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Attentional Biases in Traumatic Media Images

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Abstract

This study applied an existing experimental paradigm to study media effects on information processing. Using a dot-probe task, participants viewed negative and neutral media images at varying exposure levels. We predicted viewers would show attention biases away from negative images; however, over time their attention bias would decrease indicating desensitization. For trauma victims, we predicted that their original attention bias would remain and desensitization would not occur. Predictions regarding initial biases away from negative images were not supported. Results indicated that viewers responded faster to negative natural disaster images compared to negative manmade images, viewer reaction time decreased as exposures increased, and trauma victims continually averted their attention away from negative images. Implications for real world media effects on the mental processing of viewers will be discussed.

### Attentional Biases in Traumatic Media Images

When breaking news occurs in America and around the world, news media outlets race to be the first to cover it. Millions of people have access to various news reports at any given time of the day or night; therefore, we are constantly processing media related information. As Americans, we are bombarded everyday with images of destruction on television, the Internet, and in newspapers. The way in which we absorb and interpret these images may have an impact on our cognitive processing, specifically attention. In this study, I am interested in how the degree of exposure to negative media images relates to attentional biases.

#### *Framing of media text*

According to Entman (1993) framing is, “to select some aspects of a perceived reality and make them more salient in a communicating text” (Entman, 1993, p.52). The concept of framing is a relevant one when discussing media reports. The way in which a news story is portrayed can affect how it is perceived and recalled by the audience. For instance, a news agency can use the details of a devastating earthquake to their advantage by profiling the story of a 93-year old survivor who lost everything. Entman (1993) examined numerous U.S. and foreign media reports of the 1980’s and found that many violent events (e.g. interpersonal violence, street crime, and natural disasters) were framed in such a way that the viewer was more likely to remember that event later.

Notably, framing does not involve falsifying news reports. Instead, the most interesting and salient aspects of a story are portrayed as the most important features of the story. Therefore, certain news reports become more memorable to the audience. Logically, if frames make an event more memorable, they must also take attention away from other aspects of the event. For instance, if a death is framed in the news as a homicide allegedly perpetrated by an

African American suspect, audience attention is drawn to that confirming evidence and away from other potential suspects or explanations for the death.

As can be seen in the previous examples, the characters within an event are most often used to create a frame. Bullock and Cubert (2002) found that news reports of domestic violence contained various frames that manipulated how the audience viewed the police officers involved, the perpetrator, and the victim. The authors found three main frames consistent in every news report they studied. A first frame indicated that the people involved in the story were different in some way from the rest of society. For instance, police officers were seen as above the law, unlike usual citizens. A second frame blamed the victim for causing the perpetrator to attack her and therefore excused the criminal behavior. A third frame portrayed the perpetrator as not a normal human being and as having a mental deficit that caused him or her to attack the victim.

#### *Content analysis of news stories*

Frames contain the general mood and direction of a written news story. Humphries (1981) took a more in depth look at frames in a content analysis of crime coverage in the *New York Post*. He found that many crime stories were exaggerated in the sense that they amplified the incidence of aggression and attempted to shift viewer attention to themes of violence and fear. Importantly, Humphries (1981) reminds the reader that the *New York Post*, as well as all other media outlets, is a business. The owners and editors of these newspapers, magazines, news channels, and Internet sites choose the headlines and stories they cover based on what will gain the largest audience and hence the largest pay-off. Using the old adage “If it bleeds, it leads”, Humphries claims that the media exaggerates violence in order to increase ratings.

Entman (1991) contributes to this concept of exaggerated violence in his analysis of news reports of the KAL flight 007 and Iran Air flight 655 incidents. Each of these airplanes was shot

down due to military error and the lives of 559 people were lost. Entman's (1991) investigation revealed that news agencies used words such as 'attack', 'tragedy', and 'brutal' in the text, and computer enhanced images of the doomed flights catching fire and crashing into the ocean.

Entman (1991) maintains that the graphic text and images selected to report news events increase the amount of audience attention gained and the length of time the audience will remember the event.

