Elena Intorcia

Face Masks and User-Generated Discourse in the Covid-19 Era

Abstract

Ensuing the World Health Organization's (WHO) announcement on 11 March 2020 that Covid-19 had become a global pandemic, many governments worldwide introduced wearing masks as one of the primary measures to abide by in order to limit the spread of the virus. Since then, face masks have become one of the main symbols of the pandemic.

Although their effectiveness in reducing the spread of Covid-19 infection has been backed by scientific evidence, wearing face masks has triggered a significant debate, mostly on social media (Baker, Concannon and So 2022; Al-Ramahi et al. 2021). User-generated discourse has expanded dramatically during the pandemic due to the enhanced online interaction possibilities. In particular, mask aversion is still perceived and represented online as an antisocial norm that has emerged during the current Covid-19 pandemic (Kim 2022).

This study examines the reactions of Facebook and Twitter users to a recent new Coronavirus alert raised by New York City in response to rising cases, recommending, though not requiring, people to wear masks in public indoor settings. The comments posted were analysed using the basic methodology of Computer-Mediated Discourse Analysis (CMDA), which allows the identification of patterns in interactive message content (Herring 2010), and interpreted through a Critical Discourse Analysis lens to investigate the reasons of Internet users for and against wearing masks as a mitigation measure against Covid-19 spread. A quantitative and qualitative research approach was employed to analyse conversational and behavioural data in the social media discourse framed by the two factions supporting or contrasting mask wearing (Lang, Erickson and Jing-Schmidt 2021; Franz et al. 2019; Martin and White 2005). In addition, this study attempted to assess the variance in response to the same content posted on different platforms.

The results show that social media can be a valuable source of data mining that could help decision-makers better understand the public discourse around crucial public health issues like wearing masks to curb the Coronavirus pandemic and effectively address public perception by adopting more suitable policies.

Keywords: *mask wearing, Covid-19, social media, infodemic, Critical Discourse Analysis, Computer-Mediated Discourse Analysis*

1. Introduction and background

Since March 2020, the World Health Organization (WHO) and many leading public health organisations have shared various guidelines to limit the spread of the Covid-19 pandemic: among them is the importance of wearing face masks.[1] In a recent study, Howard et al. (2021) provided an interdisciplinary narrative review of the literature on the positive role of face masks in reducing Covid-19 transmission, backed by epidemiological and ecological data and models. Taking into account factors like pandemic spread, mask use, population, geographic statistics as well as other policy interventions, they tried to estimate the impact of mask use at a policy level.

Although masks have been recommended as a potential tool to tackle the Covid-19 pandemic since its initial outbreak in China, their usage has varied by time and location. At first, due to the new situation and the contradictory opinions of experts, including representatives of the scientific community and WHO, the threat level caused by the disease seemed unclear (Martinelli et al. 2021). By the end of 2020, over 100 countries had implemented mask requirements, and many regions in the United States had issued their mask mandates. As of April 2022, the availability of Covid-19 vaccines and treatment enabled many countries to relax their mask mandates. However, due to a highly fluctuating situation, with cases surging or waning in a given country or with the sudden rise of new Covid-19 variants, mandates are often lifted or restored on a daily basis;[2] accordingly, countries have globally been forced to continuously adapt the need of public mask wearing to their specific contexts.

Being such a significant health issue, Covid-19 has dominated public discussions and debates spread through both traditional media—like the printing press and TV—and social media from the very start. As a matter of fact, due to enforced lockdowns in the early stages of the pandemic, citizens' social media activity has been highly stimulated; the public discourse generated since then testifies to a high variation in the assessment of the perceived risks of the disease.

A prolific and frequently polarised debate has characterised Covid-19-related discussions, intertwined not only with daily reports on death and infection numbers but also with the spread of fearmongering and fake news (Tennent and Grattan 2022; Rasulo 2022; Al Ramahi et al.

[1] On its official page (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/), the WHO constantly posts materials that are regularly updated based on new scientific findings as the pandemic evolves; some sample materials connected with the topic of wearing masks are: "Coronavirus disease (COVID-19) advice for the public: When and how to use masks" (last updated December 2021) and "Coronavirus disease (COVID-19): Masks" (5 January 2022).

[2] See https://worldpopulationreview.com/country-rankings/countries-with-mask-mandates. All websites last visited 10/06/2024.

2021; Pascual-Ferrá et al. 2021). In particular, the use of face masks, which have become one of the pandemic's main (visual) symbols (Hopfer et al. 2021; Howard et al. 2020), has triggered a significant debate, mostly on popular social media platforms, which have provided users with new channels to share ideas and experiences.

This study examines the reactions of Facebook and Twitter users to a recent new Coronavirus alert raised by New York City in response to rising cases, recommending, though not requiring, people to wear masks in public indoor settings. With nearly 3 billion monthly active users, Facebook is the most used social network platform worldwide, with the United States ranking second in number of users in the second quarter of 2022. As of September 2022, users aged 25 to 34 years made up Facebook's largest audience in the US (23.6 percent of the social network's user base), with an equal gender split; overall, 9.5 percent of users aged 35 to 44 years were women, and 8.7 percent were men.[3] Other social media platforms, despite their popularity, account for smaller shares of visits; Twitter, for instance, ranked second with 9.74 per cent of all U.S. social media site visits in the same time span.

In their analysis of how Twitter mask tweets described Covid-19 risk perception and shaped mask wearing behaviour, Hopfer et al. (2021) pointed out the critical role of popular social media platforms in alerting people to disasters or pandemics. In particular, the authors highlighted how, being a mainstream news source for the American public, Twitter represents a valuable context to learn how citizens make sense of pandemic health threats like Covid-19; it also offers an insight into how new meanings are created and specific social behaviours are shaped when risk messages are edited or passed on with new additional features and significations.

