

DECLARATION BY STUDENT

This assignment is entirely my own work. Quotations from secondary literature are indicated by the use of inverted commas around ALL such quotations AND by reference in the text or notes to the author concerned. ALL primary and secondary literature used in this piece of work is indicated in the bibliography placed at the end, and dependence upon ANY source used is indicated at the appropriate point in the text. I confirm that no sources have been used other than those stated.

I understand what is meant by plagiarism and have signed at enrolment the declaration concerning the avoidance of plagiarism.

I understand that plagiarism is a serious academic offence that may result in disciplinary action being taken.

I understand that I must submit work BEFORE the deadline, and that failure to do so will result in capped marks.

Candidate no.	A	B	3	0	8	7	1
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Module Title:	Data Journalism
Module Code: (e.g. 5AABC123)	7AAVDM12

Assignment: (may be abbreviated)	Desmog: Data Journalism Group Project
Assignment tutor/group:	Thais Lobo Janna Joceli Omena
Deadline:	05/05/2021
Date Submitted:	05/05/2021
Word Count:	4135

Your assignment may be used as an example of good practice for other students to refer to in future. If selected, your assignment will be presented anonymously and may include feedback comments or the specific grade awarded. Participation is optional and will not affect your grade.

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YES NO

Corporations and Climate Denial

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INTRODUCTION

Our project focuses on bridging the gap between corporations and climate change denial among social media platforms, with a focus on Facebook.

This is particularly relevant due to the growing issue of climate change misinformation on social media and the spread of fake news online. Research conducted in 2020 found climate change denial ads promoted on Facebook by conservative organisations in the US were viewed at least 8 million times (Carrington, 2020). Our investigation was able to identify these mainstream conservative commentators and flag these problematic sources at a scalable, micro level.

Identifying the tactics used by corporations could help users to identify potential fake news as well help platforms to identify potentially harmful or false content before it goes viral.

INVESTIGATION/ RESEARCH OBJECTIVES

Our research objective is to investigate Facebook actors (individuals and organisations) and their engagement with content about climate change denial.

We have also sought to venture into the profiles and case histories of some of these actors to help us understand the proportionality of their online status to their engagement levels.

In doing so we aim to understand how Facebook as a social network pioneer either contributes, facilitates or in any manner regulates these discussions around climate denial.

INVESTIGATION/ RESEARCH APPROACH

To support our research objectives we have used the following tools to conduct a qualitative social media analysis using digital methods.

- Preliminary analysis such as cleaning the data and understanding country-specific segmentation of data, using MS Excel.
- Analysis 1: Posting activity and frequency measurement using Excel; Tableau and Raw Graphs for visualizations.
- Analysis 2: Conducted a frequency and textual analysis using Antconc
- Analysis 3: Social media engagement using CrowdTangle & Gephi
- Analysis 4: Content dissemination analysis among Facebook actors and groups using R programming language.

Analysis one:

Posting Activity among accounts: UK, AU, CA, USA

original_url	https://www.thegwpf.com/																
Column Labels	AU	CA	CZ	DE	DK	GB	GE	IS	NL	NO	SE	SK	US	VN	ZA	(blank)	Grand Total
Count of postUrl	105	106	1	11	1	192	1	66	7	1	36	1	25	1	1	449	1004

Figure 1. Total number of posts (country-wise)

i. Participation among Facebook accounts in UK, AU, CA, USA

When discussing the climate crisis, humanitarian organizations often debate the individual contributions of countries in the Global North and South and its disproportionate effect in these regions. Policies by the UN such as the Paris Agreement and Green Deal highlight the importance of centering efforts around reducing the carbon footprint of these least vulnerable countries of the Global North.

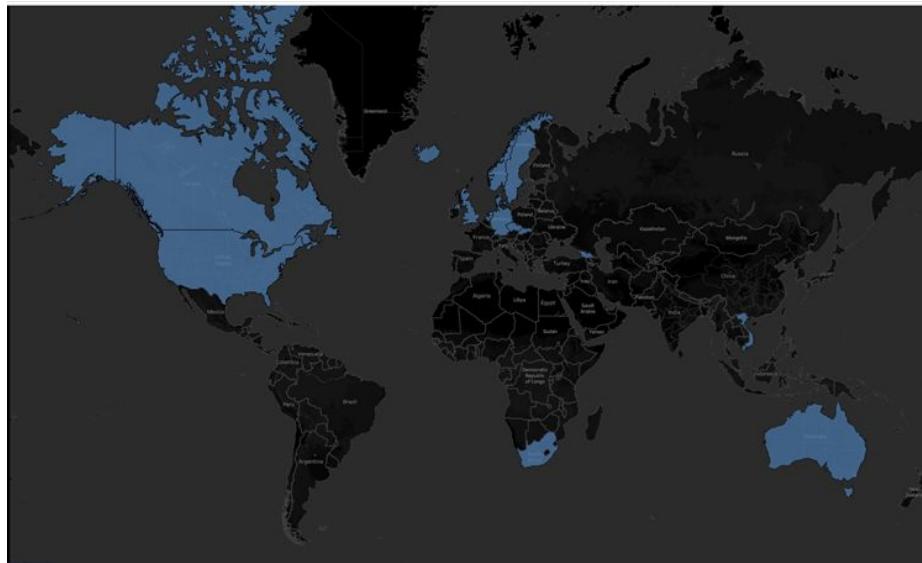


Figure 2. Mapped view of the Tufton Street database

To reinforce this notion, **the first part of the analysis investigates the degree of participation among countries such as the UK, Australia, Canada and the US who have some of the highest posting activity engaging in climate-denial on Facebook in the Tufton Street dataset.** The analysis is conducted in 2 parts: a) **Posting activity** b) **Account verification**

ANALYSIS 1 - DATASET

We investigated **posting activity** and **account verification**, since the Tufton street dataset highlighted that these characteristics were worth exploring.

Firstly, a *Beeswarm plot distribution* (Figure 3.0) identified an inflammation in posting frequency in 2020 in comparison to other years. This observation has been noted and used to further investigate the amplification and engagement of content on Facebook in 2020.

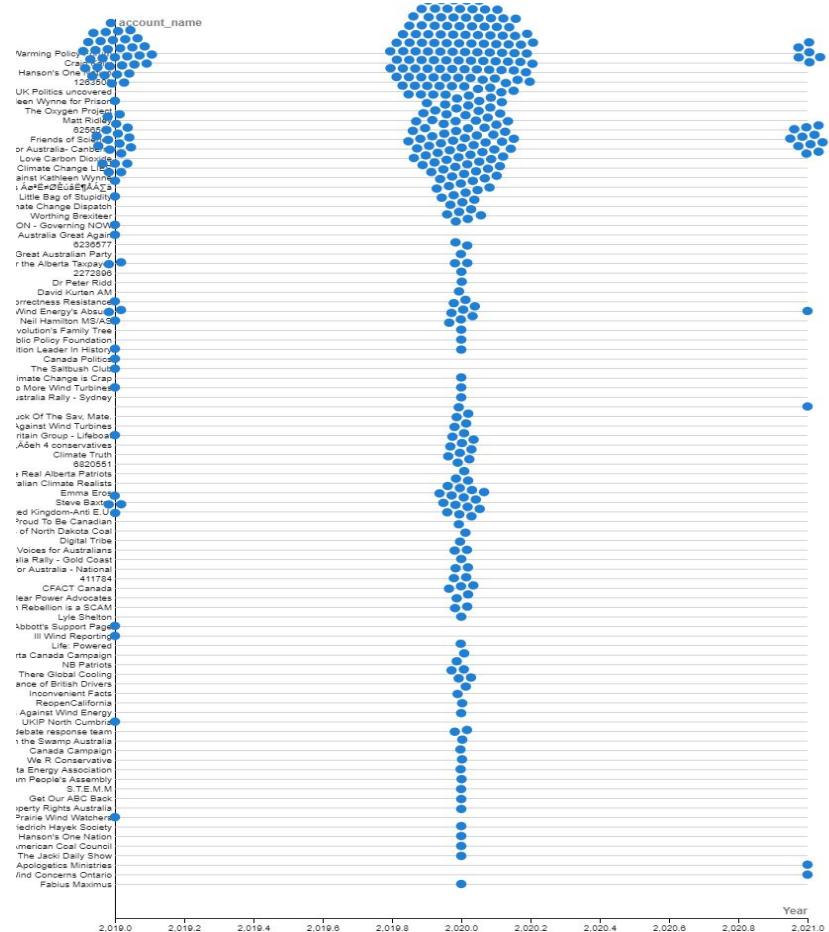


Figure 3. Yearly distribution by individual accounts

ANALYSIS 1 - DATASET

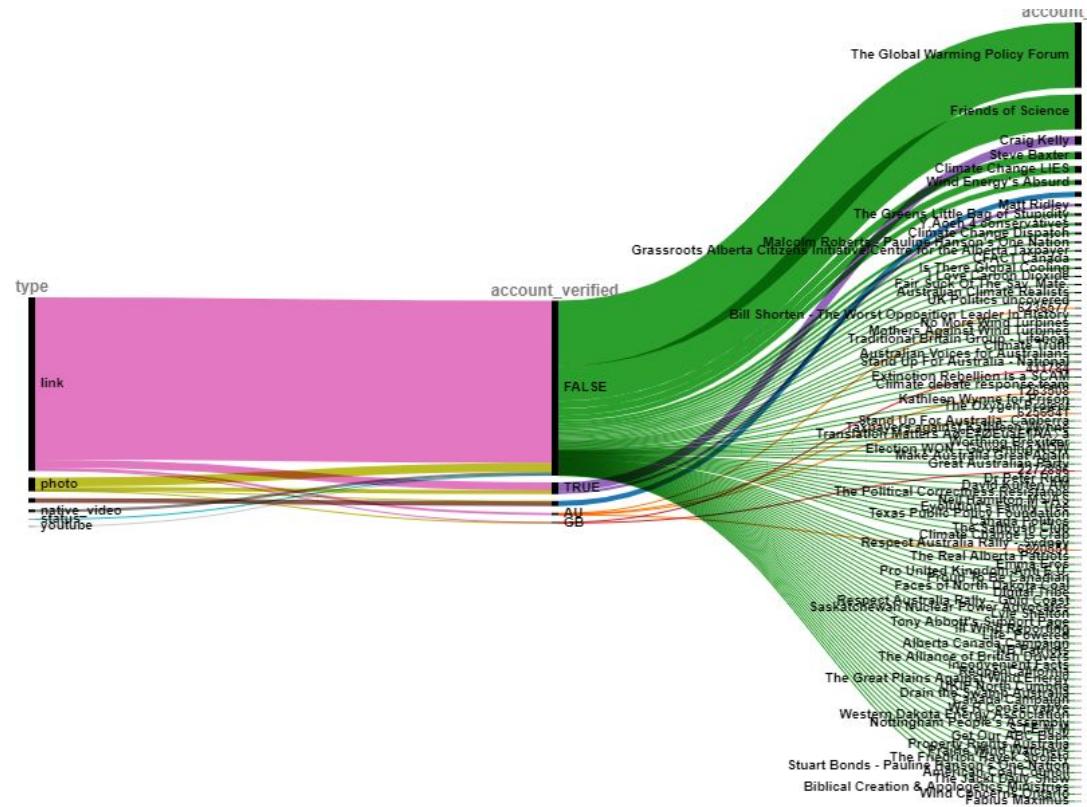


Figure 4. Type of media shared by accounts

Upon further analysis an *Alluvial diagram* (Figure 4.0) indicated that the majority of accounts are non-verified, with notable mentions of verified accounts that will be discussed shortly. On pairing account handles with “type of media” shared by them, an overwhelming majority used links such as:

David Attenborough Accused Of Misleading Public About Polar Bears, Again
Date: 02/12/19 | Press Release, Global Warming Policy Foundation

The Global Warming Policy Foundation has today filed a complaint to the BBC, accusing Sir David Attenborough of misleading the public about the state of polar bear populations in Canada.

