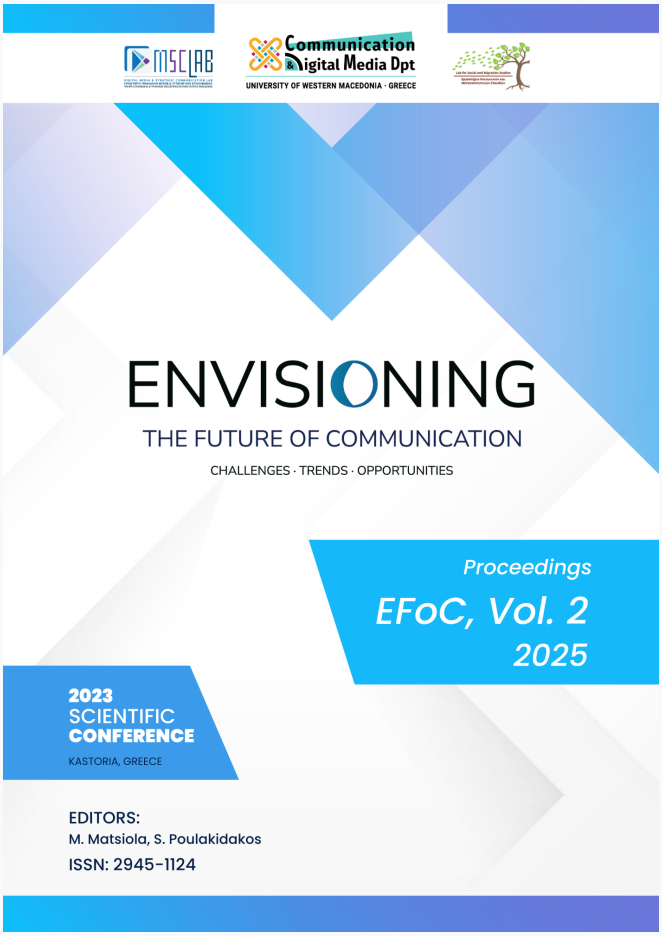
Envisioning the Future of Communication

Vol 2, No 1 (2025)

Envisioning the Future of Communication - Conference Proceedings vol. 2



Misinformation, disinformation, fake news

Konstantina Vasileiadou

doi: 10.12681/efoc.7912

Misinformation, disinformation, fake news: How do they spread and why do people fall for fake news?

Konstantina Vasileiadou*

Abstract

In the present study, after a short reference to the concepts of misinformation, disinformation and fake news and the causes of their dissemination, we focus on fake news about climate change, laying emphasis on the factors that led to the forging, through the press, of the false assertion that climate change does not exist or, if it does, it is due to natural processes and not to humans. One of the most influential deniers of climate change is former US President Donald Trump, who has consistently expressed suspicion about the origin of climate change. Misinformation on climate was also spread on the occasion of the 28th UN Climate Conference (COP28), with the most significant inaccuracy coming from the President of the Conference, Sultan Al Jaber, who made statements against scientists calling for a reduction in fossil fuel use in order to prevent a 1.5 degree rise in temperature above pre-industrial levels. According to a report on the COP28 briefing, among the biggest sources of false or misleading climate-related information, are influential states including Russia and China, fossil fuel exporting companies and online provocateurs who make money promoting claims that global warming is but a hoax. As to climate change misinformation, we highlight two cases of inaccurate statements as detected by Check4Facts news/statements verification platform, which combines investigative journalism and social research. We then describe how a fact-checker works when examining climate news/statements and conclude by proposing appropriate solutions to address climate change related fake news. These are media literacy, media reform and fact-checking by organizations whose independence and credibility can be guaranteed.

Keywords: fact-checking, fake news, fake news on climate, Check4Facts news/statements verification platform, misinformation and climate change, climate news fact checking

Introduction

Historian Michael Grant, in his study *Greek and Roman historians: Information and misinformation* (Grant 2015) notes that misinformation is as old as democracy itself and he argues that misinformation, even deliberate disinformation, is abundant in the writings of ancient historians such as Herodotus, Tacitus and Thucydides.

The definition of fake news continues to change over time (Kim, Xiong, Lee, et al., 2021); one definition is "fabricated information that mimics news media content in form but not in process or intent" (Lazer, Baum, Benkler, et al., 2018) with the intention of misleading readers.

* Konstantina Vasileiadou, journalist and fact-checker of Check4Facts platform, PhD candidate in Political Science and Public Administration, National and Kapodistrian University of Athens, affiliate to the National Center of Social Research.

Misinformation means that the false circulating information may be accidental, whereas disinformation implies intentional fabrication and dissemination (Shahi, Dirkson, Majchrzak, 2021). People also use "fake news" to label as unreliable opinions that do not support their positions (Vosoughi, Roy, Aral, 2018).

Discussing fake news and the environment where they thrive in, Nicolas Demertzis and Stamatis Poulakidakos (Demertzis, & Poulakidakos, 2024) note that within a complex and multifaceted communication framework, as the same has been shaped by the introduction of multiple sources of information into the digital public sphere and, given a number of factors that (indicatively) pertain to citizens' alienation from the political system, distrust of politicians and experts, consideration of politics as a power/strategic game that preys on people's ignorance about political matters and their rights, there has been an increase in the circulation of biased, polarized or even untrue information on current issues. This phenomenon has been the subject of public and academic debate for some years now under the term "fake news". Among other things, the increased circulation of fake news is due both to the logic of "supply" by natural or legal persons with an interest in producing and circulating incomplete or even distorted information and to the logic of "demand" by users.

