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Correlates of exposure to and seeking out graphic news content: A study of young adults

THESIS

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DEDICATION

This thesis is first and foremost dedicated to my loving parents, who graciously opened their home up to myself and my cat, River, when the world had to hastily shut down. Thank you for making space for us, adjusting to living with your daughter once again, and inevitably overhearing hundreds of hours of Zoom calls.

A quote for my friends and family who provided invaluable social and emotional support while drafting this thesis during an ongoing worldwide pandemic:

"We are all in the gutter, but some of us are looking at the stars." – Oscar Wilde

Thank you for keeping me focused on the stars.

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ABSTRACT OF THE THESIS

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Professor Roxane Cohen Silver, Chair

After a mass violence event, images of the incident and its aftermath often spread quickly through online websites and platforms, infrequently including warning labels. Repeated exposure to this graphic content has been shown to be associated with negative psychological outcomes, but limited research has examined who is exposed to the graphic content. This study of young adults (N = 2,578) examined predictors of the frequency and predictors of voluntary exposure to graphic news content. Participants completed an online survey asking how often they viewed five types of graphic news media content and how likely they were to click through a warning label while reading about breaking news events. Results indicated that demographics (female, Latinx), frequency of traditional and new media news consumption, reported anxiety symptoms, prior lifetime exposure to violence, lower disgust sensitivity, and a greater ability to engage in vivid mental imagery were associated with increased frequency of exposure to graphic news content. Individuals who were Latinx, reported depression symptoms, had prior lifetime exposure to violence, and greater ability to engage in vivid imagery were more likely to voluntarily click through a warning label to view graphic news content, while those who were older, female, Asian/Pacific Islander, or higher in disgust sensitivity were less likely to click

through a warning label. Understanding who seeks out such content can identify opportunities for intervention to prevent future negative consequences of graphic news exposure.

Introduction

Mass violence events appear with increasing frequency in the news. Coverage of domestic events (e.g., the 2019 shooting at a Walmart in El Paso, TX) to events that occur on the other side of the world (e.g., the 2019 shootings in Christchurch, New Zealand) is available in near real time. Immediately following a collective trauma and other mass violence events (e.g., a terrorist attack or bombing), the 24-hour news cycle is often inundated with graphic images and videos of the event. Due to the widespread use of smartphones, the potential to be exposed to and seek out real-life graphic news content on the Internet and social media is now easier than ever. Repeated exposure to this real-life graphic content has been associated with several negative psychological outcomes (Ahern, Galea, Resnick, & Vlahov, 2004; Hopwood & Schutte, 2017; Holman, Garfin, Lubens, & Silver, 2020). For instance, exposure has been linked to fear about future negative events, as well as increased media consumption following subsequent mass violence events, culminating in an apparent cycle of distress (Thompson, Jones, Holman, & Silver, 2019).

At least some of the exposure to graphic news content may be unintentional, though. Many websites and social media feeds will automatically start playing videos present on the screen without the user's decision to press play, and many do not require a warning label for graphic content. According to the posting policies of the image-based social media platform Instagram, users who elect to share graphic content of newsworthy events are encouraged to add a caption with the image warning their followers about graphic violence content (Community Guidelines, n.d.). However, on this particular social media platform, captions are located beneath the image or video, so the warning may be read after the content has been viewed, if it is read at all. Conversely, on another popular social media platform, Twitter, users who share sensitive

material are asked to change their account settings to indicate sensitive material being shared, which in turn, automatically includes a warning label on top of posts with graphic content (Sensitive media policy, 2020). Although the two policies differ in regard to a physical warning label being added to the content to cover graphic and sensitive media, they both rely on the individual users to add warnings and classify their own accounts as posting sensitive content. Moreover, users might not be aware of these policies because they are included in a long list of written guidelines that users may skip reading when accepting the terms and conditions. As a result, exposure to graphic news content can potentially occur at any point when engaging with certain social media platforms or online websites.

Even when users do follow the guidelines and try to warn other users of graphic content, this could have an unintended consequence of encouraging self-elected exposure. Some research suggests a warning label providing guidance regarding viewership of the content may in turn drive people of all ages to want to view the content as a form of reactance (Bushman, 2006). Overall, little information is known about the characteristics of the individuals that choose to view or not view the graphic content behind a warning label, especially a label that is covering real life breaking news content.

The degree of similarity between the psychological impacts of exposure to fictional and non-fictional graphic content is still being debated. Much of the current research exploring motivations for consuming graphic content has explored motivations for watching fictional (i.e., made for entertainment purposes) graphic content, specifically. According to Hoffner and Levine (2005), there is a genuine difference between fictional and non-fictional (real life) graphic content for the viewer. People respond with stronger negatively valanced emotions when told a graphic image they are viewing is real as opposed to fictional (Kobach & Weaver, 2012). One

explanation for this apparent difference in response to fictional versus real-life graphic media is that individuals have the option to create emotional distance as a way to regulate emotional responses when viewing fictional graphic content such as a horror film (Goldstein, 1999). This option is not necessarily available when exposed to real life graphic content. As a result, individuals may elect not to expose themselves to potential real-life graphic content if they cannot regulate their emotional responses by way of creating emotional distance. Taking this understanding of the debate into account, there is a lack of research available regarding the predictors of media-based repeated exposure to real life graphic news of mass violence. Identifying the characteristics of individuals likely to be exposed to real-life graphic news content is important to understand who is at risk for repeated exposure to coverage of mass violence events and the associated negative psychological outcomes.

Correlates of exposure to graphic content

The cycle of distress associated with repeated exposure to the real-life graphic content is reason for public health concerns. It is in the best interest of public health to identify the characteristics of individuals who are exposed to real-life graphic content to better target warnings and the presentation of news for people who are at heightened risk of exposure. While there is limited information regarding the specific characteristics associated with exposure to real-life graphic news content, there are a few variables that can be identified as associated with real-life graphic news exposure.

