Vulnerability or resilience tweets? A comparative analysis of media Outlets vs. non-governmental organizations visual representations of the 2023 Morocco earthquake survivors

Abstract

This comparative study explores the vulnerability/resilience visual framing pattern in the survivors-related visuals tweeted by 16 media outlets and 18 non-governmental organizations during the 2023 Morocco earthquake. The study proposes a vulnerability/resilience framework and investigates its potential impact on X engagement metrics. The results indicate discrepancies between media outlets and non-governmental organizations in their vulnerability/resilience perspectives as well as their gendered representations of the survivors. Theoretical and practical implications of visual framing and strategic crisis communication are further discussed.

Introduction

Natural disasters pose a significant threat to communities, with far-reaching consequences extending beyond the primary zone of the initial tragedy. Therefore, media outlets and NGOs usually spotlight them with immediate coverage (Ali, 2013). However, although both media outlets and NGOs play crucial roles during disasters, their communication strategies differ, as media outlets mostly focus on informing the public and raising their awareness, while NGOs are heavily concerned with raising funds and aiding disaster victims (Seo & Vu, 2020). The latter diverse goals often influence the communication perspectives, which have not been comparatively analyzed to date.

The affordances of social media, especially X, formerly Twitter, have promoted it as an effective communication channel during disasters (Spence et al., 2015). X becomes even more effective with visual storytelling, which can break through cluttered feeds, as visuals are the first items readers notice (Geise, 2017). Even though visuals have been found to convey urgency and evoke emotions, little is still empirically known about whether NGOs and media outlets use

visuals and portray survivors differently during disasters (Lee et al., 2022). Previous scholars predominantly focused on media messages and generic disaster images, with little attention to human aspects and NGOs' messages.

The present study addresses this gap by comparatively analyzing the survivors-related visuals tweeted by 16 media outlets and 18 NGOs during the 2023 Morocco earthquake. The researcher proposes a vulnerability/resilience framework, building on previous literature on victim/survivor portrayal and guided by Rodriguez and Dimitrova's (2011) visual framing model. The proposed framework uncovers whether media outlets and NGOs deliberately constructed vulnerability/resilience visual frames. The study further analyzes the impact of the vulnerability/resilience framework on X engagement metrics. It also analyzes the survivors' gendered representations through the lens of vulnerability/resilience and seven gendered representation themes, aiming to understand the ideological motivations behind constructing vulnerability/resilience.

This study is imperative as it is among the earliest to analyze NGOs and media coverage in a comparative approach. It also explores the potential impact of visual framing on X engagement and extends the scarce literature on natural disaster survivors' portrayals and gendered representations. Interestingly, it discusses theoretical and practical implications pertaining to vulnerability/resilience as a proposed framework for analyzing the deliberate construction of victims/survivors' representations, aiming to facilitate future analysis of survivor portrayals and shed light on the most effective frames in eliciting public responses.

Context: Morocco 2023 Earthquake

On September 8, 2023, a devastating 6.8-magnitude earthquake struck the High Atlas Mountains in Al Haouz province, approximately 72 kilometers southwest of Marrakesh, a city of 840,000

inhabitants and a popular tourist destination. Following the earthquake, several aftershocks, including a 4.9-magnitude quake, were recorded over eight consecutive hours ("Morocco Earthquake," 2023). Besides the initial quake, the aftershocks led to approximately 3,000 deaths and 15,000 injuries across nine Moroccan provinces ("Morocco Earthquake: Latest," 2023).

The World Health Organization estimated that the earthquake affected 300,000 people in Marrakesh and its surroundings; the United Nations Children's Fund (UNICEF) said this number includes at least 100,000 affected children, who account for nearly one-third of Morocco's population (Metz & Elshamy, 2023). Further, the earthquake caused extensive devastation to Moroccan villages, cultural sites, and UNESCO historical landmarks. The United States Geological Survey (USGS) described the earthquake as the strongest to hit the North African region in over a century ("Morocco Earthquake," 2023).

Media vs. NGOs Communication of Natural Disasters on X

Natural disasters are unforeseen events that pose a threat to the whole community. When not addressed effectively, they usually escalate into crises with severe economic, political, and environmental consequences (Dogra, 2007). Because of the potential impact of natural disasters, media outlets and NGOs frequently pay close attention to them (Lee et al., 2022). However, the media often limit their coverage to the initial phase of the disaster, reporting up-to-date information about the destruction and the casualties (Blondheim, 2003), while NGOs persist in documenting the aftermath throughout mitigation, preparedness, response, and recovery phases (Lee et al., 2022).

Although both media outlets and NGOs play crucial roles in addressing natural disasters, their communication strategies differ. Media outlets focus on informing the public and raising their awareness about the crisis. Their coverage often focuses on providing up-to-date information

about the disaster's impact and casualties and promoting safety measures to account for future disasters (Blondheim, 2003). NGOs, while addressing similar goals, are mostly concerned with raising funds, aiding disaster victims, and mobilizing support for their relief efforts (Seo & Vu, 2020). Their coverage focuses extensively on reporting their relief actions in the field rather than generic crisis data (Deacon, 2003).

Media reporters, although being among the first responders to disasters, are often in the field to broadcast the event rather than to serve a direct humanitarian cause (Dogra, 2007). However, NGOs rely on the media for publicity to raise their public profile (Ali, 2013). In other words, NGOs and media coverage are complementary to each other. The "public attention built up by media coverage activates civil society, relief activists, and NGOs to come forward for rescue, relief, and rehabilitation activities" (Ali 2013, p. 128). Interestingly, although the diverse goals of media outlets and NGOs can influence their coverage perspectives, this does not imply that one is more truthful than the other (Dogra, 2007).

Social media affordances, including its permanency, interactivity, and affordability, facilitate crisis communication (Seo & Vu, 2020). Therefore, both media outlets and NGOs have shifted their emergency and crisis communication to social media to expedite their information dissemination process and facilitate coordination during crises (Pond, 2016). More specifically, X has evolved into a legitimate source of crisis information and breaking news due to its hashtag feature, which enables users to locate updates in a timely manner (Spence et al., 2015). Tweets' concise nature makes them exceptionally effective for disseminating real-time disaster information (Hughes & Palen, 2009). Concise crisis-specific updates enhance individuals' situational awareness (Pond, 2016). When accompanied by visuals, they even evoke a greater sense of immediacy and transcend linguistic barriers (Lee et al., 2022). The platform further

facilitates virtual collaboration, enabling engagement with the content, and thereby mobilizing support for those affected by crises (Raja-Yusof et al., 2016).

