Disinformation is Limiting Participation in Online Climate Change Activism

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Abstract

Humans are causing climate change, and global action needs to be taken to limit any negative effects on humankind and the Earth. This paper will show that, although climate activism on Facebook and Twitter by individuals has increased in popularity and effectiveness in the last two years, the ongoing dissemination of disinformation to these same social network sites ("SNSs") causes confusion, which results in public interest in action to curb climate change remaining limited. SNSs produce a networked public, with influencers such as Greta Thunberg and organizations such as Fridays for Future and the Climate Council able to use platform affordances to effectively advocate for climate action, encouraging likeminded individuals to form networks on Facebook and Twitter which assist with online and offline actions to pressure policymakers to act on climate change. Simultaneously, the widespread release of disinformation on Facebook and Twitter means these same affordances lead users to innocently share disinformation and distribute misinformation which is reinforced and amplified in users' filter bubbles and echo chambers, resulting in ongoing public confusion about the reality of climate change. Such misinformation limits the number of participants acting to achieve social change, restricting real social change and effective collective action.

The existence of climate change should now be accepted as reality. Ninety

seven percent of scientists and other climate experts agree humans are causing

climate change (Cook et al., 2016). Consolidated global action needs to be taken

now to limit the negative effects of such change on people, economies, and

ecosystems (Intergovernmental Panel on Climate Change, 2018). Individuals

interacting on social network sites ("SNSs") use personal profiles, lists of Friends

and communication tools to form a networked public (boyd, 2010). Facebook's

and Twitter's affordances include methods to easily copy and share information

(shared posts and re-tweets), increased information searchability (hashtags), and

the possibility (particularly for influencers) to instantly reach a massive global

audience (boyd, 2010). These affordances can assist individuals in connecting

with likeminded people. As public awareness of the existence and effects of

climate change spreads, evidence shows online climate activism by individuals is

increasing, with growing numbers vocal on SNSs about the need for urgent

action. Strikes and protests encouraging policymakers to act on climate change

increase in frequency and popularity each year. Regrettably, networked publics

also support offline biases and division (boyd, 2010). As a result, the same

affordances which assist activists can lead to others occupying echo chambers

and filter bubbles which sustain misinformation and disinformation, limiting the

possibility of real social change and effective collective action. In broad terms,

misinformation can be defined as incorrect information, while disinformation is

incorrect information created with the intention to deceive (Treen et al., 2020).

These two terms can be somewhat interchangeable, as disinformation can be

innocently shared by other parties as information, resulting in them contributing to misinformation. Unfortunately, the continual release of misinformation and disinformation on SNSs means public opinion on even the existence of climate change remains highly polarized. Consequently, although climate activism by individuals on Facebook and Twitter has increased in popularity and effectiveness in the last two years, the ongoing dissemination of disinformation and misinformation on these same SNSs causes confusion, which results in public interest in action to curb climate change remaining limited.

More people than ever before are now active online. Internet usage has grown significantly in the past ten years, with a little over 51% of the global population now able to access the internet (International Telecommunication Union, n.d.). This provides individuals with increased access to SNSs, encouraging online social participation which has the potential to reach global audiences. People interested in acting on climate change have found Twitter and Facebook facilitate mobilization of likeminded activists by providing features which allow them to discuss issues, share information and invitations for specific events, and identify other members of their social networks who are also interested (Papacharissi, 2010). While some may believe online activism by individuals is simply ineffective "slacktivism" or "microactivism", social media networks such as these can play a significant role in fueling protests and facilitating social and political change (Tufekci, 2017). The strength of online networks formed by activists may differ across SNSs, for example Facebook "friends" are often frequently connected by

strong ties offline as well as online, while members of Twitter are more often

linked by weak ties, such as hashtags alone (Papacharissi, 2010). Hashtags are

a common method used by online activists to connect with their networks on both

Facebook and Twitter. A wide variety of hashtags relate to climate change in

general, including #climatechange, #climate #environment, and #savetheplanet.

Other hashtags relate to specific organizations fighting climate change, such as

#fridaysforfuture and #extinctionrebellion, and well-known influencers advocating

for climate change, most notably #gretathunberg. Such hashtags aid individuals

in locating others who share the same interests and views. A quick search of

Facebook or Twitter will reveal hundreds of thousands of such tagged posts and

tweets from both organizations and individuals.