2. Aims and purposes

Studies about the public discourse against wearing masks on social media and its potential relation to the rise of Covid-19 cases are currently limited (Al-Ramahi et al. 2021). Media reports offered frequent glimpses into the politicisation of face masks during the pandemic; however, the verbal representation of the polarisation of public discourse on mask wearing is still unexplored (Lang et al. 2021). Masking as a risk mitigation measure has become particularly controversial in the US (Eikenberry et al. 2020; Hopfer et al. 2021) and mask aversion is still represented as an antisocial norm online that has emerged during the current pandemic (Kim 2022). In addition, using face masks can be connected to multiple factors, ranging from social

[3] See https://www.statista.com/statistics/187041/us-user-age-distribution-on-facebook/.

and cultural practices to political, ethical, and health-related concerns as well as personal and social meanings (Betsch et al 2020; Martinelli et al. 2021).

In this direction, the present study focuses on the reactions of Facebook and Twitter users to a new Coronavirus alert raised by New York City authorities in May 2022 recommending the use of face masks in public indoor settings. The Critical Discourse Analysis (CDA) lens is applied to investigate the diverse perspectives of social media users both advocating and opposing mask-wearing and thus help unveil the strong interconnection existing among society, discourse, and ideology (Jaworski and Coupland 2014, 9). CDA considers any discursive event, at the same time, as "a piece of text, an instance of discursive practice, and an instance of social practice" (Fairclough 1992, 4): the online comments analysed in this study are thus meant as expressions and reproductions of ideologies in discourse and communication (Van Dijk 1999, 17).

The research objective is to find out the prominent role of discourse in the multi-faceted issue of mask-wearing by outlining the main topics—in the datasets examined—supporting or challenging the NYC authorities' invitation to wear masks, thus delving into the diversity of sociocultural, ethical, and political meanings attributed to face masks. A further aim is to identify how such meanings might affect public health policies and how such discursive representations could be considered by decision-makers to effectively address public perception in health communication through suitable communicative strategies.

3. Methodology

The social media data examined are related to an advisory issued by the NYC Health Commissioner, Dr. Ashwin Vasan, in May 2022, at a time when the City of New York was approaching the high Covid-19 Alert Level.[4] In the third year of pandemic, this event provided an occasion to investigate the extent to which the broader landscape on masks was shifting and how people's reactions were varying accordingly.

Bearing in mind the relevance of Facebook and Twitter as two popular social media platforms in the US, 362 Facebook comments to an article posted by *The Washington Post* on May 10, 2022[5] and 291 tweets in reply to a thread, created on May 16, a few days later—both related to

[4] The original advisory can be retrieved from the following link: https://www.nyc.gov/assets/doh/downloads/pdf/covid/coh-advisory-covid-masking-additional-precautions.pdf

[5] The links to the article published online on *The Washington Post* and on its official Facebook page are, respectively, https://www.washingtonpost.com/health/2022/05/09/mask-mandate-covid-cases/ (first published on May 9, 2022, later updated on May 16, 2022) and https://www.facebook.com/profile/100059456532991/search/?q=may%2010%202022%20nyc%20advisory%20face%20masks.

the aforementioned advisory to New Yorkers to wear a mask indoors[6]—were identified as the raw data for analysis. The total 653 posts collected were then analysed as two distinct corpora. Although it might be claimed that the overall corpus thus created lacks uniformity and is "static" or "sample" (Paltridge 2006, 176), being limited to a specific setting at one particular point in time, it still represented a valuable source of investigation and offered an opportunity to assess the variance in online users' response to the same content posted on different platforms.[7]

The posts collected were first converted into .txt format, then carefully read through to familiarise with the data and their content; the linguistic investigation of the corpora was carried out using the search query system *Sketch Engine*, a software which allows for text analysis and text mining by means of complex and linguistically motivated queries. For each corpus, key topics were identified based on keywords, frequencies and logical connections among the top 15 lexical words. Salient data from the two corpora were examined and contrasted based on trends regarding the identified main categories.

The comments posted were studied using the basic methodology of Computer-Mediated Discourse Analysis (CMDA), which allows for "the systematic identification of patterns in interactive message content" (Herring 2010, 237) and interpreted through the CDA lens in order to investigate the arguments of Internet users for and against wearing masks as a mitigation measure against Covid-19 spread. A research approach combining quantitative and qualitative research techniques was employed to analyse both conversational and behavioural data in the social media discourse framed by the two factions supporting or contrasting mask wearing.

From a quantitative perspective, the variables considered in the datasets collected included: volume analysis (the volumes of mentions of particular keywords within the fixed timeframe identified, i.e. May 16-17, 2022); relationship analysis, a variable useful for engagement analysis, looking at interactions between users through the responses to the posts examined; correlations (through comparison of a social media dataset with another dataset across time); clustering (to identify topics and trends).

The qualitative approach, instead, has made it possible to carry out not only a thematic analysis of the social media data collected but also a sentiment analysis to identify if texts convey a positive or negative view (Volkova et al. 2015). In particular, Martin and White (2005) define evaluation as "appraisal," considered as an interpersonal system located at the level of discourse

[6] Check https://twitter.com/nychealthy/status/1526219171549401088.

[7] See "Using Social Media for Social Research: An Introduction," Social Media Research Group, May 2016. Government Social Research. Gov. UK, 2016. https://dera.ioe.ac.uk//26600/.

semantics (Martin and White 2005, 33). Their appraisal theory explores the ways interpersonal meanings are expressed when examining evaluative aspects of language use.