How does fake news spread and why do people fall for fake news*?*

Advancing technology and growth in social media use contribute to the spread of fake news. In fact, research shows that false news often spreads faster than real news online (Vosoughi, Roy, Aral, 2018). Regular users of social media are to blame for a lot of this spread, as they like, share and otherwise engage with posts containing misinformation. Online fake news can also be spread through bots. Ferrara et al.'s (2016) look at social bots describes a bot as "a computer algorithm that automatically produces content and interacts with humans on social media, trying to emulate and possibly alter their behavior."

The novel challenge brought by bots is the fact they can give the false impression that some piece of information, regardless of its accuracy, is highly popular and endorsed by many, exerting an influence against which we haven't yet developed antibodies (Ferrara et al.'s, 2016, pp. 98-99).

False news can spread through circular reporting, where one source publishes misinformation that is picked up by another news outlet, who cites the original source as evidence that the information is accurate. This continues as other news outlets report the misinformation and perpetuate the cycle.

Focusing on the reasons leading individuals to believe fake news we notice some determinants relate to the ecosystem of media and social networks, such as the availability and rapid spread of fake news, the unselected information on platforms and the fact that consumers can become creators of fake news (Beauvais, 2022). Cognitive factors are important, such as confirmation bias, political partisanship, prior exposure and intuitive thinking. Low science knowledge and

low educational level are also involved. Psychological factors include attraction to novelty, high emotional state and the emotionally evocative content of fake news (Beauvais, 2022).

Individuals do not take the time and energy to deliberate over the accuracy of the news they are exposed to. A study by Bago, Rand and Pennycook (2020) found that individuals were less likely to believe fake news when they were given the time and mental space to deliberate over the accuracy of different news headlines. This finding suggests that people fall for fake news online because they are encountering it as they scroll quickly through their newsfeeds.

Fake news and the US presidential elections in 2016.

While history shows that false and misleading information is not a new phenomenon (Kapantai et al., 2021; Ortoleva, 2019), most observers seem to agree that misinformation, disinformation, and fake news have become much more prevalent during the last decade (Benkler et al., 2018; Kavanagh & Rich, 2018; O'Connor & Weatherall, 2019). Often cited reasons are the 2016 U.S. Presidential election and the Brexit referendum in 2016, that were both characterized by widespread disinformation and misinformation and – in the U.S. case – accusations of fake news. As a result, several scholars have argued that we currently live in a 'post-truth' era (Lewandowsky et al., 2017) or an 'misinformation age' (O'Connor & Weatherall, 2019). A BuzzFeed News analysis (Silverman, 2016) addressing the wide spread of fake news during the 2016 US election found that the top 20 fake election news stories, which rapidly expanded via Facebook, far outpaced the real election news from iconic media outlets such as the New York Times, Washington Post, Huffington Post and others. According to the same analysis, the top 3 fake election news that went viral in 2016 are: "Pope Francis supports Donald Trump", "Wikileaks confirms Hillary Clinton sold weapons to ISIS", "Hillary's email to ISIS leaked and it's worse than we imagined".

Fake news on climate

Long before the 2016 US elections, already in the 1980s, the biggest lie of the century had begun to be forged in the press: the claim that climate change does not exist, or even if it does, it is due to natural processes and not human activity. A significant part of the problem started by the media themselves. Much of the prevailing and mainstream media, particularly in the US and Australia, were manipulated by the coal industry, whose strategy was to raise doubt about climate science and therefore delay action (Lopez & Share, 2020).

The traditional media technique of "fair and balanced" coverage, which gave equal time to all sides of the argument, was essential to the big lie's crystallization. That practice led to a false equivalence of arguments. From 1988 to 2002, 53% of major US newspapers gave equal attention to both "sides" of the climate debate. According to Antonio Lopez and Jeff Share (2020), it is like giving equal TV airtime to an astrophysicist scientist and a flat-earth theory believer.

For decades, scientists have reported the data, facts and evidence that human-caused CO2 emissions are increasing the temperature of our planet. The evidence is overwhelming: The Intergovernmental Panel on Climate Change (IPCC), the UN's multi-stakeholder scientific body, highlights through its reports the **dominant role of humans in climate change**.

And yet a small powerful group of individuals have managed to create doubt in public perceptions with unfounded claims that ignore the scientific evidence. This false notion of a controversy and uncertainty, as Naomi Oreskes and Erik Conway (2010) have written about in their book, *Merchants of Doubt*, is not simply misinformation, it is actually a well-organized campaign of disinformation.

“Fact-checking is seen as a way to clear up any doubt on climate change information. Since about 2016, it has taken root in many countries as we have seen rampant misinformation on the topic," said Hong Tien Vu (University of Kansas, 2022), associate professor of journalism & mass communications at Kansas University and lead author of the study *Fact-checking Climate Change: An Analysis of Claims and Verification Practices by Fact-checkers in Four Countries*.