Clearly word choice can be a very important aspect of news reporting, as the words one uses to express an idea can capture a reader's attention or cause him or her to neglect the story completely (Welch, Price, & Yankey, 2002). A study by Altheide and Michalowski (1999) examined the use of the word 'fear' in American newspapers. The authors found that the word 'fear' and headlines related to fear-provoking incidents (e.g. terrorist acts), were printed more often on the front page of numerous major American newspapers as opposed to other pages within the newspaper. The authors' claim that the over use of 'fear' in the media is causing Americans to change their daily habits and even their lifestyles. For instance, they cite the fact that many people are now purchasing guns for their homes, as well as installing expensive security systems, and creating habits of locking windows and doors in response to rising crime statistics.

### *Psychological effects*

Many previous studies have focused only on general media analysis such as an examination of text and wording techniques. The psychological repercussions for individuals exposed to the media's portrayal of events, however, are only in the beginning stages of investigation. An increased feeling of fear is one of many psychological effects that seems to appear after exposure to media reports of violent events. For instance, Shapiro (2002) found that

media accounts of violent events that resulted in death prolonged the grieving process for family members and friends of the deceased. Her research shows that a public death can keep survivors from finding closure and moving on from the death of a loved one due to the repeated media reports of the death event. These findings are in line with other studies that have found repetitive media reports on violent or traumatic events to be triggers of delayed recall of traumatic memories (Elliott, 1997). Delayed recall can be defined as memory loss with subsequent recall of the memory of those events. Elliott (1997) extends Shapiro's (2002) findings on anxiety, claiming that delayed recall can be an initiator of anxiety and post-traumatic reaction in a general population

Perhaps one of the most significant effects of media exposure on psychological well-being was found by Slone (2000). Slone measured levels of anxiety in response to violent media video in an Israeli population. She found a significant difference in anxiety levels between a control group's anxiety level and an experimental group's anxiety level after the experimental group viewed "media portrayals [video] of terrorism, political violence, and threats to national security" (Slone, 2000, p.515), as well as neutral images. This study indicates that media accounts of violence may in fact contribute to adverse psychological effects such as anxiety.

#### *Stress responses*

The research literature remains inadequate when attempting to find an association between media exposure and psychological distress. Although studies have shown a documented link between media exposure to negative events and psychological distress, research has yet to provide an explanation as to why media exposure of traumatic events might be related to psychological distress. However, an analysis of the literature on stress responses provides a theoretical framework by which we can understand the relationship between media coverage and

psychological impact. Horowitz's (1986) theory of stress response states that prolonged intrusive repetitions of a trauma in thoughts, imagery, emotion, or behavior can be harmful to the psyche. Horowitz's theory also states that the amount of control people perceive themselves to have over the onset, duration, and content of these intrusions is predictive of the outcome of processing efforts. In other words, if a person perceives him or herself to have little or no control over the persistent traumatic intrusions, he or she will have difficulty coping with the event in a psychologically healthy way.

Horowitz's (1986) theory provides a lens for us to understand how exposure to media images may be cognitively harmful. The imagery intrusions Horowitz (1986) mentions can include photographs, video recordings, cognitive thoughts, etc. Thus, repetitive portrayals of traumatic events in media may serve as distressing intrusions under Horowitz's model. In addition, the media's photographs and video accounts of traumatic events can be seen as uncontrollable intrusions because the public has little to no control over when video footage is aired on television and when photographs are published on the front page of newspapers. In my opinion, it is very hard to read a newspaper or change the channel on television without coming in contact with graphic images of recent traumatic events.

To examine the overlap between Horowitz's (1986) stress response theory and American media, we can look to recent American terrorist attacks. Following the terrorist attacks on September 11, 2001, every major newspaper, news channel, and Internet outlet carried 24-hour coverage of the event. Many Americans mourned the tragedy and then proceeded to move on with life. Regardless, the media outlets continued to broadcast live pictures of the recovery effort and newspapers continued to print images of the event on the front page. As audience members, we had little or no control over when, where, and how these intrusive repetitions of

images were coming to our attention. It was impossible to watch TV, read a newspaper or magazine, or browse the Internet without coming across an image of that event. Therefore, according to the theory, presentations of media images of traumatic events may lead to psychological events. Additionally, if these images are intrusive to the point that a person feels as though he or she cannot control when, where, and how often they are subjected to those images, they will be particularly affected.

