/panama-papers/).

Teaching with Wikis and *Wikipedia*

Finally, further research expanding on this project might explore the potential pedagogical value of instructing students in types of arguments about genre relationships, and their relationships to how sources are taken up in articles, in an effort to help develop their meta-awareness about the relationship between genre, writing from sources, and their critical literacy of information on the Internet. Since wiki technology has become easily accessible to a range of would-be collaborators, much

scholarship to date has focused on the potential pedagogical value of wikis and *Wikipedia* for teaching practices of collaboration, revision, or for developing students' sense of writing for authentic online audiences (e.g, Forte & Bruckman, 2006; Purdy, 2009; Tardy, 2010; Schulenberg, Davis, & Klein, 2011). More recent scholarship explores *Wikipedia*'s potential value in developing students' information literacy (e.g., Sormunen & Lehtiö, 2011; Forte, 2015). Forte (2015), for example, argues that the proliferation of Web 2.0 technologies that enable open public creation of online information requires that students develop skills for assessing the credibility of information they find in such environments. In a study requiring students to contribute to a public wiki about science articles, Forte tracked how students understood and assessed online sources as they worked to contribute to this wiki. Her findings suggest that collaboratively writing in wikis can support students' skills and strategies for assessing sources online.

With a similar goal of helping students develop a critical awareness of online sources, as well as their own writing-from-sources practices, future studies might explore particularly how a pedagogy that addressed the types of arguments *about genre* that I document in chapter 2, and the corresponding sentence-level revisions to article texts that I document in chapter 3, might help students develop a meta-awareness of the relationship between sources, genres, and how writers represent external sources within texts through the use of lexical elements such as reporting verbs. Genre learning, particularly developing a meta-awareness of genre and its relationship to writing, is increasingly taken as an important aspect of supporting students' ability to approach novel writing tasks, or transfer their learning from first-year writing (or writing courses

more broadly) to novel contexts and writing situations (see Beaufort, 1999; Devitt, 2007; Clark & Hernandez, 2011; Nowacek, 2011; Reiff & Bawarshi, 2011; Wolfe, Olson, & Wilder, 2014). However, less work has considered particularly how genre awareness or genre learning may particularly intersect with or influence students' ability to integrate sources during research or reading-to-write tasks. While this current project does not have a particular pedagogical focus, it suggests that reasoning about genre inflects how writers approach collaborative writing-from-sources tasks; future work might investigate how reasoning about genre and its relationship to writing from sources may support both students' critical literacy as well as their ability to effectively integrate sources in their own work. Such inquiry may be important for continuing to support students' development of critical and agentive writers in the networked era.

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