Supplementary Material

Table 1. Distribution of tweets by the tweet types.

Class	**Top Level**	**Retweet**	**Reply**	**Quote**	**All**
Control	1,717,648	4,881,431	2,998,289	59,182	9,656,550
Act-Old	20,951	2,771,344	1,060,659	182,815	4,035,769
Act-New	102	12,410	9,169	1,189	22,870
Del-Old	18,521	1,159,560	1,009,861	131,123	2,319,065
Del-New	264	23,368	22,482	2,478	48,592
Sus-Old	25,387	1,820,945	1,646,019	204,158	3,696,509
Sus-New	333	36,039	40,939	4,724	82,035
TOTAL	1,783,206	10,705,097	6,787,418	585,669	19,861,390

Table 2. The most frequent domains shared in the tweets for each user type, ranked according to the frequency ratio. Suspicious domains that could spread false information are given in bold (i.e. fact-checked by using PolitiFact).

Cont-Old		**Cont-New**		**Act-Old**		**Act-New**	
0.122	youtube.com	0.113	youtube.com	0.072	youtube.com	0.086	youtube.com
0.023	onlyfans.com	0.076	blogspot.com	0.016	nytimes.com	0.074	itechnews.co.uk
0.022	instagram.com	0.043	instagram.com	0.016	washingtonpost.com	0.026	wesupportpm.com
0.017	spotify.com	0.035	onlyfans.com	0.014	cnn.com	0.018	cnn.com
0.016	peing.net	0.033	spotify.com	0.013	instagram.com	0.017	change.org
0.009	facebook.com	0.030	vlive.tv	0.012	foxnews.com	0.014	gofundme.com
0.009	google.com	0.028	amazon.com	0.012	thegatewaypundit.com	0.014	instagram.com
0.009	twitcasting.tv	0.019	shopee.ph	0.011	breitbart.com	0.013	spotify.com
0.008	yahoo.co.jp	0.016	google.com	0.001	change.org	0.011	washingtonpost.com
0.008	naver.com	0.016	curiouscat.qa	0.001	spotify.com	0.011	rpnnews.com
Del-Old		**Del-New**		**Sus-Old**		**Sus-New**	
0.093	youtube.com	0.075	youtube.com	0.088	youtube.com	0.114	youtube.com
0.021	change.org	0.034	thepugilistmag.co.uk	0.022	**thegatewaypundit.com**	0.053	allthelyrics.com
0.021	spotify.com	0.021	carrd.co	0.020	**foxnews.com**	0.016	cloudwaysapps.com
0.019	**foxnews.com**	0.020	change.org	0.019	**breitbart.com**	0.015	**foxnews.com**
0.018	onlyfans.com	0.019	openionsblog.com	0.012	nytimes.com	0.014	**breitbart.com**
0.017	carrd.co	0.015	gofundme.com	0.012	washingtonpost.com	0.013	headlinehustlenews.com
0.017	breitbart.com	0.014	foxnews.com	0.011	cnn.com	0.012	thegatewaypundit.com
0.017	thegatewaypundit.com	0.013	theguardian.com	0.011	spotify.com	0.011	cnn.com
0.015	curiouscat.qa	0.013	breitbart.com	0.009	google.com	0.001	blackified.com
0.014	gofundme.com	0.013	instagram.com	0.009	instagram.com	0.001	australianonlinenews.com.au

Table 3. Average confidence scores of RoBERTa model fine-tuned for sentiment analysis and hate speech. The bold score is the highest. The superscript indicates statistically significant differences in pairwise comparisons between the same superscript.

	Negative	**Neutral**	**Positive**	**Hate**	**Normal**	**Offensive**
Act-Old	0.389	**0.369**	0.242	0.045	**0.744**	$0.211^{a,\ b}$
Act-New	0.429	0.355	0.217	0.046^{b}	$0.739^{a,b}$	0.215
Del-Old	0.389	0.362	**0.251**	0.045^{b}	$0.738^{a,b}$	$\mathbf{0.217^{(a),b}}$
Del-New	0.445	0.353	0.202	$\mathbf{0.047^{(a),b}}$	$0.736^{a,b}$	$\mathbf{0.217^{a,(b)}}$
Sus-Old	0.433	0.363	0.204	$0.044^{a,b}$	$\mathbf{0.744^{a,(b)}}$	$0.212^{a,b}$
Sus-New	**0.475**	0.349	0.175	$\mathbf{0.047^{a,(b)}}$	0.737^{b}	$0.216^{a,b}$