Although media outlets consider X an essential communication channel during crises (Poulsen, 2007), and even though NGOs depend extensively on the platform as part of their relief efforts (Tucker, 2011), X is not without limitations. It is overwhelmed with vast amounts of information, which might hinder users' ability to locate valuable updates (Chung & Lee, 2019). Even when users try to filter the content using keywords and hashtags, they might encounter irrelevant tweets, known as *noise* (Pond, 2016). Additionally, X, like most digital platforms, has become dominated by mis/disinformation, leading to confusion among users regarding what to believe (Gupta et al., 2013).

Moreover, Pond (2016) argues that X, being a real-time platform, accelerates the meaning-making process to an extent that poses challenges for crisis response activities, as users struggle to keep pace with the rapid updates. Therefore, visual storytelling becomes crucial to crisis coverage as it can effectively break through the clutter on X (Lee et al., 2022); visuals can stop users from scrolling through cluttered feeds as they depict vivid moments of what is happening (Chung & Lee, 2019). They can also enhance situational awareness by offering real-time depictions (Pond, 2016). In the context of earthquakes, Ali (2014) argues that audiences pay more attention to shocking images than factual statements. He noted that "although language can capture a wide range of human experience, it simply fails when it comes to pain. Hence, the visual representation of a natural disaster makes a lasting impression on the minds and souls of humans" (p. 37). Even though visuals have been found to create a sense of urgency and evoke emotions during disasters, little is still known about whether NGOs and media outlets use visuals differently on X to achieve their diverse goals.

Visual Framing of Natural Disasters

Framing is to highlight "some aspects of a perceived reality and make them more salient" (Entman, 1993, p. 52). Visual framing is a form of visual communication that emphasizes specific aspects to boost its significance. It is a multi-step process, resulting from many decisions, such as the aspects to be captured, the overall composition, and their integration into the whole story (Geise, 2017). Although framing research is extensively focused on media messages as the primary source for impacting public opinion, Corell and Betsill (2008) found that NGOs rely heavily on public perceptions to exert a social impact and gain public support.

Jenkins (2006) suggested that NGOs communication relies on "a conception of the social problems that they address and a convincing method for bringing about change" (p. 322). Also, Lee et al. (2022) suggested that the amount of framing in NGOs' messages might be more impactful than media frames, which often focus on the disaster's initial phase, while NGOs continue further in the aftermath. Building on the latter, the present study explores the applicability of the framing theory to NGOs communication by comparatively analyzing the survivors-related visual frames in media vs. NGO coverage of the Morocco earthquake.

More specifically, Entman (1991) noted that visuals can be used to emphasize or deemphasize victims. Accordingly, several scholars adopted a framing approach to analyze victims portrayal in various contexts, including migration (e.g., Amores et al., 2019), sexual assault (e.g., Nwabueze et al., 2015), and domestic violence (e.g., Berns, 2017). However, research on disaster survivors is still scarce. Even studies that applied a framing approach to natural disaster coverage focused on the generic images of the disaster with little attention to human aspects.

Vulnerability/Resilience Visual Frames

Vulnerability is the "potential for casualty, destruction, damage, disruption, or other forms of

loss" (Forbes-Mewett 2019, P. 14). It has two sides—external and internal. The external side refers to the risks a person encounters throughout his life journey, while the internal refers to the human inability to cope with loss (Azad, 2013). Resilience highlights the capabilities of individuals to cope with loss. It is a positive attitude that reflects proactivity (Sun & Liu, 2023). It could be classified into two types—inherent and adaptive. Inherent resilience is the ability to cope with everyday situations, while adaptive resilience is the ability to cope with crises (Rose, 2014). Factors that determine vulnerability/resilience might be biological, economic, or social, which all vary from one community to another, except for the biological ones (Fordham, 1999). Wisner et al. (2004) emphasized that external factors are more impactful in shaping vulnerability/resilience, which are "determined by social systems and power, not by natural forces" (p. 7).

Hansson et al. (2020) highlighted communication as one of the main factors that increase or decrease vulnerability during crises. Pond (2016) further noted that leveraging X effectively during crises can support resilience-building efforts by providing real-time updates, ensuring accurate temporal and spatial context, and integrating vivid visuals to enhance situational awareness and crisis response coordination. In addition, Neumayer and Plümper (2007) indicated that media representations heavily influence vulnerability. The latter is consistent with the fundamental tenet of framing theory, which contends that the way media messages are framed can affect how people perceive and react to framed issues (Entman 1991). Kortendiek and Oertel (2023) experimentally examined the impact of UNHCR's visuals of refugees on shaping Germans' perceptions of them, revealing that refugees portrayed as vulnerable are likely to be perceived as dependent, and accordingly, German citizens become less willing to accept them in the country. Hence, understanding how communicators portray survivors/victims is crucial,

especially since communication messages are subject to biases. In this regard, Bankoff (2001) indicated that outsiders constantly attribute vulnerability to indigenous populations during catastrophes to legitimize Western intervention.

Although they have not explicitly defined vulnerability and resilience, previous studies have implicitly yielded both frames (e.g., Borah & Irom, 2021; Ticktin, 2016). They indirectly showed that victims are usually portrayed from (1) A vulnerability perspective, whereby humans are portrayed as helpless, passive, dependent, weak, and incapable, or (2) A resilience perspective, whereby humans are portrayed as successful, active, capable, independent, and competent. Therefore, the present study proposes vulnerability/resilience as a holistic framework for analyzing victim/survivor portrayal. A vulnerability visual frame is defined as a pictorial depiction that reflects gender stereotypes and portrays individuals as passive, powerless, and in need of assistance. A resilience visual frame is defined as a pictorial depiction that reflects gender equality and portrays individuals as active, capable, and resilient. Accordingly, the researcher proposes the following research questions:

RQ1. From the vulnerability/resilience perspective, how differently did media outlets and NGOs visually portray the 2023 Morocco earthquake survivors on X?

RQ2. What key indicators did media outlets and NGOs rely on to emphasize vulnerability/resilience in their tweets?

[Insert Figure 1 about here]

Rodriguez and Dimitrova (2011) postulated that visual frames are constructed based on four levels—denotative, stylistic, connotative, and ideological. The denotative level reveals the portrayed elements, such as the survivors, their gender, and age; the stylistic level focuses on the image's composition, the connotative level reflects the bigger concepts the image conveys, such

as vulnerability and resilience in the current study; and the ideological level reflects the convictions and motivations of the communicators. Guided by this model, the current study aims to predict the denotative and stylistic elements that construct vulnerability and resilience as connotative visual frames, following Dan's (2018) note that the elements employed at the denotative and stylistic levels are integral to the framing of people. Such denotative elements include age and gender, and stylistic elements include camera angles and nonverbal behaviors.