Source: The Global Warming Policy Foundation, 2019

Links provide much more flexibility and convenience to spread large amounts of information in a concise manner. It also facilitates the spread of misinformation with deceptive and misleading titles as clickbait for quick views.

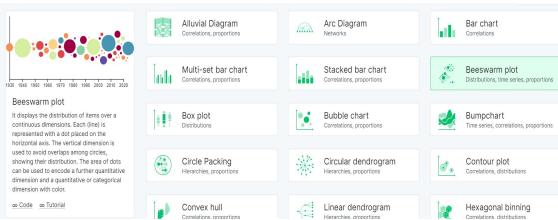
ANALYSIS 1 - METHOD

Recipe for Beeswarm plot distribution and Alluvial distribution:

Step 1: Import data from Tufton Street dataset to RAW Graphs

Column separator	13-11-2020 08:08	link	Read. Right agrees w/ https://www.thegpf.c...
Thousands separator	13-11-2020 08:08	photo	MORE FAKE NEWS Not a ... https://www.thegpf.c...
Decimals separator	02-10-2021 04:07	photo	See. Let yourself! https://www.thegpf.c...
Date Locale	13-11-2020 08:15	link	Woke my Australian... https://tinyurl.com/...
Data Transformation	13-11-2020 08:18	link	Seven satellites way https://tinyurl.com/...
Stack on	13-11-2020 08:08	link	We live (or a time like) https://www.thegpf.c...
Column	13-11-2020 08:18	link	A few video document(s) link https://tinyurl.com/...
	13-11-2020 08:07	link	ATTBURGH AT ST AL https://www.thegpf.c...

Step 2: Choose Beeswarm distribution, plot data and make modifications



3. Mapping

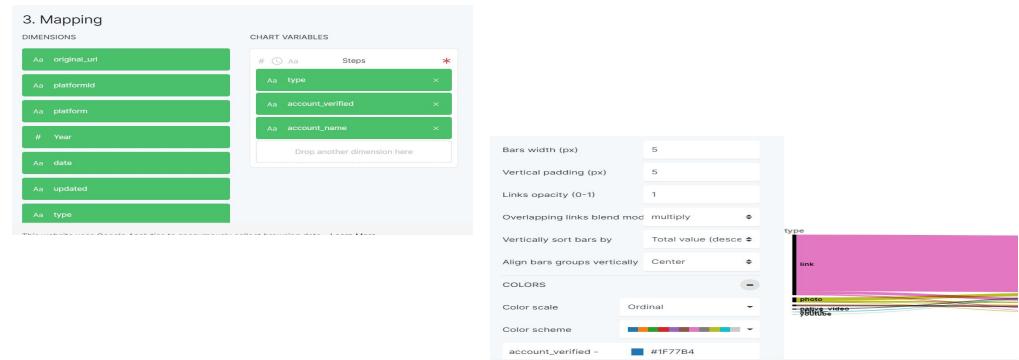
DIMENSIONS

- Aa original_url
- Aa platformid
- Aa platform
- # Year

CHART VARIABLES

- X Axis: # Year
- Size: Drop dimension here
- Label: Aa Label
- Series: Aa Series
- Drop dimensions here
- Drop dimensions here

Step 2: Choose Alluvial distribution, plot data factoring “Type”, “Account verified” and “Acc. name” and make height adjustments



ANALYSIS 1 - RESEARCH QUESTION

What is the degree of participation among some of the highly engaged countries on Facebook?

Based on **posting activity** and **account verification** countries analysed were-

1. UK
2. Australia
3. Canada
4. USA

The GWPF accounts in the Tufton street dataset were analysed. On observing higher number of posts from selected countries, the database was computed into four separate subsets, to enable the analysis of similar patterns and behaviors amongst them.

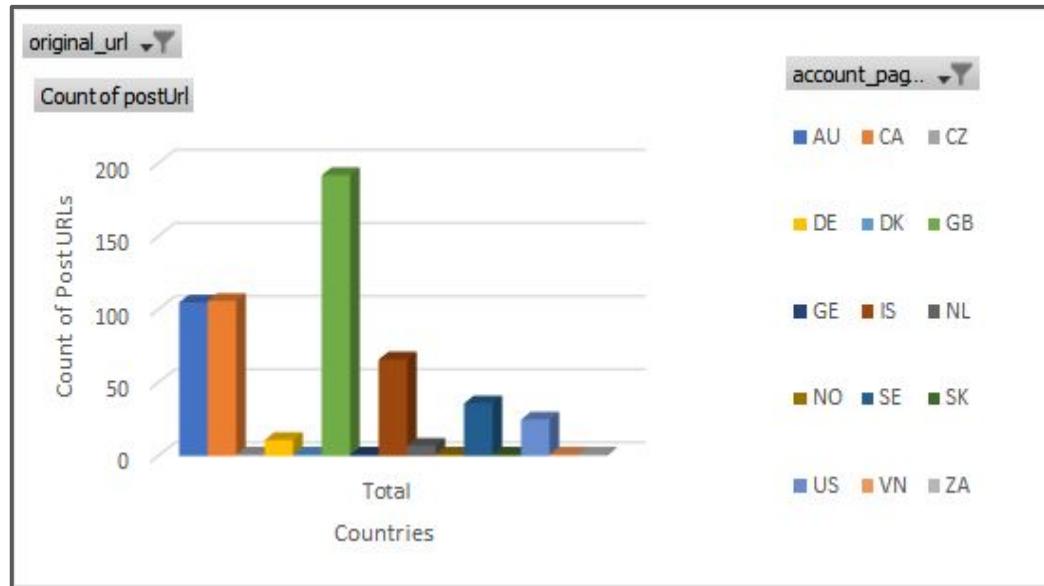


Figure 3. Level of participation on Facebook from each country

ANALYSIS 1 - POSTING ACTIVITY IN- 1. UK

Posting activity in Non-verified accounts- UK	
Account Handle	Account Verified / Post Url
Null	False
allianceofbritishdrivers	False
CIVILIZATIONINSIGHT	False
davidkurtenuk	False
digitaltribe.me	False
extinction.rebellion.is.f...	False
NeilUKIP	False
no.wind.turbines1	False
PeoplesAssemblyNotti...	False
theGWPF	False
TraditionalBritain	False
UKIPNorthCumbria	False
UKOpenpoliticaldebate	False
WindEnergysAbsurd	False
WorthingBrexit	False

Figure 4. Non-verified account handles (UK)

Posting activity in Verified accounts- UK		
Account Handle	Account Verified / Post Url	True
authormattridley	https://www.fa.. https://www.fa.. https://www.fa..	True

Figure 5. Verified account handles (UK)

A prominent account in the UK is **@authormattridley**. He is a conservative rep. in the British House of Lords and a well known author. Ridley has voiced his scepticism towards climate change on his column, “Mind of Matter” in the Wall Street Journal. He is also an advisor to the Global Warming Policy Foundation (GWPF), which coincidentally is the most engaged, non-verified climate denial page on Facebook in the Tufton Street dataset.

ANALYSIS 1 - POSTING ACTIVITY IN- 2. AUSTRALIA

Posting activity in Non-verified accounts- AU

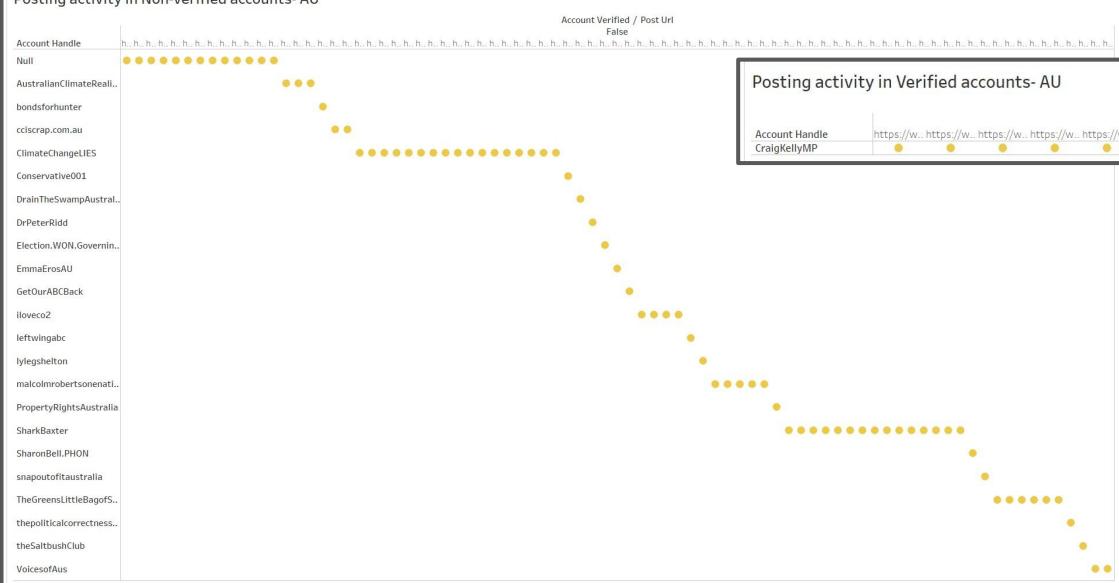


Figure 7. Non-verified account handles (AU)

Figure 7 presents non-verified accounts and their extent of engagement, where a few account handles stand out; @ClimatechangeLIES, @SharkBaxter, @TheGreensLittleBagofStupidity being the top 3.

Posting activity in Verified accounts- AU

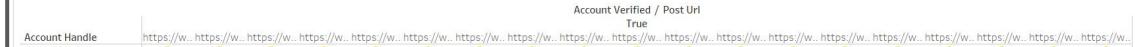


Figure 8. Verified account handles (AU)

One prominent verified handle- **@CraigKellyMP** is an MP in the Australian House of Representatives. He has been called out for his crass comments against those who advocate for scientifically evidenced climate theory. The Guardian reported a “strong theme of anti-science” (The Guardian, 2021) amongst Kelly and his supporters.

ANALYSIS 1 - POSTING ACTIVITY IN- 3. CANADA



Figure 10- Non-verified account handles (Canada)

In Canada, the dataset consisted only non-verified accounts. The account handle “@FosClimateEd” created the highest number of posts.

There were no verified accounts observed among GWPF accounts in Canada.