The Kansas University research team (Vu, Baines, & Nguyen, 2023*)* analyzed nearly 500 examples of fact-checking on climate change information from the United States, United Kingdom, Germany and Australia conducted between 2015 and 2019. They found the fact-checks mostly focused on four aspects of climate change: existence, causes, impacts and solutions. The most effective examples provided visual information, cited sources and provided concise information for the public, researchers found.

The analysis showed that among the four aspects of climate change fact-checking, in the United States, most instances assessed claims about whether climate change really existed. Australian instances most often were fact-checking claims about solutions, In the United Kingdom, most instances regarded impact. Overall, about one-fourth of claims fact-checked were about its existence, again with most of those coming from the United States, and about 22% were regarding climate change effects.

In addition to types of claims checked, the study analyzed who was making the claim. Individuals, mainly politicians, followed by businesses/corporations and posts on social media, were the most common sources of information to be checked. Apart from Germany, where most checks were conducted to verify information from social media, the vast majority (about 81%) of claims were made by politicians. The majority of claims that were fact-checked originated from the United States, as more than 300 of the nearly 500 fact-checking instances took place here.

In addition to analyzing what types of claims were fact-checked and where, the researchers examined how the fact-checkers presented their information. They argue the most effective presentations included visual information, concise summations of their responses, documentation of their sources and a clear verdict as to whether a claim was true, false or misleading. Accessibility is key, as people often don't have time to read additional, lengthy

documents when they come across information they may doubt. And if they do, it needs to be information that people can understand and transparently share its source. Most fact-checking instances did provide their sources, including links to further information.

On the fact-checking platform Check4Facts.gr climate change is one of the four topics for which the team of fact-checkers carry out validity checks of statements or news. These validity checks are carried out both in statements by politicians and in statements by people who intervene in the public debate, in news related to climate change as shown in the media as well as in related claims as they are spread through social media.

In order to verify the validity/accuracy of statements or news, team members utilize academic research tools while applying investigative journalism and data journalism methods. To carry out the validity check, they draw information from publicly accessible sources, from specialist scientists and experts. When writing the audit report they always cite the sources from which their information comes and clearly refer to them. At the same time, they enrich their text with visual material, whenever it is available (tables, graphs, images, etc.), referring at the same time to the sources from which this report derives. Before reaching a conclusion about the accuracy of the statement or publication, they evaluate the evidence base collected and categorize the degree of accuracy of the statement or news item according to an "accuracy scale" that includes the designations "accurate", "relatively accurate", "relatively inaccurate", "inaccurate", "unverifiable". Accuracy classes are also color-coded: inaccurate-red, relatively inaccurate-orange, relatively accurate-turquoise, accurate-dark green.

Donald Trump denies climate change

The most influential proponent of false and unsubstantiated climate claims is former US President Donald Trump. According to research conducted by VOX website (Matthews, 2017), from 2011-2015 he tweeted 115 times skepticism-expressing tweets about climate change! Most of them include some kind of confusion between climate and weather (e.g. he says "it's cold outside, global warming must be fake") or condemn President Obama for making climate change a priority, something Trump called silly, or interpreted climate change as an invention of the Chinese to strike the American economy.

Donald Trump never ceased to express his distrust about the causes of climate change. There have been more than a few times when he made misleading statements during interviews, for example on the "Good Morning Britain" TV show in the summer of 2019. Asked by presenter Piers Morgan whether he believes in climate change, he said, among others: "I believe that there's a change in weather and I think it changes both ways. Don't forget, it used to be called global warming, that wasn't working, then it was called climate change, now it's actually called extreme weather because with extreme weather you can't miss."

The fact checking organization "FactCheck.org" that reviewed this statement notes (McDonald, 2019) that "both terms, i.e. global warming and climate change, are still commonly used, and

their dual existence is not because the term “global warming” wasn’t “working”. Global warming from fossil fuels causes climate change. At the same time, extreme weather is a consequence of climate change, which is most often discussed, but not used by scientists in lieu of "climate change" or "global warming".

Donald Trump escalated his denial of global warming in a tweet, citing statements by noted climate sceptic Patrick Moore that climate change is a "fake science". Trump was, in essence, echoing Patrick Moore's comments on “Fox & Friends” show in Fox News channel, where they called Moore a co-founder of Greenpeace (BBC, 2019). According to Greenpeace, however, Moore is not a co-founder, but rather a "paid spokesman for a variety of polluting industries for more than 30 years” (Greenpeace, 2010).

Forbes magazine made an effort to respond to the hypothetical query on the possibility of financial ties between Donald Trump and the fossil fuel sector in an article titled "Meet The Billionaire Oil, Gas And Coal Tycoons Donating To Donald Trump" (Tindera, 2020). It said that the fossil fuel industry recognizes in Trump a natural ally and that is why 11 energy billionaires, and their spouses donated to his 2020 campaign. In contrast, only one gave to Joe Biden's campaign - and the then former vice-president, who promised not to take money from fossil fuel executives, sent that money back.

For their part, fossil fuel companies have spent billions buying rights to drill for oil and gas all over the world, which will be disastrous for the planet if allowed to continue. These colossal corporations stand to lose huge amounts of money if they do not adjust their practices, as countries gradually shift towards renewable energy sources. It is, however, ascertained that these companies are spending less on turning to cleaner energy sources and **more** on trying to convince people that climate change is fake (Lopez & Share, 2020). This questioning of the truth could not be more important at this pivotal moment in the journey of human civilization.

