Mapping polylogical discourse to understand (dis)information negotiation:
the case of the UK Events Research Programme

Authors

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INTRODUCTION

The advent of the Networked Society has radically changed the (dis)information ecosystem. A major aspect is that digital technologies and platforms have enabled new participatory models of news production, such as citizens' journalism (Allan and Thorsen 2009), where citizens are both news producers and consumers. In addition, digital media algorithms and affordances constrain the way we access, create, and negotiate information, leading to filter-bubbles and echo-chambers. Such a situation fuels media distortions including polarization and fake news. Thus, in a society where the medium is more and more the message, there is the need to make citizens active in the news gatekeeping process, exercising critical thinking when accessing, commenting and creating news discourse. This is especially important in crisis scenarios, such as the pandemic, where major uncertainties might trigger confusing official communications which, in turn, spike diverse sentiments and potential misbehaviours. As discourse analysts, to identify the roots of disinformation and prevent its genesis and propagation, it is first crucial to understand how and why discourse(s) around issues of public interest are shaped. To the latter goal, we propose in this study a scalable methodology to analyse polylogues (Musi and Aakhus 2018) where stakeholders (e.g. citizens, journalists, politicians) advance various positions (news claims) across multiple venues (e.g. social media, broadcast media, discussion fora) and pinpoint potential sources of disinformation across digital media. We apply this methodology to the analysis of discourse(s) around the Events Research Programme (ERP) in the United Kingdom, which was developed to gather evidence on the reopening of events and venues assessing the risk of SARS-CoV-2 transmission, and to pilot risk-mitigation measures in concert with the UK Government's Roadmap for COVID-19 recovery. We then compare the results with those of a questionnaire that participants taking part in the live events were asked to complete

More specifically, we focus on the first phase of the ERP during which three pilot events took place in Liverpool from 15 April to 15 June 2021. The study constitutes a privileged point of view to investigate the negotiation of (dis)information because: it is centred around a topic of radical uncertainty (is it safe to reopen large event?); it has been announced and advertised in a constrained period, thus allowing for a comprehensive data analysis; and it is geolocated, thus catalysing reactions from local to national communities.

RELATED WORK

The awareness of the presence and dangers cast by the infodemic during the pandemic has brought discourse analysts to join efforts countering the spread of disinformation. To better navigate the post-truth scenario, various studies have focused on defining different types of information distortions, distinguishing misinformation from disinformation and malinformation (e.g. Carmi et al. 2020, Wardle 2017). Another research stream has tackled the identification of deception clues in discourse, both adopting a qualitative and a quantitative/computational perspective: Marko (2022) has analysed through the lenses of critical discourse analysis the linguistic features flagging a conspiratorial anti-COVID Facebook group, while natural language processing approaches have focused on building classifiers for automatic fake news detection (Varma et al. 2021). Leveraging on the notions of fallacious discourse, Musi and Reed (2022) and Musi et al. (2022) have proposed a corpus-based taxonomy of misinformation triggers encompassing ten types of fallacies that have recurrently conveyed misleading information about COVID-19. Adopting a distribution-oriented perspective, other studies (e.g. (Scannell et al. 2021) have dealt with persuasion techniques used by fake news spreaders to achieve popularity, if not virality. Reversing the perspective, argumentation scholars have published a collective volume centred around how public argumentation has changed in the face of the pandemic from a formal, normative and functional perspective (Oswald et at. 2021). Despite differences in specific

targets of inquiries and methodologies, state of the art studies around discourse in/and the pandemic in relation to disinformation have scope over disinformation as a product. What we propose in this pilot study, is to configure a methodology to observe the shaping of discourse in its complexity as a process that might prevent the rise and the spread of disinformation.

DATA AND METHODS

To analyse how ERP has been communicated by official sources (Dataset$_{official}$), we collected both news on (1) *UK Government* and *Liverpool City Council* webpages (list of links available in the Appendix) and (2) online local (Liverpool Echo) and national (*The Guardian*, *The Independent*, *The Evening Standard*, *The Metro*, and *The Sun* and *BBC*) news media through web-scraping. We considered 15th April – 15th June 2021 as a time span during which the following three events were held in Liverpool: *Good Business Festival*, 19th April, *Circus Nights*, 30th April/1st May and *Blossoms at Sefton Park*, 2nd May 2021 (https://www.cultureliverpool.co.uk/event-research-project/). As filters to retrieve most relevant information we used a set of relevant event-specific keywords (e.g. 'liverpool' AND 'gig' AND 'pilot'). We obtained a dataset of 23 articles from governmental sources and 44 articles from online news media.

