Constructive Journalism in the Face of a Crisis:

The Effects of Social Media News Updates About COVID-19

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Abstract

The COVID-19 pandemic brought along with it concerns about anxiety, racial bias, and pushback against public health recommendations, all of which are intensified by the news and social media. This study investigated the effects of constructive journalism in the context of this crisis, by randomly assigning 492 subjects to view simulated social media news updates with different headlines and images. The results showed positive and constructive headlines led to less anger and anxiety than negative headlines. The sanitization of graphic images decreased anger, anxiety, COVID-19 risk perceptions, and anti-Chinese sentiment—a relationship that was mediated by anger and anxiety. These findings suggest constructive journalism can be useful in times of crisis, and that its visual aspect warrants more scholarly attention. Further, these results shed new light on the effects of news exposure via social media in times of crisis, and how this impact depends on specific attributes of the headlines and images of the content being shared. The findings are discussed in relation to the theory of affective intelligence and recent concerns about how news and social media influence the public in times of crisis.

KEYWORDS: affective intelligence, anger, anxiety, constructive journalism, COVID-19, graphicness, prejudice, social media

In the spring of 2020, a novel coronavirus disease (COVID-19) that had originated in China gave rise to a pandemic. Aside from the devastation caused by the disease, media coverage of the crisis exacerbated troubling tendencies. In the United States (U.S.), news coverage contributed to a wave of anti-Chinese sentiment (Kim 2020). The politicization of the coronavirus by partisan media coverage, coupled with inflammatory rhetoric from the White House (Hart, Chinn, and Soroka 2020; Pew Research Center 2020), stymied compliance with official health guidelines (Gollwitzer et al. 2020). Further, the news media and social media intensified anxiety over COVID-19, raising concerns about people's mental health (CDC 2020; Garfin, Silver, and Holman 2020; Hong et al. 2020). The current research investigated the influence of headlines and images in social media news updates about COVID-19 on news consumers' emotions, news engagement, and political attitudes. Research participants were randomly assigned to view simulated social media posts with different headlines and images. The findings have important theoretical implications and also provide insight on ways to mitigate the news media's role in exacerbating racial biases, hypervigilance, and mental health issues, while still keeping the public informed.

I build on recent research on constructive journalism, a journalistic approach that emerged in newsrooms as a way to mitigate the effects of negative news (From and Kristensen 2018; Haagerup 2017), typically by infusing news stories with positivity or solutions-oriented information (McIntyre and Gyldensted 2018). This can make news consumers feel more positive (Baden et al. 2019; Dahmen et al. 2019; McIntyre 2019) and engaged in the news (Dahmen et al. 2019; Hermans & Prins 2020; McIntyre 2015) as well as increase the media's credibility (Overgaard 2020; Thier et al. 2019; although see Meier 2018). This study investigated the potential effects of constructive journalism in the context of the COVID-19 pandemic, focusing specifically on social media, which plays an

increasingly important role in news consumption in many countries (Newman et al. 2019).

Whereas most constructive journalism research has focused on text, I employ the concept of

graphicness (Gadarian 2014) to add to recent investigations of solutions-oriented visuals

(Dahmen et al. 2019; Lough & McIntyre 2019; McIntyre et al. 2018; Midberry & Dahmen

2020). In doing so, the current research sheds new light on the potential impact of

constructive journalism in times of crisis.

Constructive Journalism: Beyond Negative News

Western news media typically focus more on negative than positive information

(Soroka 2014), and this tendency is intensifying (Van der Meer et al. 2019). A central reason

is that human beings have evolved to respond particularly strongly to negative information

(Shoemaker 1996; Soroka 2014). Because this might negatively affect news audiences, some

newsrooms have begun practicing constructive journalism (Aitamurto and Varma 2018;

Haagerup 2017; Wagemans, Witschge, and Harbers 2019), which applies "positive

psychology techniques to news processes and production in an effort to create productive and

engaging coverage while holding true to journalism's core functions" (McIntyre &

Gyldensted 2017, p. 23). Newsrooms enact constructive journalism in several ways,

including making decisions about the selection, prioritization, and presentation of

information (Haagerup 2017; McIntyre and Gyldensted 2018; Skovsgaard and Andersen

2020). Experimental investigations of constructive journalism have mostly focused on how

information is presented (Baden, McIntyre, and Homberg 2019; Hermans and Prins 2020;

Kleemans, Schlindwein, and Dohmen 2017; McIntyre 2015), whereas the selection of

information remains relatively understudied (although see: Kleemans, de Leeuw, et al. 2017;

Meier 2018; Overgaard 2020). Editorial decisions about the selection and prioritization of

information are made every day. If, for example, many people recover from a disease while

many others die from it, a news story might convey both—but what gets emphasized in the headline? Such decisions are central to the emergence of constructive journalism, which many newsrooms adopted in response to the industry's tendency to prioritize negative information (Ahva and Hautakangas 2018; Aitamurto and Varma 2018; Bro 2019; Haagerup 2017; Wagemans, Witschge, and Harbers 2019). The current research, therefore, complements past scholarship by concentrating on the impact of editorial decisions about what information is prioritized in news headlines.