Misinformation at the 28th UN Climate Change Conference (COP28), (30 November-12 December 2023, Dubai)

Climate fake news thrived on the occasion of the 28th UN Climate Conference (COP28), held in Dubai. Oddities kept coming one after the other: the President of the Conference, Sultan Al Jaber, made statements against scientists calling for a reduction in fossil fuels in order to avoid a 1.5 degree rise in temperature above pre-industrial levels (Carrington & Stocton, 2023). “There is no science indicating that a phase-out of fossil fuels is needed to restrict global heating to 1.5C," he said, making scientists concerned about the impact of his statement. [1]

[1] Fact-checking platform Check4Facts conducted a validity check of the declaration on 28 February 2024 and concluded that the declaration is inaccurate (Check4Facts, 2024).

Al Jaber is, among others, CEO of Abu Dhabi's National Oil Company "Adnoc" and head of "Masdar", the UAE's renewable energy company. He also said that phasing out fossil fuels would not allow sustainable development "unless you want to take the world back into caves".

For his part, UN Secretary General António Guterres stressed to the conference delegates that "The science is clear: The 1.5-degree limit is only possible if we ultimately stop burning all fossil fuels. Not reduce. Not abate. Phaseout – with a clear timeframe aligned with 1.5 degrees."

The United Arab Emirates is a leading oil exporter known less for its climate commitments and more for the voracious resource consumption of its most populous city, Dubai. As reported in a New York Times article (Hsu & Myers, 2023), an internal document revealed the week before the summit that the United Arab Emirates planned to use their role as host country to pursue oil and gas deals around the world. As reservations were expressed by international observers about both the choice of venue and the head of the summit, there was an attempt through the social media to reverse the climate that had been created. According to Guardian (Carrington, 2023), in the summer of 2023, a disinformation expert in Qatar discovered at least 100 fake social media accounts defending the location of the summit and its chairman, UAE's oil executive Sultan al-Jaber.

The Climate Action Against Disinformation report ahead of COP28

According to a report examining climate information integrity ahead of COP28 and released by Climate Action Against Disinformation (Climate Action Against Misinformation, 2023), an international coalition of more than 50 environmental groups, among the largest sources of false or misleading climate-related information are influential states including Russia and China whose diplomats were attending the Conference, fossil fuel exporting companies and online provocateurs, who actually make their money by promoting claims that global warming is a hoax. According to the report, the lies being spread are that: 1. humans are not responsible for climate change, 2. the wildfires of summer 2023 have been caused by arsons and not by the warmer and drier climate conditions, 3. the earth is cooling, 4. the oil and gas giants direct their actions towards carbon neutrality, 5. warnings about the environment are not but an excuse for authoritarian elites to destabilize the developing world and force everyone into lockdown and a diet based on insects and lab-grown food.

The report makes a special reference to Russia where the government was found to use state media to describe the plans to cut greenhouse gas emissions as a kind of "western imperialism" meant to thwart the advancement of the so-called global south, which is made up of some of the least developed and poorest countries in the world.

As to China, the report notes that for years, the urges to combat climate change have been portrayed in the country as a tool used by the West to impede China's economic growth, rather than as an attempt to address a global issue. It also reports that Chinese state media targeted Greta Thunberg, falsely accusing her of calling for an end to the use of chopsticks and labelling

her a "Swedish princess" after her pressures on China for more greenhouse gas emission reductions.

Climate Action Against Disinformation's report, published a day before the UN conference on 29 November, also makes extensive reference to #climatescam, meaning "climate fraud": It finds that, every month since the previous UN Conference, COP27, (6 Nov 2022 - 18 Nov 2022) in Sharm El-Sheikh, Egypt, the #climatescam hashtag generated more retweets and likes than the #climatecrisis and #climateemergency hashtags on the X platform, former Twitter. The said hashtag was used in widespread posts falsely blaming immigrants for the largest wildfire ever recorded in Europe - the fire in Alexandroupolis (Greece) in August 2023 - and repeating assertions that TV stations were misrepresenting weather maps. The researchers attributed much of the #climatescam spread to a small group of highly influential accounts, which, they note, tended to be far more influential on climate denial on the X platform than on Facebook and Instagram.

Misinformation and climate change in Greece: The Check4Facts news/statements verification platform

In Greece, the President of Elliniki Lisi (Greek Solution) political party, Kyriakos Velopoulos, is one of the most influential purveyors of climate fake news. In the June 2023 national elections, he was voted for by 231,491 people, his party has 12 seats in the Greek Parliament (Ministry of Interior, 2023) and is followed by more than 27,000 people on Twitter (X/twitter, Kyriakos Velopoulos).

Check4Facts news/statements verification platform has identified two of his blatantly inaccurate statements:

The first one was on 10 May 2023, within the framework of the political leaders' debate, stating that "green energy cannot be stored" (Check4Facts, 2023).

On 2 August 2023, through his X platform account, he posted a text referring to the "Climate Change Fairy Tale" (Check4Facts, 2023).

While checking the 1st statement ("green energy cannot be stored"), which we identified as inaccurate, we found that there are already RES energy storage facilities both in Greece and abroad, whereas the National Energy and Climate Plan (NECP) provides for the development of storage systems (with pumped storage and accumulators). At the same time, the Recovery and Resilience Fund has earmarked resources for the implementation of related projects.

