News sources and emotional responses to COVID-19 news: Findings from U.K. news users
by Daniel Jackson, An Nguyen, and Khanh Hoang

Abstract
Existing research has begun to document some of the troubling links between COVID-19 news consumption and emotional and psychological well-being, but precisely which sources of news are more likely to be related to such phenomena is still relatively unknown. Given the greater likelihood of encountering disinformation, rumour and other content of dubious origin via interpersonal networks (e.g., friends and family) on social media, we might assume that this is liable to spark greater confusion, fear, panic, anxiety and other negative emotions in comparison to, say, mainstream media. But through a nationally representative survey of U.K. news users we show that, on the whole, there were no significant statistical or practical differences in audiences’ emotional responses to the news between those who rely on social media as their primary source for COVID-19 news, and those who rely on other sources of news. Rather, we observe similarly high levels of negative and positive emotional responses for all types of news source. Findings are discussed in light of ongoing debates around news sources, emotions and public health.

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Introduction
The media has been central to public experiences of the COVID-19 pandemic (Zheng, et al., 2020). In every country where we have data, news consumption saw a dramatic surge during the first wave of the pandemic, as people all over the world sought information and guidance about the virus (Broersma and Swart, 2022; Nielsen, et al., 2020; Van Aelst, et al., 2021). In the U.K., for example, a remarkable 99 percent of online users accessed news at least once a day during the first week of lockdown (Ofcom, 2020). While news consumption across all platforms saw a rise (Nielsen, et al., 2020), where people secured their news from was of crucial importance, given the different levels of information quality between and levels of trust towards various news sources. Indeed, the potential public health consequences of widespread disinformation (the deliberate dissemination of false or inaccurate information in order to deceive the public), misinformation (the sharing of inaccurate and misleading information without malicious intent) and conspiracy theories emerging around the global health crisis prompted health authorities all over the world to direct citizens towards credible sources of news and information (Mukherjee, et al., 2021).

Amongst such public health consequences are the impacts on emotional and psychological well-being. A meta-analysis by Salari, et al. (2020) found consistent evidence that the COVID-19 pandemic triggered significantly increased levels of stress, anxiety and depression across multiple contexts, and this might have become more profound as the pandemic evolved. The World Health Organization (WHO) found that the global prevalence of anxiety and depression increased by 25 percent over the first year of the pandemic (WHO, 2022). This rise in COVID-related mental health problems has been described as the ‘second pandemic’ by some U.K. health leaders (Gregory, 2022). The emotional and mental health outcomes of the COVID-19 pandemic are important for investigation because distress symptoms are disruptive across multiple domains of life, including physical health, family and work (Kowaleski-Jones and Christie-Mizell, 2010; Ramchandani and Psychogiou, 2009). As Garfin, et al. [1] explain, “repeated media exposure to community crisis can lead to increased anxiety, heightened stress responses that can lead to downstream effects on health, and misplaced health-protective and help-seeking behaviours that can overburden health care facilities and tax available resources.”
Our contribution to this debate is to focus attention on primary sources of news during the COVID-19 pandemic, and its relationship with their emotional responses to COVID-19 news. Existing research has begun to document some of the troubling links between COVID-19 news consumption, emotional and psychological well-being (Bendau, et al., 2021; Lu, et al., 2021; Stainback, et al., 2020), but precisely which sources of news are more likely to be related to such phenomena is still relatively unknown. Given the greater likelihood of encountering disinformation, rumour and other content of dubious origin via interpersonal networks (e.g., friends and family) on social media, we might assume that this is liable to spark greater confusion, fear, panic, anxiety and other negative emotions (Garfin, et al., 2020) in comparison to, say, mainstream media. But in this paper we show that, on the whole, there were no significant statistical or practical differences in audiences’ emotional responses to the news between those who rely on social media as their primary source for COVID-19 news, and those who rely on other sources of news. Rather, we observe similarly high levels of negative and positive emotional responses for all types of news source. In so doing, we contribute to the study of news, media and public health outcomes in the following ways. First, we provide one of the first empirical assessments of how COVID-19 news affects emotional states in the United Kingdom (U.K.). Second, we shift debate from a primary focus on the negative emotional and mental well-being outcomes of COVID-19 news to a consideration of the positive impacts that audiences experienced through news consumption. Third, we seek to encourage the centring of the news media in our understanding of the emotional and mental health impacts of health pandemics.

News, negativity, and COVID-19

There are established links between exposure to negative news and negative mental states. Recent literature shows that the more a user is exposed to news about traumatic events, the more likely they will suffer psychological damage. For example, exposure to information about various terrorist events all left adverse effects on the mental health of news users, especially with consistent exposure (de Hoog and Verboon, 2020; Unz, et al., 2008). These findings indicate that people do not need to be directly in contact with a traumatic event to experience disconcerting effects.