To investigate public reactions on social media (Dataset$_{reactions}$), we have focused on the social media Twitter due to the availability of the API for the academic community. We have collected i) all the tweets published by the Liverpool City Council official pages (*Liverpool City Council*, *Culture Liverpool*; *Visit Liverpool*) in the given time span to monitor public engagement (likes, retweets) with the communicated content, amounting to 125, and ii) all the public tweets (2,144 + 813 retweets) targeting the live events according to a set of filter-keywords (e.g. 'circus' AND 'live' AND 'test') to get an overview of public stances over the (testing) of the reopening of large events.

To understand whether official communications and public stances resonate with those of aspiring participants who wanted to attend the live events, we have considered pre-event questionnaires data collected as part of a funded evaluation of the ERP (DCMS - https://www.gov.uk/government/publications/information-on-the-events-research-programme/information-on-the-events-research-programme). It focused on capturing public perception of the events, looking at their expectations, experiences, and overall organisation. (Dataset$_{questioannire}$). This gathered 40,263 responses (*Good Business Festival* = 572; *Circus Nights* = 21,583 and *Blossoms at Sefton Park* = 20,026) from individuals planning to attend. We have focused on the questions (Q2-Q7, see Appendix) aimed at capturing concerns about attending the live events, the arguments behind these concerns, and the perceived risk of catching Covid-19 and spreading it to others.

As far as methodology is concerned, we have combined natural language processing techniques (topic modelling and sentiment analysis) with qualitative content and argumentative analysis. Topic modelling (Nikolenko, Koltcov and Koltsova 2017) and sentiment analysis (Liu 2010) are natural language processing techniques respectively used to uncover hidden topics and positive vs. negative vs neutral tone in texts. We have applied both techniques over Dataset$_{official}$ and Dataset$_{reactions}$ through the Multimodal Analysis Platform (*MAP*, O'Halloran Pal and Jin 2021). Sentiment analysis is carried out in MAP using the BERT model (Hoang, Bihorac and Roucesthrough 2019). As to topic modelling, MAP gives the option of treating it as a classification problem based on a *Long Short-Term Memory* model (https://www.tensorflow.org/api_docs/python/tf/keras/layers/LSTM) trained on the News Category Dataset (https://www.kaggle.com/datasets/rmisra/news-category-dataset).

Getting an overview of the topics discussed across official news informs about how institutions and major news media outlets want to frame the ERP initiative, foregrounding certain aspects of an issue over another (Entman 1993). As underlined by Kahneman and Tversky (2013) frames have the potential to prime decision making processes, strengthening the force of certain arguments (e.g. reason to join the reopening of a large event) over others (potential deterrents). On the other side, the topics surfaced through the social media analysis shed light on what aspects are felt as relevant to be discussed or raised by communities. It contributes, over the Dataset$_{official,}$ to understanding the tone through which the events are announced to the public which might have a strategic communication impact, e.g. promoting participation or fear-mongering, while the sentiment expressed in the Dataset$_{reactions}$ provides hints as to

positive vs. negative attitudes entertained by the larger public. To investigate the arguments underlying such sentiments, we have carried out a qualitative content analysis (Krippendorff 1998) of the 100 tweets with the highest sentiment polarity (both positive and negative). The results have been compared with the questionnaire's answers, pointing to a (relative lack) of concern about catching or spreading COVID-19 at the live events. Further statistical measures have been applied to investigate correlations between concerns, gender and vaccination status.

RESULTS

Governmental and news media sources: the official ERP discourse

Supervised topic modelling over the $Dataset_{official}$ reveals that the official media releases are primarily concerned with science (i.e. the research programme) (30.4%), entertainment (26.1%), impact (e.g. on transmission, reopening of events) (17.4%), sports (8.7%) (e.g. opening of football matches etc), business (4.3%), green issues (4.3%), politics (4.3%) and travel (4.3%) (e.g. parking etc). In a temporal perspective, after the initial media release about the live events programme in early May 2021, the focus moved to science and entertainment which remained a consistent theme throughout, culminating with a focus on science and the impact of the programme at the end of May 2021.

The average sentiment of the online media articles is positive with a value of 0.686, revealing that the UK and Liverpool City Council endorsed and promoted the live events programme in a highly positive manner: the majority of articles (16 out of 23 articles) have a sentiment value within the range of 0.9 to 1.0, which is the highest possible range for positive sentiment scores (i.e. sentiment values range from −1.0 to +1.0). The rhetorical appeal of positive emotions to instil public enthusiasm is confirmed by a coherent use of images. Out of the 19 images that were found on the Liverpool City Council website, approximately half of the images are long shots of Liverpool city, which would typically be found in promotional and tourism materials for Liverpool. The other images are photos of the live events (e.g. the audience, the crowd, the band performing and promotional shot of the band), in addition to a photo of Kevin McManus, Head of Culture Liverpool, Liverpool City Council. The images function as framing devices, reinforcing the entertainment aspect of the live events, while making Covid-19 or testing less prominent topics.