ANALYSIS 1 - POSTING ACTIVITY IN- 4. USA

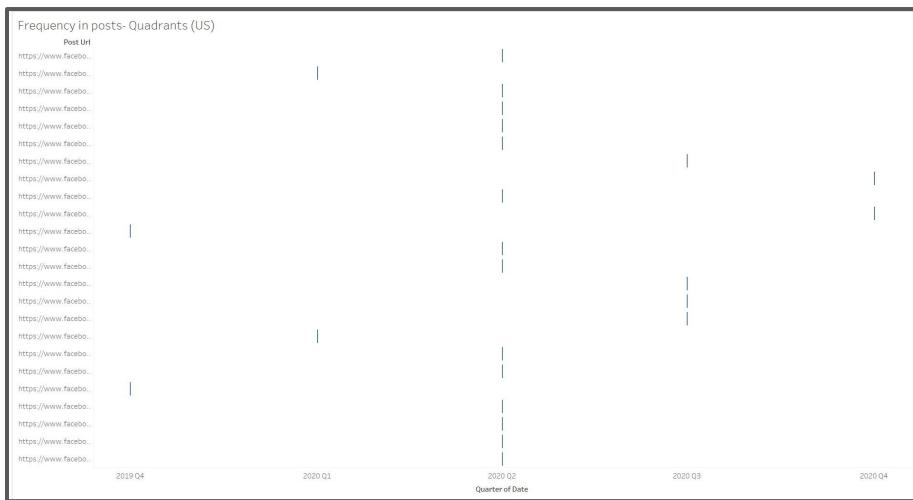


Figure 11. Frequency of posts- Quadrants (2019-2020), US

Figures 11 and 12 represent the account handles and their verification status in the US. As suggested, there is a higher volume of participation from non-verified accounts and only one verified account handle, namely, **@electdickmuri**. Dick Muri was a former member of the Republican party in the Washington House of Representatives.

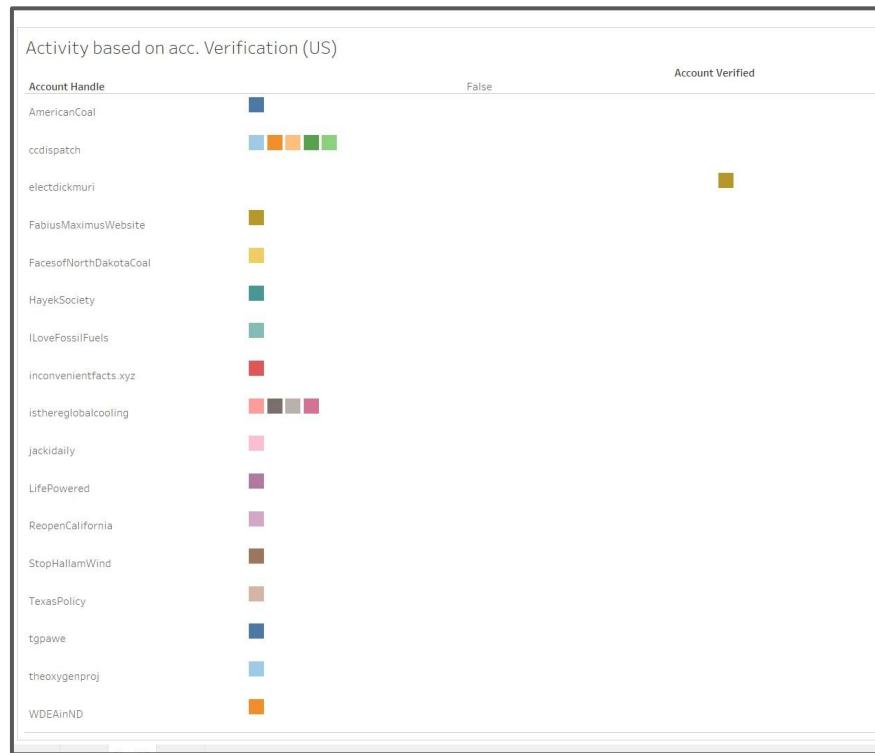


Figure 12. Verified and non-verified account handles (US)

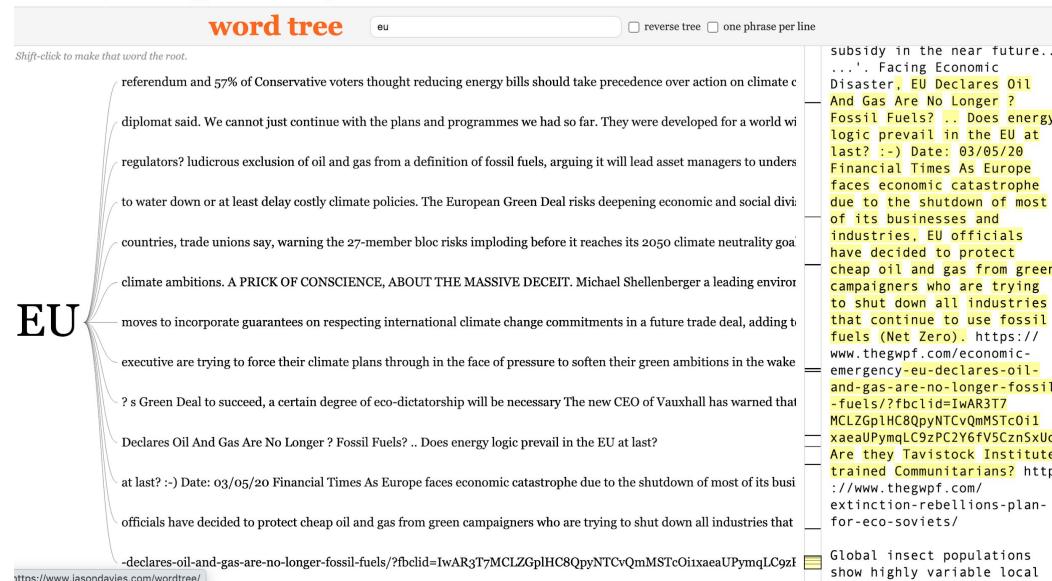
ANALYSIS 1 - FINDINGS

Key findings:

- 1] 2020 was the most active year in terms of individual posts among all 4 highly engaged countries. Further analysis has been conducted within this time-frame to look for potential reasons, patterns and behaviours of climate denial as we investigate deeper into our research project.
- 2] Links are the most commonly used ‘type of media’ shared across the dataset.
- 2] UK, Australia and USA each had one significant participant with a verified account- Matt Ridley, Craig Kelly and Dick Muri respectively. Each of them are current or former members of parliaments, all representing Conservative, Republican parties. This shows that the claims against climate denial aren’t random or innocuous, but a concentrated and focused effort from larger, overarching social systems.

Analysis two:

Textual analysis among UK, USA, CA, AU



ANALYSIS 2- QUESTION

Based on previous work, this analysis aims to compare the Facebook content from UK, US, AU, CA, to see:

- 1. *What are the differences and commonalities in climate denial posts.*
- 2. *What tactics and language is used in the discourse.*

ANALYSIS 2 - METHOD

- Step 1: Data filtering and cleaning using Excel
- Step 2: Word frequency analysis using Antconc
- Step 3: Extracted results and conducted textual analysis using Word Tree

ANALYSIS 2 - DATASET(S)

We started with 393 Facebook posts, over 17,400 words from the four key countries in the Tufton street database and then used Antconc to analyse the messages posted.

Country	Word Count
UK	5,093
US	417
AU	1,0860
CA	1,096



This word cloud shows the words that have high frequency in the UK dataset.

ANALYSIS 2 - UK

Using Antconc to analyze the frequency of words, eliminating the common conjunctions, we focused on words which have concrete meaning in the UK dataset.

1	317	the	59	10	com	118	6	public	178	4	current
2	154	of	60	10	deal	119	6	sea	179	4	currently
3	149	to	61	10	global	120	6	see	180	4	do
4	117	a	62	10	if	121	6	solar	181	4	due
5	102	and	63	10	last	122	6	then	182	9	eco
6	92	in	64	10	our	123	6	according	183	4	environment
7	73	is	65	10	when	124	5	every	184	4	every
8	78	that	66	10	never	125	5	extinction	185	4	extinction
9	53	climate	67	10	who	126	5	any	186	4	extreme
10	53	for	68	10	year	127	5	bear	187	4	found
11	46	s	69	9	cost	128	5	cost	188	4	full
12	44	on	70	9	down	129	5	found	189	6	good
13	39	it	71	9	into	130	5	governments	190	9	governments
14	35	are	72	9	most	131	5	greta	191	4	greta
15	32	we	73	9	now	132	5	david	191	4	greta
16	31	has	74	9	report	132	5	day	192	4	greta
17	30	as	75	9	subsidies	133	5	did	193	4	greta
18	30	the	76	9	theorgy	134	5	don	194	4	greta
19	28	this	77	9	were	135	5	electricity	195	4	greta
20	27	have	78	9	which	136	5	environmental	196	4	greta
21	26	by	79	9	would	137	5	evidence	197	4	greta
22	24	be	80	8	you	138	5	face	198	4	greta
23	23	new	81	8	all	139	5	first	199	4	greta
24	22	from	82	8	before	140	5	fuels	200	4	greta
25	22	they	83	8	economic	141	5	getting	201	9	greta
26	22	was	84	8	economy	142	5	herd	202	4	greta
27	21	change	85	8	has	143	5	how	203	4	greta
28	20	its	86	8	had	144	5	immune	204	4	greta
29	20	this	87	8	news	145	5	human	204	4	greta
30	19	with	88	8	t	146	5	industries	205	4	greta
31	18	about	89	8	we	147	5	industry	205	4	greta
32	18	not	90	7	warming	147	5	industries	206	4	greta
33	17	but	91	7	zero	148	5	inflation	207	4	greta
34	17	wind	92	7	costly	149	5	means	208	4	greta
35	16	energy	93	7	guidlines	150	5	michael	209	4	greta
36	16	will	94	7	possible	151	5	need	210	4	greta
37	15	been	95	7	he	152	5	next	211	4	greta
38	14	an	96	7	parliament	153	5	oil	212	4	greta
39	14	the	97	7	plans	154	5	study	213	4	greta
40	14	green	98	7	like	155	5	switch	214	4	greta
41	14	mu	99	7	one	156	5	take	215	4	greta
42	14	out	100	7	own	157	5	tax	216	4	greta
43	14	scientists	101	7	press	158	5	those	217	4	greta
44	13	more	102	7	science	158	5	thought	218	9	greta
45	13	or	103	6	tell	158	5	trade	218	9	greta
46	13	power	104	6	time	159	5	water	219	4	greta
47	13	there	105	6	university	160	5	u	220	9	greta
48	13	what	106	6	coal	161	5	way	221	3	greta
49	13	government	107	6	coronavirus	166	4	wall	222	4	greta
50	12	the	108	6	emergency	167	4	where	223	4	greta
51	12	than	109	6	activists	167	4	xa	224	4	greta
52	11	after	110	6	annual	168	4	wrong	225	3	greta
53	11	can	111	6	attborough	169	4	across	226	3	greta
54	11	europ	112	6	ice	170	4	again	227	3	greta
55	11	future	113	6	just	171	4	age	227	3	greta
56	11	so	114	6	consumer	172	4	always	228	3	greta
57	11	world	115	6	much	173	4	approved	229	3	greta
58	11	years	116	6	other	174	4	bait	230	3	greta

