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Aditi Rao, Rebecca Puhl & Kirstie Farrar

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A Visual Content Analysis of Stigma Communication in the Depictions of Individuals with Obesity in U.S. and U.K. News

ADITI RAO[1], REBECCA PUHL[2,3], and KIRSTIE FARRAR[1]

[1]*Department of Communication, University of Connecticut, Storrs, Connecticut, USA*
[2]*Rudd Center for Food Policy & Health, University of Connecticut, Hartford, Connecticut, USA*
[3]*Department of Human Development & Family Sciences, University of Connecticut, Hartford, Connecticut, USA*

Weight stigma is a pervasive form of discrimination worldwide. News media, and news images in particular, can reinforce weight stigma by portraying persons with obesity in a negative, stereotypical manner. Informed by the model of stigma communication, this study conducted a content analysis of images accompanying obesity-related news articles from the U.S. and U.K. to determine and compare the prevalence of stigmatizing images. Images ($N = 445$) in obesity-focused news articles obtained from the top four most viewed online news in the U.S. ($n = 244$) and U.K. ($n = 201$) during August 2018–August 2019 were systematically coded. These 445 images featured 228 individuals. Of these 228 individuals, 35% were identified as higher weight and 44% as lower weight. Overall, 70% of persons of higher weight in these news images were depicted in a stigmatizing manner. Further, 46% of individuals with higher weight were depicted with their head partially or fully removed from the image, compared to 25% of individuals with lower weight. Additionally, U.K. news were 2.5 times more likely to contain stigmatizing images than U.S. news. These findings highlight the prevalence of weight stigma in news images and suggest that broader systemic efforts are needed by the news media industry to eliminate the use of negative imagery that marginalizes persons of higher weight.

A critical psychosocial consequence of obesity is the societal devaluation and stigmatization faced by persons perceived to be of higher body weight (Papadopoulos & Brennan, 2015). Weight-based bias and discrimination can lead to social injustices, poor mental health, and low quality-of-life (Alimoradi et al., 2020; Pearl & Puhl, 2018; Zhu, Smith, & Buteau, 2022), and they are prevalent across healthcare, education, and workplace settings (Gerend et al., 2022). A leading purveyor of weight-based stereotypes and stigma is mass media, including news media (Ata & Thompson, 2010; Kite et al., 2022). U.S. news media, in particular, play a significant role in establishing societal norms about health-related issues (Gollust, Nagler, & Fowler, 2020), and the potential impact of stigmatizing portrayals of people with obesity in news is especially concerning. Stigmatizing portrayals of people with obesity normalizes biased perceptions of obesity (Heuer, McClure, & Puhl, 2011; Varava, 2016), devalues persons with obesity (Couch, Thomas, Lewis, Blood, & Komesaroff, 2015), and leads to internalization of weight-based stereotypes, which can worsen emotional and physical health (Emmer, Bosnjak, & Mata, 2020; Gmeiner & Warschburger, 2022; Major, Hunger, Bunyan, & Miller, 2014). Additionally, stigmatizing media portrayals can negatively influence public health policies (McCombs & Shaw, 1972), which has implications for policies targeting weight-related health.

Since visuals, including photographic images, can have a stronger effect on the reader than text (Seo, 2020), news images depicting persons with obesity in a pejorative manner may play a salient role in perpetuating weight stigma (Messaris & Abraham, 2001). Visual content analyses of U.S. news websites found that 72% of images (Heuer, McClure, & Puhl, 2011) and 65% of videos (Puhl, Peterson, DePierre, & Luedicke, 2013) accompanying obesity-focused news articles featured stigmatizing depictions of higher-weight individuals. Similar examinations in the U.K., Germany, and the Netherlands found that over 65% of news images depicted persons with higher weight in a stigmatizing manner (Atanasova, Gunter, & Koteyko, 2013; De Smaele & Lisser, 2020). In all, few studies have examined visual depictions of higher-weight individuals in news media, and considering recent initiatives and developments regarding media representations of diverse body sizes, this area of research warrants continued monitoring of news images for stigma communication. Multiple obesity and weight stigma researchers have made appeals and provided recommendations for eliminating stigmatizing portrayals of persons with obesity in news media (Nutter et al., 2023; Rubino et al., 2020). Additionally, the unprecedented growth of visually dominant social media platforms not only increased the communicative power of news imagery, but also provided greater visibility to body-positive content (Vandenbosch, Fardouly, & Tiggemann, 2022), which promotes acceptance of diverse body types, thus destigmatizing larger bodies. Furthermore, cross-cultural