Demographic factors

There is minimal research concerning the specific associations between demographic characteristics (i.e., age, gender, or socioeconomic status) and frequency of exposure or volitional exposure to graphic news content. For example, Jones and colleagues (2016) found

that demographic factors were associated with exposure to Boston Marathon bombings-related chaotic and bloody graphic content in the days following the event. However, there is ample research on these demographic factors and the use of the Internet as an information seeking tool in general, which may be one reason to voluntarily expose oneself to content of a breaking news story regarding a mass violence event. Lachlan, Spence, and Seeger (2009) found that men tend to use the Internet to engage in information seeking more than women, who preferred traditional forms of media. Given these gender differences in media usage for information seeking, there is a potential for women to be exposed to more graphic news content when using traditional forms of media (i.e., radio, newspaper, and television) as opposed to men, who are likely to be exposed more when using new media (i.e., social media and the Internet). Furthermore, females have been shown to be more psychologically distressed compared to males when told they would be watching graphic violence in a film (de Wied, Hoffman, & Roskos-Ewoldsen, 1997). Therefore, if a warning label is given alerting the viewer of graphic content, females may be less likely to click past the warning label and voluntarily expose themselves to the content. Additionally, men were more likely to choose to watch an ISIS beheading video compared to women (Redmond, Jones, Holman, & Silver, 2019).

Age has also been shown to be inversely related to perceiving the Internet as a useful tool for information seeking (Spence et al., 2006). Thus, young adults between the ages of 18 – 29 are more likely to consume news from online news websites and social media over traditional sources of news, such as the television or newspaper (Shearer, 2018). The same observation may be replicated with frequency of exposure or volitional exposure to graphic news content, too. It may be that younger age may be associated with more frequent exposure to graphic content or greater likelihood to voluntarily seek it out through new media since that is the source younger

people are likely to use to gain information. However, older individuals were more likely to be exposed to both bloody and chaotic content related to the Boston Marathon bombings in the days following the event (Jones et al., 2016). Moreover, older individuals were more likely to watch an ISIS beheading video (Redmond et al., 2019). This relation between age and graphic content on the Internet should be examined more closely as new media and the technology on which it is hosted continue to advance rapidly.

Additionally, the relation between race/ethnicity and exposure to graphic news content has yet to be well established with limited research available. Jones and colleagues (2016) reported that white participants were exposed to more chaotic Boston Marathon bombings-related content compared to all other ethnicities in the sample, and they were exposed to more bloody event-related content than black participants. Any potential differences between ethnicities in regard to frequency of exposure and the volitional nature of exposure to graphic news content in general still need to be further examined, though.

Mental health and media

An individual's preexisting mental health conditions and symptoms may aid in understanding engagement with graphic news content. Individuals with a history of anxiety or depression were more likely to be exposed to bloody Boston Marathon bombings-related content following the event (Jones et al., 2016). Common mental health disorders, specifically depression and anxiety, may influence the degree to which a person is exposed to graphic content merely due to augmented time spent engaging with and consuming media of various kinds. Individuals with major depressive disorder report more computer use than those without depression (de Wit et al., 2011). Additionally, those with various anxiety disorders (e.g., panic disorder, agoraphobia) report more hours of television watched than those without anxiety

disorders (de Wit et al., 2011). Information regarding a distressing stimulus can increase a person's attention to it by increasing fear (Field, 2006). Once an individual has elevated state anxiety, it can take longer for the individual to disengage from the fear-inducing stimulus (Fox, Russo, Bowles, & Dutton, 2001). Therefore, individuals experiencing elevated state anxiety may actually view graphic content longer than individuals who are not distressed by the information communicated by the content. Additional research must be conducted regarding the role of symptoms at any level, as opposed to only at a clinically diagnosable stage of a disorder, in explaining engagement with graphic news content in day to day life.

Violent negative life events

Prior experience with violent negative life events may also help predict frequency of exposure and volitional exposure to real-life graphic news content. Lifetime exposure to violent negative life events (e.g., being physically attacked) may be linked to increased use of social media following subsequent potential negative life events (e.g., a new mass violence event), possibly by priming or sensitizing the individual to be vigilant to other forms of violence and the presentations of violence in the media. In addition, persistent distress from prior negative events might trigger information seeking as a response to future collective traumas (Mathews & MacLeod, 1985). For example, consuming coverage of the Boston Marathon Bombings via new media, defined as consuming pictures, videos, or news updates on social media platforms and/or online news websites, in the week following the bombings was correlated with prior direct exposure to other collective traumas (Jones, Garfin, Holman, & Silver, 2016). Additionally, Blum, Silver, and Poulin (2014) found that increased perceived risk across many types of adverse events was associated with experiencing previous negative life events of any kind, but the perception was partially accounted for by having experienced more violent life events. Other

research suggests that a history of exposure to violence uniquely predicts exposure to real-life graphic images, specifically. Redmond and colleagues (2019) found that preexisting fear and a history of violence exposure was associated with viewing an Islamic State of Iraq and Syria (ISIS) beheading video, which required that individuals seek it out online. Moreover, exposure to violence prior to the Boston Marathon Bombings indirectly predicted media exposure to coverage of the Pulse nightclub massacre three years later (Thompson et al., 2019). There is reason to theorize that exposure to violent events in an individual's lifetime may be uniquely linked to frequency of and the volitional nature of an individual's exposure to graphic content of other violent real-life events.

Individual differences

There are some individual characteristics that have not previously been studied in conjunction with an individual's frequency of exposure and the volitional nature of the exposure to real-life graphic content that may help further predict who is at heightened risk of viewing the content. A psychological mechanism of interest is an individual's stable level of disgust sensitivity. Past research suggests anything that reminds humans that they are animals elicits disgust (Rozin & Fallon, 1987), and the most dreadful quality of being an animal could be the inevitability of mortality (Haidt, McCauley, & Rozin, 1994). Thus, exposure to images of victims of mass violence who were badly injured or killed may serve as reminder of one's own animalistic quality of mortality. Disgust is a defensive reaction intended to protect the self from being reminded of one's delicate mortality (Haidt et al, 1994). Therefore, individuals who are higher in disgust sensitivity may be less likely to expose themselves to potentially graphic news coverage or subscribe to social media accounts and forums known for sharing such content in the first place in an attempt to avoid images that may trigger thoughts about their own mortality.