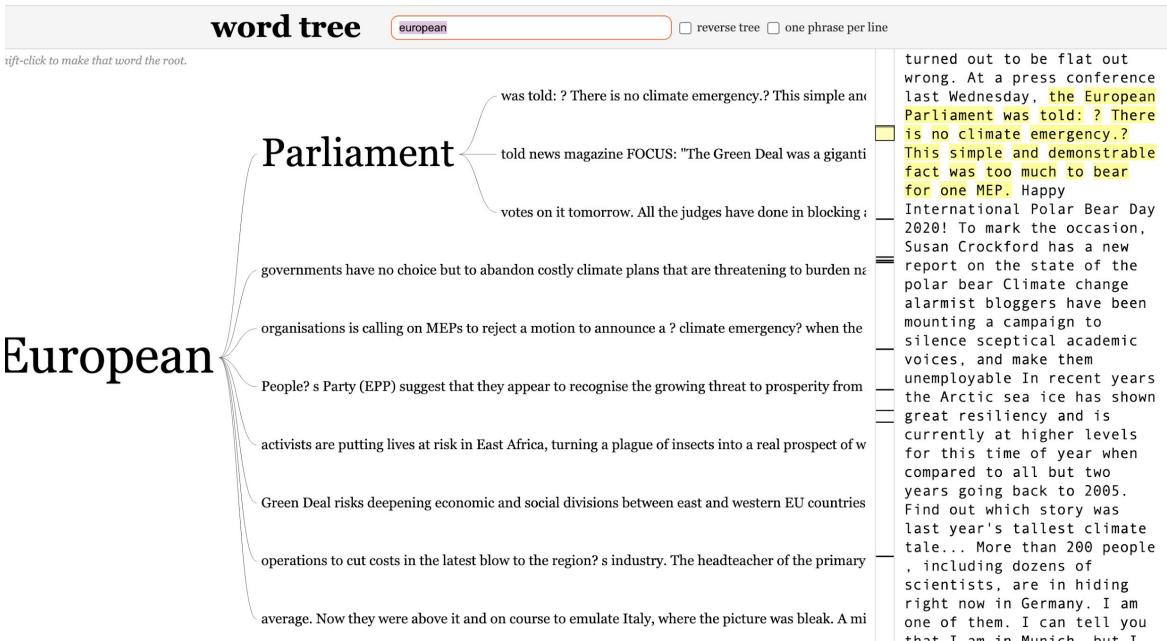


F9	A	B	C	D
Word	Frequency	Total Frequency		
climate	61	61		
EU/European/Europe	14/11/6	31		
change	21	21		
scientists/science	14/7	21		
wind	17	17		
energy	16	16		
government/governments	12/4	16		
economic/economy	8/8	16		
coronavirus/covid/pandemic	6/5/4	15		
green	14	14		
power	13	13		
future	11	11		
world	11	11		
deal	10	10		
global	10	10		
people	10	10		
report	9	9		
subsidies	9	9		
environmental/environment	5/4	9		
gas	8	8		
warming	8	8		
zero	8	8		

ANALYSIS 2 -UK

Key words: EU/European/Europe

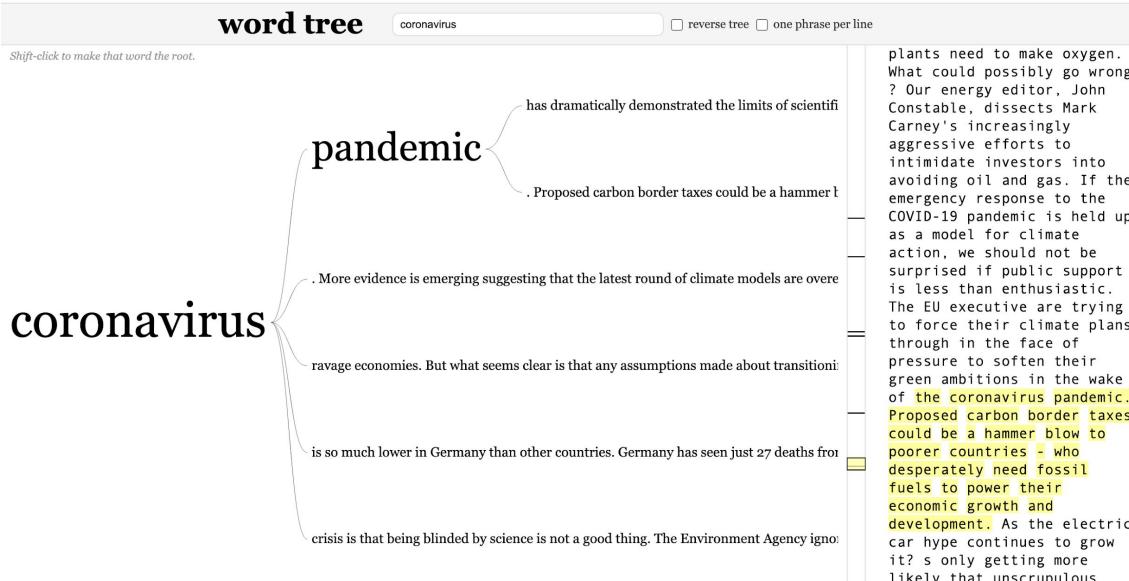
The messages involving keywords above are mainly talking about conservative voters' opinions about the stance "No climate emergency", the irrationality of the energy bill and climate policies.



ANALYSIS 2 - UK

Key words: Coronavirus

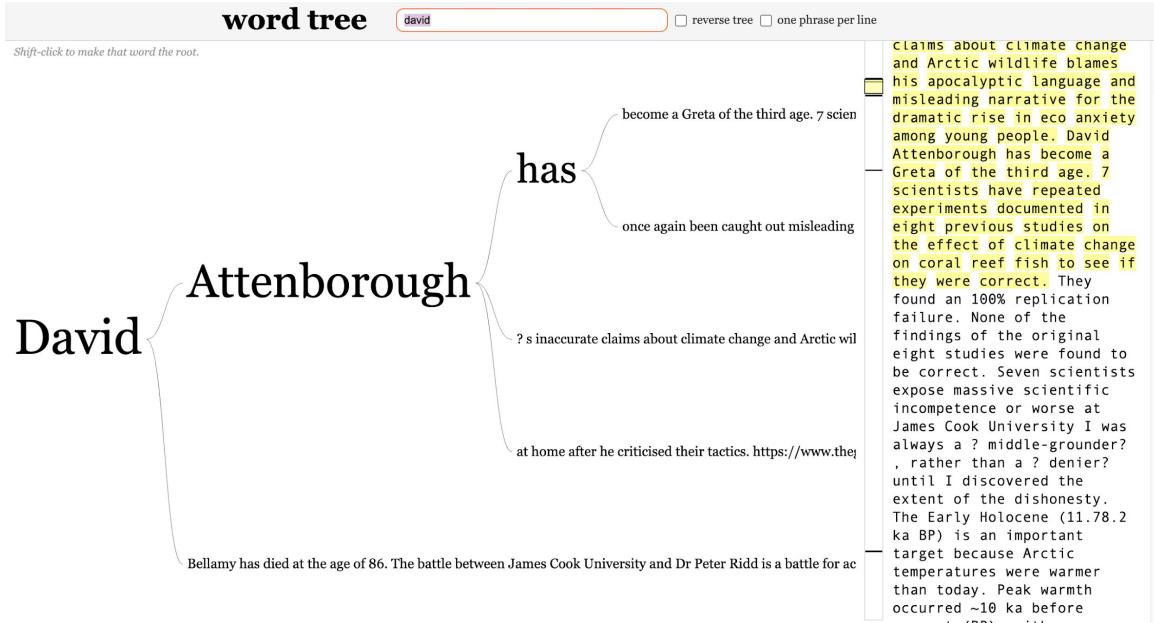
Messages with keywords related to COVID-19 are discussing about the “costly energy policies” in the post-pandemic period. They argued that climate plans are burdening countries with huge costs and job losses if they want a strong economy recovery from Covid-19 lockdowns.



ANALYSIS 2 - UK

Key words: David Attenborough

Posts involving David Attenborough (an English broadcaster) were criticizing his “inaccurate claims and apocalyptic language about climate change” which misled the dramatic rise in eco-anxiety among young generations.





This word cloud shows the words that have high frequency in the AU dataset.

ANALYSIS 2 - AU

Using Antconc to analyse the frequency of words, eliminating the common conjunctions, we focused on words which have concrete meaning in the AU dataset.

A	B	C	D	E
1 Word	Frequency	Total count		
2 scientific/science/scientist	30/19/17	66		
3 China	53	53		
4 change	49	49		
5 coal	40	40		
6 global	34	34		
7 world	33	33		
8 energy	29	29		
9 actions/action	14/12	26		
10 green	23	23		
11 Clark	22	22		
12 countries	22	22		
13 polar	22	22		
14 evidence	21	21		
15 data	20	20		
16 attenborough	20	20		
17 fraud	18	18		
18 replication	18	18		
19 billion	17	17		
20 warming	17	17		
21 bears	16	16		
22 emergency	16	16		
23 extinction	16	16		

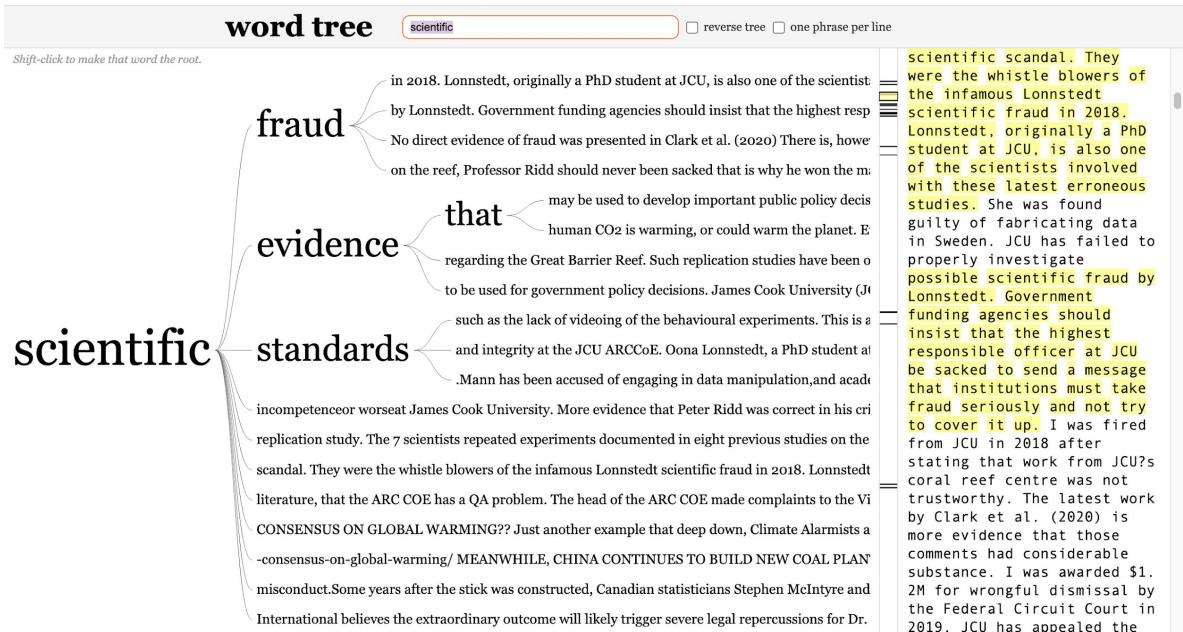
ANALYSIS 2 - AU

Keywords: Scientists

Related keywords: Clark-Timothy Clark, Fraud

A certain percentage of posts of AU are discussing about the “Lonnstedt science fraud”.