Alternatively, another effect may also be initiated by the repetition of media images. Rule and Ferguson (1986) found that following repetitive viewing of violent television images, a general population sample became desensitized to the images and were therefore less emotionally affected by them over time. Is it possible that the amount of attention a viewer pays to these images will decrease over time as well, due to a desensitization effect?

#### *Current study*

Drawing on Horowitz's (1986) theory, I propose that because many people do not wish to view images of a traumatic event repeatedly and because people have little or no control over when and how the media presents these images, it is possible that media portrayal of traumatic events has an adverse effect on Americans. Research has shown that media outlets frame news stories in an attempt to bias viewer attention and make the news event more memorable to the audience (Bullock & Cubert, 2002; Entman, 1993). Evidence has also been presented which shows that media exposure to traumatic events can produce adverse psychological effects, such as anxiety (Shapiro, 2002; Elliott, 1997; Slone, 2000). Finally, Rule and Ferguson's (1986) finding that viewers become less emotionally responsive to repeated violent images may also carry over to news media images. It may be possible for a viewer to limit not only his or her emotional response, but also the amount of attention he or she may give to a violent image.

Horowitz (1986) and other's theories give us a way to understand why repeated exposure to traumatic images may have an effect on Americans. Perhaps these psychological effects associated with media exposure to traumatic events are affected by repeated exposure to framed and exaggerated media reports, specifically media images of traumatic events. Past research has demonstrated a relationship between media exposure and distress, however this research does not give us a way of empirically assessing the effects of media exposure in the lab. One way to examine the relationship between media coverage of traumatic events and psychological effects produced by exposure to this coverage might be to analyze how much attention a viewer pays to media images.

Attention biases toward or away from traumatic images may shed light on how that trauma information is being processed in the brain. Several effects may be seen when examining exposure to traumatic media images. For instance, over time, a viewer may begin to lack attentional response to a traumatic image and he or she may be exhibiting an attentional bias in the form of desensitization, away from an image. Conversely, over time a viewer may not lack attentional responsiveness at all and continue to be distracted by a traumatic image. Therefore, he or she may be exhibiting an attentional bias toward that particular image.

Attentional biases toward or away from an image may be different for a viewer who has been subjected to personal trauma. These individuals may demonstrate a different type of attentional bias toward traumatic media images compared to viewers who have not experienced personal trauma. For instance, a viewer who has experienced personal trauma and suffers from post-traumatic stress disorder may aggravate the symptoms of this condition because he or she cannot disengage their attention from a traumatic image. In order to study attention, we turn to

methods of cognitive psychology that evaluate attentional biases associated with repeated media images.

### *Dot-Probe Task*

The dot-probe task has been used in previous studies as a way to measure attention bias in image tasks. In this task, participants are asked to view two images (negative and neutral). In each trial, a negative image appears on one side of the computer screen and a neutral on the other. The images appear on the screen for less than 500 milliseconds. Once the images are removed, a dot appears in the location where either the negative or the neutral image had previously been. The participants are asked to make key presses to indicate the location of the dot. The time it takes to find the dot provides information about the attentional bias caused by the image. For instance, when the dot appears after the negative image the participant tends to find the dot and respond very quickly, this suggests that the participant's attention was focused on the negative image, and thus the participant was able to quickly locate the dot in the same location. In contrast, when the dot appears after the neutral image and the participant takes longer to locate the dot, the longer reaction time may indicate that the individual's attention was drawn to the negative image, and thus took longer to disengage and find the dot in the different location.

In previous studies, two differing effects have been found with the dot-probe task. Using threatening facial stimuli, Macleod, Matthews, and Tata (1986) found a "vigilance-avoidance" response. In this response, a participant views an image and then rapidly averts his or her attention from it in order to avoid aggravating a state of fear. Therefore, the participant has an attention bias toward the neutral image and is therefore quicker to observe the subsequent dot. Conversely, Bowers (1981) found that for some participants, threatening facial stimuli captures

their initial attention and then maintains that attention over time. In this case, participants show an attention bias toward the negative image and are slower to observe the dot.