Such meanings are construed by means of major discourse semantic resources across three interacting domains: *attitude, engagement* and *graduation*. *Attitude* is concerned with expression of emotions, ethical judgements, and evaluations of things. *Engagement* involves linguistic resources of intersubjective positioning, by which the authorial voice situates itself with reference to the value positions referenced in the text and in relation to other voices and positions. *Graduation* focuses on linguistic mechanisms used by speakers/writers to vary the strength of their utterances, by intensifying or mitigating them (Martin and White 2005, 42-43; 94).

The main social media qualitative research method used to investigate data is passive analysis, which involves the study of information patterns observed on social media or the interactions between users. To obtain a broader context of social exchanges and, possibly, more meaningful interpretations of the data collected, bidirectional interactions among participants—that is, social exchanges of user-generated and received text between users—were considered, too (Franz et al. 2019).

In the analysis process, a preliminary careful reading of the overall corpus allowed greater insights into the context of the data; as said before, it was then split into two corpora, containing, respectively, the Facebook comments and the (re)tweets. Adopting polarisation as a methodological tool and a primary analytical strategy, two main categories—pro-mask and anti-mask—were first identified for each corpus by tagging the data during the close reading process. Further subcategories for each group were then created based on themes and patterns identified with the aid of the online corpus query system *Sketch Engine*—e.g. through frequencies, keywords, concordances of key lexical items and collocations (see Baker 2006, 21)—as well as on semantic similarities among the dominant topics pinpointed (Reference corpus: English Web 2013, enTenTen13).

The corpora were finally compared and contrasted from the perspectives of the issues discussed and, also, linguistically as two variations of a discourse type—online user-generated discourse—intended and perceived as a complex communicative event involving two opposite 'sides': pro-mask users and anti-mask users.

4. Results

A preliminary comparison of the two corpora yielded the result shown in Tab. 1, based on tokens (the total number of words) and types (the number of different words); as shown, the two corpora have a fairly similar size.

Facebook corpus	Tokens	Types	Twitter corpus	Tokens	Types
	7,280	6,324		7,355	6,232

Tab. 1: Corpora overview

Fig. 1 shows the pro- and anti-mask trends identified through a first reading in each corpus; clearly, anti-mask comments outnumbered the pro-mask ones in the Twitter corpus.

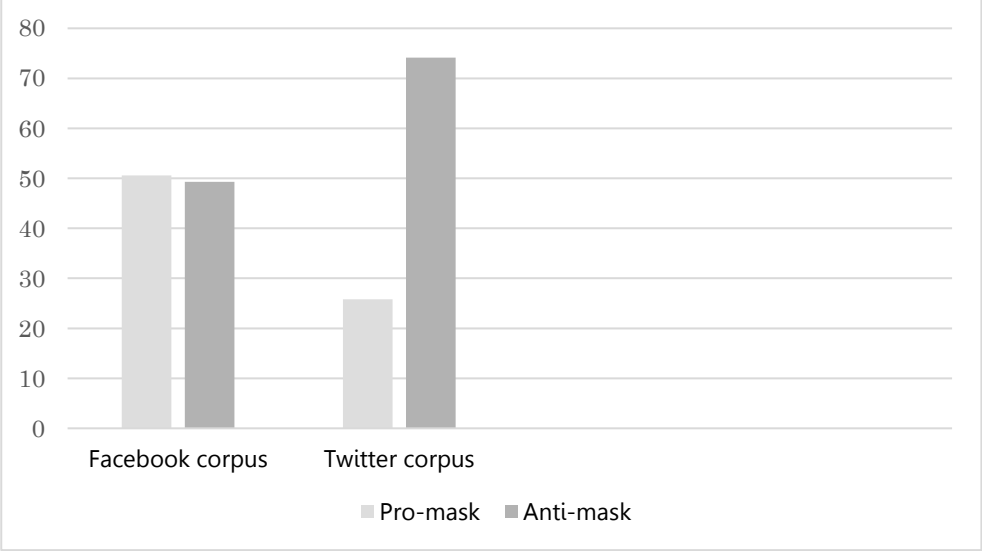

Fig. 1: Pro- and anti-mask attitudes in the corpora

In order to investigate the argumentations supporting pro- and anti-mask wearing discourses, and any recurring patterns underlying them, significant sets of data within the corpora (i.e. keywords, word sketches, concordances of key lexical items) were identified, then examined from a qualitative and CDA perspective and finally compared.

The function Word Sketch offered by *Sketch Engine* allowed an overview of the grammatical and collocational behaviour of words, while a closer analysis of the most frequent lexical words and terms (e.g. nouns, verbs, adjectives and adverbs) helped unveil possible discourses within the corpora. Tab. 2 shows the top fifteen lexical words for each dataset, thus providing a clearer understanding of what the whole corpus is about.

	Twitter corpus				Facebook corpus		
	Lemma	**Freq.**	**Norm.**		**Lemma**	**Freq.**	**Norm.**
1	mask	140	19,034.67	1	mask	126	17,307.69
2	mandate	53	7,205.98	2	wear	65	8,928.57
3	wear	43	5,846.36	3	people	63	8,653.85
4	covid	39	5,302.52	4	covid	37	5,082.42
5	people	39	5,302.52	5	mandate	31	4,258.24
6	work	29	3,942.90	6	need	20	2,747.25
7	get	23	3,127.12	7	say	19	2,609.89
8	nyc	23	3,127.12	8	know	19	2,609.89
9	need	23	3,127.12	9	protect	19	2,609.89
10	year	19	2,583.28	10	public	18	2,472.53
11	stop	19	2,583.28	11	work	17	2,335.16
12	school	16	2,175.39	12	virus	15	2,060.44
13	vaccine	16	2,175.39	13	effective	14	1,923.08
14	public	16	2,175.39	14	vaccinate	12	1,648.35
15	toddler	15	2,039.43	15	pandemic	12	1,648.35

Tab. 2: The most frequent fifteen lexical words in the Twitter and Facebook corpora. Absolute and normalised frequency per million tokens (*Sketch Engine*)

The most common lexical term in both datasets is *mask*; other recurrent words include *mandate*, *wear*, *people*, *covid*, *need* and *public*, which all point to the main issue being debated by the two social media platforms users—wearing a mask and mandating its use as a necessary means to curb the spread of the Covid-19; other interesting words are *school*, *vaccine* (16 frequencies) and *toddler* (15) in the Twitter corpus and *effective* (14), *vaccinate* and *pandemic* (12) in the Facebook comments (normalised frequency per million tokens).