For the 2nd statement, we have consulted a large amount of available scientific evidence in order to justify that the statement is inaccurate**,** and that man-made climate change is undeniable. We consulted reports of the Intergovernmental Panel on Climate Change (IPCC), articles by NASA and the US National Oceanic and Atmospheric Administration (NOAA), and books.

Finally, for both fact-checking cases, we sought guidance from expert scientists. The Check4Facts Science news/statements verification platform has been operating since February

2022, with the support of nine research-academic institutions and the National Center for Social Research as lead agency. The project is led by Nikos Demertzis, Professor of Political Sociology and Communication in the Department of Communication and Media Studies at the National and Kapodistrian University of Athens.

The primary objective of this project, which combines investigative journalism and social research, is to investigate the accuracy degree of the information circulated by the media on four key issues: climate crisis, pandemic-health, immigration-refugees, crime.

The site already lists more than 150 publications, classified by investigative journalists according to the relevant scale, as "accurate", "relatively accurate", "relatively inaccurate", "inaccurate" and "unverifiable".

How to conduct climate news fact checking. The fact checker's perspective

Collection of statements/information to be checked is carried-out through continuous monitoring of the content of print and electronic media, websites of political persons and parties, public figures' social media accounts and parliamentary debates, whether live or recorded.

Statements or news items of high impact are selected. These statements either come from politicians or individuals participating in public debates or are widely disseminated through traditional media and social media.

Fact checkers draw information from the person who allegedly made the statement, from available raw and/or secondary data and cooperate with qualified scientists, officials and experts from public and private institutions.

Possible sources of climate-related data are, among others:

- the National Observatory of Athens website
- the UN Framework Convention on Climate Change (UNFCCC) website
- the European Environment Agency (EEA) website
- the United Nations Environment Programme (UNEP) website
- the National Aeronautics and Space Administration (NASA) and European Space Agency (ESA) websites
- the US National Oceanic and Atmospheric Administration (NOAA) website
- Intergovernmental Panel on Climate Change (IPCC) reports
- the International Energy Agency website
- the World Meteorological Organization (WMO) website

The conclusion-opinion drawn by a fact-checker on a piece of information should state the accuracy degree of a statement in a well-founded and clear manner, leaving aside any biased wording.

Discussion

In the present study, after a short reference to the concepts of misinformation, disinformation and fake news and the causes of their dissemination, we focus on fake news about climate change, laying emphasis on the factors that led to the forging, through the press, of the false assertion that climate change does not exist or, if it does, it is due to natural processes and not to humans. We give some examples of inaccurate statements about climate change as made by political figures and refer to research that finds that among the biggest sources of false or misleading climate-related information, are influential states including Russia and China, fossil fuel exporting companies and online provocateurs.

We then describe how a fact-checker of Check4Facts.gr news/statements verification platform works when examining climate news/statements. The Check4Facts Science news/statements verification platform has been operating since February 2022, with the support of nine research-academic institutions and the National Center for Social Research as lead agency. On the platform, climate change is one of the four topics for which the team of fact-checkers carry out validity checks of statements or news. These validity checks are carried out both in statements by politicians and in statements by people who intervene in the public debate, in news related to climate change as shown in the media as well as in related claims as they are spread through social media. In order to verify the validity/accuracy of statements or news, team members utilize academic research tools while applying investigative journalism and data journalism methods. To carry out the validity check, they draw information from publicly accessible sources, from specialist scientists and experts. When writing the audit report they always cite the sources from which their information comes and clearly refer to them. At the same time, they enrich their text with visual material, whenever it is available (tables, graphs, images, etc.), referring at the same time to the sources from which this report derives. Before reaching a conclusion about the accuracy of the statement or publication, they evaluate the evidence base collected and categorize the degree of accuracy of the statement or news item according to an "accuracy scale".

As we underline, the conclusion-opinion drawn by a fact-checker on a piece of information should state the accuracy degree of a statement in a well-founded and clear manner, leaving aside any biased wording.

As to climate change misinformation, we highlight two cases of inaccurate statements as detected by Check4Facts news/statements verification platform. Both statements come from the chairman of the political party “Elliniki Lysis” (Greek Solution), Kyriakos Velopoulos. The first one was on 10 May 2023, within the framework of the political leaders’ debate, stating that "green energy cannot be stored". The second was on 2 August 2023, through his X platform account, where he posted a text referring to the "Climate Change Fairy Tale".

It is important for people and journalists to be able to put an end to the flow of fake news, since credibility of public debate is an essential element of democracy itself. Moreover, fake news

distorts reality and disorientates the public. When media repeat and spread lies, they contribute to undermining a basic foundation of democracy, the unbiased provision of reliable information to the public. These actions, should they remain unchecked and recurring, only benefit specific poles of power, allowing them to choose the versions of reality that best suit their political and economic interests. Given that fact-checking is not a "catch all" solution, we will conclude by proposing appropriate solutions to address climate change related fake news. These consist of media literacy, media reform and fact-checking by organizations whose independence and credibility can be guaranteed.

How can we counter the fake news on climate change? How can we identify and stop it?