In addition to disgust sensitivity, the ability to vividly imagine a graphic scene in one's mind may deter an individual from exposing oneself to graphic content. Mental imagery can be through any sensory modality including the five senses, physical sensations of emotion, or physical bodily sensations. A greater ability to engage in vivid mental imagery, such as the bodily sensation of being attacked or the sound of chaos and confusion in the immediate aftermath of a mass shooting, may be distressing to a person who can better experience those sensations through mental imagery.

The current study

We conducted a study to examine predictors of both typical and voluntary exposure to graphic news content. Because young adults are likely to be using all forms of media for news information, in particular social media and the Internet, we conducted our study among a sample of university students. We examined the correlates of both frequency of exposure to graphic news media content and the volitional nature of any exposure to graphic content in an online survey. We hypothesized that being male, younger, having a greater number of depression and anxiety symptoms, a greater history of violent negative life events, and having lower disgust sensitivity, will predict more frequent exposure to graphic news content (H1). Additionally, we hypothesized that those who report a greater number of anxiety symptoms and have experienced more violent negative life events will report greater likelihood of clicking past a warning label to view graphic news content, while those who are female, older, and higher in disgust sensitivity will be less likely to indicate they would click past a warning label to view the graphic content hidden by the label (H2).

Methods

Participants

University students enrolled in undergraduate psychology courses at a large public university participated in the study for research points that could be used for extra credit. All data collection was conducted online on participants' phones, tablets, or personal computers over the course of 19 months. Participants first read an informed consent form that outlined all aspects of the study and that they would receive one half of a research credit for their participation. Then, they checked a box indicating they consented to participate. Participants completed all survey measures in static order. All procedures for this study were approved by the Institutional Review Board of the University of California, Irvine.

Measures

Below, with the exception of the demographic variables that appeared at the end of the survey, the following variables are presented in the general order in which the items appeared in the questionnaire for each participant.

Criterion variables

Frequency of graphic news content exposure. To assess average exposure to graphic news content, participants were asked the frequency with which they are typically exposed to five types of graphic news content including crime scenes, dead bodies, bloody or injured adults, bloody or injured children, and grieving victims (α = .83). This set of items was measured on a 5-point scale anchored by 0 (*never*) and 4 (*very often*). The mean of the five items was calculated to create a final frequency of graphic news content exposure score.

Volitional exposure. Participants were asked to imagine coming across an image or video on an online news site that was relevant to a news story they were interested in, but the image had been covered up by a warning label explaining that the content underneath the label is graphic and viewer discretion is advised. They were asked a single item asking how likely it was

that they would click through the warning label to view the content on a 5-point scale from 1 (not at all likely) to 5 (*extremely likely*). This single item was used to assess volitional exposure to graphic news content.

Demographics

Subjective socioeconomic status (SES) was measured using a visual representation of a ladder that represents where people stand in the United States based on SES, also known as the MacArthur Scale of Subjective Social Status (Adler, Epel, Casttellazzo, & Ickovics, 2000). A brief explanation of the ladder and how to interpret it was followed by a sliding bar that ranged from 1 (indicating the bottom of the ladder) to 9. Participants were asked to indicate their gender by choosing one of six options: male, female, transgender, genderqueer, other, or prefer not to say. These items were then consolidated into three categories: male, female, and other. Participants indicated their age in whole years. Participants indicated race/ethnicity by choosing one of the following options: Black/African American, White or Caucasian, Latino/a or Hispanic, American Indian or Native American, Asian/Pacific Islander, Multi-racial/Multi-Ethnic, Other, Don't know, or Prefer not to say. Multi-racial/Multi-Ethnic, Other, Don't know, and Prefer not to say respondents were collapsed into one group due to small sample size.

Covariates

Media consumption habits. Respondents were asked about their average amount of daily media consumption of news content from five types of sources, indicating one of four answer choices (*Less than 1 hour per day, 1-3 hours per day, 4-6 hours per day, or More than 6 hours per day*). The five types of sources included television, radio, Internet, social media (e.g., Facebook, Twitter), and newspaper and other print media. These five sources were divided into two categories of media – traditional media comprised of television, radio, and print media (α =

.52), and new media comprised of the Internet and social media (α = .73; Jones et al., 2016). Final scores for traditional media habits were computed by taking the mean of the television, radio, and print media items. Final scores for new media habits were computed by taking the mean of the Internet and social media items.

Mental health history. To assess anxiety and depression symptoms, the four-item Patient Health Questionnaire (PHQ-4; Kroenke, Spitzer, Williams, & Löwe, 2009) was used to assess symptoms for the two weeks prior to the time the survey was completed. The PHQ-4 is a composite of the PHQ-2, which assesses depressive symptoms, and the GAD-2, which has a good specificity (81-83%) for generalized anxiety disorder, panic disorder, social anxiety disorder, and post-traumatic stress disorder (Kroenke, Spitzer, Williams, & Löwe, 2009). There were two questions asking about anxiety symptoms (α = .86) and two questions asking about depressive symptoms (α = .82) with a 4-point scale ranging from 0 (*not at all)* to 3 (*nearly every day).* A summary score for symptoms of anxiety (ranging from 0 to 6), and a separate summary score for symptoms of depression (ranging from 0 to 6) was created.

Individual differences and exposure variables

Disgust sensitivity. The death and body envelope violation domains of the Disgust Scale were used to assess disgust sensitivity (Haidt et al., 1994). Four items were measured for each domain for a total of eight items. Two items were statements that the participants marked as true or false for themselves (e.g., "It would bother me tremendously to touch a dead body," followed by the option to mark "true" or "false"). Both domains had a pair (2) of these true/false items. The responses for all four true/false items were summed across domains. The remaining two items for each of the domains asked participants to rate on a scale of 0 to 2 how disgusting they would find specific scenarios (e.g., "You see a man with his intestines exposed after an

accident," with the response options of "0 *not at all disgusting*," "1 *slightly disgusting*," and "2 *very disgusting*"). The responses across both domains were summed, and then divided by two, consistent with how this measure is typically scored. Finally, the scores for the first (true/false) set (four items) and second (0-2) set (four items) of questions were summed for a total disgust sensitivity score for each participant.