COVID-19 is undoubtedly a traumatic event that directly confronts everyone. For that reason, the media cannot ignore its traumatic elements, including the danger of the virus and the adverse consequences of this disease, in reporting this crisis. Journalists are also reporting a topic that is defined by uncertainties, especially during the early months of the outbreak. Perhaps unsurprisingly then, studies of news coverage of the pandemic have found it to be a primarily negatively framed news story (Ogbodo, et al., 2020). For example, an analysis of 141,208 headlines of global English news stories found negative sentiments outweighed positive ones 52 percent to 30 percent (Aslam, et al., 2020). An investigation into 5,285 articles about coronavirus published in online versions of USA Today, Wall Street Journal, and New York Times between January and March 2020 shared similar results: the five most common themes were “financial impact of COVID-19” (11.6 percent), “stories of affected individuals” (7.0 percent), “death and death rates” (6.8 percent), “precaution recommendations for public” (6.2 percent), and “quarantine” (5.9 percent) (Basch, et al., 2021).

Existing research tells us that consuming large amounts of hard news (topics such as politics, economics and social affairs) (Bodas, et al., 2015; Boukes and Vliegenthart, 2017) and negative news (de Hoog and Verboon, 2020; Unz, et al., 2008) can have detrimental impacts on psychological well-being. Perhaps it is of little surprise, then, that studies have found that exposure to COVID-19 news can lead have negative emotional and mental consequences, though this is not a straightforward picture. In the U.S., 43 percent indicated “feeling worse emotionally” after consuming pandemic news (Mitchell, et al., 2020) while a third of Danes cited bad effects of pandemic news on their mood (Constructive Institute, 2020). In the U.K., 66 percent of those who avoided COVID-19 news cited its “bad effect on my mood” (Kalogeropoulos, et al., 2020). One U.S. study found that greater COVID-19 media consumption is associated with greater psychological distress and that around two thirds of this effect operates indirectly through increased perceptions of COVID-19 threats (Stainback, et al., 2020). Adding more nuance to these headlines, an online survey in Germany found the frequency, duration and diversity of COVID-19 related media exposure was positively associated with symptoms of depression, COVID-specific and COVID-unspecific anxiety (Bendau, et al., 2021). Here, those exposed to COVID-related news seven times or 2.5 hours per day would pass the critical threshold “to mark the difference between mild and moderate symptoms of (un)specific anxiety and depression” [2]. Amongst Chinese adults, spending at least two hours following COVID-19 related news is associated with probable depression and anxiety (Ni, et al., 2020), while in Thailand this number is three hours (Mongkhon, et al., 2021).

Such studies reveal ‘associations’ rather than cause and effect, and when examined in closer detail, further nuances emerge. For example, Broersma and Swart (2022) found that news consumption and pandemic stress levels are not unidirectional. Users might temporarily consume more news to cope with a higher degree of stress and anxiety, or they might experience a higher stress level from intense news following, which might then lead to news aversion. Meanwhile, affective cues, which encompass emotional involvement with the news, could either enhance news experience (positive involvement) or diminish it through dissatisfaction with journalistic offers.
Social media and the ‘infodemic’

The COVID-19 pandemic and the 24/7 news cycle have created a social context in which negative emotions and psychological distress can proliferate (Stainback, et al., 2020). This can result from a negative slant of news, the conflicting advice from different information sources such as the news, public health experts and politicians; or just the sheer volume of information that citizens are processing. In this context, in March 2020 the World Health Organization (2020) warned global citizens against the so-called ‘infodemic’ characterised by the widespread dissemination of disinformation, misinformation, rumours and conspiracy theories emerging around the pandemic, that might likely contain harmful information liable to spark confusion, fear, panic, anxiety and other negative emotions (Garfin, et al., 2020) as well as street unrest. As places where verified and unverified information share the same platform, many have pointed the finger of blame at social media for this problem (see Volkmer, 2021). Even before the COVID-19 pandemic, a systematic literature review by Wang and colleagues (2019) on the spread of online health misinformation showed a high prevalence and popularity of misinformation on social media.

Furthermore, research has highlighted several other consequences of social media news consumption. Across multiple countries and time points, use of social media as a main news source is associated with lower levels of trust in news (Kalogeropoulos, et al., 2019; Park, et al., 2020). Social media also seems to have a deleterious relationship with political knowledge. Van Erkel and Van Aelst [3] find that “unlike following news via traditional media channels, citizens do not gain more political knowledge from following news on social media. We even find a negative association between following the news on Facebook and political knowledge”. Other studies have revealed how news consumption on social media can lead to a sense of information overload, leading to feelings of stress (Song, et al., 2017) and cognitive burden (Crook, et al., 2016), leading to impaired understanding of news stories (Park, 2019; Schmitt, et al., 2018).