Graphicness: The Effects of Vivid Visuals

Most constructive journalism research focuses on text but scholars have recently begun investigating its visual aspects. These advancements have mostly concentrated on solutions journalism, a form of constructive journalism dedicated to presenting news audiences with information about solutions to societal issues (Aitamurto & Varma 2018; Solutions Journalism Network 2021). Some of this work has examined how newsrooms have implemented solutions journalism through the use of visuals. Lough and McIntyre (2019) analyzed news stories curated by the Solutions Journalism Network's "Solutions Story Tracker," which collects news articles that exemplify solutions journalism, and found that less than two-thirds of the photos in these news stories reflected solutions. Recent experiments suggest that solutions-oriented photojournalism, compared to problem-oriented photojournalism, leads to greater levels of engagement (Dahmen, Thier, and Walth 2019) and that visuals are important to take into account when implementing solutions journalism (McIntyre, Lough, and Manzanares 2018). Other recent work focuses on conceptualizing visual solutions journalism, which Midberry and Dahmen (2020) theorized as being comprehensive (reporting thoroughly on problems as well as solutions), precise (accurately

representing reality), and humanizing (telling relatable stories that evoke empathy). The current research adds to these efforts by offering the concept of graphicness as a theoretical lens for understanding the visual aspect of constructive journalism in times of crisis. This concept, also referred to as vividness or intensity, has often been used for studying the effects of news coverage of violence and war (Gadarian 2014; Holman et al. 2020; Silver et al. 2013; Zelizer 2005).

The central idea of graphicness is that graphic depictions of certain issues, for example, war, are more unsettling than sanitized (less graphic) images. Beyond momentary discomfort, graphic images can lead to serious consequences for news consumers; graphic news coverage of terrorism can increase the risk of developing PTSD (Holman et al. 2020; Silver et al. 2013), graphic depictions of war victims can increase concerns about military drones (Scharrer and Blackburn 2015), and graphic terrorism reports can bolster support for the War on Terror (Gadarian 2014). Researchers have operationalized graphicness in different ways, including focusing on visual depictions of explosions, blood, wounds, and dead bodies (Fahmy et al. 2006; Gadarian 2014; Scharrer and Blackburn 2015). The current study implements the concept by focusing on images of infected or diseased coronavirus patients, which are present in the graphic images used in this experiment but removed from the sanitized versions of the images.

Graphicness may also be intertwined with news avoidance. Newman and colleagues (2017) found upsetting imagery to be one of the most common reasons people give for avoiding the news. In the current study, I expect graphic depictions of COVID-19 will increase news consumers' levels of anxiety and anger, and make them perceive the disease as more dangerous. Similar to war coverage, reporting on public health crises involves editorial decisions about which photographs to include and which to leave out: When should graphical

depictions of victims of disease or war be omitted from news coverage out of respect for the victims and their families, and when should they be included because the public needs to know what is happening? Such decisions cannot be understood solely from the perspective of media effects but must also be seen in the light of the range of factors that go into them, including journalists' and editors' personal ethics and how they perceive their audience (Fahmy 2005).

Emotional Effects of Constructive Journalism: From Valence to Discrete Emotions

Constructive journalism research has consistently found that constructive news, as compared with negative news, tend to make people feel more positive (Baden, McIntyre, and Homberg 2019; Hermans and Prins 2020; Kleemans, de Leeuw, et al. 2017; Kleemans, Schlindwein, and Dohmen 2017; Li 2021; McIntyre 2015; McIntyre 2019; McIntyre 2020; McIntyre and Sobel 2017). This work has used Fredrickson's (2001) broaden-and-build theory, which holds that positive affect tends to broaden people's thought-action repertoires (i.e., expands the range of thoughts they are likely to have and actions they are likely to take), whereas negative affect has the opposite effect. Positive emotions can, according to the theory, make people more playful, curious, and trusting of others, which helps people build resources that enhance their chances of survival in the long term. The narrowing effects of negative emotions can, on the other hand, enhance people's chances of survival in dangerous situations. The broaden-and-build theory leads to important predictions about how constructive journalism, with its uplifting emotional impact, can positively influence outcomes like news trust and self-efficacy. Although useful for studying these differences, the theory's unidimensional focus on positive versus negative affect does not distinguish between different kinds of positive or negative emotions. Such distinctions are important, which is why some communications scholars favor discrete emotions approaches over

unidimensional approaches (Nabi 2010). Most pertinent to the current research, different negative emotions may lead to distinct behaviors and political outcomes. If, for example, that is the case for emotions such as anger and anxiety, important theoretical nuances would be lost by treating them as the same.

To allow for these nuances, I build on the theory of affective intelligence (Marcus, Neuman, and MacKuen 2000). This theory posits that emotional states influence people's behavior and thought processes. Decision-making and behavior are, for the most part, habitual, but people subconsciously scan their surroundings for cues that warrant closer attention. Such cues may elicit emotions which then lead people to devote mental resources to cope with the problem at hand. According to this theory, different discrete negative emotions influence people and their political behaviors differently. The negative emotions of anxiety and anger, for example, tend to have different effects on information seeking. Experiments show that, in political settings, anxiety tends to increase people's readiness to search for new information, while anger tends to decrease it (MacKuen et al. 2010; Valentino et al. 2008). According to the theory of affective intelligence, this occurs because anger prompts people to double down on routines and beliefs that are already in place whereas anxiety prompts them to actively search for new information to deal with the perceived threat (MacKuen et al. 2008; Marcus, Neuman, and MacKuen 2000). The current study focuses on the emotions of anger and anxiety because of their implications for political outcomes and news engagement (MacKuen et al. 2010). I expose subjects to simulated social media news updates that have either constructive, positive, or negative headlines and feature graphic or sanitized images. Based on the literature reviewed above, I expect:

H1: Subjects who read news updates with constructive or positive headlines will

exhibit lower levels of a) anger and b) anxiety when compared to those who read news updates with negative headlines.