Camera angle denotes the camera placement relative to the person being photographed. A high angle looks down on the photographed person; a low angle looks up at the photographed person; and an eye-level angle looks straight to the eye level of the photographed person (Gale & Lewis, 2019). Previous scholars found that camera angles can impact how photographed people are perceived, concluding that low-angle shots reflect more power and dominance, while high-angle shots reflect powerlessness and weakness (Coleman & Wu, 2015). Nonverbal behaviors are actions captured on camera to communicate meanings; Coleman and Wu (2015) emphasized facial expressions as the most impactful non-verbal behaviors in shaping public perceptions due to their ability to convey emotional reactions to the depicted issues. Another crucial non-verbal behavior is the interaction between the portrayed individuals, which reflects the power dynamics among them; "passive, weak, dependent people are targets of others' action, while vibrant and strong individuals act themselves" (Dan, 2018, p. 24).

Denotatively, previous scholars found that women are usually portrayed in stereotyped roles and shown as emotional, sensitive, and dependent. Conversely, men are often portrayed as active, independent, and successful (Cohen, 2013). Visuals of children convey innocence and dependence, as they are often accompanied by adults to reflect their need for protection (Hove, 2013). Conversely, adult portrayals reflect maturity and independence (Strasburger et al., 2009).

Building on the aforementioned, the study proposes a vulnerability/resilience framework to explore whether media outlets and NGOs deliberately constructed vulnerability/resilience in their visual-tweets (see Figures 2 & 3):

H1. To construct a vulnerability visual frame, media outlets, and NGOs portrayed (a) women and children survivors from (b) high camera angles, (c) negative facial expressions, and (d) passive interactions.

[Insert Figure 2 about here]

H2. To construct a resilience visual frame, media outlets and NGOs portrayed (a) men and adults from (b) low camera angles, (c) positive facial expressions, and (d) active interactions.

[Insert Figure 3 about here]

Vulnerability, Resilience, and Gendered Representations

Natural disasters are not gender-neutral; women are more vulnerable to the disasters' adverse effects (Nelson et al., 2022). This often stems from their adherence to stereotypical gender-specific morals such as guilt, dignity, and the duty to protect their privacy at all costs (Mitchell et al., 2007). Such stereotypical beliefs prevent women survivors from seeking medical treatment for their physical and psychological problems resulting from a disaster (Cannon, 2002). Also, the anxiety men experience during a catastrophe aggravates violence against women, including sexual violence, especially when men lack adequate counseling and support (Ali, 2014).

Women's vulnerability is a socially constructed phenomenon influenced by everyday socioeconomic patterns and reinforced by media representations (Neumayer & Plümper, 2007). Although women might be capable of dealing with disasters' aftermath, this capability has often been overlooked, as media portrayals reinforce existing inequalities, which increase the gap

between men and women and hinder women from coping with disasters (Ali, 2014). For decades, women have been portrayed stereotypically from the perspectives of romance, glamour, and exoticism (Mthala, 2000). Even on digital platforms like X, women's stereotypical portrayals as emotional and dependent are prevalent, especially in online advertisements (Gupta, 2013). During disasters, women are usually depicted as passive and helpless victims who await external aid. Visuals of women survivors always show them shocked, grieving, or confused (Ali, 2014), which contributes to distorted images, resulting in more vulnerability among women (Korf, 2007).

Although NGOs are expected to be constructive and advocate gender equality, previous studies found that they sometimes depict vulnerable women to elicit sympathy and, therefore, get more donations. Dogra (2011) found that most NGOs' fundraising messages in 2005 portrayed vulnerable women and children, such as starving children, crying children accompanied by their mothers, and young mothers awaiting aid. These, along with media representation, have intensified perceptions of women's vulnerability (Cohen, 2013). The present study explores whether NGOs and media outlets continue to reinforce stereotypical representations on X, aiming to understand their ideological convictions. Therefore, the researcher proposes the following hypothesis and research question:

H3. While tweeting about the 2023 Morocco earthquake survivors, media outlets and NGOs visually framed (a) women from a vulnerability perspective and (b) men from a resilience perspective.

RQ3. What were the dominant gendered representation themes that media outlets and NGOs employed in their visual-tweets about the 2023 Morocco earthquake survivors?

Vulnerability, Resilience, and X Engagement

Social media engagement is a construct that describes how users interact cognitively, emotionally, and behaviorally with online content (Smith & Gallicano, 2015). Users are no longer passive recipients of media messages. They actively engage, react, and add their perspective (Shao, 2009). Previous scholars have highlighted the importance of analyzing engagement as an indicator of effective communication (Shao, 2009). Analyzing how people react to online tweets—through likes, retweets, and comments—can determine how they feel about the content (Bennett et al., 2011).

Abitbot and Lee (2017) noted that visuals motivate higher engagement. Several studies reached a similar result when analyzing Facebook posts, concluding that visuals are highly associated with more likes and shares (Kim & Yang, 2017). Li and Xie (2020) indicated that the way visuals are framed might also impact engagement. In this context, Ordenes et al. (2019) found that visuals with a call to action lead to more engagement than those communicating mere information. Lee et al. (2022) found that online messages with a *relief effort* visual frame generate more likes on X. Based on the aforementioned, the current study examines the impact of vulnerability and resilience visual frames on X engagement metrics, i.e., likes, comments, and retweets, aiming to understand which visual frame generates higher engagement among X users. Therefore, the researcher proposes the following research question:

RQ4. Which visual frame (Vulnerability/Resilience) generated the most engagement, i.e., (a) likes, (b) comments, and (c) retweets, for media outlets and NGOs visuals about the 2023 Morocco earthquake survivors?

Method

Data Collection

This study uses systematic quantitative content analysis to investigate the vulnerability/resilience

visual framing pattern in the tweets of 16 media outlets and 18 NGOs during the Morocco earthquake. X was determined to be an ideal platform for this project due to its high prominence during disasters (Spence et al., 2015). Twitter Advanced Search was used to extract all English visuals tweeted by a media outlet or an NGO during the sample period, which began when the earthquake struck on September 8, 2023, and was extended for one month until October 8, 2023. This time frame captures the initial reaction to the disaster. The following English keywords were used to extract the tweets: *Morocco, Earthquake, Moroccan Earthquake, and Survivors.* The visual-tweets were filtered manually to include only those depicting at least one survivor. The final corpus yielded 449 tweets, divided between the media outlets (n = 260) and the NGOs (n = 189).

Media outlets' tweets happened to originate from the following national and international outlets: AP, AFP, France24, The Telegraph, AlArabiya, Middle East Eye, CNN, DW, BBC, NBC, CBS, Al Jazeera, Sky News, New York Times, Arab News, and The Wall Street Journal. NGOs tweets happened to originate from the following national and international organizations: International Rescue Committee, Doctors Without Borders, UNICEF, People In Need, Human Aid Initiative, Action for Humanity, Islamic Relief, The Obama Foundation, Global Giving, World Central Kitchen, Action Aid, Give Directly, International Federation of Red Cross and Red Crescent, Humanity First, Catholic Review, World Food Program, High Atlas Foundation, and Oxfam International.