A multi-word terms analysis on each corpus yielded the outcome represented in Tab. 3.

	Twitter corpus			Facebook corpus	
	Word	**Frequency**		**Word**	**Frequency**
1	mask mandate	10	1	mask mandate	8
2	wearing mask	8	2	herd immunity	6
3	health commissioner	4	3	cloth mask	5

4	care nothing for others	3	4	wearing mask	4
5	masking toddler	3	5	n95 mask	3
6	hazard pay	3	6	surgical mask	3
7	covid case	3	7	doctor fauci	2
8	own safety	3	8	microbial disease	2
9	human rights abuse	3	9	protecting other	2
10	rights abuse	3	10	mask in public	2
11	fear mongering	2	11	individual health	2
12	severe infection	2	12	piece of cloth	2
13	urging people	2	13	following arbitrary restriction	1
14	city worker	2	14	Dem mandate	1

Tab. 3: Multi-word terms. Keywords (*Sketch Engine*)

Bearing in mind the salience of the term *mask*, frequency lists for clusters of words were considered using the N-grams to see how masks were described in the corpora (cluster size set as 3-4 tokens). An examination of 3-4-word grams and of their related concordance data (obtained through *Key Word in Context* tool) reveal some of the most common patterns: the issue of wearing a mask in public; the idea of protection implied by this act; the refusal to wear a mask; the annoyance of having to wear it again; and the need to mandate its use (Tab. 4).

	Twitter corpus				**Facebook corpus**		
	N-gram	**Freq.**	**Norm.**		**N-gram**	**Freq.**	**Norm.**
1	wear a mask	9	1,223.66	1	wear a mask	11	1,510.99
2	wearing a mask	7	951.73	2	there is no	6	824.18
3	Masks don't work	6	815.77	3	you don't	5	686.81
4	You are a	5	679.81	4	Are you aware	4	549.45
5	create mental illness	3	407.89	5	No herd immunity	4	549.45
6	abuse and child abuse	3	407.89	6	To stop the spread	3	412.09

Tab. 4: N-grams (*Sketch Engine*). Absolute and normalised frequency per million tokens

The concordance data below (Fig. 2), related to the N-gram "You are a," display the harsh reactions of Twitter users to the NYC Health Commissioner's advisory recommending the use of face masks in public.

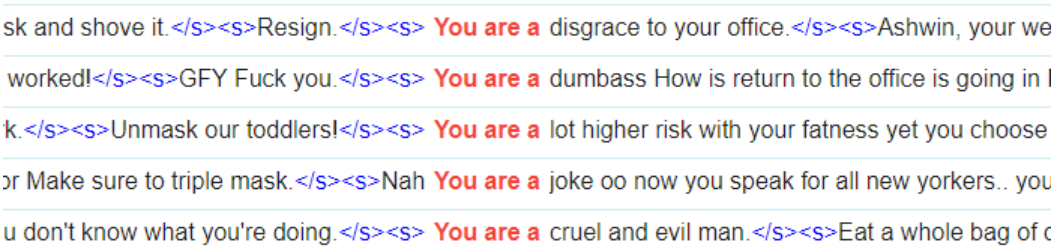

Fig. 2: Selected concordances of the lemma *mask* in the Twitter subcorpus (*Sketch Engine*)

A concordance analysis of the word *mask*, useful to implement an approach combining quantitative and qualitative analysis, highlighted the multiple ways mask wearing was perceived by social media users: in both corpora assessments varied highly, ranging from seeing this containment measure as something absolutely *acceptable* to be even enforced—"Force is the only language the public understands"—to *a human rights abuse* which is utterly *useless* and only creates *mental illness* (Fig. 3).

Fig. 3: Selected concordances of the lemma *mask* in the Twitter corpus (*Sketch Engine*)

4.1 *Pro-mask stances*

To further delve into the social and emotional meanings associated to masks, the pro-mask Facebook comments were tagged and arranged into four sub-categories based on their semantic focuses:

1) assertions of the ethical value and social responsibility of mask wearing (e.g. "What I'm seeing is the vulnerable are being exposed because those around them are becoming lax"; "Irresponsible people were always the main virus. The virus is surging again because American people don't like rules"; "From the outside it looks like a lot of Americans just think about themselves and don't understand societal responsibilities");

2) hortatives urging the use of masks or issuance of laws, rather than of simple mask mandates (e.g. "mandates don't work if people won't follow them and there's no good enforcement mechanism"; "People need laws, not mandates to protect others");

3) assertions of the efficacy of masks, especially when well-fitted (e.g. "If everyone was wearing properly fitted N95 masks, then yes, masks work");

4) mask wearing as an assertion of intelligence (e.g. "So dumb. I understand the resistance to injection. But wearing a mask? Oh, grow up").

Similarly, for the Twitter corpus, the pro-mask posts were grouped into four sub-categories:

1) importance of masking;

2) hortatives urging to mandate masking in public places like schools (this explains the recurrence of the term *toddlers*, as previously shown in **Tab. 2**);

3) complaint about the delay of public health authorities in taking action and misinformation spread by them, which generates a lack of trust;

4) specific requests on public health measures felt as necessary ("Please advice on ventilation and hepa filters also. Open windows and doors to circulate virus-free air from outside and dilute any built up virus particles hanging in indoor spaces").