H2: Subjects who read news updates with sanitized images will exhibit lower levels of a) anger and b) anxiety when compared to those who read news updates with graphic images.

Impact on News Engagement: Liking and Information Seeking

Constructive journalism may also impact news engagement, or people's attitudes toward the news and desire to seek more information. Some experiments have found positive effects of constructive journalism on news engagement (Baden et al. 2019; McIntyre 2015). The most consistent finding so far is that news consumers tend to be more willing to "like" constructive than negative news stories (Hermans & Prins 2020; McIntyre 2015). Constructive journalism may also influence information-seeking. In a study on photojournalism, Dahmen et al. (2019) found solutions-oriented photojournalism elicited stronger information-seeking intentions than problem-oriented photojournalism, although only for some topics. In another study, Li (2021) found that subjects exposed to solutions-oriented journalism had greater information-seeking intentions than those exposed to problem-focused journalism.

Research situated in more naturalistic settings has also found effects of constructive journalism on engagement. Lough and McIntyre (2021) followed the *Montgomery Advertiser's* transition to solutions journalism, by surveying audience perceptions and by looking into website analytics. The survey indicated that engagement had decreased following the transition to solutions journalism, but website analytics showed improved engagement, in terms of page views and time spent on each page. Curry and Stroud (2016)

found that Huffington Post headlines that mention a solution make news consumers more likely to access the full article than headlines that do not mention a solution.

Information seeking is important in democracies because it leads to a more well-informed electorate (MacKuen et al. 2010). Yet in several western democracies, many citizens do the opposite; they actively avoid the news because it tends to make them feel negative, disempowered, and distrustful of the news media (Newman et al. 2019). Recent qualitative work suggests that other factors and dynamics also influence news engagement, including perceiving following current affairs as a civic duty, social pressures to follow the news, as well as perceptions about gender and caretaking responsibilities (Palmer and Toff 2020; Toff and Palmer 2019). Given its implications for the democratic process, it is crucial to investigate how journalistic approaches influence consumers' willingness and desire to pay attention to the news (Skovsgaard and Andersen 2020). Informed by research on constructive journalism and graphicness, I investigate the effects of two components of social media news updates, the information type presented in headlines (negative/positive/constructive) and the graphicness of featured images (graphic/sanitized), on "liking" and information seeking. Further, building on the theory of affective intelligence, I examine the mediating roles that anger and anxiety play in this process.

RQ1: Will the information type and graphicness used in news updates have any effects on subjects' a) "liking", and b) information seeking?

RQ2: Will there be distinct indirect effects of information type and graphicness on information seeking due to anger and anxiety, such that anger decreases information seeking while anxiety increases information seeking?

The Political Impact of Constructive Journalism: Prejudice and Risk Perceptions

As COVID-19 spread through the United States, the pandemic quickly turned political (Pew Research Center 2020). This is problematic because it ties people's adherence to official guidelines to political partisanship (Gollwitzer et al. 2020). Although overcoming the coronavirus crisis depends first and foremost on the medical community, social science can also play a critical role; ultimately, effective responses to the crisis depend on the attitudes and behaviors of the public. These attitudes and behaviors may be tied to media effects. News coverage that emphasizes negative developments or presents graphic depictions of victims may, for example, make people perceive a greater threat from COVID-19. Similar tendencies have been found in other contexts: Studies focusing on the effects of visuals have found that Americans who recalled more news images in the aftermath of 9-11 were more concerned about the possibility of future terrorist attacks (Fahmy et al. 2006) and that graphic visuals, embedded in news stories about tick diseases, can make people perceive the disease as more dangerous (Gibson and Zillmann 2000). Building on recent investigations of COVID-19 risk perceptions (Gerhold 2020), I pose the question of whether the type of information presented in headlines and the graphicness of images used in news updates influence how people perceive the dangers of COVID-19.

RQ3: Will the information type and the graphicness used in news updates influence subjects' COVID-19 risk perceptions?

Another political outcome relates to prejudice toward Chinese immigrants. Coronavirus aside, there is overwhelming evidence that the news media is biased against racial minorities

(e.g., Gilens 1996; Dixon & Williams 2015). The coronavirus exacerbated this problem, as many media outlets portrayed Chinese Americans as dangerous, which fueled harassment and physical violence (Kim 2020). Such sentiments may be driven by emotions like anger and anxiety. Research shows that when people feel angry it tends to make them more prejudiced toward outgroups (DeSteno et al. 2004). Notably, this is the case even when the feelings of anger are based on something that has nothing to do with the outgroup in question. Further, increases in prejudice brought about by anger can incite people to take collective action (e.g., protesting or signing petitions) against their outgroups (Shepherd et al. 2018). Similar to anger, feelings of anxiety tend to fuel outgroup prejudice; as people get more anxious they grow more prejudiced toward members of their social outgroups, even if their anxiety is caused by something entirely unrelated (Arceneaux 2017; Coryn, Beale, and Myers 2004). Therefore, I expect that negative or graphic COVID-19 news coverage will not only intensify Americans' feelings of anger and anxiety, as hypothesized above, but will also lead to increased prejudice toward Chinese immigrants. Given the literature reviewed above, I expect this to be the case even for COVID-19 news coverage that does not focus on China or Chinese immigrants.