Address correspondence to Aditi Rao, Department of Communication, University of Connecticut, 337 Mansfield Road, Storrs, CT 06269-1259, USA. E-mail: aditi.rao@uconn.edu

research in this area remains scarce. Weight-based stigmatization has been found to be common across six Western nations (Puhl, Lessard, Himmelstein, Foster, & Jackson, 2021), reiterating the need for comparative research.

Thus, using Smith's (2007) stigma communication model, the current study conducted a visual content analysis of obesity-focused articles to determine the prevalence of weight stigma in news images in the U.S. and U.K.—two nations with comparable obesity prevalence, weight stigmatization in news narratives (Flint, Hudson, & Lavallee, 2016), and stigma experienced by higher-weight individuals (Lessard, Puhl, Himmelstein, Pearl, & Foster, 2021), but varying approaches to addressing obesity, such as implementing regulations on unhealthy food commercials on TV and online (Sweney, 2021).

Stigma Communication

According to Goffman (1963), stigma is a societal perception of "spoiled identity, being disqualified from full social acceptance by others, a personal mark of disgrace and contaminated social identity" (p. 2). Stigma arises when certain behaviors or choices deviate from societal norms. Per Smith's (2007) model of stigma communication (MSC), verbal messages communicate stigma via four types of cues: marks (cues distinguishing people), labels (cues otherizing the distinguished people as separate), responsibility (cues implying personal responsibility for being in the distinguished group), and social peril (cues presenting the distinguished group as a societal threat). While the MSC has been applied to weight stigma research, it is limited to examinations of verbal messaging, such as comments (Anderson et al., 2017), tweets (Haggerty et al., 2022), and written descriptions of various body sizes (Malterud & Anderson, 2016). This study extends the MSC to identify stigma attributes in obesity-related news images by focusing on three content cues: marks, social peril, and responsibility.

Marks

Marks are visible distinguishers that identify individuals as nonnormative and have two qualities: concealment and disgust (Smith, 2007). Marks are hard to conceal. Since the "mark" of one's weight is always visible, engaging in weight-based stigma communication commonly emerges in society (Anderson & Bresnahan, 2013).

Stigmatizing Portrayals

Body weight is often compared to a societal ideal, which further defines and distinguishes it (Anderson & Bresnahan, 2013). When news images portray persons of higher weight in a manner that deviates from the ideal (e.g., engaging in activities not associated with persons of ideal weight, such as eating junk food), they reinforce weight-based stereotypes and perpetuate negative attitudes and cognitions about persons with obesity, bolstering a foundation for weight stigma (Link & Phelan, 2001). Thus, our first research question asked: *What is the prevalence of stigmatizing portrayals of persons with higher weight? (RQ1)*

Headless Depictions

News images often depict individuals with obesity without a head or face (Heuer, McClure, & Puhl, 2011; Puhl, Peterson, DePierre, & Luedicke, 2013). While journalists may claim that headless depictions protect privacy, researchers argue that featuring the "headless torso" or "headless stomach" by isolating body parts is dehumanizing (Cooper, 2007; Mayes & Kaldor, 2016). Per the MSC, disgust is another quality of "marks" and "marks may be affixed to people by placing a temporary or permanent symbol (e.g., a brand) on a target" (Smith, 2007, p. 469). Thus, omission of the face can be seen as an attempt to evoke disgust by placing undue focus on the "mark" of body weight (e.g., emphasis on the size of one's abdomen or buttocks). Further, visual communication theory posits that face-ism impacts perception (Van Leeuwen, 2000). Fewer positive qualities are attributed to individuals depicted with few facial features (Archer, Iritani, Kimes, & Barrios, 1983), and faceless depictions can imply that higher weight evokes "disgust", thus requires hiding face. To examine the prevalence of headless depictions of persons with obesity as an attribute of stigma communication, our second research question examined: *What is the prevalence of images in which persons with higher weight are portrayed with their heads partially or fully cut off? (RQ2)*