Using the dot-probe task, we can examine how exposure to traumatic media images can affect the attention of the viewer. Our study has the potential to contribute to the field in our understanding of the way in which media images and media portrayals of traumatic events affect people on a day-to-day basis. Given daily exposure to news about an active war and terrorist threats, this type of work is critical to society today. Using past research from Shapiro (2002) and Slone (2000), constant exposure to traumatic images has an effect on the mental health of our society. To date, though, research has not examined the impact of media images at the level of how our very processing of this information may be altered; studies have relied on self-report methods to examine the relationship between the amount of media exposure and distress. As we come to better understand the effects of repeated exposure to traumatic images, we can find effective ways for the media to communicate potentially traumatic information without contributing to a culture of fear.

### *Hypotheses*

*Attentional biases.* Initial exposure to negative media images will result in attentional biases away from those images and toward the neutral images.

*Desensitization.* Over time, repeated exposure to the stimuli will be associated with a decrease in attentional bias, also known as desensitization.

*Trauma history.* For participants who have previous trauma experience, exposure to traumatic media images will capture the participant's attention and maintain that attention over time creating a large attentional bias towards the negative images. In contrast, participants without trauma history will show a desensitization effect.

## Method

### *Participants*

Our study consisted of 49 undergraduate psychology students (10 men, 36 women, 3 missing) from a small, private university. The participants ranged in age from 18 to 26. The majority of students were white. All participants had 20/20 or corrected vision and spoke fluent English. Participants were compensated with extra credit for their psychology courses or a fee of seven dollars.

### *Materials*

The stimuli in this study consisted of 40 negative and 40 neutral media images (e.g. plane crashes and landscapes, respectively). All images were collected from a public domain (e.g. Associated Press photos) such that images represented photographs that are readily available to the public through newspapers, the Internet, and other media sources. Each of the negative images collected were matched to neutral images collected from the same public domains. Images were matched in a number of ways; for instance, by the number of people in each image, the type of setting, and the number of buildings. Half of the images depicted manmade or interpersonal traumas (e.g. murder scenes) and half depicted naturally caused traumas (e.g. tornado destruction). The images were rated by a six-member panel on a “trauma scale” where 0 = not traumatic and 5 = very traumatic, for the purpose of classifying the images as negative or neutral. Any image rated as “3” or higher was considered a negative image.

### *Procedure*

Following informed consent, participants, tested one at a time, completed a probe-detection task on the computer. In this task, a probe stimulus (in this study the stimuli consisted of one negative image and one neutral image presented side by side) was presented in a specific

spatial location on the computer screen. Following the presentation of the stimulus, a dot appeared in either the same spatial location as the negative image had been presented or in the location where the neutral image had been presented. Participants were asked to make a key press when they observed the dot. Data were collected on the participant's ability to locate where the dot was and their reaction time.

The images were displayed using the computer program E-Prime. Each image was shown in color and sized to 2 x 2 inches. The distance between the images and the edges of the screen was  $\frac{1}{2}$  inch and the distance between the two images was  $\frac{1}{2}$  inch. A standard 17-inch monitor and keyboard were used in each of the tasks. The attention task consisted of 6 practice trials and 188 experimental trials. Each of the images came from a pool of 80 images (20 manmade traumas, 20 manmade neutral images, 20 natural traumas, and 20 natural neutral images). The frequency with which the images were presented was also manipulated. One third of the images were randomly selected to be shown five times throughout the procedure, one third of the images were randomly selected to be shown ten times throughout the procedure, and one third of the images were randomly selected to be shown only once during the procedure. The data collected on these images were used to assess any desensitization effects seen in the results.

The images and dot probes were randomly ordered for each participant within both the practice trial and the experimental trial. Each trial began with a fixation cross in the center of a white screen for 250 ms. The fixation was followed by an image pair (negative and neutral) for 500 ms. Following the image pair, a dot probe was presented in the location of either the negative image or the neutral image. Participants were asked to make a key press as quickly and accurately as possible in response to the location of the probe (left or right). Data were then

collected via the computer as to the participant's reaction time and his or her accuracy in detecting the location of the dot probe.