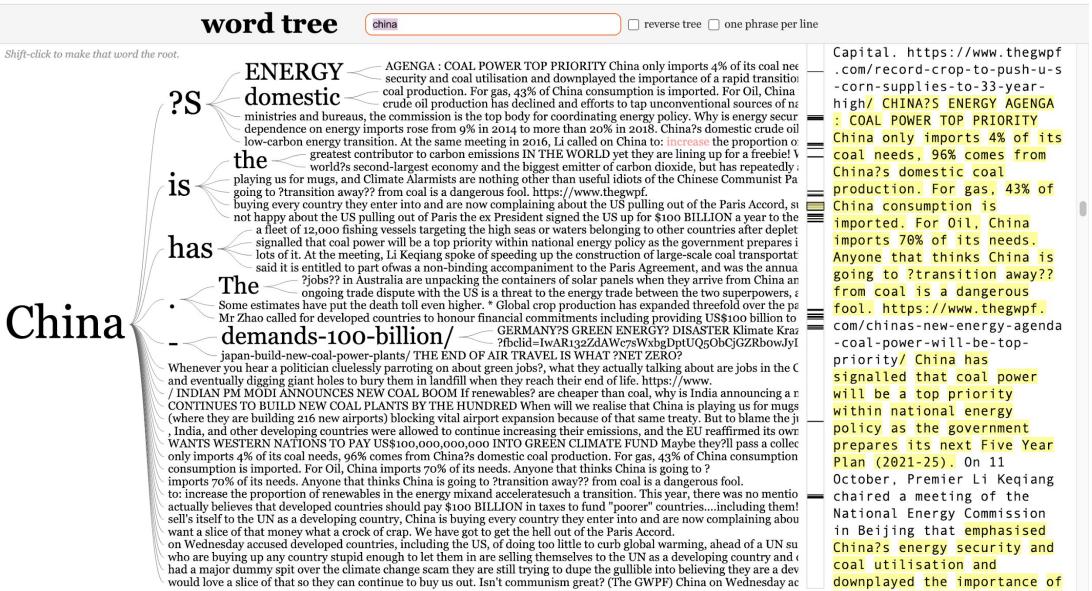
Lonnstedt science fraud refers to seven scientists who studied the effect of climate change on coral reef fish, and found 100% replication failure. All the erroneous studies were done by scientists from James Cook Universities highly prestigious Coral Reef Centre.



ANALYSIS 2 - AU

Keywords: China

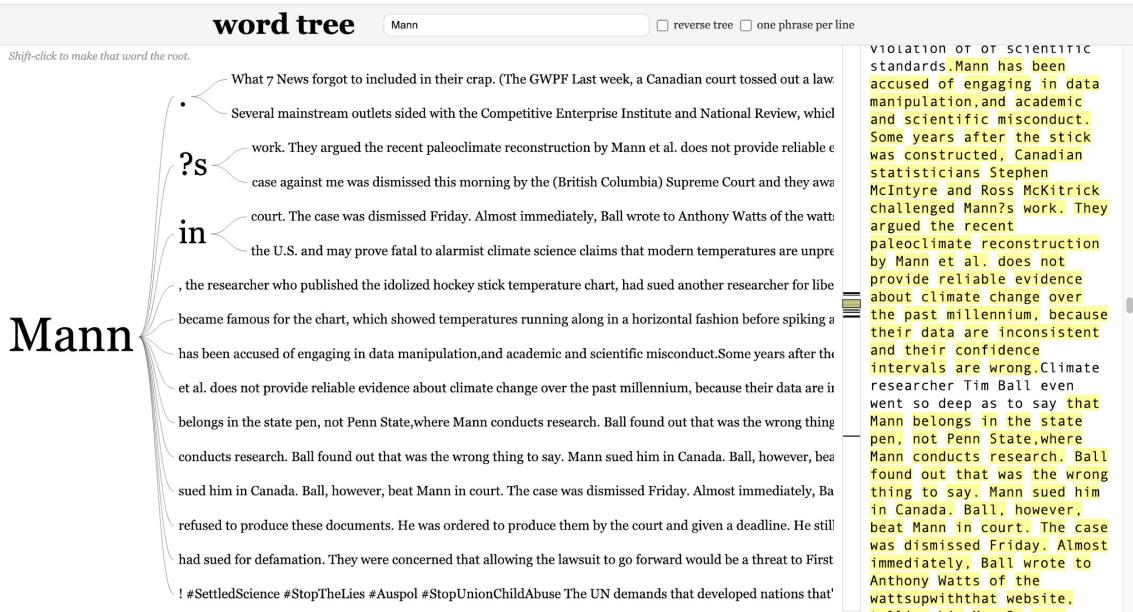
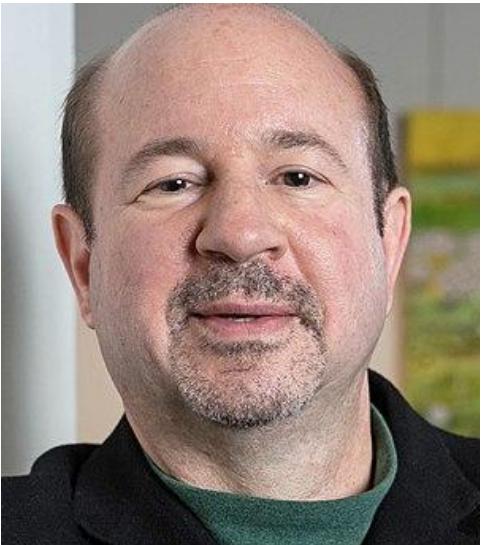
Information about China internally downplaying its low-carbon energy emission, fake economic transition and the declined importation dependence, indicating the conspiracy about political struggle between countries under the cover of climate emergency.



ANALYSIS 2 - AU

Keywords: Mann

These posts criticized the American climatologist, Michael Evan Mann, who has worked on building the temperature models since the 20th century.



ANALYSIS 2 - USA&CA

Rank	Freq	Word	#Search	Hits:	v
2	17	a	1	83	com
3	17	of	2	83	https
4	12	f	3	83	thegwpf
5	12	utm	4	83	ww
6	10	to	5	70	the
7	9	and	6	53	to
8	9	in	7	40	of
9	8	com	8	34	in
10	8	https	9	31	climate
11	8	s	10	29	and
12	8	thegwpf	11	23	is
13	8	www	12	22	for
14	7	new	13	20	green
15	6	campaign	14	19	are
16	6	e	15	18	a
17	6	www	16	16	have
			17	16	wind
			18	14	as
			19	13	that
			20	12	will
			21	11	by
			22	10	energy
			23	10	its
			^	10

Compared to posts in UK and AU, words that appeared most frequently in messages posted in US and CA tended to contain more conjunctions and words without actual meanings, referring back to the original messages, we could find that main contents of those posts are sharing links of articles from the website of GWPF .

Key findings:

1. Through in-depth textual analysis, we found posts from the four countries all have different concerns and focuses. For example, posts from the UK are concerned about policies in the EU and the economic recovery after the pandemic. While content from Australia focuses more on scientific fraud published by climatologists and countries like China. At the same time, there are less original messages among posts in Canada and United States. Those posts mainly consisted of link sharing articles of GWPF, by which, as we said previously, misinformation could spread more conveniently.
2. This shows great interests in topics involving Coronavirus, especially when it comes to the economic growth and inaccuracy of scientific modeling. Moreover, they tended to share same political stands as conservatives, such as attaching importance to industrial development.
3. Tactics of those posts includes: Exaggerations, polarized, simplified wording and metaphors, ambiguous pronoun such as '*an EU diplomat said*' . They preferred to attack celebrities to gain more attention and raise supports.
4. It is worth noting that a key finding of these posts is that they are often critical about the falsifiability of the climate change theories rather than proving systematic theories to support their stance directly, which can be proved by debates over Michael Evan Mann and the Lonnstedt Science Fraud.

Analysis three: Amplification of content on Facebook

Analysis 3 - Question

How is content amplified on Facebook from the Tufton Street organisations?

Our initial analysis showed that external link sharing was often common on Facebook, we aim to investigate which links are shared and how they are amplified through the Facebook platform.

Analysis 3 - Dataset

We started with the entire Tufton dataset and focused on two weeks in January.

This period was chosen, because our earlier analysis showed the first quarter of 2020 had the highest posting activity for 3 out of the 4 countries we are focusing on (Figure 5.0). We chose to focus on Australia, the U.S, Canada and the UK as they had the biggest posting activity.

We investigated the way content is amplified on Facebook from the Tufton Street organisations by using a recipe from the Public Data Lab using CrowdTangle and Gephi technologies.

We gained API access to CrowdTangle through King's College London, which allowed us to inspect a large amount of URLs more quickly than manually obtaining the data through the CrowdTangle extension. Once the data and imported was cleaned from our Tufton Actors spreadsheet, it was imported into Gephi to produce the visualisation

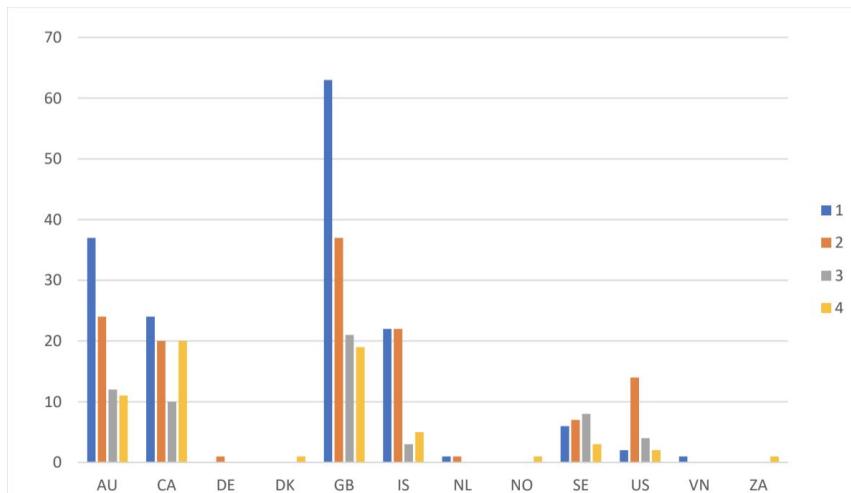


Figure 5- Frequency of posts divided by Quadrants for 2020

Analysis 3 - Method

- **Step 1:** Identified a high period of engagement on Facebook in our dataset
- **Step 2:** Using the recipe from [public datalab on Facebook URL sharing](#) and Crowdtangle API access, we exported the engagement data for the URLs shared in this time period
- **Step 3:** We then uploaded that csv file to <https://medialab.github.io/table2net/> and built a network to use in Gephi after.
- **Step 4:** We then used the VLOOKUP formula to shorten the URL names to make our visualisation clearer

fx =VLOOKUP(A2,'Feuille 1'!A2:B286,2, FALSE)