Vivid mental imagery engagement. The short-form of the Plymouth Sensory Imagery Questionnaire (Psi-Q) with 21 items assessing seven types of mental imagery modalities (i.e., vision, sound, taste, smell, touch, body, and emotion) was used to measure ability to engage in vivid mental imagery (α = .94; Andrade et al., 2014). The measure consisted of seven sets of three questions. Each set included a header with the instructions to 'imagine the [specific modality] of…' followed by three scenarios (e.g., Imagine the taste of… black pepper, lemon, mustard; Andrade et al., 2014). Participants rated their specific image for that scenario on an 11-point scale ranging from 0 (*no image at all*) to 10 (*as vivid as real life*). For every participant, the mean of the 21 items was calculated for a final Psi-Q score.

Lifetime exposure to violent negative life events. To assess lifetime history of exposure to violent negative life events, participants were asked "Have any of the following happened to you over your lifetime?" They were then asked to select "yes" or "no" for 12 different violent negative life events as defined by Blum et al. (2014) (α = .72). The exposure of each event was dummy-coded and responses to the 12 items were summed.

Analytic strategy

Analyses were conducted using Stata Version 15.1 (Stata Corp, 2017). To examine predictors of frequency of exposure and volitional exposure to graphic news content, two separate hierarchical linear regression analyses were conducted by entering several individual-

level predictors in three conceptually meaningful blocks. For both analyses, demographic covariates (gender, age, race/ethnicity, and subjective SES) were entered into the model in block one. In block two, covariates known to associate with exposure to graphic content (GAD-2 scores, PHQ-2 scores, traditional media consumption habits, and new media consumption habits) were entered into the model. In block three, individual differences (disgust sensitivity and ability to engage in vivid imagery) and lifetime exposure to violent negative life events were entered into the model.

Assumptions and statistical outliers

All assumptions underlying ordinary least squares (OLS) regression were evaluated to assure this modeling approach was appropriate. To begin testing for assumptions, I first converted the kurtosis and skewness scores of the two criteria to z-scores. The skewness z-score for the frequency of exposure to graphic content was significant ($z_{frequency\_skew} = 4.61$), while the kurtosis z-score was non-significant ($z_{frequency\_kurtosis} = 1.53$). The z-scores for volitional exposure were both significant ($z_{volitional\_skew} = -6.96$, $z_{volitional\_kurtosis} = -8.47$). I also ran a Shapiro Wilk's test of normality for both criteria variables. Results for both criteria were significant ($W_{frequency} = 1.00$, $p < .001$; $W_{volitional} = 1.00$, $p < .001$). Since these results were significant, I have to reject the null hypothesis that the data from the sample are normally distributed. However, given the large sample size, a significant normality test is expected. The large sample size is robust to small - moderate deviations in normality. In order to understand how the data are non-normally distributed in both models, I further examined the skewness and kurtosis of the criteria. Using a monotonic transformation of the frequency of graphic content criterion, there was a skewness z-score of -5.84 and a kurtosis z-score of 3.13. These transformed z-scores are worse than the original z-scores, so the non-transformed version of criterion was used. The transformed

volitional exposure criterion had a skewness z-score of -3.71 and a kurtosis z-score of -10.16. The skewness improved, but it is still statistically significant (larger than a z-score of 1.96 at an alpha level of .05), the kurtosis z-score worsened, and the transformed scale of the criterion is not intuitive to interpret, so the non-transformed version of the criterion was chosen to use in the final model, as well. Additionally, I ran a variance inflation factor (VIF) test for both models to test the level of multicollinearity in the final models with all blocks of predictors included. The VIF for the final frequency of graphic content model was 1.39, and the largest value was 2.60 for participants identifying as Asian and Pacific Islander. The VIF for the final volitional exposure model was 1.39, and the largest value was 2.60 for the Asian and Pacific Islander race/ethnicity. None of the VIF values in either model approached the threshold for concern of 4.00.

In order to test for outliers, I ran five diagnostic tests. First, I tested the studentized residuals. In the frequency of graphic content model, eight studentized residual data points exceed the heuristic cutoff of 3.00. The smallest value over the threshold was 3.11, and the largest value was 3.39. There were no data points exceeding the heuristic cutoff of 3.00 in the volitional exposure model. Second, I tested the global measure of influence by testing the standardized change in predicted scores on the criterion with and then without the participant included in the model. For each participant, I found standardized DFFIT values (DFFITS), and all data points in both models had appropriate values with no data points reaching the heuristic cutoff of 1.00. Third, to test another measurement of influence, I ran a Cook's Distance test on each model. All data points in both models were below the heuristic threshold of 1.00. Fourth, I also examined COVRATIO, which is a global measure of influence which quantifies how the participant is contributing to the stability or instability of the regression coefficients by representing the precision of the estimates comparing the model with or without a specific

participant. Values that are much smaller than 1.00 exert too much influence on the stability of the model. All COVRATIO values in both models are at or above 0.92 based on the complete data set. None of these values exert too much influence on the models. Finally, I ran standardized DFBETA (DFBETAS) tests on each predictor for each model. DFBETAS quantify the local measure of standardized change in the regression coefficient for each predictor if the individual participant were to be omitted from the model. The mathematical threshold is 2.00 divided by the square root of the sample size, which signals concern. For both models, the mathematical threshold for concern is 0.04. There are several values over the mathematical threshold of 0.04 on all variables in both models, with the largest concentration of values above 0.04 being in the DFBETAS of the age variable. When comparing the concerning DFBETAS values to the heuristic cutoff, however, no values are close to approaching 1.00. The largest DFBETAS value is -0.29 in the DFBETAS of age for the frequency of graphic content exposure model. Given the fact that the DFBETAS values do not come close to the heuristic cutoff, along with the other outlier measures, I have decided to not remove any participants based on DFBETAS values since global measures results are all acceptable values. The largest DFBETAS value in the volitional exposure model was 0.70 in the age predictor. While this is larger than the mathematical threshold for concern of 0.04, it is still below the heuristic cutoff of 1.00, so the participant was not removed as an outlier. In total, I identified eight potential statistical outliers in the frequency of graphic content exposure model based on diagnostic tests (specifically, studentized residuals and COVRATIO results). However, after running sensitivity analyses on the hierarchical regressions, the statistical inferences did not change with or without the eight potential statistical outliers present in the data set. Therefore, no outliers were removed from the frequency of

exposure model. Additionally, no outliers were removed from the volitional exposure model based on the results of the diagnostic tests.