Gender and Ethnicity

Gender and ethnicity are two salient and inherent "marks" that can contribute to weight stigma. For example, increased stigmatizing portrayals of women and minorities with higher weight may not only bolster stereotypes about persons of that gender and ethnicity, but also undermine the detrimental effects of obesity in underrepresented groups. Although Puhl, Peterson, DePierre, and Luedicke (2013) found no significant gender-based difference in stigmatizing portrayals, a higher percentage of African-Americans were portrayed with higher weight than lower weight, and a higher percentage of Caucasians were portrayed with lower weight than higher weight. However, Heuer, McClure, and Puhl (2011) found that men with higher weight were more likely to be portrayed in a stigmatizing manner than women with higher weight. Conversely, in an analysis of obesity-related images in *TIME* and *Newsweek*, women were more likely to be overrepresented compared to their true prevalence among all individuals with higher weight (Gollust, Eboh, & Barry, 2012). Considering these inconsistent findings, our third research question assessed the following: *Does the prevalence of stigmatizing images differ according to (a) gender and (b) ethnicity? (RQ3)*

Gender-Based Representation

In Western societies, cultural norms have historically placed a higher premium on physical attributes for women. While characteristics like honesty and professional success are valued more in men, high value is placed on physical attractiveness for women (Parker, Horowitz, & Stepler, 2017). Thus, weight stigma research has often focused on women (Himmelstein, Puhl, & Quinn, 2017), who have increased vulnerability to being stigmatized for having higher body weights (Spahlholz, Baer, König, Riedel-Heller, & Luck-Sikorski, 2016). In light of

this, we hypothesized: *Obesity-related news images will feature more women than men, regardless of whether they are stigmatizing or not. (H1)*

Social Peril

According to the MSC, peril is conveyed by cues that highlight danger posed by the stigmatized group to society (Smith, 2007). Obesity-related social peril reflects the belief that persons with higher weight threaten the health and well-being of society (Anderson & Bresnahan, 2013). For example, a key perceived threat is that obesity burdens the healthcare system. Whether these perceptions of social peril differ across cultures and countries has received little attention.

Cross-Cultural Comparisons

The current study focused on news from the U.S. and U.K., two societies with comparable weight shaming and weight-based discrimination (Lessard, Puhl, Himmelstein, Pearl, & Foster, 2021; Robinson, Hunger, & Daly, 2015; Robinson, Sutin, & Daly, 2017), but differing approaches to healthcare and health-related legislation (Donahue, 2018). Despite the U.K.'s universal healthcare system, compared to the private, insurance-driven model in the U.S (Groce & Groce, 2020), healthcare avoidance among adults of higher weight was higher in the U.K. than in the U.S (Puhl, Lessard, Himmelstein, Foster, & Jackson, 2021). In addition to the worldwide call for addressing weight-based stigma (Nutter et al., 2023; Rubino et al., 2020), experts warn against government policies and strategies implicitly condoning stigma in their messaging (Hill et al., 2021). Taken together, a cross-cultural analysis can provide valuable insights into weight stigma communication in news images. Thus, our study also investigated the following questions: *Does the prevalence of stigmatizing images differ between the U.S. and the U.K.? (RQ4)* and *Does the prevalence of stigmatizing images differ across different news media sources? (RQ5)*

Responsibility

Attributions of individual responsibility for one's stigmatized condition is a key function of stigma communication (Smith, 2007). At the foundation of weight stigma are views that weight status is within individual control and an issue of personal responsibility, leading to societal blame of individuals for having higher weight.

Political Leaning

Historically, health and politics have been inescapably linked, and weight stigma communication assigning personal responsibility in news media is associated with conservative political ideologies. For example, anti-fat attitudes have been associated with authoritarianism (Crandall & Biernat, 1990), and bias toward persons with higher weight is associated with the ideology that health is an individual responsibility (Lee, Shapiro, & Niederdeppe, 2014; Niederdeppe, Roh, Shapiro, & Gillison, 2015). Atanasova, Koteyko, and Gunter (2012) found that conservative news media are more likely to use narratives that frame obesity in terms of individual lifestyle factors rather than broader systemic factors. Therefore, we hypothesized: *Stigmatizing images will be more prevalent in articles by conservative news sources than in those by liberal news sources. (H2)*