Turning to the news media coverage, national ones are mostly concerned with entertainment (54.5%), arts (11.4%), impact (11.4%) and politics (9.1%). Other articles are classified as business (2.3%), college (2.3%), queer voices (2.3%), science (2.3%), wellness (2.3%) and world post (2.3%). The *entertainment frame* is apparent and in line with governmental sources, with the majority of articles appearing at the time when the live events took place, rather than before-head to promote cautionary measures.

The average sentiment score is positive, with a value of 0.694, suggesting that online news media reported the live events programme in a very favourable light, again in line with the governmental news media sources. As to local newspapers (i.e. *Liverpool Echo*), they do reveal more diversity compared to national newspapers, with a focus on entertainment (27.3%), the impact of the events (27.3%), arts (18.2%), business (9.1%), college (9.1%) and politics (9.1%). The registered sentiment is slightly lower (0. 590), but overall leaning towards positive polarity.

Social Media: The public ERP discourse

The longitudinal analysis of the public tweets ($Dataset_{reactions}$) reveals that they were primarily posted during three time periods: (a) when the live events research programme was building up in mid-April 2021 (week starting Monday 19 April 2021); (b) during the week when the live events took place (i.e. week starting Monday 26 April 2021) and (c) when the news that the live events did not lead to an increase in the spread of Covid-19 in the week starting Monday 24 May 2021 was released (https://www.liverpoolecho.co.uk/news/liverpool-news/liverpool-covid-pilot-events-had-20676455; https://news.liverpool.ac.uk/2021/05/25/liverpool-pilot-events-have-no-impact-on-covid-spread-in-region/; https://twitter.com/lpoolcouncil/status/1397221555567009796). The top 30 days of public tweet posts show that the actual events and the media release on 25 May 2021 attracted most interest

on Twitter. As shown in Figure 1, the number of retweets and likes was the highest when the news about the results of the live events was released.
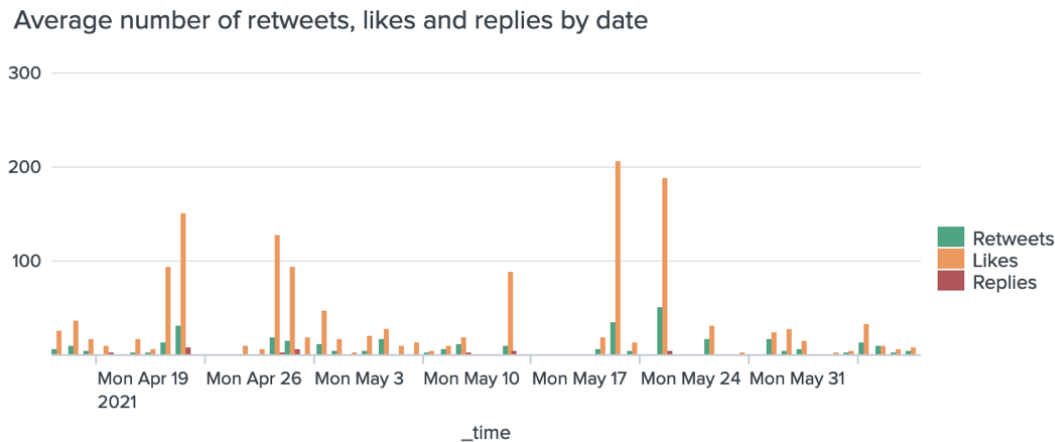
Figure 1. Public Tweets: Average number of retweets, likes and replies for live events in Liverpool

The average sentiment score for the public tweets is 0.500 (and 0.633 with retweets removed). The sentiment ranges from –1.0 to –0.9 and 9.0 to 1.0, but most tweets have a positive value of 9.0 to 1.0. On the other hand, the average sentiment scores for Liverpool City Council tweets is 0.859. This is the highest sentiment score found in the dataset, stressing the council's overall endorsement of the ERP programme. Such an intention is confirmed by the exclusive use of images (overall 101) to promote features of the live events (e.g. band, crowd and venue) rather than inciting the use of precautionary measures (e.g. there are no images of Covid-19 tests).