There were 2,578 participants who completed the online survey over the course of 19 months. Each variable had some missing data with frequency of graphic content having the least amount of missing data (1.36%) and race/ethnicity having the most amount of missing data (3.74%). After removing 133 participants with missing data, the final sample size for the frequency of graphic content exposure models included 2,445 participants. After removing the 133 participants with missing data, the final sample size for the volitional exposure models included 2,442 participants.

Three of the predictors had excessively heteroscedastic residuals, so I transformed the variables accordingly. Due to excess negative skewness in the residual versus predictor plots, vivid mental imagery engagement was logarithmically transformed using a lambda of 2.00 to achieve a normal distribution. The resulting skewness equaled 0.02 and kurtosis equaled -0.72. The mean of the transformed variable is 57.45 and standard deviation is 22.66. Similarly, violent negative life events was transformed using a lambda of 0.33 to correct for a positively skewed distribution based on the residual versus predictor plots. The resulting skewness equaled -0.00 and kurtosis equaled -1.46. The mean of the transformed variable is 0.77 and standard deviation is 0.68.

Results

Frequency of exposure to graphic content. All sample characteristics can be found in Table 1. Table 2 presents the results of the hierarchical linear regression analysis with unstandardized and standardized regression coefficients. In the final model, select demographics (female, Latinx), traditional and new media consumption, anxiety symptoms, disgust sensitivity,

the ability to engage in vivid mental imagery, and lifetime exposure to violent negative life events were statistically significant predictors of frequency of exposure to graphic news content. Specifically, identifying as a female, identifying as Latinx, spending more time per day on average consuming news through traditional and new media sources, reporting more anxiety symptoms, experiencing more violent negative life events, and having a better ability to engage in mental imagery were all positively associated with frequency of exposure to graphic content. In contrast, having a higher disgust sensitivity to death and body envelope violations was negatively associated with frequency of exposure to graphic content.

A hierarchical linear regression analysis, including three blocks of predictors (p = 16) of frequency of graphic news content exposure, was conducted. The first block of predictors included demographic variables (age, gender, race/ethnicity, and subjective SES), the second block included four substantive covariates (anxiety symptoms, depression symptoms, traditional media news consumption, and new media news consumption), and the third block included three predictors of theoretical interest (disgust sensitivity, ability to engage in vivid mental imagery, and lifetime exposure to violent negative life events). Demographic factors explained a significant proportion of variation in exposure to graphic news content [R^2 = .05, Adj. R^2 = .04, F(9, 2421) = 13.16, p < .001]. Adding anxiety and depression symptoms along with traditional media and new media consumption habits as a second set of predictors significantly improved the proportion of variation explained in frequency of exposure to graphic news content [ΔR^2 =.02, ΔF(4, 2417) = 14.21, p < .001]. This means the substantive covariates block contributed an additional 2.19% of variance explained in the outcome. Adding the predictors of theoretical interest – individual characteristics (disgust sensitivity and ability to engage in vivid mental imagery) and exposure to violent negative life events – significantly improved the proportion of

variation explained in exposure to graphic news content [ΔR^2 =.02, $\Delta F(3, 2414) = 18.76$, $p <$ .001]. Specifically, disgust sensitivity, the ability to engage in vivid mental imagery, and lifetime exposure to violent negative life events each significantly improved the proportion of variation explained in frequency of exposure to graphic news content over and above demographic variables and substantive covariates. The third block of predictors explained an additional 2.06% of variation in the criterion. Specifically, disgust sensitivity is a negative, significant linear predictor of frequency of exposure to graphic news content partially out the other 15 predictors [b = -0.02, 95% CI_{boot} (-0.04, 0.00), $t(2414) = -2.41$, $p = 0.02$]. In particular, for every one-unit increase in disgust sensitivity, there is a 0.02 unit decrease in frequency of exposure to graphic content, partialling out the other predictors in the final model. The final model including all predictors explained a significant proportion of variation in exposure to graphic news content [R^2_{all} = .09, Adj. R^2_{all} = .08, $F(16, 2414) = 14.75$, $p <$ .001]. In particular, all predictors together explained 8.91% of the observed variation in frequency of exposure to graphic news content. For individual unstandardized and standardized regression coefficients, see Table 2.

Volitional exposure to graphic content. Table 3 presents the results of the hierarchical linear regression analysis with unstandardized and standardized regression coefficients. In the final model, being younger, Latinx, reporting more depression symptoms, having a better ability to engage in vivid imagery, and experiencing violent negative life events with greater frequency were positively associated with a greater likelihood of volitional exposure to graphic news content. Additionally, identifying as female, being Asian/Pacific Islander, and having a greater disgust sensitivity to death and body envelope violations were associated with less likelihood of volitional exposure. Within the final model, disgust sensitivity, the ability to engage in vivid mental imagery, and lifetime exposure to violent negative life events explained an additional

7.90% of the proportion of variation in the criterion, over and above demographic variables and known covariates.

