Greenwashing as Grassroots or No Roots Social Movement: A Multi-Platform Approach to Social Media Monitoring of Hashtag Activism

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This article discusses the use of the #greenwashing hashtag around the issues of sustainability, climate change, and other environmental concerns of which greenwashing is a part. The article addresses the question of whether anti-greenwashing constitutes an organized social movement or is a grassroots effort that follows the ebb and flow of events as they arise and fall during the year? The multi-platform approach taken in this study analyses the discourse around key topics driving #greenwashing exploring the issue of greenwashing through an analysis of social media, including Facebook, Instagram, Reddit, and Twitter, as well as an analysis of the spread of greenwashing related stories on news media. The findings demonstrate that interest in greenwashing is tied to key events during the year, like Earth Day and COP26 but that interest is diminished to "normal" levels at other times. The absence of toxicity in the language of social media posts does not support strategic amplification, a tactic to boost interest in an issue, and an analysis of the polarity of sentiment regarding social media posts did not find support in either negative or positive feelings expressed.

Keywords: hashtag activism, social media monitoring, greenwashing, climate change, sustainability

M any corporations have positioned their products and services as "green," taking up the pro-environmental messaging of corporate social responsibility (CSR). However, the ambiguous nature of "green" has led to controversy as some corporations and other organizations use such positioning to mislead consumers, and have been charged with greenwashing, a pejorative term to describe those who have taken advantage of pro-environmental messaging, misleading consumers about the use of green production processes and use of green materials or natural resources to align themselves with sound environmental practices. The present study investigates greenwashing as a contentious network in which individual rights aligned with environmental and sustainability causes are pitted against corporate interests that create tension that is on display in the media ecosphere. The

present study views the issue of greenwashing through the lens of social media platforms to consider the discourse that takes places around the competing messaging around the greenwashing issue. The broad question raised in this research regards the degree to which anti-greenwashing is an organized social movement or merely a trending topic.

LITERATURE REVIEW

Social movements as Fuchs (2006) describes them are self-organized, going beyond mere trends. But for those movements to build beyond a short-lived trend resulting in a lasting impact, social movements are likely to follow stages that move from emergence to institutionalization. In the digital age, social movements take on forms that extend beyond in-person protests, as Gerbaudo (2012) describes "tweets on the streets" or other forms of activism to include more passive forms of engagement, characterized as slacktivism because all one needs to do to engage on an issue is to write a post or publish a photo or video to social media platforms with a hashtag hoping it will go viral or at least for a time amplify the issue. Hodson et al. (2018) express concern that environmental activism has to an extent adopted this form of passive participation, as Twenty-first Century digital activism may be characterized by performative behavior that requires little effort to engage on an issue. Treré (2019), who investigated the "grammar of protest" that he applied to several social movements, argues for a hybrid approach that involves both physical presence as well as digital engagement on a social issue. Furthermore, the goal of using digital media should not make it the sole place for a movement to emerge and perhaps grow but should serve to amplify an issue and move people from online to activists offline, as would be the case with the 2011 Arab Spring and Occupy movements. Hashtag activism may serve in the short run to draw attention to, that is temporarily amplify, an issue, building awareness and knowledge, and such content may serve as a launching pad for a movement to emerge and grow.

Social media platforms have much to do with structuring or restructuring networked publics that are at once a collection of people or rather collections of people that form ties on social media platforms. The messiness of the architecture of different stakeholders, as boyd (2010) describes it, depicts a discourse around a topic or issue made up of competing ideas. For example, the hashtag #BlackLivesMatter was initially posted in 2013 as a condemnation of the Florida verdict that acquitted a white man of murdering

a young Black man, but the hashtag didn't become a calling card of sorts for the movement until another young black man, Michael Brown, was killed by a police officer in Ferguson, Missouri. The Pew Research Center reported that the hashtag went from 5,000 to 60,000 tweets per day. And, by the time the police officer in that incident was acquitted the hashtag garnered two million tweets in a three-week period (Pew Research Center, 2016). This is just one of many hashtags, including the countermovement #BlueLivesMatter, that gained notoriety, examples of the digital approach to protest that illustrates the ebb and flow and in that the dynamics of social movement development that may in part be fueled by social media. Beyond individual engagement on an issue, mainstream media are networked publics too, and they serve an agenda setting function as they pay attention to and perhaps wittingly, or unwittingly, promote heightened emotions that are sometimes associated with social media posts and the networked publics or influencers that seek to strategically amplify varying positions on an issue.

Blumer (1969) identified three antecedents for a social movement to emerge including a perceived threat, an opportunity to act, access to resources, and a unifying message. Those antecedents fit within Blumer's four stages of social media development beginning with social ferment, then moving on to popular excitement, formal organization, and finally the institutional stage where the movement becomes ingrained in society, operating within a professional structure. Christiansen (2011) also identifies the following four stages of social movement development: emergence, coalescence, bureaucratization, and decline, although the latter should not be read as an indication of the end of a movement. Moyer (1990) presents an eight-stage model of social movements through which he characterizes activist roles within a movement as rebels, reformers, citizens, and change agents, although these roles may not always work together in consort growing a movement. And, Fuchs (2006) describes two approaches to social movement theory, the European New Social Movement approach (NSM) and the U.S. resource mobilization approach. In the NSM approach the focus is on gender, ethnicity, age, neighborhood, environment, and peace. The NSM approach distances itself from the state and market as it foregrounds the autonomous individual. The goal of the new social movement approach, therefore, is to reclaim individual rights against the larger system. When it comes to greenwashing, the topic of the present study, individual rights may be aligned with

environmental and sustainability causes, but they may be pitted against corporate interests and their lobbying efforts that create tensions in the media ecosphere in which competing discourses take place illustrating the struggle between competing messages and messengers.