Story Topic

In addition to blaming individuals for being members of a stigmatized group, stigma communication also holds individuals responsible for ridding themselves of their stigmatized condition (Anderson & Bresnahan, 2013). In response to weight concerns in Western society (Brewis, SturtzSreetharan, & Wutich, 2018), obesity-related campaigns often use fear-based messaging to motivate weight loss and healthy weight management (Gonzalez-Nahm, Bhatti, Ames, Zaltz, & Benjamin-Neelon, 2020). While studies have analyzed obesity-related news articles for either the textual narrative or the images used, few have analyzed the two in tandem. Puhl, Peterson, DePierre, and Luedicke (2013) found the highest prevalence of stigmatizing images in articles addressing topics related to health consequences of obesity. In emphasizing personal responsibility for higher body weight, news articles focusing on consequences of obesity (such as healthcare costs) may be more likely to feature stigmatizing images (Simpson, Griffin, & Mazzeo, 2019). Thus, we hypothesized: *Stigmatizing images will be more prevalent in articles addressing health consequences of obesity than in those addressing contributors to obesity. (H3)*

Methods

Sample and Search Strategy

Based on the 2019 Reuters Digital News Report (Newman, Fletcher, Kalogeropoulos, & Nielsen, 2019), the top four most viewed official news sources in the U.S.—CNN, HuffPost US, Fox News, and The New York Times (NYT)—and the U.K.—the BBC, the Guardian, Sky News, and HuffPost UK—were selected for analysis. Tabloids or aggregate news sites were excluded.

Across these eight news sites, news articles were initially searched using the following terms: "overweight," "obesity," and "obese." For all news outlets, the search results for "obese" were similar to that for "obesity." In addition, the term "overweight" yielded far less articles than the term "obesity." Thus, the term "obesity" was used for the final systematic search across news sites. The articles obtained were automatically sorted by each website according to their relevance to the topic of obesity. The articles were then screened and retained for the study if they included (i) obesity or obesity-related factors (obesity prevalence, childhood obesity, health consequences, etc.) as the primary or major topic, and (ii) an image. Only articles published during the August 2018–August 2019 time frame were included, yielding an initial sample of 660 articles across eight news sites. Since the aim of the study was to examine obesity-related news images, every article was screened and read thoroughly by one of the authors using the two aforementioned criteria. Using this process, 215 articles were excluded, and a final sample of 445 articles was obtained.

This included 244 images from the U.S. (CNN = 89, Fox News = 53, HuffPost US = 37, NYT = 65) and 201 from the U.K. (BBC = 44, Guardian = 79, Sky News = 36, HuffPost UK = 42).

Measurement

The unit of analysis in this study was the individual image accompanying obesity-focused news articles ($N = 445$). A comprehensive codebook (See Appendix 1) was developed to code variables in each image, including demographic characteristics (gender, ethnicity, and age), story topic (obesity prevalence, childhood obesity, food/diet, genetics/heredity, physical activity, diabetes, government policy, etc.), and portrayals of persons of higher weight (clothing style, weight, activity, etc.). The criteria for determining stigmatizing communication in the image were adapted from Heuer, McClure, and Puhl (2011). An image was considered stigmatizing if it met any of the following criteria: (i) it disproportionately emphasized the abdomen/lower body of a higher-weight individual, (ii) the higher-weight individual was portrayed without clothes, (iii) the higher-weight individual had their head partially or fully cut out, (iv) the higher-weight individual was shown in inappropriately fitted clothing (tight or too tight clothing), or (v) the higher-weight individual was shown engaged in a stereotypical activity, such as consuming fast food or sitting on a couch watching TV. General information such as article title, publication date, and news source were also coded.

Intercoder Reliability

All images were coded by four individuals: one of the authors and three research assistants practiced coding until satisfactory intercoder reliability was achieved. Each coder underwent 15 hours of training and individually coded 85 practice articles. The practice articles resembled the study sample in terms of the selection criteria but were not published during the time frame (August 2018–August 2019) selected for this study. Once the coders were applying the codebook reliably, 30 articles from the study sample were coded by all coders independently to establish reliability. Intercoder reliability was determined using Fleiss' Kappa, which extends Cohen's Kappa to more than two coders (Freelon, 2013). Percentage agreement of ≥ 80% was obtained for all variables. Fleiss' Kappa ranged 0.85–1.0 for image-level variables (e.g., image type and number of individuals), 0.75–1.0 for person-level variables (e.g., gender, body weight, and activity), and 0.95–1.0 for article-level variables (e.g., news source, title, and publication date), indicating adequate reliability (Landis & Koch, 1977). Story topic was the only variable with Kappa values ranging 0.6–1. Articles featuring multiple story topics (food/diet, genetics, etc.) were coded for each individual topic. Four story topics with Kappa values < .6, "school-based initiative", "weight loss how-to", "healthcare spending", and "other", were omitted from analysis.