A hierarchical linear regression analysis including three blocks of predictors (p = 16) of volitional exposure to graphic news content was conducted. The first block of predictors included demographic variables (age, gender, race/ethnicity, and subjective SES), the second block included four substantive covariates (anxiety symptoms, depression symptoms, traditional media news consumption, and new media news consumption), and the third block included three predictors of theoretical interest (disgust sensitivity, the ability to engage in vivid mental imagery, and lifetime exposure to violent negative life events). Demographic factors explained a significant proportion of variation in likelihood of volitional exposure [R^2 = .08, Adj. R^2 = .07, F(9, 2432) = 22.96, p < .001]. In particular, demographics together explain 7.93% of the variation in volitional exposure to graphic content. Adding anxiety and depression symptoms along with traditional media and new media consumption as a second block of predictors somewhat significantly improved the proportion of variation explained in volitional exposure to graphic news content [ΔR^2 =.004, ΔF(4, 2428) = 2.74, p = .03]. This means the substantive covariates block contributed an additional 0.40% of variance explained in the outcome. The significant result may be due to the large sample size, however. Adding the predictors of theoretical interest – individual characteristics and exposure to violent negative life events – significantly improved the proportion of variation explained in volitional exposure to graphic news content [ΔR^2 =.08, ΔF(3, 2425) = 77.01, p < .001]. Specifically, disgust sensitivity, the ability to engage in vivid mental imagery, and lifetime exposure to violent negative life events explained an additional 7.90% of the proportion of variation in the criterion, over and above demographic variables and substantive covariates. In looking at one of the individual differences

predictors, disgust sensitivity is a negative, significant linear predictor of volitional exposure when partialling out the other predictors in the final model [b = -0.17, 95% CI_{boot} (-0.19, -0.15), t(2425) = -14.10, p <.001]. In particular, for every one-unit increase in disgust sensitivity, there is a 0.17 unit decrease in volitional exposure to graphic news content. The final model including all predictors explained a significant proportion of variation in volitional exposure to graphic content [R^2_{all} = .16, Adj. R^2_{all} = .16, F(16, 2425) = 29.20, p < .001]. In particular, all predictors together explain 16.15% of the observed variation in likelihood of volitional exposure to graphic content. For individual unstandardized and standardized regression coefficients, see Table 3

Discussion

This study identified demographics, psychological mechanisms, and experiential correlates of exposure to graphic news content, both in terms of frequency of exposure and volitional exposure. Results indicate that as anxiety symptoms and violent negative life events increase, frequency of exposure to graphic news content also increases. This supports our first hypothesis and is consistent with prior research linking a history of mental health ailments and exposure to violent events with exposure to media coverage of mass violence (Thompson et al., 2019). Results also suggest that those who frequently use social media and the Internet, as well as traditional news sources, have more chances to be exposed to graphic news content. Results also indicate that Latinx individuals are exposed to graphic content more frequently than Caucasian individuals, signifying that a racial and ethnic breakdown should be included in future research regarding exposure to graphic news content. Likewise, as the ability to engage in vivid mental imagery increases, so too does the frequency with which participants are exposed to graphic news content, demonstrating a need to include this individual difference variable in research regarding real-life graphic news content exposure. It is possible that individuals with

greater ability to engage in vivid mental imagery are more likely to remember graphic news content to which they are exposed over time, and therefore, it may be more strongly associated with negative mental health outcomes such as intrusive thoughts, a hallmark of posttraumatic stress disorder.

Gender, race/ethnicity, depression, individual differences, and exposure to violent negative life events were significantly associated with volitional exposure to graphic news content. Supporting H2, age, being female, and experiencing violent negative life events were significantly linked with volitional exposure to graphic news content. However, unlike our second hypothesis, anxiety symptoms failed to reach statistical significance. Instead, as the number of depression symptoms experienced in the prior two weeks increases, the likelihood of volitional exposure increases. Additionally, the ability to engage in vivid imagery and identifying as Latinx were associated with increased likelihood to click past a warning label, while being of Asian/Pacific Islander was associated with decreased likelihood to click past a warning label. These results suggest that these variables need to be included in future research regarding volitional exposure to real-life graphic news content as well.

Results also indicated a negative association between disgust sensitivity and frequency of exposure to graphic news content, supporting H1. Likewise, disgust sensitivity was strongly associated with a likelihood of clicking past a warning label to view real-life graphic news content, supporting H2. Indeed, if an individual is easily disgusted by images of dead or mutilated human bodies, they may elect to not view the content. However, it may be less apparent why those with high disgust sensitivity are less likely to be exposed to the content in the first place, including accidental exposure. It is possible that people with high disgust sensitivity are less likely to follow accounts on social media that share graphic content. It is also possible

that they choose to use specific social media platforms that have user policies requiring warning labels to be added on top of all sensitive posts.

Implications

Establishing factors linked to frequency of exposure and volitional exposure to real-life graphic news content can guide future media outlets to the reporting of sensitive content and collective traumas in the news-cycle. Understanding the characteristics of people who are exposed to potentially traumatic content will better allow those at greater risk of psychological distress to be identified and encouraged to monitor their exposure. It may also serve to inform social media and news websites of the implications of policies regarding warning labels, automatically playing videos, and even algorithms that steer users toward potentially more extreme content for the purpose of maintaining engagement. Additionally, it speaks to the need for educating the general population on content warnings for a diverse audience, especially when the graphic image policy on a platform is largely for the users to monitor their own exposure. By attempting to understand the characteristics of individuals at risk for exposure to graphic news content, whether the individual is seeking it out or is accidentally exposed, the results can support a fundamental change in social media policies in the industry, as a whole, instead of relying on the ethical behavior of individual companies.