Greenwashing as Contentious Network

As is sometimes the case, corporations, especially those practicing stakeholder capitalism or corporate social responsibility (CSR), seek to participate in movements that their constituents perceive as being for the social good. But aligning one's organization with a social movement has the potential to backfire on the organization when a growing mass of people determine that what a corporation is promoting may not in reality be what is truthful or accurate. In one instance, investment firm Fundsmith took on the consumer brand company Unilever for being too focused on sustainability issues at the expense of profits setting up a conflict between stockholder and stakeholder capitalistic practices (de la Merced, 2022).

The pro-environmental messaging regarding products and policies that some corporations promote may be misleading as they attempt to align the corporation with a consumer or social issue but may merely be taking advantage of an opportunity to enhance their public image. As a result of what some people believe to be misleading advertising and promotion has taken on a term of its own – greenwashing. Labeling a corporation as a greenwasher has the opposite effect of enhancing the corporation's image, rather it is more likely to breed skepticism and perhaps cynicism that may manifest as a call for a boycott or a critique that manifests as contentiousness on social media platforms. Venturini and Munk (2021) describe this as a contested area where issues like greenwashing are "staged in and by the media and are thus open for everyone to see and engage with" (p. 2). Corporate greenwashing presents an interesting paradox: on the one hand a company may seek to align itself with consumer or broader social interests in green production processes and use of green materials or natural resources and to do so, they intend to create positive messaging; however, on the other hand, a company at the same time may not live up to their own hype of exaggerated claims regarding their environmentally friendly practices. This paradox leads to a bit of a conundrum summarized in the phrase "speaking out of both sides of one's mouth."

Greenwashing is not a new phenomenon dating back perhaps to the 1980s, and it may serve as a proxy for other environmental issues, but it has come to the fore more recently as consumers have become more environmentally conscious, especially when it comes to global climate change and sustainability issues, and hence corporations and other organizations may seek to align themselves – jump on the band wagon, so to speak – with green activism (Miller & Maxwell, 2017; Pimonenko et al., 2020). Such corporate duplicity may not always be intentional, as the ability to sustain ecological friendliness is complex throughout the 5P's of marketing: product, price, promotion, place, and people. Perhaps because of this complexity, there are no over-riding guidelines or regulations to determine what is a green practice and what is not. The ambiguous nature of "green" makes the issue ripe for misuse. Laser et al. (n.d.) who studied #greenwashing found that "calling out greenwashing is a way to establish a critical account and a call for accountability. However, one key problem is that the discourse quickly lapses into superficial truth-politics and prefabricated critique patterns." This predicament opens the possibility for corporations, governments, and other organizations, even those with good intentions, to take advantage of consumer interests to market products and services that are manufactured in an ecologically unsound manner. It is the ambiguous space between what is "green" and what is greenwashing that opens a chasm between fiction and reality, leading to mistrust that in the digital age may turn greenwashing into a hot button issue. As an illustration of the problem, the EU Sustainable Finance Taxonomy, which was adopted in April 2021, was called into question as the new regulation "may permit gas, a fossil fuel, to be labelled as 'green,'" which ignores the effects of methane. The World Economic Forum states that the "taxonomy that was to be the standard to prevent greenwashing may itself become an enabler of greenwashing" (Spors, 2021).

The climate change crisis is taken up by empowered consumers who in the digital age can call out corporations, governments, and organizations when they are perceived to be greenwashing. The tension between corporate and consumer interests keeps the greenwashing issue alive as a contentious issue, particularly on social media, but the question raised by this research regards whether greenwashing constitutes an early, mid, or late stage organized movement in and of itself, or is it just one spoke on the wheel of environmental causes faced by global societies?

Social Media's Role in Movement Formation

Sometimes tension manifests between corporate, organization and government interests and consumers in the form of online activism on social media platforms like Facebook, Instagram, Reddit, YouTube, TikTok, and Twitter. There are various reasons why individuals take their grievances to social media, instead of the streets as with, for example, the Occupy movement, as posting to social media serves as a tactic to increase public engagement on an issue like greenwashing. And to be clear, the approach here is not to compare online activism to "in the streets" activism, although one can be fuel for the other. As such this study is about online mobilization as the object of research. Online activism presents an opportunity for the author of a post, tweet, image, or video to take a stand on an issue and through engagement perhaps to develop or join a community of like-minded thinkers on the subject. For example, Adi (2018) studied the #sustainability hashtag on Twitter, concluding that the platform played a role in the formation of community around the issue. As such the researcher suggests that social media play a role in illuminating "concerns, issues and key conceptual associations" around the issue (p. 99).

Hashtags serve as markers of group identity, even if the interactions take the superficial form of a "like," a reaction or response more akin to clicktivism than activism. Networks that form on social media are not monolithic as in the relatively open space of social media there is room for positioning and counter positioning in which actants in a social network take various sides on an issue (Rogers, 2018). Hashtags, therefore, are shorthand for what groups of people – networked publics – are thinking, a unique quality of social media. Such hashtags that spread and coalesce around an issue reflect the thoughts and beliefs that may be characterized as our virtual collective consciousness. As such when a person tweets, it is reflective of an individual's inner world turned outward to become part of the messaging in a social network. "To a degree the virtual collective consciousness represents the expression of what people are thinking turned outward in a spontaneous, synchronous manner within a social network" (Alperstein, 2019, p. 204). By studying online activism, researchers can gain insights into public opinion on an issue. Questions often raised include who are the posters, who are the frequent posters, what feeling (sentiment) is being expressed, as well as how does the content fracture into networked clusters based on common interests or competing interests that surround a

hashtag? Studying online activism also provides insights into the momentum or growth of the social network that forms around an issue and provides opportunities to determine the stage in the dynamic development of a social movement.