At the same time, social media are becoming increasingly important sources of news and information for citizens all over the world (Newman, et al., 2021), particularly during fast-moving events such as disasters (Jones, et al., 2016), and the ongoing COVID-19 pandemic (Merchant and Lurie, 2020). Here, social media news consumption can include both following news organisation accounts but also, and significantly, relying on friends and relatives as a valuable source for news and information (Hermida, et al., 2012). Indeed, studies show that one’s social media network plays an important part in stimulating interest and forming news consumption and distribution patterns (Anspach, 2017; Bergström and Jervelycke Belfrage, 2018).

Some would argue that the eliciting of emotions is built into the algorithmic design and predominant user cultures of various social media platforms (Stark, 2018). This can work in both directions, with interaction on social media found to be associated with positive well-being outcomes such as greater perceived closeness, more positive affect, higher self-esteem and lower loneliness (Manago, et al., 2020; Neubaum and Kramer, 2015; Subrahmanyam, et al., 2020; Yang and Brown, 2013). In contrast, other studies have documented how the consumption of social media can induce upward social comparison and, thus, poor well-being (Rosenthal-von der Pütten, et al., 2019; Vogel, et al., 2014). In the context of news specifically, negative news content can draw longer viewing times and elicit more attention than positive posts (Kätsyri, et al., 2016). Moreover, the consumption of pro-attitudinal partisan news on social media is associated with increased anger (though not anxiety), directed at political opponents and that anger can subsequently facilitate information sharing about political issues on social media (Hasell and Weeks, 2016). Social media have also been found to be a breeding ground for online incivility as they provide a conducive environment to abusive online interactions. In the first year of the pandemic, for instance, 82 percent of respondents to Microsoft’s (2021) annual Civility, Safety and Interactions Online study reported a net increase in their perceived level of online incivility, which can be attributed to general pandemic fatigue, anxieties, frustration, anger and other negative emotions.

Given some of these dynamics, it is important to parse the emotional impacts of social media in relation to various other health news and information sources in the context of the COVID-19 pandemic. However, to date, most studies have looked at COVID-19 media or news consumption as a whole. Of the few studies to have examined information sources separately, Bendau, et al. (2021) found that all types of media consumption were related to higher levels of anxiety and depression, but that social media consumption was particularly more likely to be related to feelings of fear, anxiety and depression compared to other information sources. Similarly, Lu, et al. (2021) examined the emotional impacts of different COVID-19 information sources, including health professionals, academic organisations, government agencies, news media, social media, family and friends, moderated by the level of trust. They found that COVID-19 information from social media, family and friends — sources with a lower trust — were more likely to trigger negative emotions in readers, including anxiety, anger and fear. In turn — and perhaps most worryingly — participants were more likely to share content from these sources across their own networks, therefore potentially facilitating a negative contagion effect. With a sample of Chinese college students, Zhao and Zhou (2020) found that people who spent more time on social media reported more secondary traumatic stress (STS), depression and anxiety. Finally, looking only at ‘online health information’ rather than social media or other sources specifically, Shabahang, et al. (2020) found that seeking online health information and believing in the validity of such information was associated with greater COVID-19 anxiety.

Together, this emergent literature would appear to support the hypothesis that those who primarily rely on informal, non-expert sources on social media for COVID-19 information will experience more negative emotions and psychological distress compared to a reliance on other information sources. But only further research can determine this, especially as we cannot assume that the findings of studies in Iran (Shabahang, et al., 2020), China (Zhao and Zhou, 2020) and Germany (Bendau, et al., 2021) will necessarily translate to other national contexts, such as the U.K.
**H1:** People who rely the most on friends and relatives on social media for COVID-19 news experience more negative news-induced emotions than those who rely on other news sources.

Second, previous literature has primarily focussed on the negative emotional outcomes of COVID-19 news consumption. But assuming that news consumption does not just elicit negative emotions, but positive emotions too (Baden, et al., 2019; Kleemans, et al., 2017; McIntyre and Gibson, 2016), we draw attention to the possibility that different news sources might prompt a different range of positive emotions in relation to COVID-19 news. Given the direction of previous literature, we would hypothesise:

**H2:** People who rely the most on friends and relatives on social media for COVID-19 news experience fewer positive news-induced emotions than those who rely on other news sources.