Table 4. RQ1 Statistical Significance Tests with Mann Whitney U test p-scores

	Negative	**Neutral**	**Positive**	**Hate**	**Normal**	**Offensive**
Act-New vs Act-Old	0.00*	0.00*	0.00*	0.03*	0.04*	0.07
Del-New vs Del-Old	0.00*	0.08	0.00*	0.22	0.04*	0.02*
Sus-New vs Sus-Old	0.00*	0.01*	0.00*	0.01*	0.04*	0.05

Table 5. RQ2 Statistical Significance Tests with Mann Whitney U test p-scores

	Negative	**Neutral**	**Positive**	**Hate**	**Normal**	**Offensive**
Act-Old vs Del-Old	0.22	0.06	0.07	0.13	0.00*	0.00*
Act-Old vs Sus-Old	0.00*	0.12	0.00*	0.00*	0.04*	0.07
Del-Old vs Sus-Old	0.00*	0.21	0.00*	0.00*	0.00*	0.00*
Act-New vs Del-New	0.00*	0.27	0.00*	0.29	0.12	0.07
Act-New vs Sus-New	0.00*	0.17	0.00*	0.00*	0.05	0.10
Del-New vs Sus-New	0.00*	0.24	0.00*	0.00*	0.01*	0.01*

Table 6. Number of misinformative and spam tweets

	Act-Old	**Act-New**	**Del-Old**	**Del-New**
Blackout	362	4	307	12
Teenager	60	0	33	0
Soros	3	24	2	42
ANTIFA	796	6	557	29
Pederson	105	0	42	0
Spam	2002	27	900	61
	Sus-Old	**Sus-New**	**Cont-Old**	**Cont-New**
Blackout	221	18	0	0
Teenager	18	2	0	0
Soros	6,886	203	0	0
ANTIFA	1,323	86	0	0
Pederson	94	0	0	0
Spam	2857	235	141	0

Table 7. Number of tweets in hate speech and sentiment analysis

	Negative	**Neutral**	**Positive**	**Hate**	**Normal**	**Offensive**
Cont-Old	660,388	8,020,932	897,241	2,910	9,551,149	24,502
Cont-New	3,991	65,576	8,422	25	77,844	120
Act-Old	1,247,844	2,148,695	639,230	4,035	3,972,151	59,583
Act-New	7,440	11,806	3,624	26	22,456	388
Del-Old	682,709	1,236,007	400,349	2,568	2,280,788	35,709
Del-New	17,043	24,365	7,184	78	47,550	964
Sus-Old	1,208,767	1,961,388	526,354	4,826	3,630,208	61,475
Sus-New	31,308	40,100	10,627	167	79,989	1,879

Table 8. Lexical analysis statistical significance test results. Kolmogorov-Smirnov tests implemented with 10k samples for each type.

	p-value (Tw. len.)	**p-value (Word len.)**
Cont-Old vs Act-Old	9.61×10^{-203}	4.83×10^{-137}
Cont-Old vs Del-Old	3.43×10^{-82}	3.31×10^{-163}
Cont-Old vs Sus-Old	1.56×10^{-142}	1.73×10^{-158}
Act-Old vs Del-Old	3.54×10^{-31}	2.72×10^{-17}
Act-Old vs Sus-Old	1.54×10^{-9}	0.0729
Del-Old vs Sus-Old	1.72×10^{-12}	1.87×10^{-17}
Cont-New vs Act-New	3.90×10^{-175}	2.11×10^{-110}
Cont-New vs Del-New	1.44×10^{-222}	1.98×10^{-123}
Cont-New vs Sus-New	3.59×10^{-154}	4.84×10^{-115}
Act-New vs Del-New	0.0004	0.0338
Act-New vs Sus-New	0.0214	0.0127
Del-New vs Sus-New	3.19×10^{-9}	0.0039
Act-Old vs Act-New	0.0005	0.0138
Del-Old vs Del-New	1.86×10^{-42}	2.46×10^{-22}
Sus-Old vs Sus-New	0.0299	0.0366
Cont-Old vs Cont-New	1.59×10^{-23}	8.01×10^{-75}