Although governments have played a large role in regulating the environment, for example in the U.S. through the Clean Air Act and Clean Water Act, both dating back to the 1970s, we can also see a relationship between such regulation and activists who drove the consumer movement during that time. By the second decade of the 21st Century, environmental issues have grown complex, global, and are subject to competing views of pro-scientific climate change and climate change deniers. Additionally, corporations play a significant role, some of whom operate with good intentions, while others may obfuscate environmental problems associated with the production, distribution, and marketing of products and services. Part of the problem that greenwashing presents is that it relates to myriad issues, many reflected in corporations' attempts at social responsibility. For example, concerns have been expressed over the fast fashion industry that is having an impact on "climate change, workers and farmers, animals on land and in the oceans" (Assoune, n.d.).

Although the issues related to the environment are not new, social movements around the problems of petroleum, water availability and quality, food production, just to name a few are being addressed by multiple stakeholders from nongovernmental organizations (NGOs) like Greenpeace to activists like Greta Thunberg's Fridays for Future movement. Approaches to "green activism" range from cooperation to confrontation (Lyon, 2012). Auld (2018) describes activists as "calculating actors that have the political aim of seeing their behavioral prescriptions and proscriptions widely promulgated and enforced in the global economy" (p. 35). From that strategic orientation, Auld (2018) describes three idea types, prefiguration referring to skepticism, cooperation referring to the ability of mass-market corporations to optimistically engage in transformation and targeting that he sees as somewhere in the middle of optimism and skepticism. Regardless of orientation, all transformations according to Auld take place within what he calls a "market context." It seems plausible to suggest that the market context could apply to media, in particular digital and social media platforms that provide opportunities for consumer generated content (CGC), given that social relations form as expressions toward

an issue manifest as tweets, re-tweets, posts, videos, photos, etc. Although the U.S. Federal Trade Commission (FTC) issued "green guides" that were last updated in 2012 for marketers to follow, greenwashing has continued to evolve beyond those guidelines, which focus on products, not companies (FTC, n.d.; Dahl, 2010). Social media platforms ranging from blogs to YouTube to more recently TikTok have taken up the greenwashing mantle but based on an understanding of Blumer's antecedents required to form and develop a social movement, this research seeks to understand the degree to which greenwashing is a grassroots movement or an amorphous term that is rooted in several interrelated environmental issues. This research offers a multi-platform approach to measuring online content regarding 1) attention over time given to the topic of greenwashing in the form of Google search behavior, media stories, and social media posts; 2) engagement with greenwashing related information in the form of social media metrics; and 3) the level of toxicity as well as an analysis of sentiment in social media discourse associated with greenwashing. The following research questions in the context of online activity surrounding greenwashing are investigated:

RQ1: What is the relationship between Google search behavior, media stories and social media posts about greenwashing and periodic events associated with environmental causes? This question is based on temporality of news and events that suggests that ebb and flow of topics in various media steer activism.

RQ2: Does the presence of green washing in social media coincide with engagement during peak times when stories appear in mainstream and digital media? This question is based on the ties between social media and other news media and the levels of engagement that serve as a gauge of the episodic focus on greenwashing.

RQ3: How is the use of strategic amplification a function of the use of toxic language in social media posts, especially during peak times when greenwashing is in the news? This question is looks at the use of toxic language as an attempt to gain visibility of the greenwashing issue and the use of toxic language to amplify voices on the issues of climate and sustainability.

RQ4: How does the polarity of sentiment expressed in social media posts direct the discourse in the direction of either positive or negative feelings on the issue of greenwashing? Investigating sentiment on social media posts regarding

greenwashing provides a means to investigate the expressions of feelings that serve as triggers for steering critical discourse on social media regarding greenwashing.

METHODS

The multi-platform approach taken in this study allows the researcher to identify media influence across different digital platforms, what Rogers (2018) refers to as online grounding. By comparing related topics or issues across media, this study can identify the features that undergird greenwashing as a collective phenomenon. For example, such a multi-platform approach was taken in a study of negative dominance of Covid-19 vaccine messaging on various social media platforms (Pascual-Ferrá et al., 2021). The research begins by looking at patterns of search behavior related to Google search for "greenwashing" worldwide from January to December 2021 using Google Trends. The value of Google Trends is that it provides measures of interest in search, what can be characterized as search behavior. Google Trends has been utilized in myriad studies as interest in big data emerged when the platform was established in 2006 (Seung-Pyo et al., 2018). Particular attention was paid to peaks in web, news, image, and YouTube searches for the term "greenwashing." Those peaks are indicative of a rising trend related to queries. Results marked breakout had the biggest increase, because they are new and have had few prior searches. It was important to this research to mark the events that corresponded with those peaks that might serve as drivers of attention.

Media Cloud, an open-source platform to analyze media stories of a topic over time, was a tool used to look at patterns of attention in media coverage from the U.S. top sources collection, the digital collection, and English global media collection for the same period as Google Trends. Media Cloud aggregates data from over 50,000 news sources from around the world and serves to analyze media conversations on three primary levels: attention and coverage peaks of issues, network analysis, and clustered language use (mediacloud.org). Media Cloud has been utilized in a wide-range of studies related to the Ebola epidemic, right-wing media ecosystem, the killing of Trayvon Martin, Russia's media ecology, among others (Mediacloud.org/publications, n.d.).