### Method

Results were gathered through a national survey of U.K. adults conducted with a professional polling company, Opinium. Opinium recruited participants from a consumer panel of about 40,000 U.K. citizens who sign up to take part in its surveys on a range of subjects in exchange for small incentives. To prevent potential response bias, participants were not told about the subject of the survey when they were invited to. The final sample included 2,015 qualified respondents, which were stratified (by age, gender, ethnicity, region, and social class) to ensure representativeness with the U.K.’s adult population. The survey itself was live from 22 to 24 March 2021 — during the third of the U.K.’s lockdowns and exactly one year after the U.K. went into the first lockdown on 23 March 2020.

<table>
<thead>
<tr>
<th>Table 1: Survey sample demographics by percentage (n=2,015).</th>
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</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Male</td>
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<td>Female</td>
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<tr>
<td><strong>Age</strong></td>
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<tr>
<td>18–34</td>
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<td>35–54</td>
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<tr>
<td>55+</td>
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<tr>
<td><strong>Ethnicity</strong></td>
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<td>White</td>
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<tr>
<td>Ethnic minority</td>
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<tr>
<td><strong>Region</strong></td>
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<tr>
<td>North East</td>
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<td>North West</td>
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<tr>
<td>Yorkshire and Humberside</td>
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<tr>
<td>East Midlands</td>
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<tr>
<td>West Midlands</td>
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<tr>
<td>East of England</td>
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<tr>
<td>London</td>
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<tr>
<td>South East</td>
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<tr>
<td>South West</td>
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<tr>
<td>Wales</td>
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<tr>
<td>Scotland</td>
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</tbody>
</table>
News sources and emotional responses to COVID-19 news: Findings from U.K. news users

| North Ireland | 2.8 |

<table>
<thead>
<tr>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal qualifications</td>
</tr>
<tr>
<td>GCSE, Standard Grades or equivalent (e.g., BTEC, S/NVQ level 2)</td>
</tr>
<tr>
<td>A Level, Highers or equivalent (e.g., BTEC, S/NVQ level 3)</td>
</tr>
<tr>
<td>Certificate of Higher Education or equivalent (e.g., HNC, BTEC, S/NVQ level 4)</td>
</tr>
<tr>
<td>Diploma of Higher Education or equivalent (e.g., HND/Foundation Degree, BTEC, S/NVQ level 5)</td>
</tr>
<tr>
<td>Undergraduate Degree or equivalent (e.g., BA, BSc)</td>
</tr>
<tr>
<td>Postgraduate Cert or Dip</td>
</tr>
<tr>
<td>MBA</td>
</tr>
<tr>
<td>Other Master’s Degree (e.g., MA, MSc, PGCE, PGDE)</td>
</tr>
<tr>
<td>Doctoral Degree (e.g., PhD, DBA)</td>
</tr>
<tr>
<td>Professional qualifications (e.g., CIMA, ACCA)</td>
</tr>
</tbody>
</table>

Measures: Dependent variables

While there are many competing definitions of emotions they are, in general, viewed as internal mental states representing evaluative valenced reactions to events, agents or objects (Nabi, 2010; Ortony, et al., 1988). Taking the dimensional view of emotions (see Nabi, 2010), these variations in valence can span from positive/pleasure (e.g. happiness, euphoria, satisfaction, curiosity etc.) to negative/displeasure (e.g., sadness, anger, anxiety, fear etc.). Drawing on previous measures applied across psychology and communication sciences (Bendau, et al., 2021; Ekman, 2003; Nabi, 2002), adapted for the context of our study, five indicators of positive emotional responses to the news were developed. Measured on five-point scales (ranging from 1, ‘never’ to 5, ‘very often’), these questions asked participants when following news about COVID-19 over the past 12 months, how often have they experienced happiness \( (M = 2.69, SD = 0.84) \), optimism \( (M = 3.06, SD = 0.89) \), sympathy (for those who fall victim to COVID-19) \( (M = 3.89, SD = 0.99) \), motivation (to help other people) \( (M = 3.08, SD = 0.88) \), and control (over their life) \( (M = 2.93, SD = 0.93) \). On the same scales, negative emotional responses to following news over the past 12 months included fear (of what might happen to me) \( (M = 2.94, SD = 1.03) \), anxiety \( (M = 3.02, SD = 1.03) \), anger (over something mentioned in the news) \( (M = 3.30, SD = 1.02) \), disgust (at the actions of other people) \( (M = 3.72, SD = 0.99) \), overloaded (with information about COVID-19) \( (M = 3.37, SD = 1.06) \) and despair \( (M = 3.27, SD = 1.05) \).