H3: Levels of prejudice toward Chinese immigrants will be higher among those exposed to news updates with a) negative headlines rather than constructive or positive headlines, and b) graphic images rather than sanitized images.

H4: The effects of information type and graphicness on prejudice will be mediated by anger and anxiety such that negative headlines and graphic images will increase anger and anxiety, both of which will increase prejudice.

Method

Procedures and Design

I conducted a factorial 3 (headline: negative/positive/constructive) x 2 (featured image: graphic/sanitized) between-subjects experiment. The data was collected in May 2020 using the Qualtrics survey platform. Participants agreed to an IRB consent form and were then randomly assigned to one of six conditions (negative/sanitized, positive/sanitized, solutions/sanitized, negative/graphic, positive/graphic, or solutions/graphic). A randomization check showed the groups were comparable.[i] In each condition, participants saw a series of four simulated social media news updates (in random order) about the coronavirus pandemic from a fictitious news organization. After seeing each post, participants indicated their willingness to like it and to click to view the full article. They then answered a questionnaire.

Participants

Five hundred subjects were recruited from Amazon's Mechanical Turk (MTurk) via the CloudResearch platform (CloudResearch 2020). Although not representative of the U.S. population, MTurk samples more closely resemble it than other commonly used convenience samples (Berinsky, Huber, and Lenz 2012), and tend to produce similar results as national samples (Coppock 2019). Eight subjects were removed because they failed an attention check.[ii] Of the remaining 492 subjects, 69.7% were white, 67.5% were male, and their ages ranged from 21 to 72 ($M = 37.55$, $SD = 10.57$). Each subject was paid $1.20.

Stimuli

The simulated social media posts were adapted from published news articles. The negative headlines presented information that cast COVID-19 conditions as worsening; the positive headlines presented information that cast COVID-19 conditions as improving. Despite these

differences, the information in all the headlines was true at the time of the experiment. The constructive headlines presented the same information as the positive headlines but also mentioned specific solutions. As an example, the headlines for one of the four messages read as follows: "Coronavirus Infections Soar in Ecuador, Here's the Latest" (negative); "Coronavirus Infection Rate Plummets in Ecuador, Here's the Latest" (positive); "Coronavirus Infection Rate Plummets in Ecuador, Thanks to Face Masks" (constructive). Note that the positive and constructive versions focus on the infection rate, which was falling at the time of the experiment, whereas the negative version focuses on the absolute number of infections, which was increasing. The featured photos looked similar across conditions, except for the graphic photos containing body bags, which the sanitized photos did not. The stimuli materials are shown in the online supplemental materials (S1).[iii]

Manipulation Check

Subjects rated their agreement with five statements on a seven-point scale. For the images, two statements were used: "The Facebook updates I saw contained photos that were upsetting" and "The Facebook updates I saw contained photos of body bags, that could have been used for diseased victims of Coronavirus (COVID-19)." ANOVAs confirmed that subjects in the graphic condition agreed more strongly with these statements than subjects in the sanitized condition, $p < .001$. For the headlines, three statements were used: "The headlines described positive developments relating to the Coronavirus (COVID-19) pandemic"; "The headlines described negative developments relating to the Coronavirus (COVID-19) pandemic"; "The headlines described specific solutions that are being used to handle the Coronavirus (COVID-19) pandemic." ANOVAs with Sidak post hoc corrections confirmed that the responses to each item differed as intended across the conditions, $p < .001$. A summary of the ANOVAs and post hoc tests is provided in the online supplemental

materials (S2).

Measures

Emotions

Emotions were measured using adapted versions of MacKuen et al.'s (2010) anger and anxiety subscales. For *anger*, subjects were asked the extent to which they felt angry, upset, and hostile based on a seven-point scale. The items were combined, $M = 3.16$, $SD = 1.92$, Cronbach's alpha = 0.90. For *Anxiety*, subjects were asked, using the same scale, the extent to which they felt anxious, uneasy, and afraid. These items were combined, $M = 3.54$, $SD = 1.89$, Cronbach's alpha = 0.92.

News Engagement

Two measures of news engagement were adapted from McIntyre (2019). After seeing each of the four posts, subjects indicated, using a seven-point scale, their liking intentions (how likely would be to like the post, $M = 4.01$, $SD = 1.97$), and information-seeking intentions (how likely they would be to click and read the full article, $M = 4.86$, $SD = 1.54$). These items were calculated as the mean score for the four posts.

Political Outcomes

COVID-19 risk perceptions measures were adapted from Gerhold (2020). Subjects were asked, using a seven-point scale, how likely it was that: "[You / Someone in your family / One of your friends] will become infected with coronavirus (COVID-19) in the next month." They also indicated how likely they thought it was that they, their family members, their friends, and people in general, would die from COVID-19 if infected. The first three items measured perceived risk of infection and the last four items measured perceived risk of death. All analyses showed the same results for both types of risk perceptions. For brevity, I combined the seven items into a single risk perceptions index, $M = 3.64$, $SD = 1.72$,

Cronbach's alpha = 0.95. A principal components analysis with promax rotation showed that all seven items loaded on a single factor, which accounted for 78.36% of the variance.