The research used CrowdTangle as a tool to access data on "greenwashing" and look for patterns of attention on Facebook, Instagram, and Reddit during the same time span (crowdtangle.com). CrowdTangle is a public insights tool owned and operated by Meta that

allows researchers to analyze these social media platforms across time. The Pascual-Ferrá (2021) study cited above utilized CrowdTangle as part of their multi-platform approach. Finally, the research investigated the use of the term greenwashing on Twitter. The initial data set was retrieved via the Twitter API using Communalytic as a tool to access the data during the period under study. It consists of 450 thousand tweets from April 18, 2021, through December 31, 2021. The following operators containing the word 'greenwashing' (greenwashing OR GREENWASHING OR Greenwashing OR #greenwashing OR #Greenwashing OR #GREENWASHING) were searched on Twitter. These words and hashtags do not represent all forms of discourses around greenwashing, the environment in general, climate change specifically, or other related or semi-related accusations on Twitter. As noted from the data on the breakout trends on Google search, there is no agreement on what the term greenwashing means or to what it refers, therefore, when someone engaged in discourse around fast fashion, for example, which has implications for the environment, posts a thread on social media they may use different words or hashtags other than greenwashing to characterize that issue. Nevertheless, the #greenwashing hashtag is reflective of the thoughts and expressive language utilized by people on social media and provides an understanding of what people are thinking about at a particular time when they utilize the search term or #greenwashing hashtag and demonstrates how networked publics form around the issue. The data from Facebook, Instagram, Reddit were analyzed based on interactions. The data from those three platforms and the tweets were analyzed using the Communalytic tool, measuring for toxicity and sentiment (Grudz & Mai, 2022). For example, Alperstein (2021) studied contentious politics of social networks utilizing the Communalytic tool. The analysis and observations in this article are based on four sources of data (see Table 1).

Table 1
Data Sources and Analytic Approaches

Data Sources	Analytical Approaches
Google Trends	Search behavior for greenwashing over one-year period for web search, news search, image search, and YouTube search.
Media Cloud	Collection of 4,036 media stories over one -year period. Media attention over time. Use of greenwashing related language in stories and story themes.
CrowdTangle	Facebook, Instagram, and Reddit interactions for posts including greenwashing. Additional analysis of sentiment and toxicity.
Communalytic/Twitter API	450K tweets that include greenwashing analyzed for sentiment and toxicity.

RESULTS

Figure 1 represents data for the term greenwashing from Google Trends regarding worldwide search behavior from January 4, 2021, through January 16, 2022. Figure 1 notes search for the term on the web, for images, news, and YouTube. The values range from 0 to 100, with the latter indicative of peak popularity of the term. Peaks in YouTube searches took place in April 2021 around Earth Day. In September another peak corresponds to the establishment of a new Green Claims Code from the UK Competition and Markets Authority (CMA) that is intended to clamp down on false environmental claims by businesses. The Code was launched in anticipation of COP26. Peaks in search also coincide with the 2021 United Nations Climate Change Conference, also known as COP26 which was held, October 31 through November 12, and climate activist Greta Thunberg called for a Global Climate Strike on October 22, both events of which likely explain the uptick in search during that period. Searches varied on different platforms, for example YouTube searches peaked in April, news searches peaked in September, and web and image searches peaked in October. Google Search data is more complex in that most related search queries, referred to as "breakout" centered on questions regarding the meaning of the term greenwashing or searches for a definition of greenwashing.

To explore greenwashing as the subject of news media a query on MediaCloud.org was conducted based on U.S. national media, U.S. top digital native sources, and Global English language sources for the months starting January through December 2021. According to its creators, "Media Cloud is an open-source platform for studying media ecosystems" (MediaCloud.org, n.d.). This is an important step in the analysis as news media, as is often the case with controversies, supply oxygen in the process of amplification (Phillips, 2018). What that means for greenwashing is that the amount of coverage makes the issue more prominent. This is an example of the sword cutting both ways, as amplification can work for consumer interests and against business, government, and organizational interests, but businesses all the while may attempt to align themselves with consumer interests, perhaps attempting to usurp negative reporting. From a consumer point of view, amplifying greenwashing may be intended to catalyze various aspects of climate change and sustainability activism under the greenwashing umbrella.
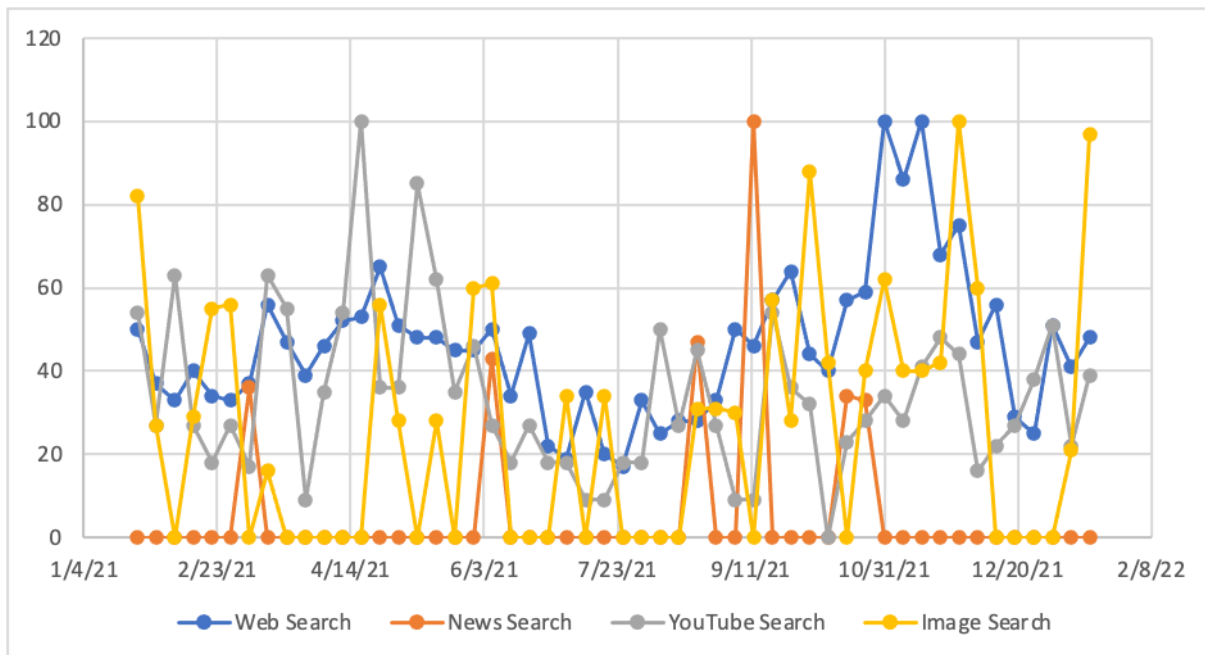