4.2 Anti-mask stances

The anti-mask Facebook comments as well were grouped into five sub-categories: 1) rejection of masks and mask mandates as they infringe individual freedom; 2) insults to mask wearers; 3) lack of scientific evidence supporting the efficacy of mask wearing; 4) Covid-19 used as a political means; 5) Covid-19 used to fear mongering, as it was no longer perceived as being a threat.

The anti-mask (re)tweets mostly revolved around the following main points: 1) masking as a human rights abuse conflicting with the individual freedom of choice and generating *mental illness*; 2) fearmongering and unnecessary alarmism (being vaccinated, the infection shows with *mild symptoms*); 3) distrust in the government and in public health authorities (*lack of leadership and transparency*; *incompetent politicians*); 4) spread of misinformation (tracking numbers of deaths and infections is seen as a *tactic* to make money for the *new Covid industry* or even as a *theatre*: "No need for the mask theatrics; Enough with the COVID theatre"; "Stop lying"); 5) mandates used as political propaganda ("These people will try to continue with the COVID-19 lie all the way up to the November elections"); 6) lack of evidence of the effectiveness of masks ("Masks don't work; hospitalisation rates are not rising despite an increase in Covid infections and, if it is the case, this means that vaccines and masking do not work as meant"; *#saynotoscam*; *#UnmaskOurKids*).

4.3 *Focus on the lemma "mandate": attitude and language use*

The second most popular lexical lemma, *mandate*, occurred in the Facebook corpus mostly coupled with modifiers such as *mask*, *dem* or *more*, verbs like *need* (e.g. "You shouldn't need a mandate to do the smart thing and protect yourself"), *encourage* (e.g. "Masks should be strongly encouraged"), *impose* (e.g. "It's because the coronavirus is becoming generally less dangerous. Please democrats impose more mask mandates"), *drop* (e.g. "When spontaneous pilot-led celebrations break out mid-flight as a mandate is dropped, it's a clear sign that policy has lost the support of the people"), *create* (e.g. "mandates create distrust and resistance"), and adjectives like *popular* (e.g. "Funny dem mandates are as popular as politicians in neighborhoods during an election year"), *necessary* (e.g. "Mandates are not necessary, the strong advisory to wear one is sufficient and still gives Americans the *choice* to wear a mask", emphasis added) and *useless* (e.g. "Mandates are *useless* when you don't have the following: correct material, cloth is a *no go* proper-fitting, *one-size* does not fit all or even many you need testing, you need to test with the mask to see that you are meeting the first two criteria", emphasis added), all involving evaluation.

Modifiers of "mandate"	**Verbs with "mandate" as object**	**Verbs with "mandate" as subject**	**adjective predicates of "mandate"**
mask (9) mask mandates	**need** (1)	**create** (1) mandates create	**popular** mandates are as popular as
dem (1) dem mandates	**encourage** (1) encouraged, mandates	**protect** (1)	**necessary**

		Mandates are about protecting	Mandates are not necessary
funny (1) Funny dem mandates	**impose** (1) impose more mask mandates	**be** (9) Mandates are	**useless** Mandates are USELESS
patchwork (1) patchwork mask mandates	**drop** (1) mandate is dropped	**go** (1) mandate is going	
more (1) more mask mandates	**hold** (1) hold the mandate	**do** (1) mandates do	
public (1) public mandate	**like** (1) like mandates	**have** (1) mandate has	
	know (1) know mask mandates		
	tell (1) tell the public mandate		
	mask (1) masking mandates		
	be (1) is no mask mandate		

Facebook corpus—Word Sketch

Tab. 5: Word Sketch for the lemma "mandate" (*Sketch Engine*)

The same search in the Twitter corpus showed that the most frequent modifiers for this word included *mask*, *back*, *vaccine*, and others conveying a negative evaluation like *silly* or *foolish*, while the main verbs were *need*, *bring*, *waive*, *reimpose* or *stop*. (**Tab. 6**)

Modifiers of "mandate"	**Verbs with "mandate" as object**	**Verbs with "mandate" as subject**	**adjective predicates of "mandate"**
mask (10) mask mandates	**need** (2) need a mandate	**be** (1) mandate is	**due** (1) mandates due
back (2) back mandates	**bring** (2) bringing back mandates	**need** (1) mandates need	
vaccine (2) vaccine mandates	**do** (2) do mandates	**do** (1) mandates not only do	
bring (1) Bring back vaccine mandates	**have** (2) had a mandate	**go** (1) mandate is going	
vax (1) vax mandate	**be** (2) the only mandate	**do** (1) mandates do	

silly (1)	**waive** (1)	**have** (1)
silly mandates	waive the vaccine mandate	mandate has
foolish (1)	**reimposes** (1)	
foolish mandates	reimposes a mandate	
only (1)	**put** (1)	
only mandate	put the mask mandate	
indoor (1)	**mask** (1)	
indoor mask mandates	masking mandates	
last (1)	**stop** (1)	
Last mandate	stop the foolish mandates	

Twitter corpus—Word Sketch

Tab. 6: Word Sketch for the lemma "mandate" (*Sketch Engine*)

As seen in the previous figures, the frequent co-occurrence of *mask* and *mandate* with adjectives implying evaluation suggests a process of polarisation of mask wearing. Adopting the Bakhtinian dialogic perspective of all verbal communication, whether written or spoken, Martin and White (2005) claim that whenever speakers produce utterances on a theme, they enter a relationship "with those other speakers who have previously taken a stand with respect to the issue under consideration, especially when, in so speaking, they have established some socially significant community of shared belief or value" (Martin and White 2005, 93). The authors point to the linguistic resources used by speakers/writers to adopt a specific stance and address the issue of how the latter engage with previous speakers/writers on the same theme "as standing with, as standing against, as undecided, or as neutral with respect to these other speakers and their value positions" (Martin and White 2005, 93).