At the completion of the experimental trials, participants were asked to complete the Edinburgh Handedness Inventory (Oldfield, 1971), The Trauma Symptom Checklist (Briere, 1996), The Brief Betrayal Trauma Survey (Goldberg & Freyd, in preparation), and the Reactions to Research Participation Questionnaire (Newman & Kaloupek, Revised 2001). Finally, participants were debriefed as to the purpose of the study and to acquire information about his or her feelings towards participation in the study.

All data was collected via computer and stored by participant number guaranteeing that the participants' responses were kept confidential. The data were analyzed using the computer program SPSS. After the results of the study were evaluated, participants were offered a feedback form clarifying the purpose of the study and summarizing the results.

## Results

### *Preliminary Analyses*

The data were examined for errors, which were operationalized as trials in which participants made the wrong key press. These trials were omitted from the final data. As in previous studies, all participant response times less than 100 milliseconds (ms) and over 1000 ms were omitted from the data. Data from one participant were removed from the analyses because the mean response times across several conditions were more than three standard deviations above the sample means. The final data included response times and survey responses from 48 participants.

In preliminary analyses of the data, we examined the number of participants who identified as having experienced trauma. Sixteen participants endorsed physical, sexual, or

emotional items on the Brief Betrayal Trauma Survey (Goldberg & Freyd, 2004) and were categorized as interpersonal trauma victims. Thirty-three participants did not endorse physical, sexual, or emotional abuse and were categorized as non-trauma victims and seven participants endorsed having experienced a natural disaster and were categorized as natural disaster trauma victims. However, because the natural disaster victim cell size was so low, we simply included them in the non-trauma category and we will not discuss any further analyses concerning these participants.

Each image category was separated into exposure levels based on the number of times each image was shown to participants (Low exposure = 1 or 2 exposures to images, Medium exposure = 3-5 exposures, High exposure = 6-10 exposures). Means and standard deviations were calculated for each participant's response time based on the image type and exposure level.

#### *Primary analyses*

*Attentional biases.* We hypothesized that on the initial exposure to negative media images, participants would be faster to respond to a dot that followed the neutral images and slower to respond to a dot that followed negative images, thereby showing that the participant's attention was averted from the negative images. The hypothesis was tested using two paired samples t-tests. The first paired samples t-test compared reaction time to locate a dot that followed a negative natural disaster image compared to when the dot followed a neutral natural disaster image. A trend approached significance ( $t(47) = 1.71, p = .09$ ) and suggested that participants were faster to respond to the dot that followed a negative natural disaster image compared to a neutral image. The second paired samples t-test compared reaction time to locate a dot when the dot followed a negative manmade image compared to when the dot followed a neutral manmade image. We found that there was no difference in the time it took participants to

find the dot when it followed negative manmade images compared to neutral manmade images ( $t(47) = .04, p = .97$ ).

In a Post Hoc analysis, a 2 (Image type: natural disaster vs. manmade) x 2 (Probe position: dot follows negative image vs. dot follows neutral image) repeated measures ANOVA was run. The two-way (image type x probe position) interaction was significant,  $F(1,47) = 3.97, p = .005$ , as seen in Figure 1. The interaction, as well as visual examination of the mean response times, indicates that when the dot followed the negative image, participants were faster to respond for natural disaster images compared to manmade images. Conversely, when the dot followed the neutral image, participants were faster to respond for manmade images compared to natural disaster images.

*Desensitization.* The prediction that repeated exposure to negative images would be associated with faster reaction times when the dot followed the negative image (desensitization) was tested. For this analysis, we focused only on conditions under which the dot followed the negative image because previous research on desensitization (Rule & Ferguson, 1986) has shown that desensitization effects occur only with violent or negative images. A 2 (Image type: Manmade vs. neutral) x 3 (Exposure: Low, medium, high) repeated measures ANOVA was performed on all participants' response times to the images. As displayed in Figure 2, the analysis revealed a significant main effect of exposure,  $F(2, 46) = 8.26, p < .05$ , and a significant main effect of image type,  $F(1, 48) = 4.35, p < .05$ . The exposure main effect indicates that people became significantly faster over time at identifying the dot when it followed the negative image. As predicted, this finding shows that desensitization did occur over repeated exposure of images. The main effect for image type indicates that participants took longer to locate the dot when it followed the manmade images compared to the natural disaster images.