Figure 1 - Google Trends interest over time for "greenwashing" Worldwide

Based on the search query for greenwashing, Figure 2 shows the number of matching stories at both "normal" and peak attention levels. Media attention to greenwashing parallels Google search behavior during the same period of time. For both news media stories and Google search both peaked during the 2021 United Nations

Climate Change Conference, COP26, between October 31 through November 12. RQ1 raised the question regarding the relationship between Google searches, media stories and social media posts about greenwashing and periodic events associated with environmental causes. The peaks in Google searches on the topic of greenwashing demonstrate temporality of news and events reflecting the ebb and flow of interest. In terms of RQ1, peaks in Google searches and media posts run parallel to one another, associated with key events during the year.
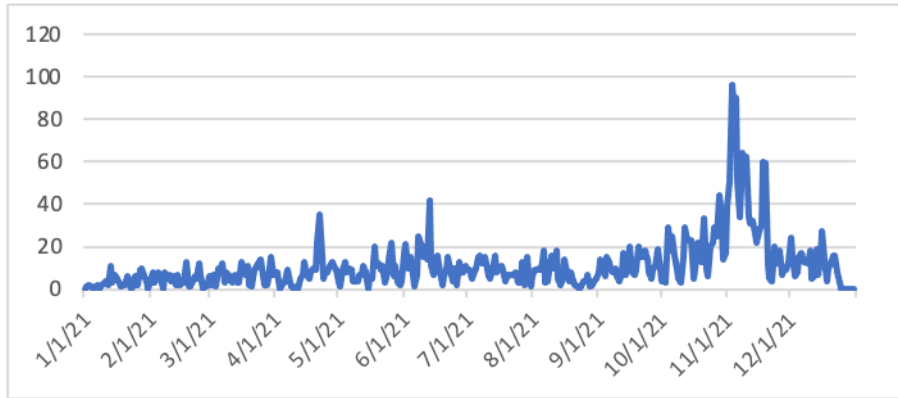
Figure 2 - Media Attention Over Time – Media Cloud Story Count

During the year-long period, there were 4,069 stories that included greenwashing either in the headline or body of the story. Media Cloud organizes stories based on themes indicating different narratives developing around the search term (see Figure 3). The larger the color circle, the more prominent the theme. The colored circle matches a particular theme, as in this case 47 percent of the stories were about the environment, followed by stories related to finance at 38 percent, global warming at 34 percent, and air pollution at 21 percent of stories that matched the query.
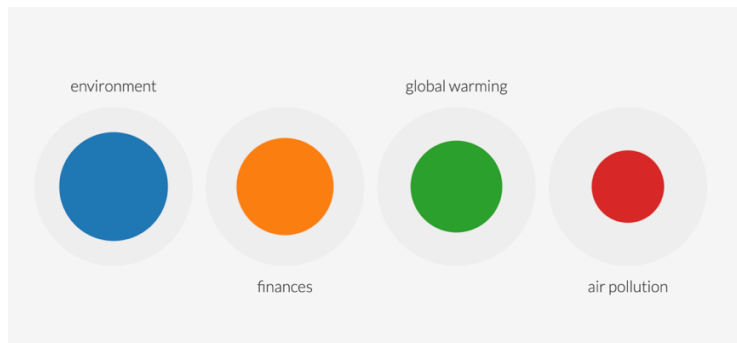

Figure 3 - Media Stories based on Greenwashing Themes

Another way of looking at the trends in greenwashing stories is through a word cloud that reflects the language being used and helps to identify how the issue is being talked about in the media stories. In Figure 4, the words shown in the cloud that are larger indicate those words are present in more stories. Greenwashing is the word most often found in stories, which is to be expected. But words that follow reflect myriad interests that range from corporate and financial interests, climate and sustainability issues, oil, gas, biodegradability, and so on.

Figure 4 - Word Cloud of Terms Connected to Greenwashing Stories

The cloud represents the diffuse nature of greenwashing, as there is no solid or single discourse that drives the issue. Rather there are a diversity of issues and topics that connect to greenwashing. The complexity of the concept, greenwashing, suggests it is difficult for individuals to rally around an issue that lacks a central connection or a clear definition of the issue.

Tables 2 and 3 identify the people most mentioned in greenwashing news stories, the organizations most mentioned provide additional information and insights into greenwashing. Table 2 indicates the names of people most mentioned in stories about greenwashing. For example, U.S. President Joe Biden is mentioned 378 times, climate activist Greta Thunberg is mentioned 353 times, and UK Prime Minister Boris Johnson is mentioned 246 times. Paradoxically, the names represent some views from extreme ends of the spectrum regarding the environment, climate change, and sustainability.

Table 2

Top 10 Names Mentioned in Greenwashing news stories*

Name in the News	No. of Mentions	Percentage
Joe Biden	378	5%
Greta Thunberg	353	4%
Boris Johnson	246	3%
Biden	176	2%
John Kerry	155	2%
Donald Trump	152	2%
Mark Carney	147	2%
Jair Bolsonaro	114	1%
Larry Fink	92	1%
Alok Sharma	88	1%

*7913 news stories

For example, Donald Trump and Jair Bolsonaro represent climate change deniers, while Joe Biden, Boris Johnson and John Carey are government officials who represent pro-science approaches to climate change. Greta Thunberg, the climate activist, who stands out as someone without an official title, is the second most mentioned name in news stories containing greenwashing as a topic. Mark Carney is the UN Special Envoy on Climate Action and Finance, and Alok Sharma is president of COP26 conference, which factors highly as a key marker for the greenwashing debate. Larry Fink shows up on the list as the chairman and CEO of BlackRock, an American multinational investment management corporation who is a strong advocate of stakeholder capitalism.