The most liked Liverpool City Council Tweet overall concerns the absence of risk posted by the Liverpool Public Health Officials on 25th May 2021:

"#BreakingNews | #Liverpool Public Health officials and scientists find that the city's 4 pilot events had no impact on #Covid19 spread in the region. Learn more: https://t.co/f6ZIpEWzeH @DPH_MAshton @LivUni @profbuchan @CIRCUSmusic @FRfestivals"

The classification of topics across the public tweets shows a focus on healthy living (21.3%), entertainment (18.8%), business (18.4%), sports (11.2%), travel (7.2%), wellness (3.7%), and politics (3.5%). This marks a shift from the earlier classifications of official and news media articles which are variously focused on entertainment, impact, science, arts, travel and politics. The classifications for the Liverpool City Council tweets are entertainment (32.5%), travel (27.7%), wellness (10.8%), queer voices (7.2%) and impact (4.8%). The classifications for Liverpool City Council tweets fit with patterns from other media, but with an increase in focus on wellness.

From the content analysis of the 100 top positive and negative tweets, respectively 7 and 10 main underlying reasons have emerged (ordered according to frequency). Those underpinning positive sentiments are mostly evaluative propositions targeting features of the lived events (1, 2, 6) or their positive impact on the urban and cultural environment overall (3, 4, 7) with a few mentions to the of the rationale of the ERP program itself (assisting research, 6). On the other side, COVID-19 related issues are catalysed by reasons underlying negative sentiments (5, 7, 9, 10), next to practical aspects (3, 4, 5, 6) and inclusivity policies from a hospitality perspective (1 and 8):

- ■ Positive sentiments:
    1. Positive feelings about seeing the events on media
    2. Positive feelings about attending the events
    3. Wishing luck for future opening
    4. Happiness towards reopening of culture events
    5. Follow health measures to assist research

6. Positive feelings about the artists and music at the events.
7. Positive feelings about Liverpool as a city to live in

■ Negative sentiments:
1. Neglecting small venues
2. Complicated process to book.
3. Concerns about weather
4. Concerns about fellow event goers lack of etiquette
5. Criticism against the government
6. Noise complaints
7. Ethical concerns
8. Anger about artists selection to the events
9. Anger at having to take tests
10. Lack of scientific rigor

Questionnaire: the participants' discourse

At the time of completing the survey, 55.5% (22,366) of respondents had not received the vaccine, 15.1% (6,094) had received one dose and 8.3% (3,333) had received both doses, with 21.0% (8,470) not responding to this question.

The perceived risk of catching Covid-19 at the live events was low, with 35.5% and 31.7% of participants responding that it was "very unlikely" and "fairly unlikely" respectively. The number of people who thought it "very unlikely" increased proportionally over time, suggesting an increased level of confidence about the low-level risk as the live events approached. However, the tendency to not respond to this question increased over time as well.

The perceived low level of risk of catching coronavirus at the live events correlated with a lack of concern about infecting others, as displayed in Figure 2. That is, the majority of people who thought it "very unlikely" to catch covid were "not at all concerned" with infecting others. Those who thought it "fairly unlikely" were largely "not at all concerned" or were only "slightly concerned" about infecting others.
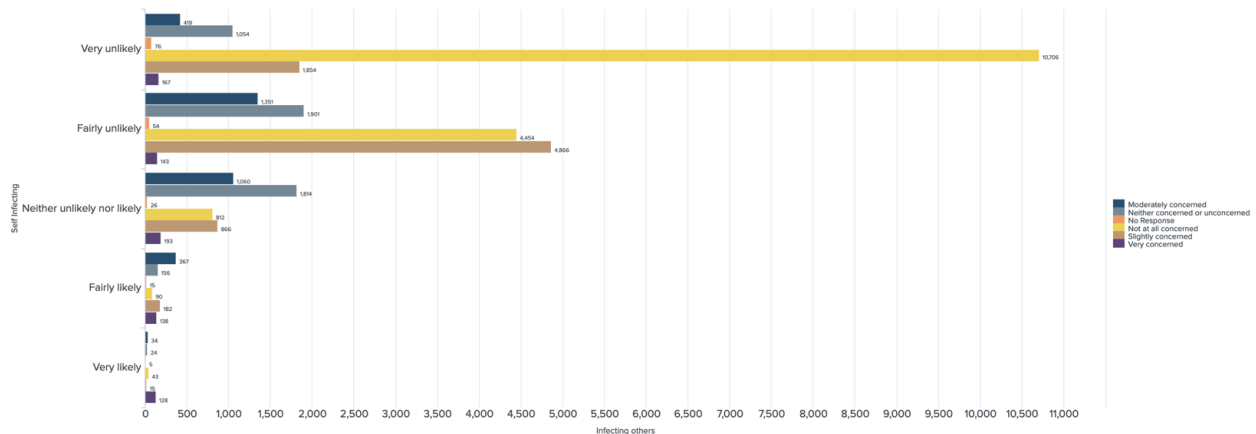
Figure 2: How likely do you think you are to catch covid at the event and infect others