Prejudice toward Chinese immigrants was measured by having subjects rate their level of agreement, using a seven-point scale, with three statements adapted from Xu and Liu (2020): "Chinese immigrants have damaged public health in the U.S. by spreading coronavirus (COVID19)"; "Chinese immigrants should not be blamed for the spread of coronavirus (COVID19) in the U.S. (reversed)"; "Chinese immigrants are responsible for the spread of coronavirus (COVID19) in the U.S." The items were averaged together, $M = 3.28$, $SD = 1.69$, Cronbach's alpha = 0.78.

Results

To test the effects of information type and graphicness on emotions (anger and anxiety), news engagement (liking and information seeking), and political outcomes (risk perceptions and prejudice), ANOVAs with Sidak post hoc corrections were used. Table 1 summarizes the results. There were no significant interactions between information type and graphicness. To examine the indirect effects of information type and graphicness on information seeking and prejudice, through anger and anxiety, mediation analyses were conducted, using model 4 from SPSS PROCESS (Hayes 2017). This macro runs a series of regression analyses, using bootstrapped samples (in this analysis 10,000) to estimate the magnitude and significance of the indirect effect of an independent variable (e.g., graphic images) on a dependent variable (e.g., prejudice) through a mediating variable (e.g., anger). Several such mediation analyses were run to examine all the relevant indirect effects.

Emotional Outcomes

H1a predicted that constructive or positive headlines would elicit lower levels of anger than negative headlines. This hypothesis was supported, $F (2, 486) = 10.04$, $\eta_p^2 = .04$, $p < .001$.

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Anger was lower for those exposed to news updates with constructive headlines ($M = 2.92$, $SE = 0.15$) or positive headlines ($M = 2.87$, $SE = 0.14$) than for those exposed to news updates with negative headlines ($M = 3.70$, $SE = 0.15$). Post hoc comparisons showed significant differences between the constructive and negative conditions ($p = .001$) and between the positive and negative conditions ($p < .001$), but not between the constructive and positive conditions ($p = .991$). Likewise, in support of H1b, anxiety was lower for those who read solutions posts ($M = 3.21$, $SE = 0.14$) or positive posts ($M = 3.13$, $SE = 0.14$) than for those who read negative updates ($M = 4.31$, $SE = 0.14$), $F (2, 486) = 21.84$, $\eta_p^2 = 0.08$, $p < .001$. Post hoc comparisons showed that those in the constructive condition and those in the positive condition had lower levels of anxiety than those in the negative condition ($p < .001$) but that there was no difference between those in the constructive condition and those in the positive condition ($p = .974$).

[INSERT TABLE 1 approximately here]

H2a predicted that subjects exposed to news updates with sanitized images would be less angry than those exposed to updates with graphic images. This hypothesis was supported, $F (1, 486) = 11.57$, $\eta_p^2 = .02$, $p = .001$. The level of anger was lower among those exposed to updates with sanitized images ($M = 2.88$, $SE = 0.12$) than among those exposed to updates with graphic images ($M = 3.45$, $SE = 0.12$). H2b predicted that those exposed to updates with sanitized images would exhibit lower levels of anxiety than those exposed to updates with graphic images. This hypothesis was also supported, $F (1, 486) = 8.99$, $\eta_p^2 = .02$, $p = .003$. Those exposed to updates with sanitized images were less anxious ($M = 3.31$, $SE = 0.12$) than those exposed to updates with graphic images ($M = 3.79$, $SE = 0.12$).

News Engagement Outcomes

RQ1 asked whether the information type and graphicness used in the news updates would influence subjects' a) willingness to "like" the posts, and b) information seeking. There was a main effect of information type on "liking", $F(1, 486) = 8.31$, $\eta_p^2 = .03$, $p < .001$. Those exposed to news updates with constructive ($M = 4.33$, $SE = 0.15$) or positive ($M = 4.19$, $SE = 0.15$) headlines reported a greater willingness to like the posts than those exposed to news updates with negative headlines ($M = 3.50$, $SE = 0.15$). Because Levene's test showed evidence of unequal group variances, the Games-Howell procedure was used for these post hoc comparisons. The post hoc tests showed that those exposed to constructive headlines were significantly more willing to like the updates than those exposed to negative headlines ($p = .001$) and that those exposed to positive headlines were also significantly more willing to like the updates than those exposed to negative headlines ($p = .007$), but that there was no difference between those exposed to constructive versus positive headlines ($p = .759$). There were no effects of information type on information seeking, $F(2, 485) = 0.07$, $\eta_p^2 = .00$, $p = .935$. For graphicness, there were no effects on neither liking [$F(1, 486) = .31$, $\eta_p^2 = .00$, $p = .581$] nor information seeking [$F(1, 485) = .00$, $\eta_p^2 = .00$, $p = .954$].