Coding Scheme

The unit of analysis is every single visual-tweet. For multi-image tweets, each image was coded separately. First, the researcher coded each tweet for descriptive purposes, i.e., tweet link, source: media/NGO, and type: image or meme, i.e., image with text. Then, the following variables were

coded:

Dominant visual frame: To capture the dominant visual frame for each visual-tweet (i.e., vulnerability/resilience), the researcher coded for indicators adapted from Kortendiek and Oertel (2023).

Vulnerability indicators: (1) Survivors receiving aid, (2) survivors passively waiting in crowded camps or amid the rubble, (3) survivors grieving heavily, (4) survivors sleeping in the streets or camps, (5) survivors begging for help, and (6) N/A.

Resilience indicators: (1) Survivors providing help for others, (2) survivors actively working to rebuild, (3) survivors smiling or hoping for a better future, (4) survivors assisting the volunteers or facilitating their missions, and (5) N/A.

Denotative elements: To understand whether vulnerability and resilience were purposefully constructed at the denotative level, the researcher coded for (1) Survivors Gender and (2) Age.

Survivors Gender. (1) Men, (2) Women, and (3) Both.

Survivors Age. (1) Adults, (2) Children, and (3) Both.

Stylistic elements: To understand whether vulnerability and resilience were purposefully constructed at the stylistic level, the researcher coded for (1) Camera Angle, (2) Survivors Facial Expressions, and (3) Survivors Interaction.

Camera Angle. (1) high camera angle for images captured from an above-eye level, (2) regular camera angle for images captured from an eye level, and (3) low camera angle for images captured from a below-eye level.

Survivors Facial Expressions. (1) positive for images portraying a happy/smiling survivor, (2) negative for images portraying a sad, suffering, or angry survivor, and (3) neutral for images portraying a poker face.

Survivors Interactions. (1) passive for images portraying survivors as targets of others' actions and (2) active for images portraying survivors who exert actions themselves.

Gendered Representation: The following themes were adopted from Ali (2014): (1) men as savers, (2) women as homemakers, (3) women are physically and emotionally weak, and (5) women are capable. Two more categories were added for exhaustivity: (6) men are physically and emotionally weak, and (7) men and women are equal.

[Insert Table 1 about here]

X Engagement: The researcher separately inserted the frequency of likes, comments, and retweets for each unit and the number of followers of each X account to control for its intervention role.

Intercoder reliability:

The researcher coded the whole sample (n=449). To ensure reliability, an outsider coder was trained on (n=15) visuals and then coded 10% of the sample (n=45). Scott's pi values were acceptable for all variables and ranged from .87 to .100.

Data Analysis

IBM SPSS was used to analyze the data. Chi-square tests were run to explore the variations among frequencies and the statistical significance of each coded variable. Another series of Chi-Square and Cramer's V tests were conducted to examine the role of the proposed denotative and stylistic elements in constructing vulnerability/resilience visual frames. A Binary Logistic Regression was run to test the goodness of fit and the overall statistical significance of the proposed framework. Negative Binomial Regressions were run to examine the impact of vulnerability and resilience on X engagement metrics; this test was determined to be ideal given the overdispersion in engagement data.

Results

The corpus included 449 visual-tweets divided into 260 (57.9%) by media outlets and 189 (42.1%) by NGOs. Exactly 98% of the tweets were images, while only 2% were memes. The average likes the tweets received were 66 (SD=126.05), ranging from 0 to 4048. The average retweets were 27 (SD=68.90), ranging from 0 to 1445. The average comments were 5 (SD=16.66), ranging from 0 to 266. The latter implies an overdispersion in all engagement metrics.

The analysis revealed statistically significant differences between media outlets and NGOs in portraying the earthquake survivors ($\chi 2=26.38$, $p=.001$). Media outlets mostly adopted a resilience perspective in (57.3%) of their tweets, while NGOs mostly adopted a vulnerability perspective in (67.2%) of their tweets. As shown in Table 2, the most widely employed vulnerability indicator was passive survivors; almost one-third of NGOs' tweets (31.2%) and (21.2%) of media outlets' tweets portrayed survivors passively waiting amid the rubble. The least employed vulnerability indicator by NGOs (3.2%) and Media outlets (1.9%) was survivors begging for help.

[Insert Table 2 about here]

The most employed resilience indicator by media outlets was survivors actively working to rebuild, appearing in (30%) of their tweets, while the most used resilience indicator by NGOs was survivors assisting the volunteers, appearing in (13.8%) of their tweets. NGOs' least employed resilience indicator was survivors providing help for others, appearing in only (4.2%) of their tweets. Media outlets' least employed resilience indicator was survivors hoping for a better future, appearing in only (9.6%) of their tweets.

H1 predicted that vulnerability visual frames were deliberately constructed. Results from a

Chi-Square test showed statistically significant support for the impact of the hypothesized elements. Also, results from Cramer'sV test revealed that each of the predicted elements was more strongly correlated to constructing vulnerability than resilience. Women were present in (21.8%) of the vulnerability tweets (Cramer'sV=.38, *p*=.001) compared to only (8.7%) of the resilience tweets (Cramer'sV=.32, *p*=.001); Children were present in (5.1%) of the vulnerability tweets (Cramer'sV=.28, *p*=.001) compared to only (1.1%) of the resilience tweets (Cramer'sV=.25, *p*=.001); Survivors were photographed from high angles in (21.6%) of the vulnerability tweets (Cramer'sV=.42, *p*=.001) compared to only (4.9%) of the resilience tweets (Cramer'sV=.36, *p*=.001).

[Insert Table 3 about here]

Survivors were shown with negative expressions in (15.1%) of the vulnerability tweets (Cramer'sV=.53, *p*=.001) compared to only (1.8%) of the resilience tweets (Cramer'sV=.36, *p*=.001); Survivors engaged in passive interactions in (51%) of the vulnerability tweets (Cramer'sV=.93, *p*=.001) compared to only (2.2%) of the resilience tweets (Cramer'sV=.92, *p*=.001). Moreover, results from a Binary Logistic Regression showed statistically significant support for the proposed vulnerability framework as a whole ($\chi 2$= 513.87, OR=7.86, 95% CI, *p*<.001), which indicates a strong correlation between all hypothesized predictors and vulnerability. Additionally, the substantial differences in the percentages of the predictor elements present within vulnerability frames, supported by statistical significance, indicate that their presence was not coincidental. Instead, they were purposefully employed to construct vulnerability visual frames.