63.1% (25,400) of participants were "not at all concerned" about attending the event, with women being slightly more concerned than men. Gender differences in risk perception (Gustafsod 2006) are, thus, not significant across the participants' sample. For example, 29.7% (11,942) of women and 30.9% (12,459) of men were not at all concerned, and 7.7% (3,113) of women and 5.4% (2,188) of men were slightly concerned, as displayed in Figure 3.
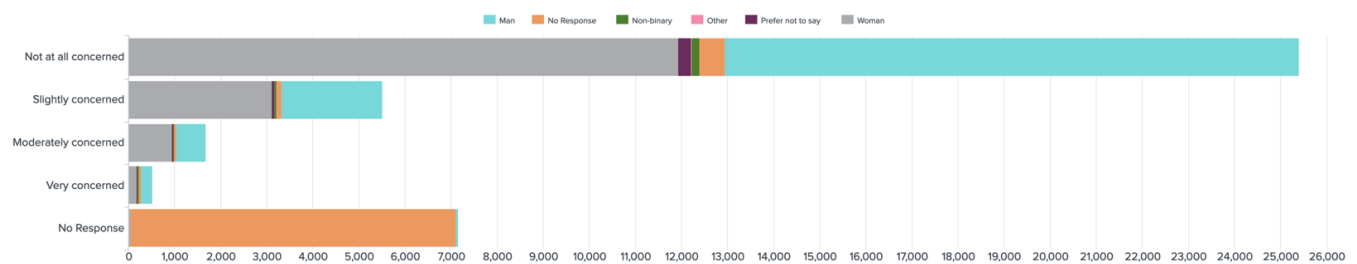
Figure 3: Level of concern about attending the event and gender

Participants expressed low levels of concern about attending the event, regardless of whether they had been vaccinated or not, as shown in Figure 4.
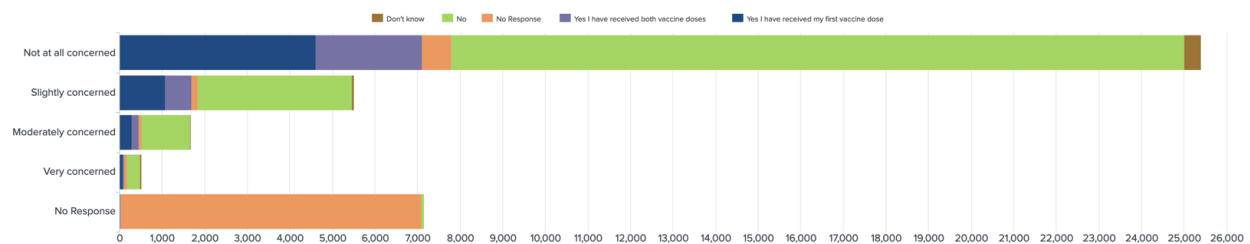
Figure 4: Level of concern about attending the event and vaccination status

The reasons selected for being "not at all concerned" are the following (in order of frequency):

Item	Number
Because I have followed guidance on reducing the spread of coronavirus (COVID-19)	3170
Because I've been tested; Because I have followed guidance on reducing the spread of coronavirus (COVID-19)	2190
Because I've been tested; Because I've been vaccinated; Because I have followed guidance on reducing the spread of coronavirus (COVID-19)	2000
Because I've previously had Covid-19	1630
Because I've been tested	1513
Because I've been vaccinated	1566
Because I've previously had Covid-19; Because I've been tested; Because I have followed guidance on reducing the spread of coronavirus (COVID-19)	1322
Because I've previously had Covid-19; Because I've been tested; Because I've been vaccinated; Because I have followed guidance on reducing the spread of coronavirus (COVID-19)	781
Other	2331

Table 1: Reasons for being "not at all concerned"

More generally, 81.6 % (32,855) of respondents did not express any specific concerns about attending the event, such as possibly catching Covid-19, having to self isolate if tested positive, having others think that the person is being reckless, and social anxiety. The largest single concern was catching Covid-19 (4.4%), though this was coupled with other concerns (e.g. having to self isolate if tested positive for Covid-19, Others thinking I am being reckless) in 8.4 % of cases. Most participants considered it "very important" and "moderately important" to resume the events, regardless of gender.

DISCUSSION

The analysis of discourse(s) around the pilot live events from different stakeholders (UK government, official national and local media, social media users and aspiring participants at the large events) across media outlets (official website, news media outlets, Twitter and questionnaire) reveals common trends as well as mismatches between official communication and public concerns that indicate the presence of/the potential for disinformation to spread.