RQ2 asked whether anger and anxiety (induced by negative and graphic updates) would have different effects of information seeking. To test this, mediation analyses were conducted following the procedure outlined above. As there were no significant differences between constructive and positive headlines, for the sake of parsimony, a dummy variable was created that grouped these two conditions, juxtaposing them with the negative condition. The variable was coded as 1 for negative and 0 for constructive/positive. A robustness check, running the analyses using two separate dummy variables, produced the same results in terms of direction and significance. When information type was the independent variable, image

was used as a covariate and vice versa. The analyses showed significant indirect effects of both information type and graphicness through anger, as well as anxiety on information seeking. For information type, the indirect effect on information seeking via anger was significant (0.27, SE = 0.06, 95% CI [0.15, 0.40]). The indirect effect of information type on information seeking via anxiety was also significant (.40, SE = 0.07, 95% CI [0.27, 0.54]). For graphicness, the indirect effect on information seeking via anger was significant (.20, SE = 0.06, 95% CI [0.09, 0.33]). The indirect effect of graphicness on information seeking via anxiety was also significant (.17, SE = 0.06, 95% CI [0.06, 0.29]). In sum, the mediation analyses indicate that both anger and anxiety increased information seeking.

Political Outcomes

RQ3 asked if information type and graphicness would influence coronavirus risk perceptions. For information type, there were no such effects, F (2, 486) = 0.76, η_p^2 = .00, p = .467. For graphicness, there was a significant difference in risk perceptions between those exposed to news updates with sanitized images (M = 3.47, SE = 0.11) and those exposed to news updates with graphic images (M = 3.80, SE = 0.11), F (1, 486) = 4.64, η_p^2 = .01, p = .032.

H3a predicted that those exposed to news updates with constructive headlines or positive headlines would be less prejudiced toward Chinese immigrants than those exposed to negative headlines. This hypothesis was not supported, F (2, 486) = 1.03, η_p^2 = .00, p = .357. H3b predicted that those exposed to news updates featuring sanitized images would be less prejudiced toward Chinese immigrants than those exposed to updates featuring graphic images. This hypothesis was supported, F (1, 486) = 6.04, η_p^2 = .01, p = .014. Subjects who saw updates with sanitized images exhibited lower levels of prejudice (M = 3.09, SE = 0.11) than those exposed to graphic images (M = 3.47, SE = 0.11).

H4 predicted there would be indirect effects through anger and anxiety of the information type and graphicness used in the updates on prejudice and that both anger and anxiety would be positively linked to prejudice. The same analysis strategy was used as for RQ2 and the findings supported H4. The indirect effect of information type on prejudice via anger was .42 (*SE* = 0.10) and the 95% confidence interval ranged from .24 to .62. The indirect effect of information type on prejudice via anger was .52 (*SE* = 0.09), and the confidence interval ranged from .36 to .71. Similar results were found when examining the indirect effects of graphicness on prejudice through anger and anxiety. The indirect effect of image on prejudice via anger was significant (.30, *SE* = 0.09, 95% CI [0.12, 0.48]), and the indirect effect of image on prejudice via anxiety was also significant (.22, *SE* = 0.08, 95% CI [0.07, 0.38]). These indirect effects are illustrated in Figure 1, along with the indirect effects of information type and graphicness through anger and anxiety on information seeking.

[INSERT FIGURE 1 approximately here]

Discussion

Social media and news media may fuel prejudice and impair people's mental health during times of crisis (CDC 2020; Dutheil et al. 2020; Garfin et al. 2020; Hong et al. 2020; Kim 2020). Using the context of the coronavirus pandemic, the current study investigated how content modifications, based on the tenets of constructive journalism, influence these processes. Combining the theory of affective intelligence with previous graphicness and constructive journalism research, I examined the effects of constructive journalism on news consumers' emotions, news engagement, and political attitudes. The results revealed that anger, anxiety, coronavirus risk perceptions, and prejudice toward Chinese immigrants were higher among those exposed to social media posts with graphic images than among those exposed to posts with sanitized images. Those exposed to posts with negative headlines felt

angrier and more anxious afterward than those exposed to posts with constructive or positive headlines. These findings have important theoretical implications and reveal how editorial decisions about headlines and visuals can influence the public in times of crisis.

This study adds several contributions to the growing literature on constructive journalism and validates previous work, which has found constructive journalism to positively influence news consumers' emotions (Baden et al. 2019; Hermans & Prins 2020; Kleemans et al. 2017; McIntyre 2019). This is particularly striking considering recent concerns that repeated exposure to disturbing media coverage about COVID-19 can have detrimental effects on news consumers' mental health (CDC 2020; Garfin, Silver, and Holman 2020). This study suggests that constructive journalism might help mitigate these concerns. The current research complements previous work by focusing on the selection and prioritization of information, as opposed to how information is presented (Skovsgaard and Andersen 2020). Previous research on constructive journalism has broken important theoretical ground by investigating the impact of how information is presented (e.g., Hermans & Prins 2020; McIntyre 2015). Yet the impact of what information is selected and prioritized remains understudied despite being a potentially important way to enact constructive journalism (Haagerup 2017; Skovsgaard & Andersen 2020), and despite being integral to the emergence of constructive journalism among some practitioners (e.g., Bro 2019; From & Kristensen 2018). The current research fills this gap by focusing specifically on the effects of journalistic and editorial decisions about which information to present in news headlines.

This study also compared positive information to solutions-oriented information, finding that, in this context, headlines that conveyed positive information but mentioned no specific solution led to the same effects as headlines that conveyed the same positive information and mentioned a specific solution. Future studies are needed to understand the

boundary conditions for when mentioning specific solutions lead to effects above and beyond conveying positive information. It is also worth noting that no experimental conditions in this study combined negative and solutions-oriented information. Including solutions-oriented information in otherwise negative news stories may have beneficial effects on news consumers. Future experiments can untangle this by including positive versus negative information and solutions versus no solutions as distinct experimental factors.