The content of Facebook posts relating to climate change has not been well

researched, but studies show most tweets related to climate change activism are

for information sharing rather than calls for protest mobilization (Boulianne,

Lalancette, et al., 2020). Such tweets can serve a larger purpose, using shared

hashtags such as #schoolstrike4climate and #fridaysforfuture to form a

networked public enabling individuals to connect local events to worldwide

events and indicate a global community's displeasure to encourage political

leaders to act on climate change (Boulianne, Lalancette, et al., 2020). Fridays for

Future is an organization which aims to pressure policymakers into action in just

such a manner (Fridays for Future, n.d.-a). They use SNSs including Facebook

and Twitter to share information on climate change protests and other actions,

with many of these posts "retweeted" or "shared" from groups and individuals

which have "tagged" their username or used the hashtag #fridaysforfuture to alert

them (Fridays for Future, n.d.-b; Fridays for Future, n.d.-c). Each country is

encouraged to have its own Fridays for Future social media channel, and the

Fridays for Future website features a feed from Twitter of all such channels they

have identified (Fridays for Future, n.d.-d). Statistical numbers of strikes and

attendees are not readily available, but the data self-reported by Fridays for

Future activists shows their numbers have risen from zero in August 2018 to an

estimated total of 14 million strikers attending 94,000 events in 8,000 cities

between then and late March 2021 (Fridays for Future, 2021). This shows that

hashtags are an efficient method of linking climate activists and protest events,

increasing the numbers of activists taking effective action and thus increasing the

pressure on policymakers to act on climate change.

These figures support Boulianne, Koc-Michalska, et al.'s (2020) analysis of

protest survey data, which found individuals who post to Twitter or Facebook

about a protest are three times as likely to participate in the protest, and those

individuals who join a relevant social media group are five times as likely to take

part. Fisher and Nasrin (2020) note the number of studies researching the direct

effects of actions such as strikes and protests on climate change is minimal,

however those which do exist, like Munoz et al.'s (2018), have found a positive

correlation between pro-environmental protests and results which reduce CO^2

emissions. This supports a large body of research which indicates such tactics

were very effective in achieving government action to introduce environmental laws and the government agencies to enforce them (Fisher & Nasrin, 2020). Crowdfunding contributions from more than 16,000 individuals successfully transformed the Australian Government's defunded Climate Commission into the Climate Council, an independent Australian climate change communications organisation (McLean & Fuller, 2016). In March 2021, the Climate Council's Facebook page had over 272,000 followers, their Twitter account had over 57,000 followers, and they claim to have been the source of over 20,000 Australian media stories (The Climate Council, n.d.-a; Climate Council, n.d.-b; The Climate Council, 2016). These results demonstrate that even people who do not consider themselves activists can use online networks to achieve effective action which combats climate change, indirect as it is (McLean & Fuller, 2016). Those who do consciously use the power of online networks to advocate climate action can be particularly influential in sharing awareness of climate issues and stirring others to action.

Social media influencers are individuals with large numbers of followers on SNSs who influence their followers to take interest in particular brands or topics. Swedish student Greta Thunberg's lone school strike in September 2018 went viral, originally on Instagram, but soon spreading to many other social media platforms (Jieun et al., 2020). This initial exposure gained Thunberg a large following on several SNSs and provided her with virtual podiums online where she communicated her passion to combat climate change with her audience,

further increasing her followers. This enabled Thunberg to draw worldwide attention to the climate crisis. By March 2019 Thunberg's influence was powerful enough to successfully motivate around 1.6 million students to participate in a worldwide school strike in March 2019 to raise further awareness of climate issues (Jieun et al., 2020). When Thunberg spoke at the United Nations Climate Action summit a year after her original solo strike, millions of posts on SNSs had ensured she was already an international symbol for the climate movement, influencing diverse groups of people and inspiring many more teenagers to become involved in climate activism (Jieun et al., 2020). In March 2021 Thunberg had nearly five million Twitter followers and over three million Facebook followers (Thunberg, n.d.-a; Thunberg, n.d.-b). SNSs thus allow the views and opinions of a teenage student to be easily shared with a large worldwide audience and has enabled Thunberg to become the focal point of a loose social network composed of widespread individuals who share a similar viewpoint. Of course, not all those who wield influence and encourage network ties have altruistic motives.

As early as 1968, America's national trade association for the oil and gas industry, the American Petroleum Institute ("API"), was warned by scientists that CO^2 emissions from fossil fuels could cause severe environmental damage to the world (Robinson & Robbins, 1968). If the public became aware that fossil fuel companies were knowingly damaging the environment, the profit margins of the API's members would be threatened. So instead of alerting policymakers and the public to the potential dangers of increased fossil fuel use the API published their

first verifiable piece of disinformation in 1980, designed to downplay climate change, and reassure the public (Franta, 2021). This first item of disinformation went unnoticed for roughly the next fifty years, apparently encouraging the fossil fuel industry to continue their deceptive tactics. Fossil fuel companies have since paid millions of dollars to disinform the public, although post-2008 such funding has become more difficult to prove (Brulle, 2014; Frumhoff et al., 2015; Farrell, 2016). Fossil fuel companies are not the only ones with an incentive to confuse the public about the reality of climate change, nor are they the only ones proven to have shared incorrect information to mislead the public on this topic. Conservative political groups opposing market regulation have also been determined to be significantly involved in the release of misinformation aimed at promoting environmental skepticism (Jacques et al., 2008). While neither the fossil fuel industry nor political groups have been specifically proven responsible for the widespread dissemination of misinformation and disinformation on Facebook and Twitter, studies reviewed by Treen et al. (2020) suggest they are ultimately the cause of a large portion of it. Detailed knowledge of the way networks share information on SNSs has even led to the creation of automated systems for spreading false information, such as bots.