The official UK government media and the Liverpool City Council messages were concerned with science (i.e. the research programme), entertainment and the impact of the events, with a high positive sentiment score. The Liverpool City Council posted images of the city and photos of the live events (e.g. audience, band, and bright lights), which promoted the entertainment aspects of the live events programme and Liverpool city itself. Similarly, the UK news media press also focussed on the entertainment and the arts, and to a lesser extent on impact, with a similar positive sentiment score. Overall, the official discourse framed ERP events with the strategic goal of promoting them, downsizing possible risks. As shown by previous studies (e.g. Xu and Guo 2018) the use of positive sentiment words is a successful strategy to increase message popularity. In the case of ERP, message popularity was advocated to guarantee the involvement of a wide spectrum of participants with diverse demographic features. From a media perspective, the strategy of stressing the positive aspects brought about by ERP counterbalances the increasing news avoidance, which has at its core the depressing nature of news, especially during the pandemic (Toff and Kalogeropoulos 2020). However, such a rhetorical strategy brings about opportunities for both intentional and unintentional misleading news to spread, bringing to misinformation and disinformation rather than increased literacy (Carmi et al. 2020).

From the close qualitative analysis of tweets with negative sentiment, it is apparent that members of the public were concerned with the partiality and/or lack of accurate information received about the risks, and the measures put in place by the UK government to mitigate them. Criticism ranges from pointing out the bad timing (e.g "recipe for disaster, and too early for such a socially enclosed event. bbc news - covid: uk clubbers return to liverpool for trial night https://t.co/ixzgaphdyo") to the neglect of the consequences that this might have on vulnerable people (e.g. "@circusmusic remember it's an experiment to see who gets sick, if they pass on to a vulnerable person, and kill them... fools rush in. i am in the vulnerable category but it appears any events in liverpool exclude us. if deaths go up, on your hands. can i have my tax back?"). To ascertain the soundness of these critiques we went through the official communication and news articles about the *Circus Nights*: besides having partial information about the health measures involved in the pilot events, we attested the presence of non-factual information; namely that pilots are part of the pilots for vaccine passport, which is not the case. On the contrary, the ERP was conceived as an opportunity to not only monitor public behaviours, but also gather public stances over the potential use of vaccine passports to inform future policies. One of the questions in the post-event questionnaire that participants were asked to complete was, in fact, meant as a public consultation over the matter: "If similar events in the future would require attendees to present a 'Covid passport' in order to enter, how likely are you to join such events?". The majority of participants (ca 75%) positively answered either "likely" or "very likely". We, thus, confirm that public reactions on social media rightly point to the presence of misinformation from official sources, which has been identified and discussed by various studies during the pandemic (Kyriakidou et al. 2020, Islam et al. 2021). It must be noted that lack of information can be as detrimental as non-factual information in triggering misbehaviours (Musi et al. 2022), thus counting as misinformation. Regardless of its type, misinformation opens doors for conspiratorial thinking and, at best, scenarios to decrease trust in institutions which hinders effective communication in crisis scenarios. Transparent and accurate communication about the institutional goals for setting up the ERP would rule out misunderstandings which are bound to fuel disinformation. Public tweets were, for instance, questioning the motive of the programme, reconducting it to governmental discrimination towards Liverpool (e.g. "liverpool were the first to pilot the lateral flow tests and now we're the first to pilot events without social distancing, masks etc. y'all the government really hates us don't they😂"). The lack of benevolence from the UK government (Mayer, Davies and Schoorman 1995), which is a key pillar of institutional trust, is most likely at the origin of public fears about being involved in an experimental study. A closer scrutiny at the tweets expressing concerns reveals widespread worries about local people being used as "guinea pigs" and "rats" in a government supported scientific experimental study (e.g. "Using scousers as social experiment guinea pigs", "Government social experiment. Using Liverpool as guinea pigs. We've

nothing to lose, so lets see how it goes they'll say"; "Liverpool again ! Guinea pigs !!! Not London ???? Wonder why?"). That of inferring malicious intentions as the best possible explanation in absence of others easily accessible constitutes one of the major causes of conspiratorial thought (Moffitt, King and Carley, 2021).

The results of the questionnaire show that most aspiring participants were not worried about catching or transmitting COVID-19, being on the other side of the spectrum. Their main rationale is that they have followed guidance on reducing the spread of coronavirus, showing that trust in institutions is at the very basis of a perception of safety. However, detrimental consequences following from the lack of information could highly impact their trust.