*Trauma history.* Finally, the prediction that trauma victims would not show a desensitization effect (i.e. participant response times would not get faster over time) to the exposure of negative manmade media images was also tested. We examined response times in the manmade category and not in the natural disaster category because we thought that people with an interpersonal trauma history would not show desensitization to manmade traumas. We did not have any reason to believe that this would be the case for natural disaster images because there was not sufficient previous research to indicate that this effect would occur. Furthermore, our sample of natural disaster trauma victims contained only seven participants; due to this low cell size, we did not examine these participants' desensitization to natural disaster images. Participants with interpersonal trauma history were compared to participants without interpersonal trauma history on response time over repeated exposure to the negative manmade images.

A 2 (Trauma history: Interpersonal vs. no interpersonal trauma) x 3 (Exposure: Low, medium, high) repeated measures ANOVA was performed on participants' response times to locate the dot when it followed a negative manmade image. The interaction between trauma history and exposure approached significance levels,  $F(1, 47) = 3.79, p = .057$ . As revealed in Figure 3, non-interpersonal trauma victims were faster to find the dot on increasing exposures, whereas the interpersonal trauma victims were not.

## Discussion

### *Attentional Bias*

This study investigated how attention is affected by different image types, varying exposure to those images, and a participant's past trauma history. Based on studies by Entman (1993) and Bullock and Cubert (2002), it was hypothesized that on the initial exposure to

negative media images, participants' attention would be averted from the negative images and toward the neutral images. Participants' attention was assessed by their ability to respond to a dot. Therefore, we hypothesized that participants would be faster to respond to a dot that followed the neutral images and slower to respond to a dot that followed the negative images.

We assume that a participant's attention is averted from or directed towards a particular image based on the participants' response time to the subsequent dot. For instance, if the dot appears after the negative image, the participant may find the dot and respond very quickly. The rapid response time suggests that the participant's attention was focused on the negative image, and thus they were able to quickly locate the dot in the same location. In contrast, if the dot appears after the neutral image and the participant is slow to locate the dot, the longer reaction time may indicate that the participant's attention was focused on the negative image, and therefore the participant took longer to disengage and find the dot in the different location.

We tested the interaction between image category (manmade and natural disaster) and image type (negative and neutral). Contrary to expectations, there was no difference in the time it took participants to find the dot when it followed a negative manmade image compared to a neutral manmade image. Also contrary to expectations participants were faster to find the dot when it followed a negative natural disaster image compared to when the dot followed a neutral natural disaster image. Therefore, we can infer that the viewer's attention was drawn to the negative natural disaster image because he or she was faster to respond to the dot. However, because we did not find a difference in viewer response times to negative and neutral manmade images, we have to infer that participants' did not show an attention bias for manmade images. Therefore, our hypothesis was not supported.

In post hoc analyses we found a significant interaction between image category (manmade and natural disaster) and probe position (dot follows negative image and dot follows neutral image). The interaction implies that, on the whole, when the dot followed the negative images, participants were faster to respond for natural disaster images compared to manmade images; conversely, when the dot followed neutral images, participants were faster to respond for manmade images compared to natural disaster images.

This interaction suggests that people might process human made trauma versus natural disasters differently. Pictures of events caused by other humans (e.g. murder, assault, accidents, etc.) may make the viewer want to avoid seeing the images in order to avoid any negative emotions the image might conjure up. Alternatively, the lack of attention bias for manmade images may have been caused by the particular stimuli chosen for the study. The human induced traumas included images with people, but the natural disaster images did not include human stimuli. Perhaps, simply viewing injured or dead humans causes viewer attention to be averted from negative manmade images. Future studies should use natural disaster images that depict violence against humans in order to assess this effect. Perhaps in these studies, response times will be more evenly distributed between negative manmade and negative natural disaster images. If this result is found, it may show that participants are actively averting their attention from images of humans being harmed.