Results

Sample Characteristics

The final sample ($N = 445$) included obesity-focused news articles with images from the U.S. ($n = 244$, 55%) and U.K. ($n = 201$, 45%). Of these 445 articles, 338 (76%; U.S.: $n = 157$, U.K.: $n = 181$) contained images and 107 (24%; U.S.: $n = 93$; U.K.: $n = 14$) contained videos with a thumbnail image, in which case, the thumbnail image was coded.

Overall, food/diet was the most prevalent story topic with a mention in 218 (49%, U.S.: $n = 132$, U.K.: $n = 86$) articles, followed by government policy and obesity prevalence each of which were mentioned in 127 (29%, U.S.: $n = 33$, U.K.: $n = 94$) and 123 (28%; U.S.: $n = 42$, U.K.: $n = 81$) articles, respectively. While government policy was the most prevalent topic in U.K. articles, food/diet was most commonly mentioned in U.S. articles. Further, 116 of 445 images were sourced from Getty Images (26%; U.S.: $n = 47$, U.K.: $n = 69$).

Table 1 shows the demographic characteristics of all individuals portrayed in the sample. The 445 images analyzed featured 281 people. Of these, 228 were coded as individuals ($n =$ 1 or 2 people) and 53 as a group ($n \geq 3$). Of these 228 individuals, 135 were adults (59%; U.S.: $n = 73$, U.K.: $n = 62$) and 135 were categorized as White (59%; U.S.: $n = 62$, U.K.: $n =$ 73). With respect to body weight, 101 of 228 individuals (44%; U.S.: $n = 61$, U.K: $n = 40$) were coded as "lower weight" and 80 (35%; U.S.: $n = 28$, U.K.: $n = 52$) as "higher weight/overweight." For 57 of 228 individuals (25%; U.S.: $n = 32$, U.K.: $n = 25$), the body weight "could not be determined;" thus, they were excluded from further analysis. Adapting the methodology used by Heuer, McClure, and Puhl (2011), all subsequent analyses compared individuals coded as lower weight ($n = 101$) with those coded as higher weight ($n = 80$).

Stigmatizing Attributes of News Images

Marks

Stigmatizing Portrayals. Of the 80 individuals coded as higher weight, 56 (70%; U.S.: $n = 15$, U.K.: $n = 41$) were depicted with at least one stigmatizing feature. Among these 56 individuals, 36 (64%) were depicted with inappropriately fitted clothing (tight or too tight clothing), 37 (66%) with their head partially or fully removed, and 26 (46%) with a disproportionate emphasis on the abdomen. In addition, the frequency of stigmatizing depictions was significantly lower for portrayals of lower-weight individuals compared to higher-weight individuals, $\chi 2$ $(1, 181) = 10.32$, $p < .05$.

Headless Depictions. Thirty-seven of 80 (46%) individuals with higher weight were depicted with their head partially or fully removed, compared to 25 of 101 (25%) individuals with lower weight. This difference was significant, $\chi 2(1, 181) = 63.45$, $p < .001$.

Gender and Ethnicity. Chi-square analysis revealed that the prevalence of stigmatizing images did not differ significantly between men ($n = 22$) and women ($n = 22$), $\chi 2$ $(1, 44) = 1.62$, $p = .203$. With respect to ethnicity, 25 were characterized as

Table 1. Demographic characteristics of individuals portrayed in obesity-related online news images ($N = 445$)