Measures: Independent variables

Alongside gauging overall news consumption habits (not reported in this paper), we asked participants what their single most important source of COVID-19 news was. Choices included local and national government agencies (9.2 percent), health authorities (e.g., NHS, WHO) (16.6 percent), scientific institutions (e.g., universities, research organisations) (6.9 percent), mainstream media (53.7 percent), friends and relatives on social media (7.2 percent), alternative news sources (e.g., The Canary, Skwawkbox, Spiked) (2.9 percent) and others (3.3 percent).

Data analysis

First, a set of one-way ANOVA tests was carried out to confirm the differences of each emotion between seven groups of news preferences. Post-hoc Tukey-Kramer test performance subsequently followed to identify where these differences lay, i.e., between which groups of news preferences. It should be noted that Tukey-Kramer was selected over the standard Tukey test due to the unequal sample size in each group of news source preferences (see Lee and Lee, 2018). It is also worth noting that Levene’s test, which is to test the homogeneity of variance — one crucial requirement of the ANOVA test — was always run during the ANOVA process. If they were violated — indicated by sig. < .05, we would run Welch’s ANOVA instead of the standard one-way ANOVA and choose the post-hoc Games-Howell’s test over the Tukey-Kramer’s test to explore the existing differences’ positions (see McDonald, 2014).
Neither Tukey-Kramer’s test nor Games-Howell’s test, while serving the task of identifying where the differences were, could not tell how practically significant they were. As both tests are categorised as pairwise tests, Cohen’s $d$ effect size calculation was utilised to clarify this aspect (Balkin, 2008). Effect sizes are determined as small ($d = 0.2$), medium ($d = 0.5$), and large ($d = 0.8$) based on benchmarks suggested by Cohen (1988).

Findings

Table 2: Association between negative emotional responses and primary news sources for COVID-19 (ANOVA among the variables expressed in F-value and Eta squared).

<table>
<thead>
<tr>
<th>Negative emotional responses</th>
<th>Local and national government agencies</th>
<th>Health authorities</th>
<th>Scientific institutions</th>
<th>Friends and relatives on social media</th>
<th>Mainstream media</th>
<th>Alternative news sources</th>
<th>Others</th>
<th>F-value</th>
<th>Eta squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feel fearful about what might happen to me.</td>
<td>2.88</td>
<td>3.09</td>
<td>2.98</td>
<td>3.21</td>
<td>2.87</td>
<td>3.29</td>
<td>2.64</td>
<td>5.91***</td>
<td>.017</td>
</tr>
<tr>
<td>Feel anxious about what might happen to me.</td>
<td>2.95</td>
<td>3.23</td>
<td>3.15</td>
<td>3.08</td>
<td>2.96</td>
<td>3.19</td>
<td>2.70</td>
<td>4.87***</td>
<td>.014</td>
</tr>
<tr>
<td>Get angry because something mentioned in the news.</td>
<td>3.31</td>
<td>3.44</td>
<td>3.39</td>
<td>3.21</td>
<td>3.24</td>
<td>3.49</td>
<td>3.36</td>
<td>2.40*</td>
<td>.007</td>
</tr>
<tr>
<td>Feel disgusted by the action of some people in the news.</td>
<td>3.77</td>
<td>3.82</td>
<td>3.64</td>
<td>3.30</td>
<td>3.77</td>
<td>3.63</td>
<td>3.54</td>
<td>6.18***</td>
<td>.018</td>
</tr>
<tr>
<td>Feel overloaded with news about Covid-19.</td>
<td>3.37</td>
<td>3.42</td>
<td>3.39</td>
<td>3.32</td>
<td>3.34</td>
<td>3.44</td>
<td>3.60</td>
<td>.842</td>
<td>.003</td>
</tr>
<tr>
<td>Feel despair at the current situation.</td>
<td>3.15</td>
<td>3.44</td>
<td>3.34</td>
<td>3.33</td>
<td>3.21</td>
<td>3.47</td>
<td>3.10</td>
<td>3.17**</td>
<td>.009</td>
</tr>
</tbody>
</table>
We begin by focusing on the relationship between primary sources of COVID-19 news and negative emotions. The levels of fear (of what might happen to me) were significantly different between groups depending on their most important news sources for COVID-19 (F(6, 2008) = 5.915, p < .001, \( \eta^2 = .017 \)), so were those for anxiety (F(6, 2008) = 4.872, p < .001, \( \eta^2 = .014 \)), anger (F(6, 2008) = 2.406, p = .025, \( \eta^2 = .007 \)), disgust (F(6, 320 ) = 5.986 , p < .001, \( \eta^2 = .018 \)) and despair (F(6, 2008) = 3.484, p = .004, \( \eta^2 = .009 \)). In all these cases, however, while statistically significant, the eta-squared figures suggest that these differences are very small. Meanwhile, there was no statistically significant relationship between news source preference and feelings of being overloaded with news about COVID-19 (p = .537).