Finally, in terms of the natural disaster images, it may be that because most people in this sample had not experienced a natural disaster first hand, or because the images are not as disturbing as many interpersonal images are, participant's can focus their attention on the negative images. Therefore, the participant is able to respond faster to the subsequent dot because his or her attention is directed toward the negative natural disaster image. However,

future studies should address the question of how psychologically disturbing the images truly are by creating a scale and asking participants for their opinions.

### *Desensitization*

Based on past research (e.g. Elliott, 1997; Rule & Ferguson, 1986; Shapiro, 2002; and Slone, 2000), it was hypothesized that as participants viewed the images over time their initial attention bias would begin to decrease. A decrease in attention bias, as reflected by changes in reaction times, was predicted to reflect desensitization to the images. The hypothesis was supported. As number of exposures increased, participants' reaction times changed in the predicted direction. Participants' initial attention bias was toward natural disaster images when the dot followed negative images and toward manmade images when the dot followed the neutral images. After repeated exposures, however, viewer attention was more evenly distributed across image type and participants were faster to make a key press in response to seeing the dot. This finding shows that over time, participants' attention was not as strongly drawn toward a negative or neutral image, but was instead more evenly spread across all image types. The decrease in reaction time seen here can be considered a proxy of desensitization.

A study on desensitization to violent television programs by Rule and Ferguson (1986) found that a lack of participant emotional response to negative stimuli created a desensitization effect. This study may have replicated a lack of viewer emotional response to the images. Thus, the decreasing reaction time over repeated exposure in the current study may reflect a similar process by which the viewer's emotional response decreases over time allowing their attention to be focused on the negative image (and subsequently making a faster response to the dot located in that location). However, because we did not assess viewer's emotional reaction to the images, we have to consider alternative explanations for the desensitization effect. For instance, the

change in reaction times over multiple exposures may reflect a practice effect by which participants were able to make faster key presses in response to seeing the dot. Over time, participants may have simply pressed the button because they knew the dot was going to appear and they had learned that making a key press in response to the dot was the correct action. Future studies should focus on developing a way to control for practice effects to adequately make generalizations regarding desensitization effects.

### *Interpersonal Trauma Victims*

It was hypothesized that exposures to traumatic manmade media images would capture participants' initial attention and maintain that attention over time for participants who had a previous trauma history. Such a pattern would indicate that individuals with a trauma history did not show desensitization to the images. A trend approached significant interaction between negative manmade images and interpersonal trauma history. This interaction suggests that over time, trauma victims tended not to decrease their reaction times to negative manmade images as steadily as non-trauma victims. Therefore, trauma victims did not experience as large of a desensitization effect.

Our findings indicate that on initial exposure to negative manmade images, trauma victims are slower than non-trauma victims to respond to a dot that follows those negative images. This finding indicates that trauma victim's attention was averted away from the negative image. However, over repeated exposures to the negative images, trauma victims become slightly faster at responding to a dot that follows the negative images. Yet, they do not decrease their response times to the dot as significantly when compared to non-trauma victims. This finding indicates that trauma victims are continuously averting their attention from negative manmade images even over repeated exposures.

There are many ways to interpret this finding. Victims of trauma may avert their attention from negative images because of their previous negative experience, as Macleod, Matthews, and Tata (1986) found. Therefore, it continuously takes trauma victims longer to respond to a dot that follows a negative image. It may be that once a person experiences a trauma, he or she is then hypersensitive to violent or traumatic stimuli. In this case, those stimuli could be considered negative manmade media images. However, due to low power and unequal cell size biases in this study, we must be cautious in generalizing this finding. Future studies should include an even number of trauma and non-trauma victims to more adequately examine attentional biases within trauma victims.

### *Implications*

These effects may have implications for the world of media images. Our findings indicate that viewers may be processing images of manmade traumas and images of natural disasters differently. Interpersonal violence is commonly seen in images of war, crime scene photos, and transportation accident images. One can find these images 24 hours a day on any news channel. However, images of natural disasters are not as commonly shown, perhaps because of the lack of interesting imagery associated with them. Our findings that when the dot follows a negative image, viewers are faster to respond to natural disaster images may indicate that viewer attention is being averted from negative manmade images. However, this main effect comes into question with the finding that there was no difference in response time between negative and neutral manmade images. Based on our findings, it is difficult to interpret if viewer attention is averted or directed toward the negative manmade images because participants had relatively equal response times to both negative and neutral manmade images. What this study

does indicate is that images of manmade trauma and natural disaster trauma are being processed differently by viewers.