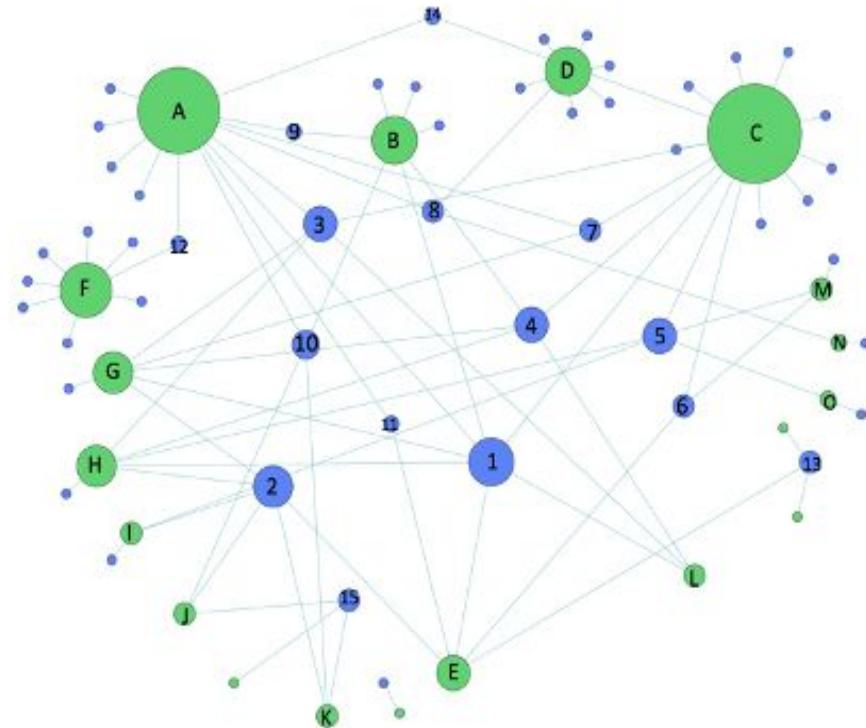
URL	Title
https://www.thegwpf.com/boris-johnson-ignores-climate-activists-and-saves-airline/	Boris Johnson ignores climate activists
https://www.thegwpf.com/boris-johnson-ignores-climate-activists-and-saves-airline/	Boris Johnson ignores climate activists
https://www.thegwpf.com/boris-johnson-ignores-climate-activists-and-saves-airline/	Boris Johnson ignores climate activists
https://www.thegwpf.com/the-inconvenient-facts-on-australian-bushfires/	Australian Bushfires
https://www.thegwpf.com/the-inconvenient-facts-on-australian-bushfires/	Australian Bushfires

Analysis 3 - Visualisation -

Visualisation of content amplification by Tufton Street Organisations on Facebook

A = David Attenborough Blamed
B = Australian Bushfires
C = Thwaites Glacier
D = Media Ignores Michael Manns Court Loss
E = David Attenborough Makes same Mistake as Greta Thunberg
F = Trump rejects environmental prophets
G = Lower energy bills over climate action
H = Wind farms Built
I = Boris Johnson Climate Change
J = Greenpeace on Extremist List
K = Dark Age for Climate Science
L = Boris Johnson Ignores Climate Activists
M = Trees Felled in Scotland
N = Therapy for Eco-Anxiety Pandemic
O = Wind Farms paid to turn off turbines

1 = The Global Warming Forum Policy
2= Iowa Climate Science Education
3 = CO2 en Klimaat: een beetje realisme
4 = Climate Change is Natural
5 = Friends of Science
6 = Climate Change Battle Royale
7 = Australian Climate sceptics group
8 = The Greens Little Bag of Stupidity
9 = cfact Canada
10 = Klimatsans
11 = Carbon Dioxide is Cool
12 = Climate & Energy UK
13 = Climate Change lies
14 = Anthropogenic (man made) climate change is a hoax!
15 = No wind Turbines

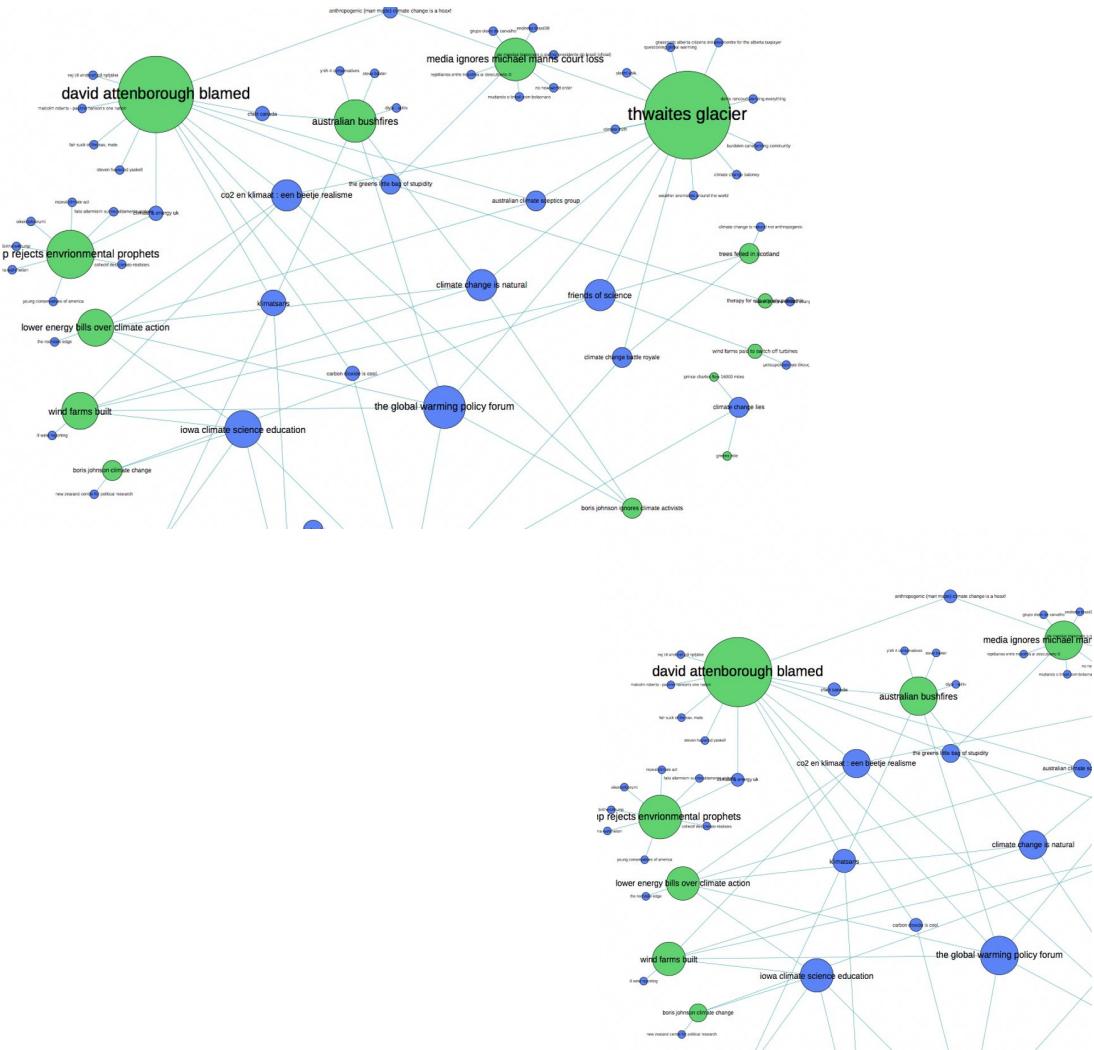


Analysis 3- Findings

Looking at the Gephi visualisation we created, we can see that the wider the green circle (URLs), the more these have been shared by Facebook pages (blue circles) therefore showing that the wider the blue circle, the more these Facebook pages interact with different websites.

The pages titled: *Thwaites Glacier*, *David Attenborough Blamed*, *Trump rejects environmental projects* and *Australian Bushfires* are the most shared URLs within our dataset. This coincides with the political and climate situation in both countries at the time. Our visualisation represents January 2020, the exact time when the Australian Bushfires were happening, David Attenborough's film had been released (September 2020) and Trump's presidency was nearly finished.

Although some of the most shared URLs were amplified by many different pages, we can see that The Global Warming Policy forum, The Iowa Climate Science Education and Friends of Science are responsible for amplifying the spread of a lot of content.



Analysis 3 - Findings

Having researched the most popular Facebook groups, we have found that there were political connections with some:

Morton Paulson was listed as the media contact for Friends of Science and was also a spokesman for the Conservative Party in 2006. He was also a registered lobbyist for two oil and gas industry companies - 1/3 of their funding is provided by the oil industry (Desmog, 2020)

In 2014, the GWPF was described as the “UK’s most prominent source of climate change denial” (Cockburn, 2020) and in the same year, GWPF listed a board of trustees consisting of both Labour party and Conservative politicians

Lord Vinson, who was important in the rise in power of Margaret Thatcher, had donated at least £15,000 to the GWFP. (Montague, 2014)

One of the foundation’s secret donors is Michael Hintze, who also supports and donates to the Conservative Party. (Ward, 2013)

The Iowa Climate Science Education doesn’t disclose much information. We do not know who owns it or where the funding comes from.

Analysis four: Engagement on Facebook

Analysis 4 - Facebook Accounts & Engagement

This part of the study investigates the dissemination of content from the Global Warming Policy Forum via Facebook to discover:

Which groups are most active in sharing the GWPF content?

Which Facebook groups/individuals have the highest levels of engagement?

Analysis 4 - Method

1. Imported the cleaned dataset from an excel to R

Import Excel Data

File/URL:
~/gwpf.xlsx

Data Preview:

original_url (character)	platform (character)	date (double)	type (character)	message (character)	expandedLinks_0_original (character)
https://www.thegwpf.com/	Facebook	2021-02-03	link	While our Australian fishing Fleet is locked out of large swat...	https://tinyurl.com/y7bq85pe
https://www.thegwpf.com/	Facebook	2021-02-02	link	We live in a time where every extreme weather or climate-re...	https://www.thegwpf.com/the-inconvenient-facts-on-austra...
https://www.thegwpf.com/	Facebook	2021-02-02	photo	MORE FAKE NEWS Not a day passes with a fake news climat...	https://www.thegwpf.com/new-model-of-predicted-polar-b...

Previewing first 50 entries.