Research aimed at understanding the characteristics of people who are exposed to graphic news content is particularly important given that some recent mass shootings have been live streamed on social media. Three mass shootings occurring in 2019 posted manifestos online, and the perpetrator from the Christchurch, New Zealand, mosque attack live-streamed his attack on Facebook. Most social media platforms and forums are dedicated to free speech and avoid censoring users' voices unnecessarily. This is especially true for more fringe websites such as

8Chan, where suspected perpetrators posted announcements of at least three mass shooting and provided links to their manifestos minutes before their alleged attacks (Harwell, 2019). The graphic videos of such mass violence events are typically taken down as quickly as possible on more mainstream social media platforms, given their policies on the intent behind posting graphic content, but users sometimes re-upload the content repeatedly after it is flagged and taken down. The likelihood that some additional users will be unintentionally exposed to the graphic content during this process is inevitable, though. This project was designed to contribute to the growing body of literature aimed at discerning those characteristics associated with exposure, volitional or otherwise, to real-life graphic news coverage.

Limitations and future directions

We acknowledge several limitations of our study. We cannot guarantee that participants reported their average or hypothetical behaviors accurately. Individuals may simply be wrong about their self-observation (Jones & Nisbett, 1972). However, as Skitka and Sargis (2006) found, the quality of the data collected from online measurements are similar to that of paper surveys or face-to-face interviews. Additionally, online surveys have been shown to be lower in social desirability bias than phone-based data collection (Skitka & Sargis, 2006). Also, our measurement for volitional exposure to graphic news content consisted of a single item. Future research should include multiple items to more fully capture this complex behavior. Additionally, the sample is limited as it was a convenience sample using university students, although young adults are a large portion of the population likely to use new media for gathering news. Future research should aim to include a more demographically diverse sample (e.g., more gender balanced) from the general population. Moreover, we acknowledge the relatively low reliability score of the traditional news consumption variable ($\alpha = .52$). This specific

combination of media sources (i.e., television, radio, and print media) has been used in prior work on media use and exposure to graphic content, prompting our use of the variable operationalized in this manner (Jones et al., 2016). It is possible the smaller alpha is a product of the specific sample, specifically the mean age of the sample. As age increases, likelihood of receiving news from one of the three traditional sources of media increases, as well (Shearer, 2018). It is possible the low reliability score is due to the relatively young age of the current sample choosing to use the different types of traditional media at different rates, resulting in poor interrelatedness between items. Lastly, breaking news stories popular in the media over the 19 months during which data was collected might have played a role in people's reporting of typical media consumption or the experience of mental health symptoms in the two weeks prior to completing the survey. However, the frequency with which violent breaking news events occurs suggests this is not a strong confound, and it is not a particularly strong explanation for our findings. To continue this line of research, we plan to replicate this study with a different, more generalizable sample to target a wider population. We are also interested in exploring the causal links between both frequency of exposure and volitional exposure to graphic news content with the circulation of such content through social media and directly with friends and family. Lastly, we plan to collect another set of data using behavioral measures to examine the characteristics of individuals who actually click past a real warning label to view the hidden graphic content.

Conclusion

Graphic coverage of mass violence is linked to psychological distress and other negative psychological outcomes. Presently, research regarding the characteristics of people who consume this graphic news coverage is largely underdeveloped. Our study aimed to identify demographics, psychological mechanisms, individual differences, and prior experience variables

associated with the frequency of exposure and volitional exposure to graphic news content following a mass violence event. This study is one of only a few that attempt to identify characteristics of people exposed to real-life graphic news content, as opposed to fictional graphic violence. Though this line of research is preliminary, a pattern is beginning to emerge in the data. People who have been previously experienced negative life events seem to be drawn to real-life graphic news content (Thompson et al., 2019). To further this research, the present study is the first to find an ability to engage with vivid mental imagery and disgust sensitivity as significantly associated with both frequency of exposure and volitional exposure to real-life graphic news content. Future research should investigate the motivations behind volitional exposure to this specific type of graphic content. Moreover, research should also examine the characteristics of those who choose to share or repost this potentially traumatic content within the Internet ecology to which others can accidentally or purposefully be exposed.

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Table 1

Sample characteristics of all criteria and predictors

	Percent of Sample	Mean	Standard Deviation
Frequency of Exposure		1.64	0.79
Volitional Exposure		3.43	1.20
Age		20.73	3.14
Gender			
Male	18.91		
Female	80.3		
Other	0.79		
Race/Ethnicity			
Caucasian	13.42		
African American	1.93		
Latinx	29.37		
Native American	0.32		
Asian/Pacific Islander	44.64		
Multi-racial/Multi-ethnic/Other	10.31		
Subjective SES		5.36	1.55
Traditional Media		1.18	0.34
New Media		2.31	0.83
Anxiety Symptoms		2.30	1.77
Depression Symptoms		1.65	1.65
Disgust Sensitivity		5.22	1.97
Vivid Imagery		57.45	22.66
Violent Negative Life Events		0.77	0.68

Note. Vivid Imagery and Violent Negative Life Events are the transformed versions of the variables. Sample size of the "other" gender category is too small to interpret in the results. Both the African American and Native American race/ethnicity categories contain sample sizes that are too small to be able to interpret in the results.

Table 2

Predictors of frequency of exposure to graphic news content. (N = 2,445)