Table 3

Top 10 Organizations Mentioned in Greenwashing Stories

Organization	Number of Mentions	Percent
UN	650	17%
United Nations	455	12%
EU	390	10%
European Union	358	9%
ESG	346	9%
Shell	312	8%
Greenpeace	294	8%
Amazon	253	6%
U.N.	236	6%
BP	214	5%

The acronym ESG (Environmental, Social, and Corporate Governance) is a data-driven measure of a company's standing on non-financial factors, including social and environmental factors. ESG is the only non-organization that shows up on the list of top 10 organizations mentioned in greenwashing news stories (see Table 3). However, the other organizations represent either political bodies like the EU or the UN but also include Shell, Amazon, and BP corporations that have been accused of greenwashing. The activist group Greenpeace also shows up on the list. We can see from this data the tensions that exist as individuals and organizations compete for attention in news stories about greenwashing reflecting divergent opinions on this and related issues.

For the social media data, differences were observed by platform. Figures 5, 6, and 7 show the volume of interactions on Facebook, Instagram, and Reddit for English language posts from January to December 2021. The Facebook data (see Fig. 5) includes interactions with public pages, groups and verified accounts. The volume of interactions on Facebook peaked on April 9, 2021, at 40,379 and again on November 2 at 95,022 and November 5 at 39,580. The data showed similar peaks as was found in the Google Trends and Media Cloud data with peaks in April corresponding with Earth Day and October corresponding to the COP26 conference.
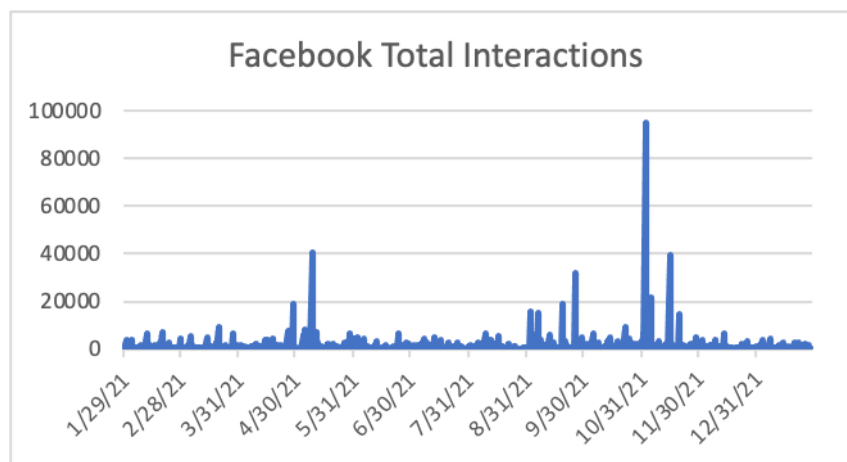

Figure 5 – Facebook volume of interactions 1/1/21 through 12/31/21

Figure 6 indicates that interactions on Instagram peaked during the COP26 conference at 3,987,798 interactions but returned to "normal" levels of interest during the year.
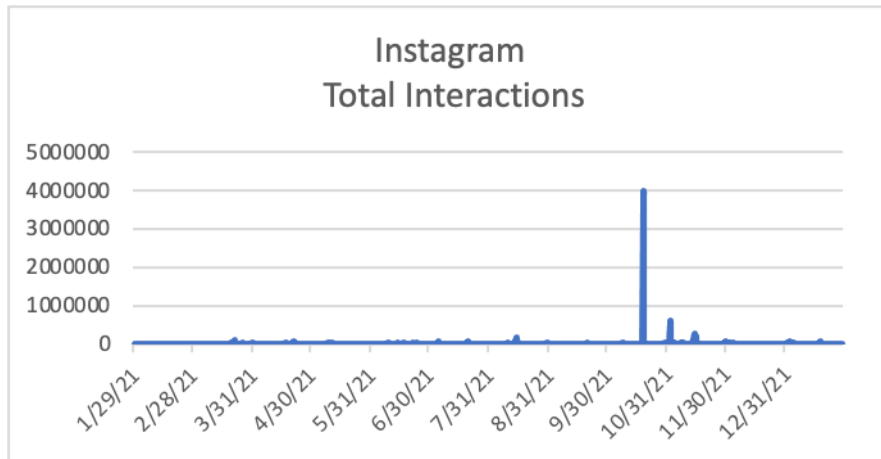
Figure 6 – Instagram volume of interactions 1/1/21 through 12/31/21

The highest peak for Reddit interactions (see Fig. 7) was March 21 at 3,692 and April 5 at 3,018. Volume picked up again September 21 at 926 interactions and again on October 4 at 2,992.
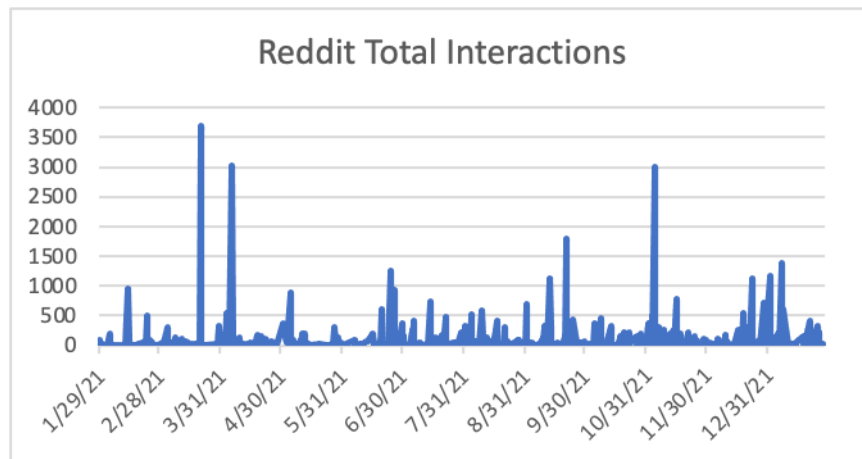