1. **By media literacy**, i.e. critical thinking skills and fundamental research techniques to distinguish legitimate and authentic information from propaganda, disinformation, lies and blatant manipulation (Dame, 2022). People learn to seek the truth by accessing multiple sources, checking different data and making well-justified decisions based on facts and evidence. Given the informational overload to which a person is subjected, studies have found that another efficient strategy to stop the spread of disinformation is a proactive approach, called "prebunking" (preemptive debunking). This relies on the idea of "inoculating" people against disinformation, so that they are better trained to identify disinformation tactics when they are faced with them. Those who support pre-bunking (Lewandovsky and van den Linden 2021) believe that, just as in the case of a real vaccine, once a person comes in contact with a "weakened" version of the practice of disinformation, then they will become immune when encountering that practice in the real world. A study conducted by Roozenbeek, J., van der Linden, S., Nygren, T. (2020), also found that prebunking interventions based on "inoculation" theory can reduce susceptibility to misinformation across cultures. More specifically, the researchers found that analogous to the process of medical immunization, "prebunking," or preemptively warning and exposing people to weakened doses of misinformation, can help cultivate "mental antibodies" against fake news. They conclude that social impact games rooted in basic insights from social psychology can boost immunity against misinformation across a variety of cultural, linguistic, and political settings.
   A series of studies summarised by Lewandowsky and van den Linden (2021) have shown the efficiency of inoculation against fake news. Thus, van den Linden et al. (2017) and Cook et al. (2017) both conducted an inoculation experiment where people were presented with disinformation about climate change as well as an inoculation treatment through warnings about disinformation techniques. Those who had received "inoculation" before seeing the particular piece of disinformation tended to rate the accuracy of the false statements as much lower than those that had not been exposed to the inoculation treatment.
2. **By reforming the media,** including more democratic-participatory forms of structural organisation of the media and placing climate emergency as a top editorial and corporate

priority. Canadian journalism scholar and activist, Robert A. Hackett, makes the following recommendations (Hackett et al., 2017): *Treat media as a "public good" (like roads, airports, etc.).* Recognize that they are part of a commons. This includes strengthening alternative media, which provides diversity. *Revive trust in a democratic media through reform.* This can be achieved with a diverse strategy that includes: giving charity status for non-profit news; allow for a "Citizenship News Voucher" (such as contributing funds to an outlet of choice when filing taxes); create trusts (like The Guardian); set up cross-subsidization schemes by applying small taxes on telecoms, cable subscriptions, advertising or spectrum licenses; increase funding for public broadcasting; and fund multimedia community access centers. *Support alternative media (through grants, donations, subscriptions, patronage, etc.).*There are many great research and news outlets producing excellent research and reporting, like "Democracy Now!", "National Environment Reporting Network" and "Inside Climate News".

One of the most inspiring media reform manifestos that came out was in the form of a letter by Extinction Rebellion's Clare Farrell (climate activist) to The Guardian (Farell, 2018) on how the BBC can change its climate reporting practices. This is worth quoting in its entirety because it's a model that can be applied to any media organization (Lopez & Share, 2020):

"The director general, Tony Hall, agree to a meeting with a delegation from Extinction Rebellion to discuss how the BBC can tell the full truth on the climate and ecological emergency.

The BBC declares a climate and ecological emergency.

The BBC places the climate emergency as its top editorial and corporate priority by adoption of a climate emergency strategic plan, at the level of urgency placed on informing the public about the second world war.

The BBC to divest all pension funds, investments and bank accounts from fossil fuel corporations and their bankers.

The BBC, its subsidiaries and its supply chain to agree to be zero-carbon by 2025.

The BBC to publish an annual eco-audit of all BBC operations, including summary of key ecological and carbon data.

The BBC to take a lead on encouraging other national and global media corporations to join the global efforts to save humanity/nature from existential crises.

The BBC to only allow thinktank spokespersons on air to discuss the climate emergency whose funding is fully transparent. ("The Truth" – Extinction Rebellion)

Finally, media reform also entails breaking up media monopolies and turning companies like Facebook and Google into public utilities (Lopez & Share, 2020). The domination of media oligarchs leads to a kind of monoculture in the media ecosystem.

3. **By fact-checking** carried-out by organizations which can guarantee their independence and reliability. Fact-checking organizations are at the heart of the scrutiny procedure for information disseminated in the public sphere, mainly online, with combatting

misinformation being their main objective (Demertzis & Poulakidakos, 2024). Based on specific protocols, these organizations assess the accuracy of verifiable information circulating in the public sphere, either as statements or as news/references to facts, by investigating raw and/or secondary sources of data. This form of assessment of published statements and information seeks to hold politicians, journalists and other public stakeholders accountable for the accuracy of their statements. In the context of checking the validity of information introduced into the public sphere, fact-checkers look for reliable sources which can confirm or refute such information, either in whole or in part.

Contrary to the current prevailing trend of sensationalist journalism, rapid consumption and poor understanding of the concepts introduced in the public sphere, fact-checking the accuracy of public information advocates the logic of research, critical thinking, comparison of data and the search for the most appropriate sources. It highlights the need to consume and digest information content in a more responsible way, so that we can (co-)judge and formulate a reasoned opinion on what is happening in the public sphere (Demertzis & Poulakidakos, 2024).