After the statistically significant differences had been confirmed, we ran post-hoc tests to determine where the differences lie among our seven groups of news source preferences. A Tukey-Kramer post-hoc test followed the standard one-way ANOVA while Games-Howell post-hoc test was chosen after a one-way ANOVA test with a Welch statistic. This allowed us to pinpoint if emotional responses differed between those who chose social media as the most important source for COVID-19 and those who favoured other news sources. We subsequently tested each emotion variable that had significant differences depending on one’s primary news source, paying attention to both statistical (t-test) and practical (Cohen’s \( d \)) differences (Table 3).

<table>
<thead>
<tr>
<th>Vs. local and national government agencies</th>
<th>Vs. health authorities</th>
<th>Vs. scientific institutions</th>
<th>Vs. mainstream media</th>
<th>Vs. alternative news sources</th>
<th>Vs. others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Diff.</td>
<td>Effect size</td>
<td>Mean Diff.</td>
<td>Effect size</td>
<td>Mean Diff.</td>
<td>Effect size</td>
</tr>
<tr>
<td>Feel fearful about what might happen to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.337**</td>
</tr>
<tr>
<td>Feel anxious about things that might happen to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get angry because something mentioned in the news</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel disgusted by the action of some people in the news</td>
<td>- .472**</td>
<td>- .482</td>
<td>-.524**</td>
<td>-.535</td>
<td>- .475**</td>
</tr>
</tbody>
</table>

These tests revealed that those who rely on social media for COVID-19 news were significantly more likely to be fearful about what might happen compared to those who primarily use mainstream media (MD = .337, p < .001, Cohen’s \( d = .322 \)) and ‘other’ news sources (MD = .565, p < .001, Cohen’s \( d = .551 \)). For all other sources of news, there were no significant relationships.
Feeling 

*disgusted by the action of some people in the news* was significantly lower for the social media group compared to those who primarily consume COVID-19 news from local and national government agencies (MD = -.472, p < .001, Cohen’s $d$ = -.482), health authorities (MD = -.524, p < .001, Cohen’s $d$ = -.535) and mainstream media (MD = -.475, p < .001, Cohen’s $d$ = -.495).

The levels of *anxiety* related to news consumption were significantly different between COVID-19 news source preferences (see Table 2). However, the difference did not lie between the social media group and the rest of the news source preferences because Tukey-Kramer post-hoc test results p-values are all above the alpha level. A similar conclusion was drawn for the emotions of *anger* and *despair*.

In summary, given that only one of six negative emotions felt in response to consuming COVID-19 news was significantly related to social media use (compared to other news sources), $H1$ cannot be supported.

| Table 4: Association between positive emotional responses and primary news sources for COVID-19  |
|-----------------------------------------------|------------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Positive emotional responses                  | Local and national government agencies | Health authorities | Scientific institutions | Friends and relatives on social media | Mainstream media | Alternative news sources | Others | F-value | Eta squared |
| Feel happy about what is reported in the news | 2.76             | 2.64            | 2.82            | 2.90            | 2.66            | 2.80            | 2.36            | 4.72*** | .014        |
| Feel that things will get better out there.   | 3.15             | 3.03            | 3.04            | 3.10            | 3.09            | 2.98            | 2.69            | 2.63        | .008        |
| Feel sympathetic for those who fall victim to COVID-19. | 3.83             | 4.02            | 3.81            | 3.41            | 3.99            | 3.49            | 3.40            | 13.63*** | .039        |
| Feel motivated to help other people.         | 3.09             | 3.25            | 3.29            | 3.21            | 3.01            | 3.00            | 2.66            | 7.78*** | .023        |
| Feel a sense of control over my life.        | 2.96             | 2.91            | 3.06            | 3.14            | 2.90            | 2.81            | 2.94            | 2.22*     | .007        |

A similar story emerges when we look at positive emotional responses to COVID-19 news (Table 4). Feelings of *happiness* were significantly different between groups based on their most important sources for COVID-19 news (F(6, 2008) = 4.721, p < .001, $\eta^2 = .014$), as were those for *sympathy* (F(6, 2008) = 13.632, p < .001, $\eta^2 = .039$), *motivation* (F(6, 2008) = 7.789, p < .001, $\eta^2 = .023$) and *control* (F(6, 2008) = 2.228, p < .05, $\eta^2 = .007$). However, and again, while statistically significant, the eta-squared figures (ranging from .007 to .039) suggest that news source preference can only explain a very small proportion of variation in emotional responses to the news. Optimism (*feeling that things will get better out there*) levels were not related to one’s primary news source (p = .066).
Table 5: Statistical and practical differences in effects of social media vs other news channels as primary news sources on positive emotional responses to COVID-19 news.