Import Options:

Name: Max Rows: First Row as Names

Sheet: Skip: Open Data Viewer

Range: NA:

Code Preview:

```
library(readxl)
gwpf <- read_excel("gwpf.xlsx")
View(gwpf)
```

2. Loaded the relevant libraries and subset the data

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

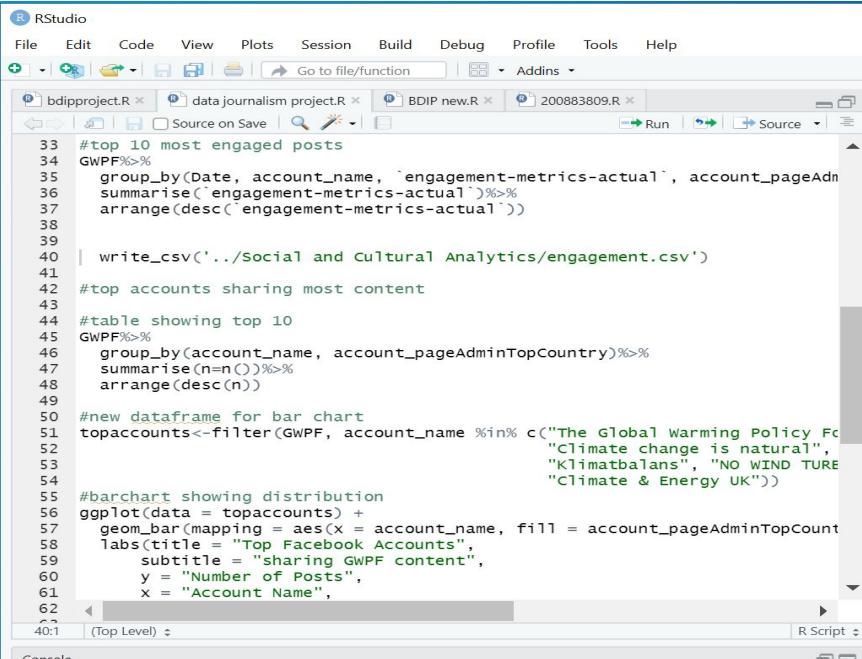
+ Go to file/function Addins

bdiproject.R x data journalism project.R x BDIP new.R x 200883809.R x Run Source

```
1 #Load libraries and dataset
2 library(foreign)
3 library(tidyverse)
4 library(tidyr)
5 library(knitr)
6 library(dplyr)
7 library(ggplot2)
8 library(lubridate)
9
10 GWPF<- Tufton_Dataset_Countries_Added
11
```

Analysis 4 - Method

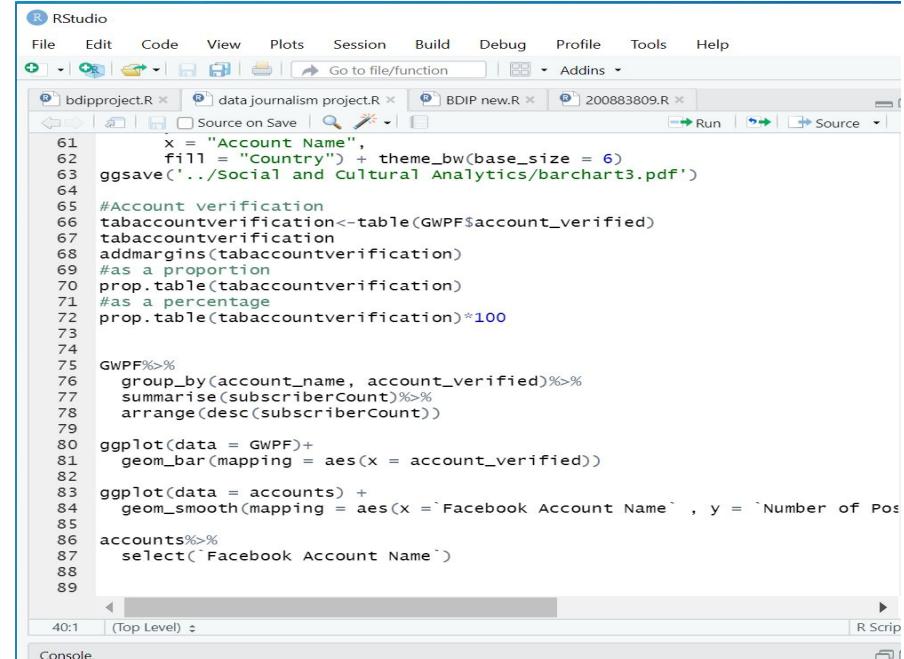
3. Code used to create visualisations, using R/RStudio



RStudio interface showing R code for data journalism. The code is organized into several sections:

- #top 10 most engaged posts
- GWPF %>% group_by(Date, account_name, `engagement-metrics-actual`, account_pageAdmin) summarise(`engagement-metrics-actual`)%>% arrange(desc(`engagement-metrics-actual`))
- write_csv('../Social and Cultural Analytics/engagement.csv')
- #top accounts sharing most content
- #table showing top 10 GWPF %>% group_by(account_name, account_pageAdminTopCountry)%>% summarise(n=n())%>% arrange(desc(n))
- #new dataframe for bar chart topaccounts<-filter(GWPF, account_name %in% c("The Global Warming Policy Found", "Climate change is natural", "Klimatbalans", "NO WIND TURE", "Climate & Energy UK"))
- #barchart showing distribution ggplot(data = topaccounts) + geom_bar(mapping = aes(x = account_name, fill = account_pageAdminTopCount) labs(title = "Top Facebook Accounts", subtitle = "sharing GWPF content", y = "Number of Posts", x = "Account Name",

The code is located in a script named bdipproject.R.



RStudio interface showing R code for Social and Cultural Analytics. The code includes:

- x = "Account Name", fill = "Country") + theme_bw(base_size = 6) ggsave('../Social and Cultural Analytics/barchart3.pdf')
- #Account verification tabaccountverification<-table(GWPF\$account_verified) tabaccountverification addmargins(tabaccountverification) #as a proportion prop.table(tabaccountverification) #as a percentage prop.table(tabaccountverification)*100
- GWPF %>% group_by(account_name, account_verified)%>% summarise(subscriberCount)%>% arrange(desc(subscriberCount))
- ggplot(data = GWPF)+ geom_bar(mapping = aes(x = account_verified))
- ggplot(data = accounts) + geom_smooth(mapping = aes(x = `Facebook Account Name` , y = `Number of Posts`)) accounts%>% select(`Facebook Account Name`)

The code is located in a script named data journalism project.R.

Figure 1 - Top 10 Facebook accounts sharing posts from the Global Warming Policy Forum

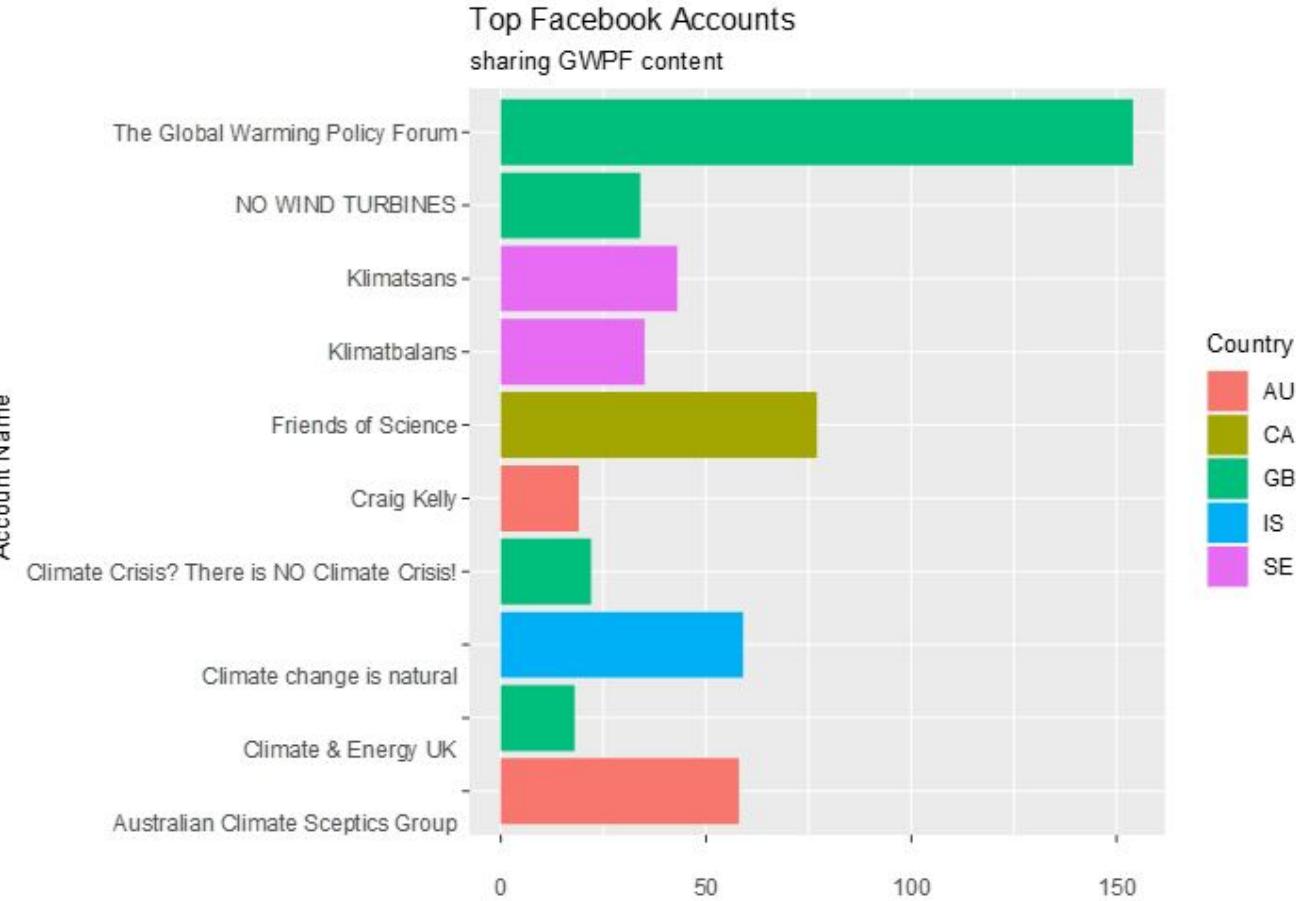


Figure 1 shows that it is a small collection of Facebook accounts which make up a large percentage of the groups spreading disinformation online from the GWPF website, with the top 10 accounts sharing 51% of the posts.

Unsurprisingly the GWPF's own Facebook page accounted for highest percentage of posts shared via URL (15%) in comparison to the other accounts, highlighting further the saturation.