References

Adnoc. *Our leadership*. Adnoc. https://www.adnoc.ae/en/our-story/our-leadership [accessed 20 January 2024]

Bago, B., Rand, D.G., Pennycook, G., (2020). Fake news, fast and slow: Deliberation reduces belief in false (but not true) news headlines. *Journal of Experimental Psychology*: General, 149(8), 1608–1613. https://doi.org/10.1037/xge0000729.

BBC. (2019, March 12). *Greenpeace hits back at Trump tweet on climate change denial*. BBC. https://www.bbc.com/news/world-us-canada-47543905 [accessed 2 December 2023]

Beauvais, C., (2022). Fake news: Why do we believe it?, *Joint Bone Spine*, Volume 89, Issue 4, 105371Jul;89(4):105371. doi: 10.1016/j.jbspin.2022.105371

Benkler, Y., Faris, R., & Roberts, H. (2018). *Network propaganda. Manipulation, disinformation and radicalization in American politics.* Oxford University Press.

Carrington D. (2023, June 8). *Army of fake social media accounts defend UAE presidency of climate summit.* The Guardian. https://www.theguardian.com/environment/2023/jun/08/army-of-fake-social-media-accounts-defend-uae-presidency-of-climate-summit [accessed 2 December 2023]

Carrington D., Stocton B. (2023, December 3). *Cop28 president says there is 'no science' behind demands for phase-out of fossil fuels.* The Guardian. https://www.theguardian.com/environment/2023/dec/03/back-into-caves-cop28-president-dismisses-phase-out-of-fossil-fuels [accessed 4 December 2023]

Check4Facts.gr. *Σχετικά (About us/Activities)*. Check4Facts. https://check4facts.gr/about/project [accessed 20 January 2024]

Check4Facts.gr. *Σχετικά με την Δεοντολογία και την Μεθοδολογία του έργου (About the Ethics and Methodology of the project).* Check4facts. https://check4facts.gr/about/ethics [accessed 20 January 2024]

Check4Facts.gr. https://check4facts.gr/ [accessed 20 January 2024]

Check4Facts.gr, (2023, August 30). *Κυριάκος Βελόπουλος: Η πράσινη ενέργεια δεν αποθηκεύεται (Kyriakos Velopoulos: Green energy cannot be stored).* Check4Facts. https://check4facts.gr/article/173/display [accessed 2 September 2023]

Check4Facts.gr, (2023, October 2). *Το παραμύθι της κλιματικής αλλαγής (The climate change fairy tale).* Check4Facts. https://check4facts.gr/article/174/display [accessed 5 October 2023]

Check4Facts, (2024, February 28). *Δεν υπάρχει καμία επιστήμη που να λέει ότι η σταδιακή κατάργηση των ορυκτών καυσίμων είναι απαραίτητη για τον περιορισμό της υπερθέρμανσης του πλανήτη* (*There is no science that says that phasing out fossil fuels is necessary to limit global warming)*. Check4Facts. https://check4facts.gr/article/192/display [accessed 2 March 2024]

Climate Action Against Misinformation, (2023, November). *Deny, Deceive, Delay (vol. 3), Climate Information Integrity Ahead of COP28.* Climate Action Against Misinformation. https://caad.info/analysis/reports/deny-deceive-delay-vol-3-climate-information-integrity-ahead-of-cop28/ [accessed 2 December 2023].

Cook J, Lewandowsky S, Ecker UKH (2017). Neutralizing misinformation through inoculation: Exposing misleading argumentation techniques reduces their influence. *PLoS ONE* 12(5): e0175799. https://doi.org/10.1371/journal.pone.0175799

Dame Adjin-Tettey, T. (2022). Combating fake news, disinformation, and misinformation: Experimental evidence for media literacy education. *Cogent Arts & Humanities*, 9(1). https://doi.org/10.1080/23311983.2022.2037229.

Demertzis, N., & Poulakidakos, S., (2024). Issue 43 - Preamble. *Science and Society: Review of the Political and Moral Theory*, *43*, 3–10, recovered from https://ejournals.epublishing.ekt.gr/index.php/sas/article/view/36884 [accessed 21 February 2024].

Farrell, C., (2018, December 16). *BBC has a key role in tackling the climate emergency*. Letters, The Guardian. BBC has a key role in tackling the climate emergency | Letters | The Guardian [accessed 3 November 2023].

Ferrara, E., Varol, O., Davis, C., Menczer, F., Flammini, A., (2016). The rise of social bots**,** *Communications of the ACM*, Volume 59, Issue 7, pp 96–104, https://doi.org/10.1145/2818717

Grant, M. (2015). *Roman historians: Information and misinformation*, Routledge.

Greenpeace (2010, July 6). *Greenpeace Statement On Patrick Moore.* Greenpeace https://www.greenpeace.org/usa/news/greenpeace-statement-on-patric/ [accessed 19 October 2023].

Hackett R., Forde S., Gunster S., Foxwell-Norton K., (2017). *Journalism and Climate Crisis. Public Engagement, Media Alternatives*, Routledge.

Hsu T., Lee Myers S. (2023, November 30). *Disinformation is one of Climate Summit's Biggest Challenges*, The New York Times. https://www.nytimes.com/2023/11/30/technology/cop28-climate-disinformation.html [accessed 5 December 2023].

Intergovernmental Panel on Climate Change (IPCC). https://www.ipcc.ch/ [accessed 3 November 2023].