H2 predicted that resilience visual frames were deliberately constructed. Results from a Chi-Square test showed statistically significant support for the impact of the hypothesized

elements. Also, results from Cramer'sV test revealed that each of the predicted elements was more strongly correlated to resilience than vulnerability. As shown in Table 4, men were present in (31.2%) of the resilience tweets (Cramer'sV= .40, *p*=.001) compared to (18.2%) of the vulnerability tweets (Cramer'sV=.38, *p*=.001); Although adults were present in (39.6%) of the vulnerability tweets compared to (31.6%) of the resilience tweets, Chi-Square and Cramer'sV tests showed a stronger association between adults' existence and resilience (Cramer'sV=.37, *p*=.001) rather than vulnerability (Cramer'sV= .35, *p*=.001).

[Insert Table 4 about here]

Survivors were photographed from low angles in (21.6%) of the resilience tweets (Cramer'sV=.50, *p*=.001) compared to only (.8%) of the vulnerability tweets (Cramer'sV=.46, *p*=.001); Survivors were shown with positive expression in (5.8%) of the resilience tweets (Cramer'sV=.59, *p*=.001) compared to only (.9%) of the vulnerability tweets (Cramer'sV=.23, *p*=.001). Survivors engaged in active interactions in (45.2%) of the resilience tweets (Cramer'sV=.93, *p*=.001) compared to only (2.2%) of the resilience tweets (Cramer'sV=.92, *p*=.001). Moreover, results from a Binary Logistic Regression showed statistically significant support for the proposed resilience framework as a whole ($\chi 2$ = 499.238, OR=2.23, 95%CI, *p*<.001), which indicates a strong correlation between all hypothesized predictors and resilience. Additionally, the substantial differences in the percentages of the predictor elements present in resilience frames, supported by statistical significance, indicate that their presence was not coincidental. Instead, they were purposefully employed to construct resilience visual frames.

H3 predicted that media outlets and NGOs visually framed women from a vulnerability perspective and men from a resilience perspective. Results from a Chi-Square test revealed statistically significant support for the latter ($\chi 2$= 46.62, *p*=.001). Both media outlets and NGOs

visually portrayed women from a vulnerability perspective in (18.8%) and (26%) of the tweets, respectively. Further, media outlets and NGOs visually portrayed men from a resilience perspective in (32.7%) and (29.1%) of the tweets, respectively.

Further, results from a Chi-Square test revealed statistically significant differences ($\chi 2=22.80$, $p=.001$) among seven gendered representation themes. The most employed theme by both media outlets and NGOs was Men as Savers, appearing in (36.2%) of media outlets' tweets and (33.9%) of NGOs' tweets. The second most employed theme by media outlets was Men and Women are Equal, appearing in (19.2%) of their tweets. Conversely, the second most employed theme by NGOs was Women are Physically and Emotionally Weak, appearing in (28%) of their tweets.

[Insert Table 5 about here]

For the impact of vulnerability/resilience visual frames on X engagement, results from a Negative Binomial Regression revealed statistically significant differences $p<.001$ between vulnerability and resilience tweets in their impact on all engagement metrics. Tweets that employed a vulnerability visual frame gained more likes ($\beta=.188$, IRR=1.206, $p<.001$), comments ($\beta=.904$, IRR=2.471, $p<.001$), and retweets ($\beta=.008$, IRR=1.008, $p<.001$). Conversely, tweets that employed a resilience visual frame gained fewer likes ($\beta=-.188$, IRR=.828, $p<.001$), comments ($\beta=-.904$, IRR=.405, $p<.001$), and retweets ($\beta=-.008$, IRR=.992, $p<.001$).

[Insert Table 6 about here]

For the impact of each of the vulnerability/resilience elements, all elements showed a statistically significant impact on all engagement metrics, except for low camera angle in association with comments $p=.577$. The presence of women generated the greatest number of

likes (β=.969, IRR=2.638, p<.001) and retweets (β=.482, IRR=1.619, p<.001), while active interactions generated the greatest number of comments (β=1.788, IRR=5.973, p<.001). The presence of men led to significantly fewer likes (β=-1.117, IRR=.327, p<.001), comments (β=-1.548, IRR=.212, p<.001), and retweets (β=-.653, IRR=.521, p<.001). Positive facial expressions led to fewer likes (β=-.403, IRR=.668, p<.001) and retweets (β=-.076, IRR=.927, p<.001). The least engaging variable was the presence of children, which generated the least engagement in likes (β=-2.002, IRR=.135, p<.001), comments (β=-1.636, IRR=.194, p<.001), and retweets (β=-1.882, IRR=.152, p< .001).

Discussion

This comparative study delves deep into understanding how media outlets and NGOs visually portrayed the 2023 Morocco earthquake survivors on X. The study investigates the vulnerability/resilience visual framing pattern and exposes the discrepancies in the digital pictorial representations between media outlets and NGOs during disasters. Further, it proposes a vulnerability/resilience framework, which predicts how survivors-related visual frames might be purposefully constructed through stylistic and denotative elements and their potential impact on X engagement metrics. In addition, the study explores the gendered representations of the survivors on X, aiming to uncover whether communication messages continue to reinforce gender inequalities through stereotypical representations.

The analysis revealed distinct visual strategies employed by media outlets and NGOs to achieve their diverse communication goals and stand amidst the clutter on X. Media outlets extensively portrayed the survivors from a resilience perspective, depicting them as competent members actively working to rebuild and collaborate with the volunteers to facilitate their rescue and aid missions. Two main indicators were utilized to intensify resilience: First, portraying

active survivors who courageously rescue children and animals from under the rubble, carry dead bodies with fortitude to bury them, and work fearlessly to rebuild or move broken furniture and personal stuff from the debris—Second, portraying survivors as providing help for others, including working collaboratively with the volunteers to facilitate their mission, donating blood and providing emotional support for other victims (Figures 4 & 5).

Resilience media portrayals reflect an implicit intention to communicate hope and optimism to X users by highlighting the Moroccan citizens' capabilities in coping with the disaster's adverse effects. They challenge the stereotypical narratives of victimhood, which have always been attributed to those affected by crises (e.g., Amores et al., 2019). These portrayals also promote long-term self-determination and autonomy among the survivors, which, in the end, might increase their capabilities and inspire international communities to solidarity with them. The latter assumptions align with Kortendiek and Oertel's (2023) findings that whenever victims are portrayed positively, they tend to receive more support from international societies.

Unlike media outlets, NGOs extensively adopted a vulnerability perspective while visually tweeting about the survivors. They were depicted as weak and incapable individuals who await external aid; two primary indicators were deployed to strengthen vulnerability: First, portraying helpless survivors passively waiting in camps or amid the rubble, sometimes confused, suffering, or in a deep state of grief—Second, portraying survivors as receiving aid from volunteers, including food, water, medical assistance or emotional support (Figures 6 & 7).