	Model 1				Model 2				Model 3			
	b	*b**	*p*	95% CI_{boot}	*b*	*b**	*p*	95% CI_{boot}	*b*	*b**	*p*	95% CI_{boot}
Block A: Demographics												
Age	-0.00	-0.00	0.98	-0.01, 0.01	0.00	0.00	0.91	-0.01, 0.01	-0.00	-0.02	0.37	-0.02, 0.01
Gender												
Male (ref. group)												
Female	0.09	0.11	0.02	0.01, 0.17	0.09	0.12	0.02	0.01, 0.17	0.11	0.14	0.01	0.03, 0.19
Other	0.22	0.28	0.22	-0.16, 0.60	0.20	0.25	0.27	-0.18, 0.57	0.17	0.22	0.32	-0.18, 0.52
Race/Ethnicity												
Caucasian (ref. group)												
African American	0.21	0.27	0.08	-0.05, 0.47	0.17	0.21	0.17	-0.09, 0.42	0.12	0.16	0.30	-0.13, 0.39
Latinx	0.32	0.40	0.00	0.21, 0.42	0.27	0.35	0.00	0.17, 0.38	0.26	0.33	0.00	0.16, 0.36
Native American	0.12	0.15	0.67	-0.37, 0.61	0.01	0.02	0.96	-0.39, 0.42	-0.08	-0.10	0.76	-0.50, 0.33
Asian/Pacific Islander	-0.05	-0.06	0.35	-0.14, 0.05	-0.07	-0.09	0.16	-0.16, 0.02	-0.05	-0.06	0.31	-0.14, 0.04
Multi-racial/Multi-ethnic/Other	0.11	0.14	0.10	-0.02, 0.24	0.08	0.11	0.19	-0.05, 0.21	0.06	0.08	0.31	-0.06, 0.19
Subjective SES	0.00	0.00	0.87	-0.02, 0.02	0.00	0.00	0.86	-0.02, 0.02	0.00	0.00	0.89	-0.02, 0.02
Constant	1.48	-0.20	0.00	1.18, 1.78								
R^2	0.04											
Block B: Covariates												
Traditional Media					0.12	0.05	0.01	0.02, 0.22	0.12	0.05	0.01	0.02, 0.22
New Media					0.08	0.09	0.00	0.04, 0.13	0.08	0.08	0.00	0.03, 0.12
Anxiety Symptoms					0.05	0.11	0.00	0.03, 0.07	0.05	0.10	0.00	0.02, 0.07
Depression Symptoms					-0.01	-0.03	0.31	-0.04, 0.01	-0.01	-0.03	0.23	-0.04, 0.01
Constant					1.06	-0.17	0.00	0.73, 1.39				
R^2					0.07							
ΔR^2					0.02							
Block C: Individual Differences and Exposure												
Disgust Sensitivity									-0.02	-0.05	0.02	-0.04, 0.00
Vivid Imagery									0.00	0.08	0.00	0.00, 0.00
Violent Negative Life Events									0.12	0.10	0.00	0.07, 0.16
Constant									1.04	-0.19	0.00	0.69, 1.38
R^2									0.09			
ΔR^2									0.02			

Note. All confidence intervals bootstrapped with 5000 resamples.
Model 1: $F(9, 2429) = 12.12$, $p < .001$, Adj. $R^2_{model1} = 0.04$
Model 2: $F(13, 2425) = 13.14$, $p < .001$, Adj. $R^2_{model2} = 0.06$
Model 3: $F(16, 2422) = 14.18$, $p < .001$, Adj. $R^2_{all} = 0.08$

Table 3

Predictors of volitional exposure to graphic news content. (N = 2,442)

	Model 1				Model 2				Model 3			
Block A: Demographics	*b*	*b**	*p*	95% CI_{boot}	*b*	*b**	*p*	95% CI_{boot}	*b*	*b**	*p*	95% CI_{boot}
Age	-0.01	-0.04	0.06	-0.03, 0.00	-0.01	-0.04	0.07	-0.03, 0.00	-0.03	-0.07	0.00	-0.04, -0.01
Gender												
Male (ref. group)												
Female	-0.32	-0.27	0.00	-0.44, -0.20	-0.32	-0.27	0.00	-0.45, -0.20	-0.17	-0.14	0.00	-0.29, -0.05
Other	-0.13	-0.11	0.62	-0.62, 0.36	-0.17	-0.14	0.53	-0.66, 0.33	-0.08	-0.07	0.75	-0.60, 0.44
Race/Ethnicity												
Caucasian (ref. group)												
African American	0.03	0.02	0.87	-0.32, 0.38	0.02	0.01	0.93	-0.34, 0.37	0.01	0.00	0.98	-0.34, 0.35
Latinx	0.19	0.16	0.02	0.03, 0.34	0.18	0.15	0.03	0.02, 0.34	0.22	0.18	0.01	0.06, 0.37
Native American	-0.15	-0.13	0.71	-0.98, 0.67	-0.16	-0.13	0.70	-0.99, 0.67	-0.41	-0.34	0.30	-1.04, 0.22
Asian/Pacific Islander	-0.53	-0.44	0.00	-0.68 -0.38	-0.54	-0.45	0.00	-0.69, -0.39	-0.41	-0.34	0.00	-0.55, -0.26
Multi-racial/Multi-ethnic/Other	-0.02	-0.01	0.86	-0.22, 0.19	-0.03	-0.03	0.75	-0.23, 0.17	-0.05	-0.04	0.63	-0.24, 0.15
Subjective SES	-0.01	-0.02	0.35	-0.05, 0.02	-0.01	-0.01	0.54	-0.04, 0.02	0.00	0.00	0.99	-0.03, 0.03
Constant	4.26	0.38	0.00	3.79, 4.73								
R^2	0.08											
Block B: Covariates												
Traditional Media					0.01	0.00	0.92	-0.14, 0.15	-0.03	-0.01	0.72	-0.17, 0.12
New Media					0.01	0.01	0.72	-0.05, 0.07	0.00	0.00	0.97	-0.06, 0.06
Anxiety					0.00	-0.01	0.80	-0.04, 0.03	0.02	0.02	0.35	-0.02, 0.05
Depression					0.05	0.07	0.01	0.01, 0.09	0.04	0.05	0.05	0.00, 0.07
Constant					4.13	0.39	0.00					
R^2					0.08							
ΔR^2					0.00							
Block C: Individual Differences and Exposure												
Disgust Sensitivity									-0.17	-0.28	0.00	-0.19, -0.15
Vivid Imagery									0.00	0.06	0.00	0.00, 0.00
Violent Negative Life Events									0.08	0.04	0.03	0.01, 0.14
Constant									4.83	0.23	0.00	4.32, 5.34
R^2									0.16			
ΔR^2									0.08			

Note. All confidence intervals bootstrapped with 5000 resamples.
Model 1: $F(9, 2432) = 22.96$, $p < .001$, Adj. $R^2_{model1} = 0.07$
Model 2: $F(13, 2428) = 16.79$, $p < .001$, Adj. $R^2_{model2} = 0.08$.
Model 3: $F(16, 2425) = 29.20$, $p < .001$, Adj. $R^2_{all} = 0.16$.