Kapantai, E., Christopoulou, A., Berberidis, C., & Peristeras, V., (2021). A systematic literature review on disinformation: Toward a unified taxonomical framework. *New Media & Society*, 23(5), 1301–1326. https://doi.org/10.1177/1461444820959296

Kavanagh, J., & Rich, M. D. (2018). *Truth decay. An initial exploration of the diminishing role of facts and analysis in American public life*. Rand.

Kim, B., Xiong, A., Lee, D., et al. (2021). A systematic review on fake news research through the lens of news creation and consumption: research efforts, challenges, and future directions. *PLoS One* 2021;16 [e0260080]. https://doi.org/10.1371/journal.pone.0260080

Lazer, D.M.J., Baum, M.A., Benkler, Y., et al. (2018). The science of fake news. *Science* 2018;359:1094–6. DOI:10.1126/science.aao2998

Lewandowsky, S., Ecker, U. K. H., Seifert, M., Schwarz, N. C., & Cook, J. (2012). Misinformation and its correction: Continued influence and successful debiasing. *Psychological Science in the Public Interest,* 13(3), 106–131. https://doi.org/10.1177/1529100612451018

Lewandowsky, S., & van der Linden, S. (2021). Countering Misinformation and Fake News Through Inoculation and Prebunking. *European Review of Social Psychology*, *32*(2), 348–384. https://doi.org/10.1080/10463283.2021.1876983.

Lopez, A., & Share, J., (2020, April 29). Fake Climate News: How Denying Climate Change is the Ultimate in Fake News. *Journal of Sustainability Education, Vol. 23, Ecomedia Literacy*. ISSN: 2151-7452. Fake Climate News: How Denying Climate Change is the Ultimate in Fake News « Journal of Sustainability Education (susted.com) [accessed 2 October 2023].

Masdar. *Our management*. Masdar. Masdar | Masdar Renewables Board of Directors [accessed 20 January 2024].

Matthews D., (2017, June 1) *Donald Trump has tweeted climate change skepticism 115 times. Here's all of it.* Vox. Donald Trump has tweeted climate change skepticism 115 times. Here's all of it. - Vox [accessed 18 October 2023]

McDonald J., (2019, June 7). *Trump Bungles Climate Change in UK.* FactCheck.org. https://www.factcheck.org/2019/06/trump-bungles-climate-change-in-uk/ [accessed 19 October 2023]

Ministry of Interior, (2023, June). *National Elections, Elliniki Lisi – Kyriakos Velopoulos*. Last update on 12/07/2023. Ministry of Interior. https://ekloges.ypes.gr/current/v/home/parties/108/ [accessed 18 October 2023]

O'Connor, C., & Weatherall, J. O. (2019). *The misinformation age. How false beliefs spread*. Yale University Press.

Oreskes, N., & Conway, E. M. (2010). *Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. New York, NY: Bloomsbury Press.

Ortoleva, P. (2019). Canards, Fausses Nouvelles, paranoid style. Classic authors for an emerging phenomenon. In J. E. Katz & K. K. Mays (Eds.), *Journalism & truth in the age of social media* (pp. 119–132); Oxford University Press. https://doi.org/10.1093/oso/9780190900250.003.0009

Roozenbeek, J., van der Linden, S., & Nygren, T. (2020). Prebunking interventions based on "inoculation" theory can reduce susceptibility to misinformation across cultures. *Harvard Kennedy School (HKS) Misinformation Review*. https://doi.org/10.37016//mr-2020-008

Shahi, G. K., Dirkson, A., & Majchrzak, T. A. (2021). An exploratory study of COVID-19 misinformation on Twitter. *Online Social Networks and Media*, *22*, 100104. https://doi.org/10.1016/j.osnem.2020.100104

Silverman, C. (2016, November 17). *This Analysis Shows How Viral Fake Election News Stories Outperformed Real News On Facebook*. Buzzfeednews. https://www.buzzfeednews.com/article/craigsilverman/viral-fake-election-news-outperformed-real-news-on-facebook [accessed 18 September 2023]

Tindera M., (2020, June 26). *Meet The Billionaire Oil, Gas And Coal Tycoons Donating To Donald Trump.* Forbes. https://www.forbes.com/sites/michelatindera/2020/06/26/these-are-the-energy-oil-and-gas-billionaires-donating-to-donald-trump/?sh=6f3bd0127d59 [accessed 19 October 2023]

University of Kansas. (2022, December 12). *Study analyzes how fact-checkers from four different countries assess climate change claims.* ScienceDaily. https://www.sciencedaily.com/releases/2022/12/221212140623.htm [accessed 7 October 2023]

Van der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the Public against Misinformation about Climate Change. *Global Challenges*, *1*(2), 1600008. https://doi.org/10.1002/gch2.201600008

Vosoughi, S., Roy, D., Aral, S., (2018). The spread of true and false news online. *Science* 2018;359:1146–51. https://doi.org/10.1126/science.aap9559

Vu, H. T., Baines, A., & Nguyen, N. (2023). Fact-Checking Climate Change: An Analysis of Claims and Verification Practices by Fact-Checkers in Four Countries. *Journalism & Mass Communication Quarterly,* 100(2), 286-307. https://doi.org/10.1177/10776990221138058

X/twitter, Kyriakos Velopoulos. Κυριάκος Βελόπουλος (@velopky) / X [accessed 5 August 2023].