NGOs' vulnerability portrayals echo an implicit strategy to portray powerless individuals in desperate need of food, shelter, and medical assistance to mobilize policymakers, governments, and ordinary citizens toward exerting humanitarian activities, including donating money and allocating resources to relief efforts. This is consistent with Ali (2014), who noted that

humanitarian aid organizations deliberately portray vulnerable individuals to elicit public sympathy and, accordingly, gain more donations. One contextual factor that might have contributed to NGOs adopting a vulnerability perspective is the obstacles that the Moroccan government put to limit foreign aid during the disaster; Morocco only accepted help from four governments and denied help from many more countries (Gathara, 2023).

Several international NGOs expressed their frustration toward the Moroccan government's decisions, which, as argued by NGOs representatives, might have slowed down rescue operations. In this regard, Caroline Holt, director of the IFRC noted that "the Moroccan government is taking careful steps with regard to opening up.", Vladimir Vlcek, FRS CR representative said, "The longer it is delayed, the slimmer is a chance for someone to survive under the rubble". Arnaud Fraisse, founder of Rescuers Without Borders stated "all of our team members who train regularly year-round for this type of thing are miserable that they couldn't leave and put their skills to use." He continued "many other groups found themselves in the same situation as us. Around a hundred rescue teams have offered to help, but the Moroccan authorities have made their choice. It's a shame, but we have to accept it." ("Rescue teams frustrated," 2023; "Morocco earthquake," 2023). Accordingly, NGOs might have applied vulnerability attributes to expose survivors' need for help and indirectly condemn the Moroccan government's decisions (Bankoff, 2001; Gathara, 2023). However, a notable reason the Morrocan government denied help from many INGOs might be the long-held political tensions that have arisen from disputes over Western Sahara and immigration policies, particularly with France and Germany ("Earthquake in Morocco," 2023; "Rescue teams frustrated," 2023).

As for the proposed vulnerability/resilience framework, the results revealed that vulnerability and resilience visual frames were not an outcome of coincidence. Instead, they were purposefully

constructed through multiple denotative and stylistic elements. Denotatively, resilience frames mostly portrayed adult male survivors, while vulnerability frames mostly portrayed female and child survivors. Men's presence often signifies independence, dominance, and capability (Dogra, 2011), reinforcing resilience, while women's and children's presence reflects insecurity and helplessness (Stirrat, 2006), thereby constructing and strengthening vulnerability. The latter representations support the traditional stereotypes of men as society's primary leaders and protectors, especially amid crises (Cohen, 2013). It also exposes the power dynamics and gender inequalities in Morocco, especially in rural and marginalized areas such as where the earthquake struck, i.e., Al Haouz province, one of Morocco's poorest provinces (Bergh, 2010). Despite this, several Moroccan initiatives work extensively toward empowering Moroccan women. Even during the 2023 earthquake, some organizations dedicated themselves to aiding women survivors. Examples include Amal Women's Training Center, a women-led non-profit organization, which provided food and shelter for women affected by the disaster. Jood is another women-led organization that distributed medicine and menstrual products for females impacted by the crisis ("Morrocco Earthquake Response," 2023).

Stylistically, resilience visual frames mostly depicted survivors from low camera angles; the camera looked up at the photographed survivors to reflect their powerfulness, dominance, and superiority (Gale & Lewis, 2019), which constructed and reinforced their resilience (See Figure 7). Conversely, vulnerability visual frames mostly depicted survivors from high camera angles; the camera looked down at the photographed survivors to reflect their powerlessness, weakness, and incapability (Coleman & Wu, 2015), which constructed and reinforced their vulnerability (See Figures 4 & 5). Moreover, resilience visual frames considerably portrayed survivors engaging in active interactions, depicting them as taking actions themselves or being proactive,

such as rescuing other victims, collaborating with the volunteers, and providing support to other people. This strategy reflected survivors' ability to adapt to the devastation and overcome its accompanying challenges. It also conveyed a sense of determination and confidence (Dan, 2018), strengthening a resilience perspective (See Figure 4). On the contrary, vulnerability visual frames portrayed survivors engaging in passive interactions, depicting them as being acted upon, such as being aided by volunteers, which represented those survivors as being at the mercy of the terrible circumstances, communicating a sense of helplessness and intensifying their vulnerability (See Figure 7).

Further, most of the visual-tweets showed survivors with neutral facial expressions. However, proportional to vulnerability and resilience, positive expressions dominated the resilience frames, while negative expressions dominated the vulnerability frames. This strategy conveyed the survivors' emotional reaction to the disaster (Coleman & Wu, 2015); those portrayed with positive expressions looked at the disaster with hope and optimism, which conveyed their capabilities and strengthened their resilience. Conversely, those portrayed with negative expressions looked at the disaster with shock and pain, which communicated their incapabilities and amplified their vulnerability.

As for the gendered representations, the analysis showed that both media outlets and NGOs continue to reinforce stereotypical gender roles by portraying men as resilient and women as vulnerable. This aligns with previous studies on gendered representations, which yielded that women are often negatively portrayed as passive, helpless, and much more emotional than men (e.g., Korf, 2007; Mthala, 2000). It is also consistent with societal biases and stereotypes, which continue to exist despite the ongoing efforts to combat gender inequalities. These biased representations neglect women's capabilities to recover from or cope with the adverse effects of

crises. They also overlook men's normative susceptibilities and pressure them to almost always perform the role of society's protectors.

The resilience and vulnerability of men and women, respectively, were evident through gendered representation themes. *Men as Savers* was the most commonly employed theme by both media outlets and NGOs. Most survivor-related visuals showed men engaging in relief activities independently or collaboratively with volunteers to rescue women and children (Figure 8). Women, on the other hand, were rarely shown participating in rescue operations. However, media outlets slightly challenged this stereotypical view, with their second most commonly used theme being *Men and Women are Equal*, which portrayed men and women in equal positions either negatively, such as sleeping in camps or standing amid the rubble, or positively, such as collaborating altogether to rebuild the earthquake's aftermath (Figure 9). Conversely, NGOs' second most employed theme was *Women are Physically and Emotionally Weak,* whereby women were portrayed through the lens of victimhood. Such portrayals emphasized women's image as weak, helpless, and passive victims, who were shown as grieving loudly, emotionally unstable, or physically incapable compared to men. The latter implies that online communication messages on X continue to reinforce societal biases and gender inequities.

The current work further analyzed the impact of vulnerability and resilience frames and elements on X engagement metrics, as indicators for the most effective strategies in eliciting public response among X users during disasters. This investigation is crucial to understanding how both media outlets and NGOs can leverage their visual storytelling to achieve their communication goals and overcome X limitations, such as the cluttered feed, the prevalence of irrelevant and spam tweets, and the accelerated meaning-making process that can overwhelm users, as noted by previous scholars (e.g., Chung & Lee, 2019; Gupta et al., 2013; Pond, 2016).