Bots are an automated example of the type of misinformation and disinformation released every day on many SNSs. With large numbers of bots active on Twitter it should be no surprise that some are specifically set to target discussions on climate change. A study by Marlow et al. (2021) of the activity of climate change

focused bots on Twitter determined that although less than 10% of the user accounts studied were identified as bots, these accounts posted around 25% of all climate change tweets on an average day. The idea that a quarter of all climate change tweets are issued by bots is already worrying, but with researchers Marlow et al. (2021) noting daily bot activity may have been underestimated, it is even more concerning. Veltri and Atanasova (2017) determined 67% of hyperlinks shared on Twitter led to professional media articles, which would be encouraging if Pearce et al. (2018) did not point to data suggesting even articles by media organisations are not necessarily exempt from misinformation. Regrettably, data suggests bots are more likely to promote polarization of social media users by supporting denialist views of climate science (Marlow et al., 2021). These findings are especially disturbing since most people find it difficult to distinguish a tweet by a bot from a tweet by a real person (Edwards et al., 2014). This reflects the notion Twitter users are mainly connected by weak ties and often have no little to no offline interaction with the users they network with online. Interestingly, very little bot participation was recorded in tweets by activists advocating action on climate change (Marlow et al 2021). This indicates both that bots are actively spreading disinformation on Twitter and that, despite this, activists can effectively use Twitter to create positive social change within their networks with limited interference from such bots.

The spread of incorrect information online is augmented by several key features of SNSs which are responsible for the way misinformation and disinformation is amplified amongst users. Homophily refers to the way in which SNSs algorithms encourage users to connect and engage with people in their online network who have similar opinions (Treen et al., 2020). Homophily can lead to users forming filter bubbles and echo chambers, which support and increase any existing confirmation bias they may have by providing more of the information they like and less of the information they dislike, potentially leading to opinion polarization (Brugnoli et al., 2019; Treen et al., 2020). These factors can make the spread of information on Facebook and Twitter much easier and faster. The Oregon Petition is an excellent example of misinformation. In a story shared over 555,000 times on Facebook during six months in 2016, it was claimed 31,000 scientists had signed the Oregon Petition, declaring global warming a hoax (Lewandowsky et al., 2017). Without further investigation those sharing this story had no way of knowing that less than 1% of the 31,000 "scientists" who had signed the petition eighteen years earlier had any climate science expertise, or that numerous fake signatories included Charles Darwin and the Spice Girls (Lewandowsky et al., 2017). In a more recent example of disinformation with a global spread, Twitter bots and trolls were found to be responsible for a campaign wrongly claiming arsonists were responsible for Australia's many bushfires in the 2019/20 summer, when actually climate change was determined to be a significant factor (Knaus, 2020). Worryingly, research has shown exposure to misinformation can permanently undermine an individual's

perception of the truth, even when it is later revealed as misinformation (Van der Linden et al., 2017). In this way, misinformation has led large numbers of the public to doubt even the extent of agreement amongst the scientific community about the reality of climate change (Van der Linden et al., 2017). When individuals doubt climate change exists, or that humans are causing it, they are disinclined to take any action to counter its potential effects (Cook et al., 2018). This constrains the speed with which numbers of effective online climate activists grow.

The scientific consensus is humans are causing climate change, and we have a limited span of time in which to take action to prevent catastrophic consequences from befalling humankind and planet Earth. SNSs such as Facebook and Twitter provide affordances allowing individuals to participate in climate change activism by connecting with likeminded people in online networks to share information and mobilize to take part in offline actions such as strikes and protests, pressuring policymakers to achieve meaningful social change. Unfortunately, these same affordances also enable the quick and easy spread of misinformation and disinformation amongst other members of the networked public, leading many to doubt both the existence of climate change and the need for any action to limit its effects. Given most existing research in relation to sharing of climate change content is focused on Twitter, it is recommended more research be undertaken to analyze the content and spread of climate change posts shared on Facebook. In addition, while the origin of climate change disinformation in mainstream media

has been thoroughly investigated, further research is needed to try and

conclusively prove the sources of disinformation on Facebook and Twitter which

is discouraging public action on climate change, so that they may be effectively

countered.

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