Variable	CNN ($n = 89$)	Fox News ($n = 53$)	HuffPost US ($n = 37$)	NYT ($n = 71$)	BBC ($n = 44$)	Guardian ($n = 79$)	HuffPost UK ($n = 42$)	Sky News ($n = 30$)
Weight								
Lower Weight	22 (21.8%)	14 (13.9%)	7 (6.9%)	18 (17.8%)	13 (12.9%)	12 (11.9%)	11 (10.9%)	4 (4.0%)
Higher Weight	3 (3.8%)	12 (15%)	6 (7.5%)	7 (8.8%)	17 (21.3%)	13 (16.3%)	7 (8.8%)	15 (18.8%)
Could not be determined	19 (33.3%)	6 (10.5%)	6 (10.5%)	1 (1.8%)	6 (17%)	18 (31.6%)	1 (1.8%)	1 (1.8%)
Gender								
Male	13 (17.6%)	12 (16.2%)	4 (5.4%)	9 (12.2%)	11(14.9%)	14 (18.9%)	4 (5.4%)	7 (9.5%)
Female	13 (12.6%)	14 (13.6%)	9 (8.7%)	14 (13.6%)	19 (18.4%)	15 (14.6%)	12 (11.7%)	7 (6.8%)
Age								
Youth	5(15.2%)	3 (9.1%)	1 (3%)	1 (3%)	11 (33.3%)	8 (24.2%)	4 (5.9%)	0 (0%)
Adult	22 (16.3%)	24 (17.8%)	15 (11.1%)	12 (8.9%)	24 (17.8%)	21 (15.6%)	8 (5.9%)	9 (6.7%)
Ethnicity								
White	21(15.6%)	22 (16.3%)	7(5.2%)	12(8.9%)	20 (14.8%)	31 (23%)	7(5.2%)	15 (11.1%)
Black	1 (4%)	2 (8%)	6 (24%)	8 (32%)	1 (4%)	3 (12%)	4 (16%)	0 (0%)
Latino	1 (25%)	1 (25%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)	1(25%)	0 (0%)
Asian	2(15.4%)	1(7.7%)	0 (0%)	4(30.8%)	1(7.7%)	3 (23.1%)	2(15.4%)	0 (0%)
Other	20 (31.3%)	6 (9.4%)	7 (10.9%)	1(1.6%)	15 (23.4%)	6 (9.4%)	7 (10.9%)	4 (6.3%)

Black, four as Latino, and 13 as Asian, resulting in a cell size with < 5 items. Hence, these categories were collapsed to create a "non-white" category. However, no significant ethnicity-based differences were found (white, $n = 135$ vs. nonwhite, $n = 42$), $\chi 2(1, 177) = 1.04$, $p = .308$.

Gender-Based Representation. Of the 228 individuals identified, 103 were categorized as women and 74 as men. This difference was significant, $\chi 2(1, 177) = 4.75$, $p < .05$. Hence, *H1* was supported. Additionally, a two-way chi-square revealed no significant differences in gender between U.S. and U.K. news images, $\chi 2(1, 177) = .14$, $p = .713$.

Social Peril

Cross-Cultural Comparisons. Of the 56 stigmatizing depictions of higher-weight individuals, 15 (27%) were featured in U.S. news and 41 (73%) in U.K. news. Thus, U.K. news was significantly more likely to feature stigmatizing portrayals than U.S. news, $\chi 2(1, 105) = 11.98$, $p < .001$. With regard to the news source, the highest number of stigmatizing depictions were in articles from the BBC (15, 27%), followed by Sky News (12, 21%), The Guardian (9, 16%), HuffPost UK (5, 9%), Fox News (7, 13%), HuffPost US (3, 5%), NYT (3, 5%), and CNN (2, 4%). This difference was statistically significant, $\chi 2(7, 104) = 22.78$, $p < .01$.

Responsibility

Political Leaning. *H2* predicted that conservative news sources would be more likely to portray persons with higher weight in a stigmatizing manner than liberal news sources. Among U.S. news, CNN, NYT, and HuffPost US are considered liberal, while Fox News is conservative (Mitchell, Gottfried, Kiley, & Matsa, 2014). Among U.K. news, the Guardian and HuffPost UK are left-leaning, while Sky News and the BBC are considered right-leaning (Crawford & Levonyan, 2018; Lewis & Cushion, 2019). Overall, conservative news sources featured 34 stigmatizing depictions while liberal news sources featured 22. This difference was statistically significant, $\chi 2(1, 104) = 7.76$, $p < .01$. Thus, *H2* was supported.