RECOMMENDATIONS

The polylogue around ERP events showcases how the analysis of discourse can help not only identifying, but also preventing the rise of both misinformation and disinformation. Such an endeavour calls first of all for an awareness of the complexity of the current information ecosystem where information is not communicated top-down from official news media venues, but it is, instead, continuously negotiated amongst different sectors of society. Drawing from our analysis, three key recommendations emerge to craft effective public messages in crisis scenarios:

- Understand public epistemic needs and concerns: social media reactions need to be scrutinised while shaping a communication campaign. As evidenced by public reactions on Twitter, for instance, the safety measures put into place to ensure compliance for the safety of everyone involved should have been provided. At the same time, the rationale behind the live events and their role as a form of public consultation rather than an experiment to enforce governmental decisions should have been clearly stated.
- Develop standpoints and arguments aimed at minimising risks: the communication goals of official media should prioritise public risk avoidance. From the questionnaire, it was clear that people who wanted to attend the live event considered the risk to be extremely low, even though that may not have necessarily been the case in a testing scenario. A negative outcome would have caused a public backlash against institutions as well as fuelled conspiratorial thought.
- Use framing devices as means to achieve communication goals: both natural language and multimodal content (images) shall be used to foreground both advantages and risks (and precautionary means) to guarantee accountability without fear-mongering. Thematic content and images shall have emphasised all key issues rather than focussing on the entertainment aspect of the events.

REFERENCES

Allan, S. and Thorsen, E. eds., 2009. *Citizen journalism: Global perspectives* (Vol. 1). Peter Lang.

Carmi, E., Yates, S.J., Lockley, E. and Pawluczuk, A., 2020. Data citizenship: Rethinking data literacy in the age of disinformation, misinformation, and malinformation. *Internet Policy Review*, *9*(2), pp.1-22.

Entman, R.M., 1993. Framing: Towards clarification of a fractured paradigm. *McQuail's reader in mass communication theory*, *390*, p.397.

Gustafsod, P.E., 1998. Gender Differences in risk perception: Theoretical and methodological erspectives. *Risk analysis*, *18*(6), pp.805-811.

Hoang, M., Bihorac, O.A. and Rouces, J., 2019. Aspect-based sentiment analysis using bert. In *Proceedings of the 22nd nordic conference on computational linguistics* (pp. 187-196).

Kyriakidou, M., Morani, M., Soo, N. and Cushion, S., 2020. Government and media misinformation about COVID-19 is confusing the public. *LSE Covid-19 Blog*.

Krippendorff, K., 2018. *Content analysis: An introduction to its methodology*. Sage publications.

Islam, M.S., Mahmud, R. and Ahmed, B., 2021. Trust in Government during COVID-19 Pandemic in Bangladesh: An Analysis of Social Media Users' Perception of Misinformation and Knowledge about Government Measures. *International Journal of Public Administration*, pp.1-17.

Mayer, R.C., Davis, J.H. and Schoorman, F.D., 1995. An integrative model of organizational trust. *Academy of management review*, *20*(3), pp.709-734.

Marko, K., 2022. Extremist language in anti-COVID-19 conspiracy discourse on Facebook. Critical Discourse Studies, pp.1-20.

Moffitt, J.D., King, C. and Carley, K.M., 2021. Hunting conspiracy theories during the COVID-19 pandemic. *Social Media+ Society*, *7*(3), p.20563051211043212.

Musi, E. and Aakhus, M., 2019. Framing fracking: Semantic frames as meta-argumentative indicators for knowledge-driven argument mining of controversies. *Journal of Argumentation in Context*, *8*(1), pp.112-135.

Musi, E., Aloumpi, M., Carmi, E., Yates, S. and O'Halloran, K., 2022. Developing fake news immunity: fallacies as misinformation triggers during the pandemic. *Online Journal of Communication and Media Technologies*.

Musi, E. and Reed, C., 2022. From fallacies to semi-fake news: Improving the identification of misinformation triggers across digital media. *Discourse & Society*, p.09579265221076609.

O'Halloran, K. L., Pal, G. and Jin, M., 2021. Multimodal approach to analysing big social and news media data. *Discourse, Context & Media*, *40*, p.100467. https://doi.org/10.1016/j.dcm.2021.100467.

Oswald, S., Lewiński, M., Greco, S. and Villata, S., 2022. *The Pandemic of Argumentation* (p. 371). Springer Nature.

Scannell, D., Desens, L., Guadagno, M., Tra, Y., Acker, E., Sheridan, K., Rosner, M., Mathieu, J. and Fulk, M., 2021. COVID-19 vaccine discourse on Twitter: A content analysis of persuasion techniques, sentiment and mis/disinformation. Journal of health communication, 26(7), pp.443-459

Toff, B. and Kalogeropoulos, A., 2020. All the news that's fit to ignore: How the information environment does and does not shape news avoidance. *Public Opinion Quarterly*, *84*(S1), pp.366-390.