Overall, the analysis showed that visual-tweets that emphasized a vulnerability perspective gained more engagement than those emphasizing resilience. This finding suggests that negative images are generally more engaging among X users, which could be attributed to their ability to elicit emotions and trigger interactions, which aligns with Chung and Lee (2019), who noted that negative images elicit higher public responses toward CSR campaigns. It also aligns with Miller and LaPoe's (2016) finding that people recall visuals triggering negative emotions the most.

For the impact of specific vulnerability and resilience elements on X engagement metrics, the analysis revealed that the presence of women led to more engagement than the presence of men. This is consistent with previous studies, which demonstrated that NGOs constantly portray women in their campaigns to elicit emotions and receive more donations (Ali, 2014; Stirrat, 2006). The analysis also revealed that high camera angle, a vulnerability element that reflects powerlessness and weakness, led to more likes. In addition, positive expressions were associated with low engagement compared to negative expressions, which once again supports the potential impact of negative images on social media engagement. Surprisingly, the presence of children was the least engaging element, implying that X users did not resonate with children survivors. It is worth mentioning that the presence of children was relatively low in the corpus, as only 6.4% of the visuals portrayed children, which might not be a sufficient percentage to make a judgment on the impact of their presence on X engagement.

Theoretical and Practical Implications

The present study contributes theoretically and practically to the field of visual framing and organizational communication. Theoretically, it takes the lead in analyzing media and NGOs' visuals in a comparative approach during a recent disaster. The work demonstrates the applicability of the framing theory to NGOs' communications, which were found to frame visual-tweets, just like what media do. However, more studies are needed to establish this result.

Moreover, the current study proposes a vulnerability/resilience framework, which facilitates future analysis of whether communicators deliberately construct vulnerability or resilience in their visuals. Although the work here statistically supported the high validity of the proposed framework, more investigations are encouraged to establish its reliability in various contexts. Further, the present study advances the literature on survivors' portrayals and gendered representations, and the impact of survivors' visual frames on X engagement.

Practically, the work provides insights to practitioners on the most effective visual frames in eliciting public response and receiving high online engagement while communicating crises on X, shedding light on effective crisis communication strategies. The results of the current study might be helpful for professional and organizational communicators, including NGOs and those responsible for CSR campaigns when preparing a crisis communication plan that tackles the short and long-term effects of crises.

The study also paves the way for several future research directions. First, the reliance on English keywords for extracting the visuals in the study limits the investigation through the local Morrocan perspectives on the crisis and the survivors' gendered representations. Future scholars are encouraged to uncover more localized viewpoints by incorporating native language sources and involving a broader range of local actors. Second, the work is heavily conceptualized around vulnerability and resilience narratives. Future scholars are to explore a broader spectrum of frames and representations employed by NGOs and media outlets in communicating natural disasters.

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Appendices

Figure 1.

An example of a resilience visual frame of an active woman carrying a huge bucket vs. a vulnerability visual frame of a passive woman crying amid the rubble.

Figure 2.

Proposed Vulnerability Model

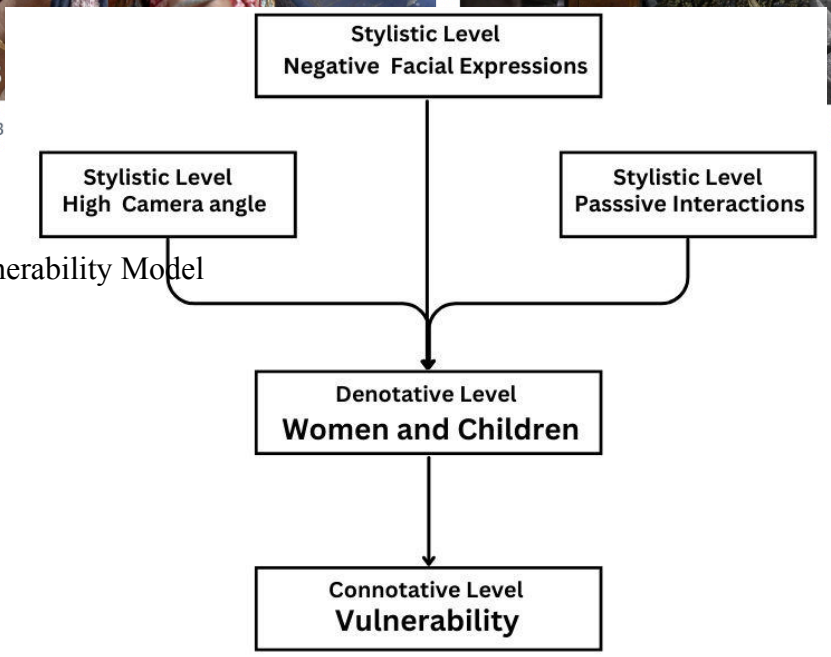

Figure 3.

Proposed Resilience Model

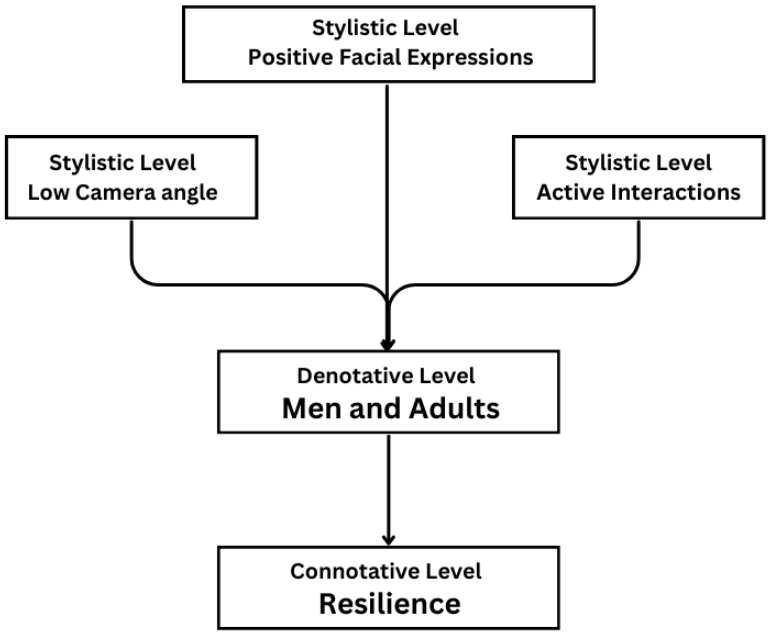

Table 1.