In terms of desensitization, our findings have interesting implications. Important media events are shown and discussed repeatedly throughout time. For example, two and a half years after the terrorist attacks of 9/11, the event is discussed and shown on news channels almost weekly. This study indicates that the repeated exposure to those images may change the amount of attention a viewer gives to those images. This study found that over repeated exposure, viewer reaction times decreased for both image types, indicating that viewer attention changed over time in comparison with the initial exposure to the images. However, viewers with a trauma history tended to continuously avert their attention from negative images, even over repeated exposures suggesting that desensitization did not occur.

The suggestion that viewers will change the amount of attention paid to negative images over time is consistent with Horowitz's (1986) theory of stress response. The theory centers on the idea that prolonged intrusive repetitions of a trauma can be harmful to the psyche. The theory also states that the amount of control a person perceives themselves to have over the onset, duration, and content of the intrusions will determine how well he or she can process the information. In this study, participants were shown images repeatedly and the viewers did not have any control over what images they saw, when they saw the image, or how many times the image was shown. According to Horowitz (1986), these participants should therefore have a difficult time processing the images. If a viewer is constantly averting their attention from negative stimuli, even after repeated exposure, similar to the trauma victims in this study, does that mean that he or she is not processing the image in a healthy manner? Alternatively, is a viewer who becomes desensitized to a negative image the one who is not processing the image in

a healthy manner? Future studies in this domain should place a greater emphasis on desensitization and attempt to determine which effect is more problematic, the desensitization effect shown by non-trauma victims or the non-desensitization effect shown by interpersonal trauma victims.

### *Limitations & Future Directions*

This study does not replicate the natural way in which Americans absorb news media. In the lab, viewers are not exposed to verbal commentary or video footage; they are simply viewing a still image for 500ms. We are cautious to generalize these findings to real news media outlets, however it does bring up interesting questions to be addressed in future studies.

Returning to the example of repeated media images of the September 11<sup>th</sup> terrorist attacks, it is apparent that the constant exposure to these images may be affecting our society in the way in which we process negative media images. As Americans become less emotionally reactive to the images, it may be possible that the meaning of the event will lose significance to the audience.

Future studies in this domain should focus on desensitization and how other populations emotionally react to negative images over time. These studies should also examine how desensitization effects interact with memory and opinions on race, gender, sexual preference, etc. Future studies may be able to detect, for instance, how females react to negative media images as opposed to males. Females may react in a more emotional way to the images, while males react in a more curious fashion. Future studies should also strive for greater demographic diversity, as this study contained a limited number of male participants and participants of different race and class backgrounds. In conjunction with this suggestion, subsequent studies should gain a sample with more life experience. The majority of the sample in this study were college students who

came from upper-middle class families. A sample collected from women's shelters, substance abuse centers, prisons, or foster care centers would be beneficial to better understand how these effects transpire in trauma victims.

The images used in this study depicted a variety of events dating back 10 to 15 years. For some of the participants, these events occurred when they were children. Images that depict more recent events or images that are customized toward the ages of the participants would be beneficial in future studies. Similarly, a more in depth look at where participants access media images, for instance through newspapers, television, or the Internet would improve later studies understanding of how people process media related information. How an audience member processes media images or text may depend on which medium he or she uses to get the news. For instance, do viewers process video images differently than still images? Does newscaster commentary affect viewer processing or attention biases?

### *Conclusions*

The greatest contribution of this study may be the application of an existing experimental paradigm to the study of media effects on information processing. In terms of the trauma literature, this study implies that victims of trauma may be processing negative images differently than non-trauma victims. These findings lead to more questions regarding the effects of media on the mental processing of viewers and in what other ways negative media can affect the processing and emotions of trauma victims.

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Figure Captions

*Figure 1.* Mean response times for each image category.

*Figure 2.* Mean response times of participants over exposure levels in valid trials in each image condition.

*Figure 3.* Mean response times of interpersonal trauma victims and non-trauma victims over exposure levels in valid trials in manmade image condition.