The modifiers for the lemma *mandate* identified in Tab. 5 and 6 for both Facebook and Twitter corpora (i.e., respectively, *popular*, *necessary useless* and *silly*, *foolish*) provide an example of what Martin and White call "attitude," a subsystem of the appraisal system which deals with what people feel (*affect*), how they judge behaviour (*judgement*), and how they evaluate things or phenomena. When engaging in interpersonal relations, language users tend to construe greater or lesser degrees of positivity or negativity, thus proposing stance or evaluation, fundamental to appraisal.

Lang et al. (2021) point to a central theme that has emerged from the research on political polarisation in social media: users tend to interact with like-minded others, a principle referred to as "social homophily." They claim that "[h]omophily generates a selective pattern of

networked communication commonly known as the 'echo chamber' effect by reinforcing preexisting views and limiting opposing views" (Lang et al. 2021, 18).

4.4 Face masks: a societal responsibility or an infringement of individual freedom?

Despite being a public health measure intended to protect all members of society, mask wearing became in many countries, but especially in the US, a highly controversial issue in public discourse exacerbated by contextual forces. As explained above, the main reasons against mask-wearing that emerged from the corpus analysis are related to a deep tension between government authority and individual liberty, a core issue in American political life.

Fig. 4 shows a concordance list of the word *freedom* in the Facebook corpus (8 frequencies; normalised frequency per million tokens). The main areas of concern touched upon by sceptical users have to do with the risk one runs as a citizen by giving up one's freedom to politicians, while advocates of masks claim this *has little to do with freedom, more to do with common sense*. Mask wearing is seen from this viewpoint as an ethical duty towards others.

) e Karens and Kens get to decide whats best for all, them and their so called representatives who are all about	freedom	of choice, the exception being for women to control their own healthcare. troll see 86.2% have been vaccinate
) ERMS."</s><s>Actually, I have quite a few people that care.</s><s>Sorry you don't.</s><s>Once you give up	freedom	, politicians won't easily give it back.</s><s>(11) you gave up your freedom when you decided to live in a soci
) ou don't.</s><s>Once you give up freedom, politicians won't easily give it back.</s><s>(11) you gave up your	freedom	when you decided to live in a society.</s><s>You're subject to a plethora of laws, regulations, and rules.</s><
) e in a society.</s><s>You're subject to a plethora of laws, regulations, and rules.</s><s>Apparently, the only "	freedoms	" you care to whine about are the ones designed to not kill people. if you want to continue following arbitrary
) was an effective COVID treatment, I can understand why you think everything is arbitrary. we already gave up	freedom	when George W Bush signed the Patriot Act. only the criminals Here comes the midterm variant yea you're rig
) zes spread of respiratory diseases, but sadly it's become some sort of focal point for people to rant about their	freedom	.</s><s>And Have you been out of your basement lately?</s><s>The vast majority of America is unmasked.<
) en out of your basement lately have you?</s><s>The vast majority are unmasked.</s><s>Has little to do with	freedom	, more to do with common sense "There is no mask mandate in Japan but EVERYONE is wearing one indoors
) your hands & wear disposable gloves before you touch anything.</s><s>Impressed."</s><s>Karens have the	freedom	to stay home Watch 2000 mule's I'm at the point where I just don't care This year is going to be a repeat of las

Fig. 4: Concordances of the word *freedom* in the Facebook corpus (*Sketch Engine*)

The concordance list above contains an interesting phrase, *Karen and Kens*. The word *Karen* has become a widespread meme in recent years, signifying a specific type of middle-class white woman, who exhibits behaviours stemming from privilege. Since 2020, with the spread of the Covid-19 pandemic, the meme has evolved into "Coronavirus Karen," a phrase referring to those who refuse to wear a face mask in public places, do not stick to quarantine, and think the whole pandemic is an exaggeration. Dynel (2021) analysed humorous Covid-19 face mask memes drawn from four popular social media platforms and examined them from a multimodal discourse analytic viewpoint. Applying the Bakhtinian notion of voicing—meant as a multiplicity of perspectives—the author argues that the humorous memes posted by users can provide an insight into socio-political current topics through their intricate interlace of various viewpoints, whether endorsing, ridiculing or recontextualizing previous voices through new posts.

As aforesaid, some of the alleged reasons for refusing to comply with mask wearing are deeply connected with issues of personal choice and individual freedom. Terms like *force*, *enforce* and *enforcement*, along with *choice* are recurrent in the two corpora, but mainly in the Twitter dataset, which counted a more significant number of anti-mask supporters. Here, for instance, the phrase "My body my choice" recurs twice, which connects the freedom of wearing a mask to women's claim for reproductive rights. Conversely, clusters of words associated with politics (i.e. *elections*, *vote*, *propaganda*) are to be found more in the Facebook corpus.

Bokemper et al. (2021) conducted an experimental study on the causal relationship between beliefs about mask efficacy and masking behaviours and attitudes in the United States and Italy—two countries most affected by Covid-19. Regarding the United States, they found that providing information about how masks protect others will likely encourage others to do so; moreover, community mask use increases intentions to wear a mask properly. This means that persuasive health communication appealing to protecting others may be a particularly effective strategy for unleashing positive effects.

With this in mind, special attention was paid to the lemma *protect*, which appears quite often in the corpora examined in the present study: 6 times as a verb and 4 times as a noun in the Twitter corpus (with the words KN95, KF94 and N95 co-occurring), 19 times as a verb and 3 times as a noun in the Facebook corpus (frequency per million tokens). The occurrences are mainly connected with either the sense of responsibility in protecting other people's health or with (dis)trust about the efficacy of masks in preventing the spread of the virus. The higher frequency of *protect* is consistent with the varied frequency in the corpora of another crucial lemma, *effective*, which appears 14 times in the Facebook dataset, against the 3 occurrences in the Twitter one, testifying to a greater involvement of Facebook users in prosocial discussions viewing masks as an effective containment measure.