<table>
<thead>
<tr>
<th></th>
<th>Vs. local and national government agencies</th>
<th>Vs. health authorities</th>
<th>Vs. scientific institutions</th>
<th>Vs. mainstream media</th>
<th>Vs. alternative news sources</th>
<th>Vs. others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Diff.</td>
<td>Effect size</td>
<td>Mean Diff.</td>
<td>Effect size</td>
<td>Mean Diff.</td>
<td>Effect size</td>
</tr>
<tr>
<td>Feel happy about what is reported in the news.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Feel that things will get better out there.</td>
<td></td>
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</tr>
<tr>
<td>Feel sympathetic for those who fall victim to COVID-19.</td>
<td>-.426**</td>
<td>-.430</td>
<td>-.617**</td>
<td>-.633</td>
<td>-.407**</td>
<td>-.405</td>
</tr>
<tr>
<td>Feel motivated to help other people.</td>
<td></td>
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<tr>
<td>Feel a sense of control over my life.</td>
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T-tests with Cohen’s $d$ effect size calculations were again used to identify the statistical and practical significance of any positive emotion’s differences that exist between group of social media vs groups of the other news sources (Table 5). When we look closer at the statistically significant relationships, we find that happiness about what is reported in the news (MD = .545, p < .001, Cohen’s $d$ = .564) and motivation to help others (MD = .550, p < .001, Cohen’s $d$ = .565) is significantly higher for those who primarily rely on social media for news in comparison to those who use ‘other’ sources of news, but there were no significant differences for any of the other news sources. Those whose primary news source is social media are significantly less likely to feel sympathy for those who fall victim to COVID-19 than those who rely on local and national government agencies (MD = -.426, p < .001, Cohen’s $d$ = -.430), health authorities (MD = -.617, p < .001, Cohen’s $d$ = -.633), scientific institutions (MD = -.407, p < .001, Cohen’s $d$ = -.405) and mainstream media (MD = -.582, p < .001, Cohen’s $d$ = -.612). A sense of control among social media users is greater compared to those who rely on mainstream media (MD = .247, p < .01, Cohen’s $d$ = .273) as a primary news source. Since only sympathy gets close to consistently significantly differences between people who are most reliant on social media for COVID-19 news than other news sources that we tested, $H2$ is, at best, only partly supported.

Discussion and conclusion

The aim of this paper was to test the hypothesis — supported by previous literature — that people who rely the most on friends and relatives on social media for COVID-19 news experience more negative news-induced emotions than those who rely on other news sources. Furthermore, and in an expansion of this literature, we also tested the hypothesis that social media-reliant news users
would experience fewer positive news-induced emotions than those who rely on other news sources. This research agenda was developed in the context of concern over the role of social media in relation to the COVID-19 ‘infodemic’, and the serious implications this might have for engagement with public health guidelines.

However, when it comes to the emotions associated with the consumption of news, we found very little practical differences between those who primarily consume pandemic news through social media and those who rely the most on other sources. Supporting some previous studies (Bendau, et al., 2021; Lu, et al., 2021), we found that social media users experienced more fear than those who relied on some other news sources (including mainstream media), but this was not the case for other negative emotions. Indeed, social media users were significantly less likely to associate news consumption to one negative emotion — disgust — in comparison to some other news sources. Based on our data, it is therefore hard to sustain the argument that consistent exposure to news on social media results in more negative emotional responses. Given the downstream health-related behaviours that are associated with negative emotional states (e.g., Garfin, et al., 2020; Ramchandani and Psychogiou, 2009), this may be considered promising news. Our findings may also be seen as a corrective to some of the more alarmist accounts of social media’s impact on mental health during the pandemic.

But this is not the end of the story. While social media may not consistently elicit more negative emotions than other news sources, this does not mean that we should be sanguine about its role during the COVID-19 pandemic. This is because when we look at the overall means for negative emotions for all news sources (Table 2), they are quite high across the board (overall mean = 3.27, SD = .693, based on five-point scale). This suggests that the format or platform of news media consumption is not likely the key variable, but rather that exposure to COVID-19 news — on any platform — had deleterious consequences for mental health. This would put our findings at odds with those who find social media to have worse mental health outcomes than other news sources (Bendau, et al., 2021; Shabahang, et al., 2020; Zhao and Zhou, 2020) and instead align with those who find equally negative effects for all news (see Stainback, et al., 2020).