Table 9. Hate, Sentiment, Spam and Misinformation statistical test results

	Hate	**Sentiment**	**Spam**	**Misinformation**
Cont-Old vs Act-Old	3.92×10^{-31}	1.28×10^{-34}	1.24×10^{-34}	N/A
Cont-Old vs Del-Old	1.18×10^{-31}	1.28×10^{-34}	1.25×10^{-34}	N/A
Cont-Old vs Sus-Old	1.17×10^{-34}	1.28×10^{-34}	1.38×10^{-35}	N/A
Act-Old vs Del-Old	4.72×10^{-4}	1.63×10^{-34}	1.25×10^{-5}	4.68×10^{-7}
Act-Old vs Sus-Old	4.86×10^{-24}	1.28×10^{-34}	1.31×10^{-34}	1.15×10^{-34}
Del-Old vs Sus-Old	2.24×10^{-11}	1.28×10^{-34}	1.65×10^{-34}	1.12×10^{-34}
Cont-New vs Act-New	1.06×10^{-1}	1.15×10^{-34}	8.00×10^{-4}	N/A
Cont-New vs Del-New	2.35×10^{-7}	1.18×10^{-34}	4.54×10^{-8}	N/A
Cont-New vs Sus-New	3.12×10^{-14}	1.19×10^{-34}	2.57×10^{-4}	N/A
Act-New vs Del-New	7.99×10^{-4}	1.29×10^{-6}	7.73×10^{-2}	2.74×10^{-2}
Act-New vs Sus-New	1.45×10^{-8}	1.92×10^{-23}	1.10×10^{-10}	9.11×10^{-14}
Del-New vs Sus-New	1.52×10^{-2}	1.28×10^{-17}	2.14×10^{-17}	2.20×10^{-13}
Act-Old vs Act-New	2.19×10^{-15}	7.65×10^{-8}	6.98×10^{-2}	1.78×10^{-8}
Del-Old vs Del-New	4.03×10^{-1}	8.49×10^{-34}	1.06×10^{-2}	1.62×10^{-1}
Sus-Old vs Sus-New	8.03×10^{-4}	2.48×10^{-33}	2.11×10^{-22}	2.61×10^{-11}
Cont-Old vs Cont-New	8.88×10^{-24}	7.56×10^{-32}	3.12×10^{-1}	N/A

Table 10. Normalized factor ratios reported in Radar Chart

	Hate	**Sentiment**	**Spam**	**Misinfo**
Act-Old	0.11	0.15	0.07	0.03
Act-New	0.13	0.15	0.17	0.15
Del-Old	0.13	0.14	0.06	0.04
Del-New	0.18	0.17	0.18	0.17
Sus-Old	0.15	0.16	0.11	0.23
Sus-New	0.23	0.18	0.41	0.38
Cont-Old	0.03	0.03	0.00	0.00
Cont-New	0.04	0.02	0.00	0.00

Table 11. Difference Between Factor Ratios (Non-Normalized)

	Hate	**Negative**	**Spam**	**Misinfo**
Cont-Old vs Act-Old	-6.96×10^{-4}	-2.40×10^{-1}	-4.81×10^{-4}	-3.29×10^{-4}
Cont-Old vs Del-Old	-8.04×10^{-4}	-2.25×10^{-1}	-3.73×10^{-4}	-4.06×10^{-4}
Cont-Old vs Sus-Old	-1.00×10^{-3}	-2.58×10^{-1}	-7.58×10^{-4}	-2.31×10^{-3}
Act-Old vs Del-Old	-1.08×10^{-4}	1.48×10^{-2}	1.08×10^{-4}	-7.72×10^{-5}
Act-Old vs Sus-Old	-3.06×10^{-4}	-1.78×10^{-2}	-2.77×10^{-4}	-1.98×10^{-3}
Del-Old vs Sus-Old	-1.98×10^{-4}	-3.26×10^{-2}	-3.85×10^{-4}	-1.91×10^{-3}
Cont-New vs Act-New	-8.16×10^{-4}	-2.74×10^{-1}	-1.18×10^{-3}	-1.49×10^{-3}
Cont-New vs Del-New	-1.28×10^{-3}	-3.00×10^{-1}	-1.26×10^{-3}	-1.71×10^{-3}
Cont-New vs Sus-New	-1.72×10^{-3}	-3.30×10^{-1}	-2.86×10^{-3}	-3.77×10^{-3}
Act-New vs Del-New	-4.68×10^{-4}	-2.54×10^{-2}	-7.48×10^{-5}	-2.21×10^{-4}
Act-New vs Sus-New	-8.99×10^{-4}	-5.63×10^{-2}	-1.68×10^{-3}	-2.28×10^{-3}
Del-New vs Sus-New	-4.31×10^{-4}	-3.09×10^{-2}	-1.61×10^{-3}	-2.06×10^{-3}
Act-Old vs Act-New	-1.37×10^{-4}	-1.61×10^{-2}	-6.85×10^{-4}	-1.16×10^{-3}
Del-Old vs Del-New	-4.98×10^{-4}	-5.63×10^{-2}	-8.67×10^{-4}	-1.30×10^{-3}
Sus-Old vs Sus-New	-7.30×10^{-4}	-5.46×10^{-2}	-2.09×10^{-3}	-1.46×10^{-3}
Cont-Old vs Cont-New	-1.68×10^{-5}	1.78×10^{-2}	1.47×10^{-5}	0.00