Varma, R., Verma, Y., Vijayvargiya, P. and Churi, P.P., 2021. A systematic survey on deep learning and machine learning approaches of fake news detection in the pre-and post-COVID-19 pandemic. *International Journal of Intelligent Computing and Cybernetics*.

Wardle, C., 2017. Fake news. It's complicated. *First Draft*, *16*, pp.1-11

Xu, Z. and Guo, H., 2018. Using text mining to compare online pro-and anti-vaccine headlines: Word usage, sentiments, and online popularity. *Communication studies*, *69*(1), pp.103-122.

Appendix

Sources:
https://liverpool.gov.uk; https://www.cdc.gov/coronavirus/2019ncov/index.html;
https://www.ecdc.europa.eu; https://www.gov.uk/coronavirus;
https://www.gov.uk/government/organisations/scientific-advisory-group-for-emergencies;
https://www.independentsage.org; https://www.nhs.uk/conditions/coronavirus-covid-19;
https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Questionnaire

(Q1) What are the main reasons you decided to join the Events Research Programme?

(Q2) Are you concerned about attending the event?
Not at all concerned
Slightly concerned
Moderately concerned
Very concerned

(Q3) Are there any factors that might contribute to some of your concern about attending the event?
Possibly catching Covid-19
Impact of having to self-isolate if I test positive for Covid-19
Social anxiety
Others thinking I'm reckless
Other

(Q4) How likely do you think you are to catch coronavirus at the event?
Very unlikely
Fairly unlikely
Neither unlikely nor likely
Fairly likely
Very likely

(Q5) How concerned are you about potentially infecting others after attending the event?
Not at all concerned
Slightly concerned
Neither concerned nor unconcerned
Moderately concerned
Very concerned

(Q6) If 'not at all concerned' on last question, having stated that you are not concerned, share reasons why
Because I've previously had Covid-19
Because I've been tested
Because I've been vaccinated
Because I've followed guidance on reducing the spread of Covid-19
Other

(Q7) How important do you think it is to resume these kinds of public events as soon as possible?
Not at all important
Slightly important

Neither important nor unimportant
Moderately important
Very important

(Q8) In the past seven days, how often did you wash your hands with soap and water straight away after returning home from a public place?
Always
Often
Sometimes
Not very often
Never

(Q9) In the past seven days, have you used a face covering when outside your home to help slow the spread of the coronavirus (COVID-19)?
Yes
No
Not applicable

(Q10) While you were inside a public space (e.g., shop, public transport) in the last seven days, how often did you wear a protective face covering to help slow the spread of the coronavirus (COVID-19)?
Always
Often
Sometimes
Not very often
Never

(Q11) On average, how often do you follow the guidance on social distance when outside of support/childcare bubbles, maintaining 1-2 metres between yourself and other people?
Always
Often
Sometimes
Not very often
Never

(Q12) In the past seven days, have you had any visitors inside your home from outside your support/childcare bubbles, including trades people, carers or medical staff?
Yes
No

(Q13) When you have had a visitor inside your home, which of the following actions did you take to reduce the spread of the coronavirus (COVID-19)?
Worn a face mask
Asked the visitor to wear a mask
Opened windows or doors
Cleaned touch points
Maintained social distancing
Washed hands regularly
Other,
None of the above

(Q14) As part of your condition for attendance to this event, you will be required to complete a test. In case that this test results comes back negative, which statement below best describes what it means to you?
I am definitely not infectious
I am probably not infectious

I am probably infectious
I am definitely infectious
Don't know

(Q15) What gender do you most identify with?
Man
Woman
Non-binary
Other
Prefer not to say

(Q16) Ethnicity
Asian/Asian-British- Indian, Pakistani, Bangladeshi, other
Black/Black British- Caribbean. African, other
Mixed race- White and Black/Black British
Mixed race- other
White- British, Irish, other
Chinese/Chinese British
Middle Eastern/Middle Eastern British- Arab, Turkish, other,
Other ethnic group
Prefer not to say

(Q17) Have you previously been diagnosed with Covid?
Yes, I've had a positive test (antibody or swab)
Yes, most likely but I've not had a test to confirm
No, don't think I've had Covid-19
Don't know

(Q18)   Have you received your vaccination?
Yes, I have received my first vaccine dose
Yes, I have received both vaccine doses
No
Don't know

Notes on Co-Authors

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Dr Elena Musi is a Senior Lecturer in Communication and Media at the University of Liverpool and Program Lead of the MSc in Data Science and Communication. Her research focuses on the interface between Artificial Intelligence and Communication.

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