This story is made more complex when we consider the positive emotional responses elicited by COVID-19 news. We found only very limited support for our hypothesis that social media-reliant news users would experience fewer positive news-induced emotions than those who rely on other news sources. Indeed, the overall means for positive emotional responses for all news sources (Table 2) are relatively high ($M = 3.13, SD = .565$), and comparable to the overall mean for negative emotions. This is an important finding in light of debates over the news media’s role during the pandemic, which has been dominated by the proposition — supported by several studies — that exposure to COVID-19 news often had negative mental health implications. Our study shows that COVID-19 news can simultaneously elicit both negative and positive emotional responses. Of course, the fact that the news can trigger positive emotions should come as no surprise as it is well established in journalism studies literature (Baden, et al., 2019; Kleemans, et al., 2017; McIntyre and Gibson, 2016). Furthermore, global studies of pandemic news coverage show that positive news frames such as ‘hope’ punctuated the primarily negative news agenda (Ogbodo, et al., 2020). In the U.K., for example, Sir Captain Tom Moore’s “Walk for the National Health Service” (where the 99-year-old World War II veteran walked laps of his garden to raise funds for the NHS) was a regular ‘feel good’ news story throughout the summer of 2020 and penetrated the public’s experiences of COVID-19 news. In addition, stories on how individuals and organisations deal with the many problems of the pandemic or those providing daily-life tips on how to overcome lockdown fatigue, have been perceived to elicit positive effects on psychological well-being. But this study is amongst the first to establish the range of positive emotions elicited by news consumption across media channels in the context of COVID-19. Given the direction of our findings, future research might pay more attention to the consequences of positive emotional responses to pandemic news in terms of, for example, pro-social and pro-health related behaviours.

There still remains an unresolved question that emerges from our findings, which is why — in contrast to the expectations of the literature — was social media no more likely to trigger negative (or positive) emotions than other news sources? While there are no straightforward answers here, we offer two potential explanations. First, we know that social media is a place where rumour, conspiracy theories and misinformation are more likely to proliferate (Shu, et al., 2017; Sharma, et al., 2019); and that resultantly it is — on the whole — a less reliable space for quality information compared to other news sources such as mainstream media or scientific institutions. Furthermore, despite lower levels of trust in information on social media compared to other news sources (Karlsen and Aalberg, 2021), those who primarily rely on social media might be more likely to believe in such mis- and disinformation (Mitchell, et al., 2021). However, the impacts of these phenomena are more likely to be seen in assessments of citizens’ knowledge, understanding and beliefs, and not necessarily emotions. Second, and relatedly, we are reminded that some social media platforms such as Facebook and Instagram are spaces that — through design — privilege positive affect (boyd, 2010; Spottswood and Hancock, 2016). For example, key affordances such as reactions, emojis and stickers offer a greater range of positive than negative emotions. The influence of marketing and advertising, and the associated aspirational, cheery worldview, runs through the culture of such platforms (Carter, 2014; Stark and Crawford, 2015; Utz, 2015). It is more difficult to sustain this argument for Twitter, of course, but this positivity imperative (Paasonen, 2016) of social media may provide some explanation for our findings.

The findings of this study should be understood considering its limitations. One such limitation is the question of causality. Some cross-sectional surveys have correlated sources of news with measured emotions at the time the survey was taken, (e.g., Lee, et al., 2021). Our study addressed causality slightly more directly by exploring positive and negative emotional responses to the news. But there are still more robust measures and methods to deepen our understanding of causality. For instance, scholars could implement more experimental and panel designs. Intensive longitudinal designs such as daily diaries or experience sampling may
better capture the concurrent variations of emotions and social media use patterns on a daily level (Zhao and Zhou, 2020). We also do not test for bidirectional relationships. Here, a negative feedback loop could exist between news consumption and various forms of psychological distress, that may encourage more media consumption, which in turn increases the psychological distress. Similarly, a feedback loop may also be evident where negative emotional responses to the news lead to more news avoidance.

Our study also did not isolate either underlying anxiety or existing mental health issues as influencers in causing negative psychological responses to news about COVID-19. We are therefore unable to see changes in emotional states compared with a baseline status. Nekliudov, et al. (2020), for instance, found the effect of excessive reception of COVID-19 information on increased state anxiety was particularly strong among respondents with low trait anxiety. Similarly, Fraser, et al. (2022) reported that college students with less anxiety symptoms who displayed an increase in social media use because of COVID-19 also displayed increased concern for their future while people with more depressive symptoms showed a positive interaction between increased social media use and concern for society.

Further, our focus was on social media as a news source, but future research might benefit from parsing each social media platform. As Kreiss, et al. (2018) argue, different platforms increasingly have their own affordances, audiences, and genres: the norms and social conventions unique to various social media platforms. On this basis, it is possible that those who follow news on Twitter have different emotional responses than those on Instagram or TikTok.

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Notes


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