The current research also contributes to the study of constructive journalism by using the concept of graphicness as a theoretical lens for understanding its visual aspect. In doing so, it adds to recent efforts to theorize visual solutions journalism (Midberry and Dahmen 2020) and understand its effects (Dahmen, Thier, and Walth 2019; McIntyre, Lough, and Manzanares 2018). The current findings reveal that, in the context of public health crises, the sanitization of graphic visuals may be an important constructive journalistic technique that can mitigate some of the potentially negative effects of news coverage on news consumers' mental health (e.g., CDC 2020; Garfin et al. 2020; Hong et al. 2020). These results suggest that the visual aspect of constructive journalism warrants further scholarly examination and that the concept of graphicness can aid such investigations.

With its focus on anxiety and anger, this study integrates the theory of affective intelligence (Marcus et al. 2000) into the literature on constructive journalism. Contrary to the theory, both anger and anxiety were positively linked to information seeking, whereas the theory predicts that anger dampens information seeking while anxiety increases it. This finding suggests that in the context of constructive journalism, anger and anxiety do not necessarily play different roles in terms of their effects on political outcomes and news engagement outcomes. More research is needed to integrate the theory of affective intelligence with the literature on constructive journalism and to more thoroughly test and

theorize how discrete emotions impact news engagement and political outcomes. To this end, future studies can distinctly manipulate anger but not anxiety and vice versa. It is worth noting that emotions are only a part of what influences information seeking and that social factors and dynamics are important to take into account (Palmer and Toff 2020; Toff and Palmer 2019). Future research on constructive journalism could use in-depth interviews or observational methods to untangle the complexities of information seeking in relation to constructive journalism. Also, whereas the current research focused on discrete negative emotions, future investigations of constructive journalism could examine its impact through the lens of positive emotions like enthusiasm (MacKuen et al. 2010) or the positive psychological concepts of hedonia and eudaimonia.

This study also found that the sanitization of graphic images curbed prejudice toward Chinese Americans and that this effect was mediated by anger and anxiety. This has both practical relevance and theoretical implications. For journalists, it is important to be aware of the unforeseen damaging effects anger and anxiety-inducing news can have on people's attitudes toward racial minorities. Theoretically, this finding extends research that has found that anger and anxiety can increase outgroup prejudice (Arceneaux 2017; Coryn et al. 2004; DeSteno et al. 2004) by showing that exposure to news content on social media might drive this process. This finding also theoretically advances research on graphicness, showing that graphic visuals can intensify prejudice. Further, this finding bridges the concept of graphicness and the theory of affective intelligence, showing the sanitization of graphic visuals can curb anger and anxiety, which, in turn, can reduce outgroup prejudice. Given the large amount of attention paid to political polarization and its democratic implications (e.g., Gollwitzer et al. 2020; Hart et al. 2020), the finding that anger can exacerbate intergroup tensions, and that constructive journalism can buffer against it, is particularly noteworthy and

warrants further exploration. Yet it is worth noting that headlines did not affect prejudice. The limitations of positive or constructive information to curb prejudice may be taken as an indication that this problem is not easy to mitigate in American culture.

Graphicness also affected the subjects' coronavirus risk perceptions. Those exposed to graphic images perceived COVID-19 to be more dangerous. This finding adds to the literature on graphicness, showing that graphic visuals can increase people's risk perceptions in times of crisis. It is not clear, however, whether this is normatively preferable or not. On the one hand, citizens should take public health crises seriously and minimize the spread of infectious diseases. On the other hand, being overly afraid of threats can lead to hypervigilance, which may contribute to various anxiety disorders, including PTSD (Hoffman and Al'Absi 1998). Anxiety and PTSD, exacerbated by the news media, have indeed been posed as a potential by-product of the COVID-19 pandemic (CDC 2020; Dutheil, Mondillon, and Navel 2020; Garfin, Silver, and Holman 2020). Further, the decision to include or omit graphic visuals from news coverage is not only a matter of media effects but also a matter of ethics and balancing the need to keep the public informed with respecting victims who may have been photographed (Fahmy 2005). One outcome was influenced by the headlines but not by the images: people's willingness to like the news updates. Those exposed to positive or constructive headlines expressed greater willingness to like the posts than those exposed to negative headlines. This finding echoes past scholarship (Hermans & Prins 2020; McIntyre 2015).

This study is subject to some limitations. Exposing participants to a series of simulated social media posts approximates how people typically encounter news on social media but future research is needed to examine how the observed effects play out on real social media platforms, where the number of posts are higher and may be recommended by

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friends. This study is also limited by not including a control group, meaning that although the experimental conditions can be compared to one another, they cannot be compared to a neutral baseline. The current study also did not assess the temporal validity of the findings. Not many studies have investigated the effects of constructive journalism beyond short-term lab experiments (although see Lough & McIntyre 2021; McIntyre 2020); future studies should employ longitudinal designs to examine how the effects of constructive journalism work over time.

Another potential limitation is that the sanitization of images was implemented by cropping graphic images, thereby making the people and objects appear at a closer range in the sanitized than graphic images. Future studies could validate the current findings by operationalizing graphicness and sanitization differently. Also, the sanitized images included visual cues of paramedics or protective equipment, which might be taken as indicators of bad news. The different effects of the graphic and sanitized visuals thus suggest that sanitization need not involve removing all potentially negative visual cues to buffer against some of the anger and anxiety-inducing effects of graphic visuals. Future research could test the effects of various degrees of graphicness, as opposed to dichotomizing the concept.