Story Topic. Looking at story topic, articles addressing health consequences of obesity featured 23 stigmatizing depictions while those addressing contributors to obesity featured 12. This difference was also statistically significant, $\chi 2(1, 56) = 4.69$, $p < .05$. Hence, *H3* was supported.

Discussion

Guided by the MSC, the current study identified the prevalence of stigmatizing images of persons with obesity in U.S. and U.K. news. Contextual factors contributing to perceptions of persons with higher weight, such as gender, ethnicity, story topic, and faceless portrayals, were also examined. Our findings revealed that 70% of persons with higher weight featured in news images were depicted in a stigmatizing manner. Thus, the majority of news images featuring higher-weight individuals communicate stigma by including cues that highlight higher weight as the "mark" of the stigmatized condition (Smith, 2007). Further, 73% of stigmatizing depictions were from U.K. news sources. The prevalence of stigmatizing images was significantly higher in U.K. news (79%) than in U.S news (54%). One possible explanation for this difference is that the litigious culture in the U.S. could have prompted news sources to refrain from publishing content that could invite backlash.

This study also confirmed the phenomenon of the "headless torso" in news media (Cooper, 2007) as higher-weight individuals were more likely to be depicted without their head compared to lower-weight individuals ($p < .001$). While it's possible that news media might refrain from publishing identifiable content to avoid liability suits, headless depictions emphasize isolated body parts (e.g., abdomen) as a distinguishing stigmatizing marker for people of higher weight rather than people of all sizes (Anderson & Bresnahan, 2013; Smith, 2007). Further, we found no gender- and ethnicity-based differences in the prevalence of stigmatizing images, indicating a lack of support for their role as inherent "marks" of stigma communication. However, women were significantly more likely than men to be featured in images accompanying obesity-focused news ($p < .05$). This difference communicates that the "mark" of weight is more salient for women than men, reflecting the higher premium placed on appearance in women, who are judged more harshly for not adhering to an "ideal" size. Overall, except for gender- and ethnicity-based differences, significant findings were observed across all research questions and hypotheses pertaining to the "mark" of weight in stigma communication across news images.

Regarding social peril (i.e., communication highlighting the stigmatized as a threat to society), we found that the prevalence of stigmatizing images differed significantly between the U.S. and the U.K. ($p < .001$) and between the eight news sources analyzed in this study ($p < .01$). U.K. news images were 2.5 times more likely than U.S. news images to communicate weight stigma. The BBC had the highest number of stigmatizing depictions across all eight news sources, followed by Sky News. A previous analysis of stigmatizing depictions of higher-weight individuals in U.K. news found 65% of the images to be stigmatizing (Atanasova, Gunter, & Koteyko, 2013). The high proportion of stigmatizing images in U.K. news observed in our study (79%) could be due to several reasons. In the U.K., the study period (August 2018–August 2019) was marked by several government initiatives to reduce childhood obesity rates (Department of Health and Social Care, 2018). Consequently, several policy changes were introduced, such as the ban on unhealthy food advertising before 8 pm (Hornall, 2019), which might have led to increased news coverage of obesity. This may also explain why government policy was found to be the most common story topic in U.K. news in our study. While the mention of government policies may indicate a shift in the narrative, articles that addressed government intervention in the text may also have inadvertently communicated weight stigma if the accompanying image stereotyped individuals with higher weight. Baker, Brookes, Atanasova, and Flint (2020) found that obesity reporting in

the U.K. doubled between 2008–2017 and that obesity was increasingly framed as a growing issue, potentially stigmatizing those with higher weight. Hence, the findings of our study may not be limited by the time-frame of the data.

In contrast, our findings revealed a lower prevalence of stigmatizing content in U.S. news images than previously documented. Heuer, McClure, and Puhl (2011) and Puhl, Peterson, DePierre, and Luedicke (2013) analyzed U.S. news and found the prevalence of stigmatizing images and videos to be 72% and 65%, respectively. While our finding that 54% of persons of higher weight in U.S. news images were depicted in a stigmatizing manner is lower compared to studies conducted a decade ago, suggesting an improvement, the majority of depictions continue to be negative and stigmatizing.