Figure 7 – Reddit volume of interactions 1/1/21 through 12/31/21

RQ2 raised the question whether the presence of green washing in social media coincided with engagement during peak times when stories appear in mainstream and digital media. It was based on the expected ties between social media and other news media and the levels of engagement or interactions that serve as a gauge of the episodic focus on greenwashing. These observations make it clear there is a consistency between search behavior, mainstream and digital media sources, and social media activity corresponding with key events driving interest at intervals during the year.

RQ3 raised the question regarding the use of strategic amplification a function of the use of toxic language in social media posts, especially during peak times when greenwashing is in the news. This question was raised based on the use of toxic language as an attempt to gain visibility of the greenwashing issue and the use of toxic language to amplify voices on the issues of climate and sustainability. Strategic amplification is one of the ways in which individuals and organizations use language to attract attention and perhaps create controversy in the hopes that their posts, tweets, images, or videos will become viral. Such messaging may include trigger words or phrases that are intended to promote an issue and provoke interaction. One way to measure amplification is through an analysis of toxicity. Perspective API (https://www.perspectiveapi.com/) was utilized to measure toxicity among 5,000 Facebook posts, although posts without text or in languages not supported were skipped. Similarly, almost 8,000 posts on Instagram were analyzed, 12,000 posts on Reddit, and more than 450 thousand tweets were analyzed for the use of toxic language.

Table 4
Toxicity scores for greenwashing related posts on social media (Jan.-Dec., 2021)

Greenwashing	N	Average Toxicity	Low Toxicity <0.3	High Toxicity >0.7
Facebook	5000	0.14	0.000	.93
Instagram	7889	0.15	0.000	.95
Reddit	12,027	0.20	0.000	1.00
Twitter	456,087	0.15	0.000	1.00

As indicated in Table 4, while toxicity does exist in the system, there is very little toxicity overall. Low levels of toxicity were found on Facebook and Instagram, where average toxicity is 0.14 and 0.15 respectively. Similarly, the toxicity score on Twitter at 0.15 was quite low as well. And, on Reddit, toxicity was slightly higher at 0.20. This finding holds importance as it was expected that the use of toxic language on any or all these platforms would be associated with amplification of the issues surrounding greenwashing. If that had been the case there would be support for the belief that toxic language would amplify an issue on social media, serving to draw attention and "light-up" controversy perhaps raising greenwashing to the level of hot-button issue.

RQ4 raised the question regarding the polarity of sentiment as an expression of social media discourse. Sentiment analysis provides an understanding of feelings being

expressed as either positive, neutral, or negative. Investigating sentiment on social media posts regarding greenwashing provides a means to look for triggers that steer critical discourse in one direction or another. Sentiment analysis was used to determine if posts on Facebook, Instagram, Reddit, or Twitter express positive, neutral, or negative sentiments based on the TextBlob natural learning processing software (https://textblob.readthedocs.io/en/dev/). Posts were analyzed in English, French, and German but other languages were skipped. The analysis does not include usernames, hashtags, cashtags, or URLs.

As indicated in Table 5, based on a sample of posts, almost 46 percent of the Facebook posts expressed positive sentiment, whereas almost 51 percent expressed positive sentiment on Instagram.

Table 5
Sentiment analysis of greenwashing posts on social media (Jan.-Dec. 2021)

	# Of Posts	Negative Sentiment Values (-1..-0.05)	Neutral Sentiment Values (-0.05..0.05)	Positive Sentiment Values (-0.05..0.05)
Facebook				
English	1823	880 (48.27%)	107 (5.87%)	836 (45.86%)
French	837	50 (5.97%)	242 (28.91%)	545 (65.11%)
German	555	122 (21.98%)	206 (37.12%)	227 (40.90%)
Instagram				
English	4497	498 (11.07%)	1728 (38.43%)	2271 (50.50%)
French	610	101 (16.56%)	309 (50.66%)	200 (32.79%)
German	935	166 (17.75%)	506 (54.12%)	263 (28.13%)
Reddit				
English	9923	1910 (19.25%)	3650 (36.78%)	4363 (43.97%)
French	52	1 (1.92%)	46 (88.46%)	5 (9.62%)
German	41	0 (0.00%)	41 (100.00%)	0 (0.00%)
Twitter				
English	29,9521	54,866 (18.32%)	12,7741 (42.6%)	116,914 (39.03%)
French	46,814	7,390 (15.79%)	18,270 (39.03%)	21,154 (45.19%)
German	33,177	4,772 (14.38%)	19,276 (58%)	9,129 (27.52%)

For Reddit, almost 44 percent of the posts were positive, and on Twitter 39 percent were positive. The lack of polarity of sentiment is confounded, as a negative expression of sentiment for a corporation, in the context of greenwashing, could be from a consumer

perspective positive, whereas positive sentiment might be a positive expression of support for exposing greenwashing in contempt of the negative actions of a corporation. In other words, negative sentiment toward a greenwasher could be an expression of positive feelings toward the greenwashing issue. The sentiment analysis does not provide a clear indication of the polarity of feelings regarding greenwashing.