Regardless of these limitations, the current study offers several contributions to the study of journalism and communication. These include theoretically bridging previously separated bodies of work, on affective intelligence, constructive journalism, graphicness, and racial prejudice. In doing so, this study reveals some of the ways in which exposure to news content on social media may influence the public. The key findings—that the headlines and images used in news updates on social media can influence people's anger, anxiety, risk perceptions, and prejudice—suggest that graphicness and constructive journalism may have noteworthy effects on social media users during times of crisis. These findings are

particularly striking in light of recent concerns about the news media exacerbating racial

biases (Kim 2020), and negatively influencing news consumers' mental health (CDC 2020;

Garfin, Silver, and Holman 2020). This study reveals that subtle changes to headlines and

images in news content shared on social media can effectively buffer against these problems

while still allowing the public to be informed.

Data availability statement

The dataset generated for this project is available for replication from the author.

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Endnotes

[i] A series of ANOVAs and Chi-squared tests showed that there were no significant differences between the groups, with regards to demographic factors (gender, age, race, income, education), the subjects' personal experience with the virus (i.e., whether they, their family members, or any of their acquaintances had tested positive for COVID-19), or how closely they had followed COVID-19 news before the study.

[ii] As a robustness check, all the analyses reported in this article were also conducted using the full sample. All the results remain unchanged in terms of direction and significance regardless of whether the eight subjects who missed the attention check are included or removed.

[iii] Link to online supplemental materials:
https://osf.io/b3gkh/?show=view&view_only=a6eb4d2ab79947a386b6d38da66a49fb

Table 1

Summary of the Effects of Information Type and Graphicness

(a) Information Type

	Constructive	Positive	Negative	F-test			
	M (SE)	M (SE)	M (SE)	F	df	p	η_p^2
Emotions							
Anger	2.92 (.15)[b]	2.87 (.14)[a]	3.70 (.15)[a,b]	10.04	2,486	< .001	.04
Anxiety	3.21 (.14)[b]	3.13 (.14)[a]	4.31 (.14)[a,b]	21.84	2,486	< .001	.08
News engagement							
Liking	4.33 (.15)[b]	4.19 (.15)[a]	3.50 (.15)[a,b]	8.31	2,486	< .001	.03
Information seeking	4.83 (.12)	4.86 (.12)	4.89 (.12)	0.07	2,485	.935	.00
Political outcomes							
Prejudice	3.22 (.13)	3.18 (.13)	3.43 (.13)	1.03	2,486	.357	.00
Risk perceptions	3.56 (.13)	3.59 (.13)	3.78 (.14)	0.76	2,486	.467	.00

(b) Graphicness

	Sanitized	Graphic	F-test			
	M (SE)	M (SE)	F	df	p	η_p^2
Emotions						
Anger	2.88 (.12)[a]	3.45 (.12)[a]	11.57	1,486	.001	.02
Anxiety	3.31 (.12)[a]	3.79 (.12)[a]	8.99	1,486	.003	.02
News engagement						
Liking	4.06 (.13)	3.96 (.12)	0.31	1,486	.581	.00
Information seeking	4.85 (.10)	4.86 (.10)	0.00	1,485	.954	.00
Political outcomes						
Prejudice	3.09 (.11)[a]	3.47 (.11)[a]	6.04	1,486	.014	.01
Risk perceptions	3.47 (.11)[a]	3.80 (.11)[a]	4.64	1,486	.032	.01

Notes. Results are based on 2x3 two-way ANOVAs. *M* = mean; *SE* = standard error; η_p^2 = partial eta squared. Means in the same row sharing the same letter superscript differ at *p* < .05.

Figure 1

Indirect Effects on Information Seeking and Prejudice Through Anger and Anxiety
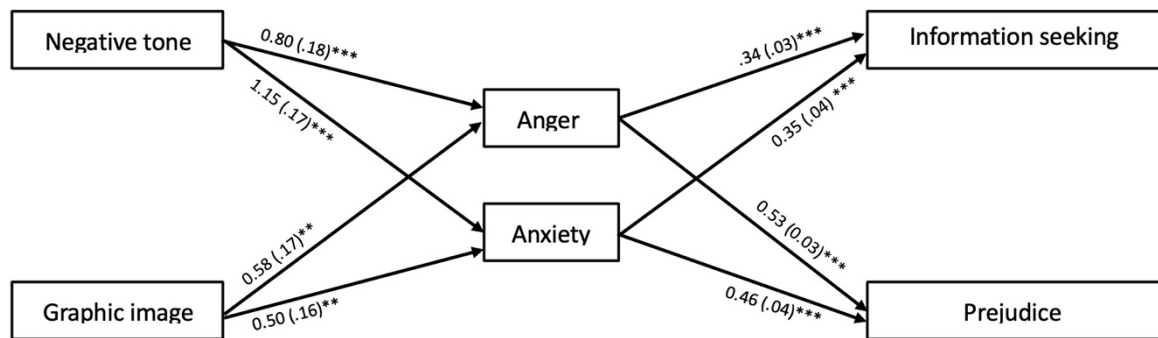
Note. Standard errors in parentheses, ***p < .001, **p < .01.