Those who do not want to comply with wearing masks are frequently labelled in both corpora as *selfish* and *ignorant*. Such attributes can be interpreted as *emotive intensifiers* (Jing-Schmidt 2007) in so far as they intensify the affective strength of language while drawing attention to what is being said. Discursive processes of stigmatisation (i.e. negative emotional responses, social labelling, or prejudicial attitudes) toward people with and without masks can also be found in the whole corpus: *insane* and *ridiculous* are some examples drawn from the Facebook comments; *disgusting human beings*, *cruel and evil*, *cowardly* and *mindless masking* from the Twitter dataset (see Betsch 2020, Betsch et al. 2020 for a deeper insight into the social and behavioural consequences of mask policies during the Coronavirus pandemic).

Despite their relatively low frequency (respectively 8 and 6 frequencies in the whole corpus - normalised frequency per million tokens), *selfish* and *liar* appeared to be particularly revealing, as they pointed more specifically to attitudes and behaviours towards mask wearing; as such, they helped shift the investigation focus further from a merely quantitative data analysis to a more qualitative one.

the plan I don't do mandates not only do I know the government	lies	but I'm not gay Because masks do nothing but create mental illnes
gusting who is disgusting people with no values they know it's a	lie	they just hate God and love Satan That was omicron it spread like
ly This sentiment is pure selfishness and spite.</s><s>Keep the	lies	going!</s><s>These people will try to continue with the COVID-19
ing!</s><s>These people will try to continue with the COVID-19	lie	all the way up to the November elections.</s><s>This way they ca
e masks."</s><s>Not "can offer additional protection".. More	lies	Will you let it go already?!</s><s>Pathetic.</s><s>Leave it up to p
</s><s>I think you need to come up with a more effective way to	lie	to people. #saynotoscam This means nothing to most.</s><s>A m
n't the pandemic over? or are you bringing it back?</s><s>Stop	lying	We're over 2 years into this.</s><s>If you're still throwing shit arou
re down.</s><s>Either the website is either incorrect or you are	lying	.</s><s>Wonder what is worse (the latter is nothing new).</s><s>
isn't utter bullshIt and you know it!</s><s>We've been living the	lies	for 2+ years now.</s><s>We're not idiots!</s><s>NJ people with c
ons nobody trust these so-called medical professionals.</s><s>	Lie	about vaccines and lie about masks.</s><s>They just keep doubli
so-called medical professionals.</s><s>Lie about vaccines and	lie	about masks.</s><s>They just keep doubling down.</s><s>Do yo

Fig. 5: Concordance of the lemma *lie* in the Twitter corpus (*Sketch Engine*)

4.5 Mask-wearing attitudes and political affiliations

In their study investigating the nature of anti-mask attitudes during the Covid-19 pandemic, Taylor and Asmundson (2021) reported that, according to public opinion polls, people with conservative political affiliations (Republicans in the US) are less likely to wear masks than people with liberal affiliations (Democrats). In fact, in the early stages of the pandemic, the study has shown that Republican political leaders themselves were reluctant to wear masks and even mocked those who did, thus making mask-wearing even more controversial.

As Lang et al. (2021) notice, "[m]ask wearing was politicised in an election year marked by violent partisan vitriol, which was deliberately inflamed by populism and divisive rhetoric and amplified by the media." References to Democrats and Republicans appear in the whole corpus, but mainly in the Facebook corpus (with 7 occurrences out of 8), where terms like *Trump*, *Trumpski* and *Trumpified* also appear (Fig. 6), with no occurrences at all in the Twitter corpus. In one occurrence, a user complains about Americans being *Trumpified*, handled by *malign Republican trolls* (i.e. individuals who misrepresent their identities to promote discord). This shows evidence of another pattern suggesting that non-compliance with the acceptance of face masks is apparently triggered by the example set by Republican political leaders. As a matter of fact, while the Democratic presidential candidate, Joe Biden, frequently wore a face mask in

public and encouraged its use, the Republican presidential candidate, Donald Trump, did the opposite and even mocked Biden publicly for wearing masks so often (Pascual-Ferrá et al. 2021; Zareva and Zamora 2022).

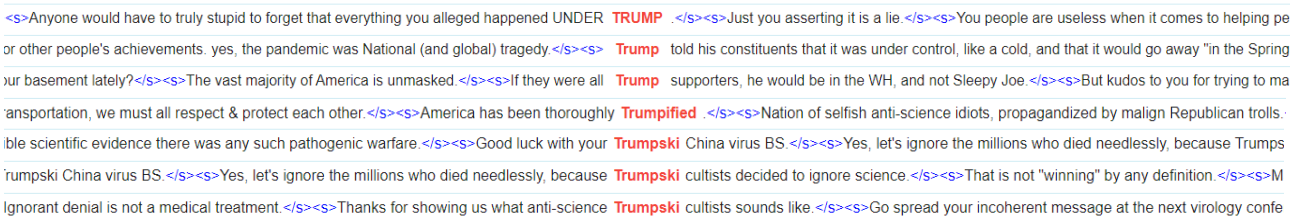

Fig. 6: Concordance of the lemma *Trump* in the Facebook corpus (*Sketch Engine*)

A similar concordance search of the lemma *Biden*—which, just like *Trump*, did not occur at all in the Twitter corpus—showed an equal misalignment with the government's decision to open borders and a fairly strong distrust in its ability to handle with the health emergency (Fig. 7).