Figure 2. Level of engagement via individual Facebook post in 2020

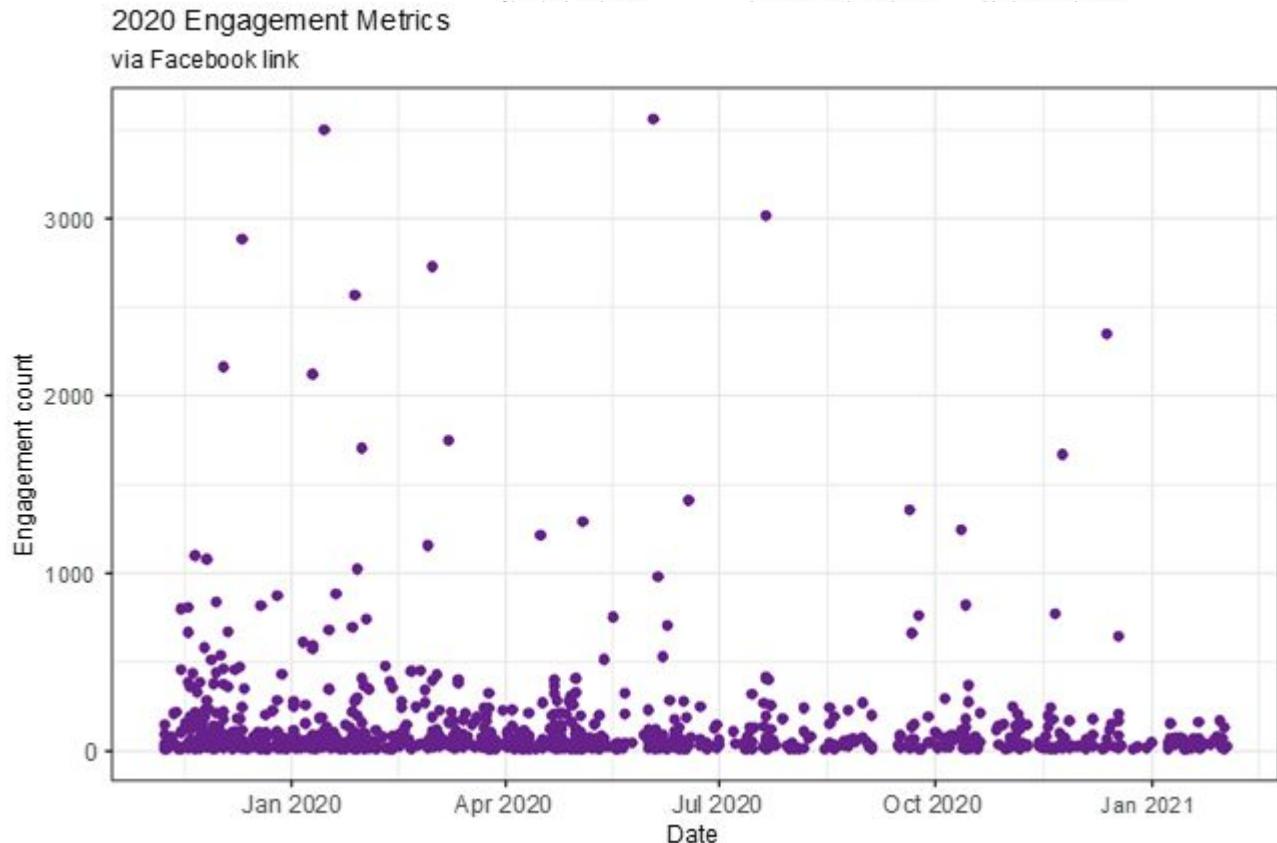


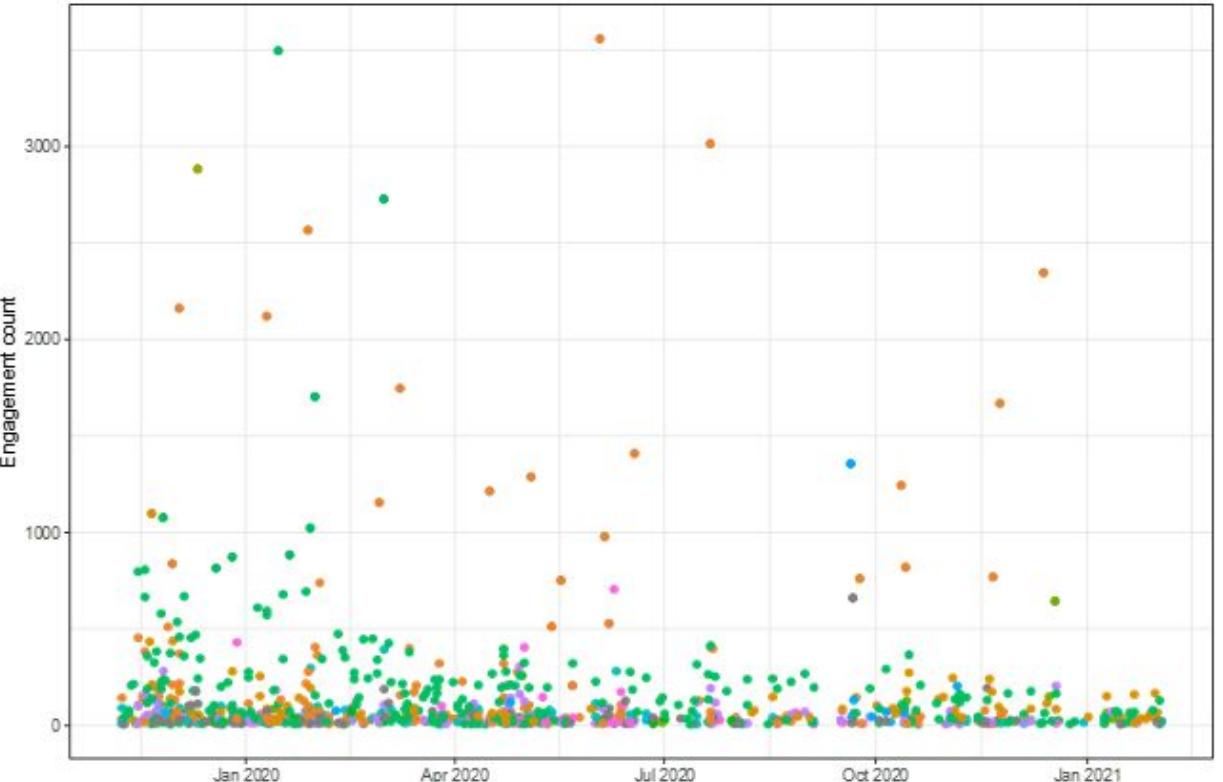
Figure 2 shows the levels of engagement each Facebook post received in 2020, with each plot representing a post.

Engagement was highest between January to June and drops significantly from July onwards.

There are a variety of outliers, whose posts tend to generate a far greater amount of interest than others, with the two top posts generating around 3,500 in total engagement metrics, this includes number of likes, shares etc.

Figure 3. 2020 Engagement metrics by date and country

2020 Engagement Metrics
via country and date



The UK represents a high proportion of posts, however the engagement is relatively low. They account for only two of the most significant outliers. Engagement levels and number of posts are saturated in the first quarter of 2020, January to April.

Australia have significantly less posts but they have a far higher engagement metric, accounting for the largest proportion of outliers in our analysis. Enabling these accounts spread disinformation more vastly than the other accounts due primarily to their wider reach of audiences.

Figure 4. Top 20 posts with the highest rate of engagement

Date	Account Name	Engagement Metrics	Country
03/06/2020	Malcolm Roberts - Pauline Hanson's One Nation	3559	AU
15/01/2020	The Global Warming Policy Forum	3497	GB
21/07/2020	Craig Kelly	3015	AU
11/12/2019	Bivðrn Hvðcke	2884	DE
01/03/2020	The Global Warming Policy Forum	2728	GB
28/01/2020	Malcolm Roberts - Pauline Hanson's One Nation	2567	AU
13/12/2020	Craig Kelly	2347	AU
03/12/2019	Craig Kelly	2162	AU
10/01/2020	Malcolm Roberts - Pauline Hanson's One Nation	2121	AU
08/03/2020	Craig Kelly	1747	AU
31/01/2020	UK Politics uncovered	1704	GB
24/11/2020	Craig Kelly	1669	AU
18/06/2020	Craig Kelly	1410	AU
20/09/2020	Motvind World	1357	NO
04/05/2020	Craig Kelly	1289	AU
12/10/2020	Craig Kelly	1245	AU
16/04/2020	Craig Kelly	1214	AU
28/02/2020	Craig Kelly	1156	AU
21/11/2019	Kathleen Wynne for Prison	1099	CA

Figure 4 shows the majority of outliers were made up of two Australian accounts: ‘Malcolm Roberts – Pauline Hanson’s One Nation’ and ‘Craig Kelly’.

Malcolm Roberts shared a relatively low amount of content from the GWPF website, 5 posts in total. However, 3 of those were within the top 20 most engaged with posts from the entire dataset, with a post in June 2020 totalling 3559, the highest level of engagement metrics in total.

Craig Kelly was far more active in sharing the GWPF’s content, one of the accounts who featured in both the top 20 shared posts and top 20 highest engagement. Craig Kelly and Malcolm Roberts account for 14 of the top 20 posts with the highest engagement metrics. Highlighting that a very small number of accounts are responsible for spreading the GWPF’s disinformation via Facebook.

Findings:

1. On Facebook the majority of content being shared is primarily by a small number of groups from various countries. Figure 1 shows this, with accounts in the UK, Canada, Australia, Sweden, and Iceland sharing large volumes of content. Disseminated by a relatively small number of groups or individuals, with the top 10 accounts sharing 51% of the posts on Facebook. Highlighting further the saturation of content dissemination from the GWPF website and how vastly information spread online.
2. When investigating different levels of post engagement, we found that accounts in Australia and the UK were the most active in sharing GWPF content. However, there were some differences between the two countries. The UK represents a high proportion of posts but their engagement level is relatively low. They account for only two of the most significant outliers and their engagement levels and number of posts are saturated in the first quarter of 2020, between January to April, and proceed to level off throughout the year.

While Australia account for less posts than the UK, they have much higher level of engagement, posts from Australian Facebook pages account for the largest proportion of outliers in our analysis. We could therefore hypothesis that while they engage less actively with the GWPF website, due to their higher levels of engagement on Facebook, they are actively spreading disinformation about climate change more vastly than the other accounts under analysis. In particular, Australian politicians Craig Kelly and Malcolm Roberts, who were the most influential in regards to engagement metrics, making-up with majority of the outliers in the dataset. Emphasising further how disinformation around climate change has clear links to politicians and organisations with predefined levels of public influence.

Conclusion

The aim of this project was to investigate the dissemination of climate change denial on Facebook, with the purpose of providing a technical analysis, grounded in mixed-method research approach. The intention is to contribute to an area of academic interest, which has become ever more prevalent due to the growing awareness surrounding the spread of 'fake news' online (Cockburn, 2020). Our project focused specifically on discovering if there were significant links between organisations and prominent individuals, such as politicians. Our project was data-driven and investigated through four types of analysis which promotes reliability of our results and a lesser focus of opinion based research.

Our research revealed some interesting themes throughout. Firstly, each analysis found that the content from the GWPF website had a global reach, with the four most engaged countries including the US, UK, Australia, and Canada. Highlighting that not only climate change, but the denial and disinformation attached to it is a global issue and must be addressed further. The textual analysis found that while this information was being used globally, each country used this to address specific concerns, such as EU policies or accusations of climate fraud. Showing how the same information can be used tactically to promote different political motivations or opinions.

Conclusion

The content dissemination analysis found that it was primarily a small number of groups, organisations or individuals who were the most compliant in spreading information online, emphasising the saturation of information and concerns regarding how vastly it spreads online. Some prominent figures were identified easily in various analysis, including Australian MP Craig Kelly, whose Facebook page has recently been removed due to repeatedly spreading misinformation (Taylor, Karp, 2021). While others required doing more granular research to discover connections, such as Morton Paulson who has significant ties with Friends of Science, the Conservative Party and oil and gas industries.

Overall, this research has found that the promoters of climate denial have a specific agenda's, which are interchangeable dependent on country and context, highlighting further the fallibility of information which circulates online and the need for greater awareness in this sphere. Prominent figures tended to identify with right-wing politics, with a focus on the importance of industrial development, suggesting further that their stance on climate change can be attributed to personal interests or involvement in certain corporations, instead of primarily climate denial beliefs.

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