DISCUSSION

The findings of this research provide clear indication of the ebb and flow of #greenwashingtied to peak events during the year. A key finding reflected in the results is that interactions on social media, news stories, and search behavior follow similar patterns based on those peak events. Therefore, amplification is associated with the temporality of news and information regarding greenwashing as tied to peak events. Furthermore, greenwashing is closely tied to broader issues concerning the environment, finance, global warming, and air pollution as indicated by the Media Cloud data making it difficult given the confluence of related issues to bring focus to greenwashing as a sustainable rallying point for activists.

The findings regarding toxicity do not map well onto the concept of strategic amplification. While it was expected that toxicity would be high because the use of strong language is a means to amplify messaging and gain attention for a cause or issue, there was, however, little to no toxicity in any of the four social media platforms. Sentiment polarity is a means to quantify outrage, but this measure, the research found, is confounded by the inability to determine whether positive sentiment is an expression of negative feelings toward greenwashers or negative sentiment is a positive response to what consumers perceive to be a negative situation. In other words, negative tweets or re-tweets regarding the petroleum or fast fashion industry, for example, would be scored as positive sentiment regarding support of anti-greenwashing activism. Therefore, alternative methods would need to be employed to delve deeper into whether negative sentiment could be perceived as positive by those engaged in the greenwashing issue on social media.

Although the term greenwashing may be well-established in the digital public sphere, it is utilized by different stakeholders for different reasons without a singular definition of the term or agreed upon understanding of greenwashing. In other words, the

term greenwashing is not well understood as it is not clearly defined or codified in a way that establishes it outside of its connections to related environmental issues. As such the term serves more as a buzzword then as the seedbed of a social or environmental movement. Hashtags as a form of activism in many instances are short-lived, boosting interest and attention lasting only a few days, whereas in other movements like #Fridays4Future, interest has been sustained over time. In the case of the use of #greenwashing, the hashtag appears in peaks and valleys as it is tied to events that connects it to related environmental issues or events. There is a temporal nature to greenwashing as it encompasses so many different aspects of contemporary consumer life from manufacturing, food production, energy, among many other environmental and sustainability concerns faced by the planet. These issues are polarizing in that they pit corporations and governments influenced by corporate lobbyists against consumers and vice versa. Corporations sometimes use "green" to position their products in alignment with what they perceive to be consumer interests, and at the same time consumer groups and individuals present a counter-narrative, all of which creates tension around the topic of sustainability, another term greenwashing is associated with. In this sense, stakeholders on either side of this issue are fighting for what marketers term "share of voice," in other words, it is a matter of who "screams" the loudest that gets heard. The manner in which this takes place in the digital era is through the use of #hashtags and other forms of language that are likely for a time to draw attention to an issue. Likewise, the ability of a thought leader or organization on either side of the proverbial fence may have the ability to commandeer the conversation and give direction to the narrative. This was evidenced in the list of individuals and organizations whose names representing divergent perspectives were included in news stories. The ebb and flow of attention on social media makes the ability of an emerging movement to sustain itself consistently over time most difficult, as attention is inextricably tied to the occurrence of events throughout the year.

The critical discourse that emerges calls out for accountability among those responsible for greenwashing, but the amorphous nature of the term makes it difficult to avoid what looks like in terms of networked publics as tribal accounts that focus on a single aspect of greenwashing that appears as short-term reactions that never form into a

broader, perhaps better connected, critique that might sustain a movement. As this study has pointed out, greenwashing spikes at times or events like Earth Day or the COP26 conference but interest exists at a lower more normalized level when it comes to search behavior, social media interactions, and media coverage. In this sense, it is from time to time that those aspects related to greenwashing ranging from product manufacturing to natural resources become hot button issues. However, only when peaks arise that negative attention is temporarily directed toward greenwashers. Furthermore, what is a hot button issue for some people doesn't make it a hot button issue for all. Therefore, the fragmentation of greenwashing based on the evidence presented in this study prevents it from moving beyond the emergent stage of social movement development. Having said that, the movement around climate crisis of which greenwashing is one part certainly is more mature in its development with unrelenting leaders like Greta Thunberg and the #Fridays4Future environmental movement. To that point, there is no key influencer in the greenwashing network, like Thunberg, but there are ample climate change deniers operating in the same media ecosystem. Although we have seen celebrities like Jane Fonda take up the climate change issue, however, with no greenwashing champion and no organized movement either "in the streets" or digitally based, greenwashing will likely remain an ancillary issue within the larger climate crisis and sustainability movement. Topics or issues related specifically to greenwashing may rise and fall depending on changing social, political, economic, and cultural factors. Monitoring data in the media ecosystem, as with the multi-platform approach taken in this study, provides opportunities to track the ebb and flow of issues related to greenwashing and how the issue operates as a secondary or perhaps as tertiary discourse regarding climate change and sustainability movements.

Limitations

The sentiment analysis in this study is based on the Perspective API, which has been subject to inaccuracies (Awal et al., 2020; Gruzd et al., 2020). Awal et al. found in their research there were false positives that sometimes contradicted one another. As manually coding large datasets is to a great extent impossible, researchers must rely on the limitations of machine learning to measure, in this instance, toxicity on social media platforms. It is important for researchers to be aware of such limitations of automation

and understand that machine learning algorithms may not be able to detect nuances in language. Similarly, sentiment analysis is also conducted through machine learning in which the technology is not able to ascertain cultural contexts to differentiate polarity of sentiment that may be confounded by the use of positive sentiment to express a negative feeling toward the issue.

Suggestions for Future Research

The multi-platform approach was useful in monitoring social media and news media coverage of greenwashing and related issues. The approach provides a method of surveillance that is useful to researchers studying various issues that present themselves on various social media platforms. The software utilized in this article provides a means to go beyond a single social media platform to consider the complexity of the ways in which several platforms work within the broader media ecosystem. This approach should serve future research that might look at the complexity of issues as they play out on various social media platforms.

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