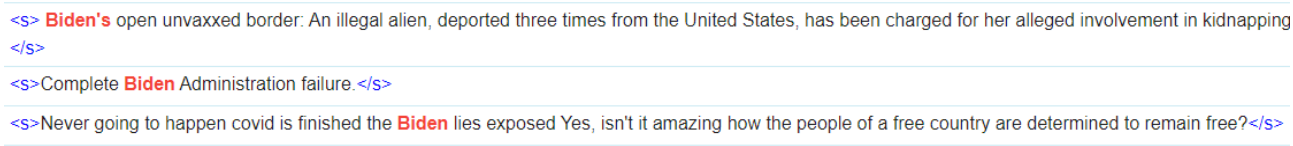

Fig. 7: Concordance of the lemma *Biden* in the Facebook corpus (*Sketch Engine*)

4.6 Mask aversion and infodemic

A common point raised by anti-mask parties in both corpora has to do with complaints about conflicting sources of information and misinformation sometimes spread by public authorities and institutions themselves. The term infodemic, coined by combining the terms *info* and *epidemic* and first introduced in 2003, is defined by the WHO as follows:

> [...] too much information including false or misleading information in digital and physical environments during a disease outbreak. It causes confusion and risk-taking behaviours that can harm health. It also leads to mistrust in health authorities and undermines the public health response. An infodemic can intensify or lengthen outbreaks when people are unsure about what they need to do to protect their health and the health of people around them. With growing digitisation—an expansion of social media and internet use—information can spread more rapidly. This can help to more quickly fill information voids but can also amplify harmful messages.[8]

[8] Source: https://www.who.int/health-topics/infodemic#tab=tab_1.

Most Covid-19 infodemic studies are focused on misinformation (incomplete or inaccurate) and disinformation (intentional falsehoods). For sceptical users, public health authorities were just uselessly fearmongering people in NYC (Fig. 8).

Fig. 8: Sample anti-mask tweets from Twitter corpus

In conclusion, the results of the present study showed how the digital sharp polarisation of public opinion on mask wearing was often characterised by emotionally charged semantic antagonism (Lang 2021). This is not new in online discussions, especially when important issues like public health are debated (Garzone, Paganoni and Reisigl 2019, 7). Pascual-Ferrá et al. (2021) investigated the toxicity of Twitter messages regarding face mask wearing during the Covid-19 pandemic. In online discussions, the term toxicity refers to a rude, disrespectful comment or a form of online harassment and verbal violence. Toxicity trends on social media, they claim, should be monitored by public health agencies and other governmental institutions to learn more about public perception of their recommendations and then adjust their risk communication messaging toward mask wearing, vaccine uptake, and other interventions. In their investigation, they found that anti-mask tweets were more toxic than pro-mask tweets for most hashtags analysed, and they also reflected a low perceived risk of Covid-19. In the Twitter corpus examined in the current investigation, for instance, curse words like *fuck* are found 11 times, while this term does not appear at all in the Facebook corpus.

5. Conclusions

Recent years have witnessed an impressive development of social media. As to the two social networks considered in this study, Facebook had about three billion monthly users, while Twitter had over 500 million tweets sent each day at the time of writing. Consequently, social

media data have become an easily and quickly available source of data that analysts and policymakers in government have begun to consider in order to target evidence-based policymaking.

Data mining, as the one illustrated in this investigation, can contribute to get a deeper understanding of citizens' behaviours and attitudes about important public issues; this appears crucial to design more effective health communications, as the one about Covid-19 pandemic. In particular, a careful analysis of social media data can provide policy and decision makers with precious insights into how to manage infodemic, thus reducing its impact on community health behaviours during health emergencies.

Some findings that emerged from this study were related to the need for a greater transparency in health communication and for an evidence-informed health policy. In times of urgent circumstances, as public health emergencies, government decisions to persuade people may be justified, but a transparent communication for those decisions is always needed, and the evidence should not be distorted (Oxman et al. 2022). Citizens should be addressed with targeted and appropriate communication capable to raise awareness among them by implementing information on debated public health issues. A containment measure like mask wearing should still enable people to make an informed decision about whether to wear a face mask or to understand the reason for a mask mandate. In this way, public health messaging strategies can increase message acceptance around a mandatory policy like mask wearing.

This study, nevertheless, is not without limitations. Firstly, it relies on a sample corpus limited to a specific setting at one particular point in time; secondly, although a corpus-based approach to Discourse Analysis aims at reducing—if not removing—researcher bias (Baker 2006, 10), the focus of the present study is narrowed down to a relatively small number of Facebook and Twitter comments to a specific post published on an equally specific date. This raises questions of representativeness, selectivity and voice; undoubtedly, the data examined cannot be generalised to society.

However, the methods used for data collection and analysis are consistent with the aim of this investigation: to explore the wide range of personal and social meanings of mask wearing, providing possible insights into how governmental and public health authorities could more effectively address people on sensitive public health issues regarding the whole community. For instance, the spread of inconsistent information during the Covid-19 crisis is seen in the two corpora as a factor affecting citizens' perception of infection risks, which might result in excessive fear or denial of the reality of the pandemic itself. Therefore, transparency and

scientific evidence accompanying containment measures appear crucial in promoting citizens' compliance with government regulatory efforts, such as mandating face masks.
Further studies could focus on how to improve communication strategies related to important issues, such as public health, even beyond the Covid-19 pandemic (Martinelli et al. 2021).

Elena Intorcia *is Adjunct Professor of English Language and Translation at Università degli Studi del Sannio. Her research interests lie primarily in the fields of ESP and, lately, Discourse Analysis. She holds a PhD in Cultural and Postcolonial Studies of the Anglophone World from the University of Naples "L'Orientale." She was granted a Fulbright scholarship at the UIC (University of Illinois, Chicago) and has often taught Italian as a foreign language abroad within the LLP-Erasmus programme.*

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