Operationalization of Gendered Representation Themes used to analyze the Gender Representations

Theme	Operational Definition
Men as savers.	Visuals portray men rescuing women and children or helping volunteers exert their missions.
Women as homemakers.	Visuals portray women performing traditional roles of cooking,

	washing clothes, cleaning, and looking after children.
Women are physically and emotionally weak.	Visuals portray women crying, in deep grief, or being helped by others.
Women are capable.	Visuals portray women as active actors in evacuation, relocation, and rehabilitation operations.
Men are physically and emotionally weak.	Visuals portray men crying, in deep grief, or being helped by others.
Men and women are equal.	Visuals portray men and women equally, either positively or negatively, e.g., working equally to rebuild or passively waiting in camps.

Table 2.

Summary of vulnerability and resilience indicators present in the survivors-related visual-tweets of media outlets (n= 260) and NGOs (n= 189).

Vulnerability Indicators	**Media Outlets**	**NGOs**	**Chi-Square**
Survivors passively waiting in camps, queues, or amid the rubble	55 (21.2%)	59 (31.2%)	62.55***
Survivors receiving aid	12 (4.6%)	47 (24.9%)	
Survivors crying or grieving heavily	27 (10.4%)	10 (5.3%)	
Survivors sleeping in the streets or camps	12 (4.6%)	6 (1.6%)	
Survivors begging for help	5 (1.9%)	5 (3.2%)	
Not applicable	149 (57.3%)	62 (32.8%)	
Total	260 (100%)	189 (100%)	
Resilience Indicators	**Media Outlets**	**NGOs**	**Chi-Square**
Survivors actively working to rebuild	78 (30%)	16 (8.5%)	61.78**
Survivors providing help for other	36 (13.8%)	8 (4.2%)	
Survivors assisting the volunteers or facilitating their missions	10 (3.8%)	26 (13.8%)	
Survivors smiling or hoping for a better future	25 (9.6%)	12 (6.3%)	

Not applicable	111 (42.7%)	127 (67.2%)
Total	260 (100%)	189 (100%)

Note. ***p* = .001.

Table 3.

Association between proposed elements and vulnerability visual frame (n= 449).

	Vulnerability			**Resilience**		
	N (%)	**Chi-Square**	**Carmer's V**	**N**	**Chi-Square**	**Carmer's V**
Women	98 (21.8%)	66.47**	.38	39 (8.7%)	47.81**	.32
Children	23 (5.1%)	36.04**	.28	5 (1.1%)	26.89**	.25
High Camera Angle	97 (21.6%)	79.21**	.42	22 (4.9%)	58.69**	.36
Negative Facial Expressions	68 (15.1%)	208.96**	.68	8 (1.8%)	57.36**	.36
Passive Interactions	229 (51%)	388.6**	.93	10 (2.2%)	381.69**	.92

Note. ***p* = .001.

Note. The frequencies and percentages in the table are calculated out of the whole sample (N = 449) per each variable, i.e., Gender, Age, Camera Angle, Facial Expression, and Interaction.

Table 4.

Association between proposed elements and resilience visual frame (n= 449).

	Resilience			**Vulnerability**		
	N (%)	**Chi-Square**	**Carmer's V**	**N (%)**	**Chi-Square**	**Carmer's V**
Men	140 (31.2%)	71.62**	.40	82 (18.2%)	64.59**	.38
Adults	142 (31.6%)	61.72**	.37	178 (39.6%)	55.05**	.35
Low Camera Angle	79 (21.6%)	114.39**	.50	4 (0.8%)	95.10**	.46
Positive Facial Expressions	26 (5.8%)	158.19**	.59	4 (0.9%)	24.75**	.23

Active Interactions	203 (45.2%)	388.06**	.93	10 (2.2%)	381.69**	.92

Note. ***p* = .001.

Note. The frequencies and percentages in the table are calculated out of the whole sample (N = 449) per each variable, i.e., Gender, Age, Camera Angle, Facial Expression, and Interaction.

Table 5.

Summary of gendered representation themes present in the survivors-related visual-tweets of media outlets (n= 260) and NGOs (n= 189).

Gendered Representation Themes	**Media Outlets**	**NGOs**	**Chi-Square**
Men as savers	94 (36.2%)	64 (33.9%)	22.80**
Women are physically and emotionally weak	47 (18.1%)	53 (28%)	
Men and women are equal	50 (19.2%)	24 (12.7%)	
Men are incapable	32 (12.3%)	37 (19.6%)	
Women are capable	27 (10.4%)	6 (3.1%)	
Women as Homemakers	10 (3.8%)	5 (2.6%)	
Total	260 (100%)	189 (100%)	

Note. ***p* = .001.

Table 6.

Association between vulnerability/resilience and X engagement metrics (n= 449)

	Likes			**Comments**			**Retweets**		
	β (SE1)	IRR (SE2)	Sig.	β (SE1)	IRR (SE2)	Sig.	β (SE1)	IRR (SE2)	Sig.
Vulnerability	.188	1.206	<.001*	.904	2.471	<.001*	.008	1.008	<.001*
women	.969	2.638	<.001*	1.089	2.969	<.001*	.482	1.619	<.001*
Children	-2.002	0.135	<.001*	-1.636	0.194	<.001*	-1.882	0.152	<.001*
High Camera Angle	.459	1.583	<.001*	.394	1.482	<.001*	.361	1.435	<.001*

Negative Facial Expressions	.202	1.224	<.001*	.442	1.555	<.001*	.028	1.028	<.001*
Passive Interactions	-.813	0.444	<.001*	-2.226	0.108	<.001*	-462	0.010	<.001*
Resilience	-.188	.828	<.001*	-.904	.405	<.001*	-.008	.992	<.001*
Men	-1.117	0.327	<.001*	-1.548	0.212	<.001*	-.653	0.521	<.001*
Adults	.160	1.173	<.001*	.581	1.788	<.001*	.375	1.455	<.001*
Low Camera Angle	-0.000	1.000	.577	.993	2.697	<.001*	.140	1.150	<.001*
Positive Facial Expressions	-.403	0.668	<.001*	.538	1.713	<.001*	-.076	0.927	<.001*
Active Interactions	.924	2.516	<.001*	1.788	5.973	<.001*	.375	1.455	<.001*

Note. **p = .001

Figure 4. An example of a resilience visual frame that depicts an active woman moving her broken furniture from the rubble. The visual is also captured from a low camera angle to convey powerfulness.

Figure 5. An example of a resilience visual frame that depicts active survivors working hard in rescue operations. The visual is also captured from a low camera angle to convey powerfulness.

Figure 6. An example of a vulnerability visual frame that depicts a passive woman sitting on the street.

Figure 7. An example of a vulnerability visual frame that depicts a crowd of survivors receiving aid from volunteers. The visual is captured from a high camera angle to convey weakness.

Figure 8. An example of the theme Men as Savers depicts a man holding his child and walking amid the rubble.

Figure 9. An example of the Men and Women are Equal theme depicts two women and a man passively standing amid the rubble.