Overall, while the majority (70%) of images of higher-weight individuals were stigmatizing, some context is warranted. First, weight status could not be determined in 25% of images featuring individuals (57 of 228 individuals). These images didn't feature enough of the person to categorize their weight (e.g., images of a person's feet on a scale). Further, in the present study, 35% (80 of 228 individuals) of individuals were portrayed to be of higher weight, compared to 65% (286 of 441 individuals) in the study by Heuer, McClure, and Puhl (2011). This decrease could reflect a possible attempt to reduce stigmatizing portrayals by avoiding images of individuals with higher weight altogether.

Lastly, political leaning of the news source influenced study findings; conservative news sources were significantly more likely to depict higher-weight individuals in a stigmatizing manner than liberal news sources ($p < .01$). Further, the prevalence of stigmatizing images was almost twice as high in articles addressing consequences of obesity than in those addressing contributors to obesity ($p < .05$). These findings underscore the political conditioning of perceptions of public health. News media supportive of conservative ideology were more likely to communicate stigma by holding individuals responsible for their weight (Atanasova, Koteyko, & Gunter, 2012; Smith, 2007). By choosing to include stigmatizing depictions in articles about the consequences of obesity, news media reinforce stigma through narratives of personal responsibility while downplaying environmental and societal factors.

Overall, the results carry theoretical and practical implications. This study advances stigma research by applying the stigma communication model (Smith, 2007), a theory of verbal cues, to visual elements of weight stigma communication in news images. In future studies, stigma attributes of marks, social peril, and personal responsibility can be examined in both news articles and images, offering a more comprehensive analysis. Further, considering the growing video-based nature of social media and the continued reliance on social media to get news (Liedke & Matsa, 2022), the ability to apply this theory to visuals is important and necessary. Future research should investigate visual markers of stigma related to not just obesity, but other sensitive health issues such as mental health as well.

The practical implications of the study findings are multifold. Our findings call for responsible representation of individuals with higher weight in news via broad, organizational-level changes. Weight stigma remains a common societal stigma, and in some cases, more prevalent than other forms of bias such as sexism and racism (Charlesworth & Banaji, 2022; Puhl, Andreyeva, & Brownell, 2008). Many news media outlets obtain images from online retailers of stock images, such as Getty Images and Shutterstock, who may be unaware of weight bias or insensitive to respectful representations of persons with higher weight. While suppliers of stock images offer a variety of creative and vivid visuals produced by professionals, the visuals don't appear to be screened for weight-stigmatizing content. Thus, by using stigmatizing visuals of persons with obesity in news images, news media can perpetuate visual health misinformation (Nan, Thier, & Wang, 2023) about obesity and higher-weight individuals. As a solution, several research and obesity advocacy organizations have created and made available their own image galleries that depict persons with obesity in a respectful manner*. Prioritizing greater awareness of weight stigma, being mindful of journalistic ethics, and using appropriate, respectful portrayals of persons with higher weight can help reduce societal weight stigma. The use of non-stigmatizing visuals in news stories can also help amplify support for anti-weight discrimination policies (Ambwani, Elder, Sniezek, Goeltz, & Beccia, 2021; Brochu, Pearl, Puhl, & Brownell, 2014). Change within the news media industry would require integrating the topic of weight bias into established ethical guidelines that advise against stereotyping gender, age, religion, ethnicity, geography, sexual orientation, disability, physical appearance, or social status, and understanding that images are not a commodity or click bait.

*https://stopweightbias.com/resources/image-galleries/

This study has several limitations. First, future research should analyze larger and more diverse sample sizes of news articles from each country to better delineate potential nuances in the portrayal of persons with obesity. Second, our study only focused on online news sources, not print media. However, considering that 53% of Americans prefer getting their news digitally (Forman-Katz & Matsa, 2022), online news media is highly relevant. Third, our study focused on images; a visio-textual analysis assessing the article in its entirety along with the effects of multiple narratives (Baker, Brookes, Atanasova, & Flint, 2020) can offer more insights especially with respect to potential effects of the article topic, which had lower Kappa values in our analysis.

In conclusion, this study extended the MSC (Smith, 2007) to visual messaging and provided new insights into the role of U.S. and U.K. news images in communicating weight stigma. While the majority of depictions of higher-weight individuals in U.S. and U.K. news were stigmatizing, U.K. news images were 2.5 times more likely to communicate stigma. Given that these images are prevalent and rarely challenged, news images can be an insidious source of weight stigma (Heuer, McClure, & Puhl, 2011). However, although news images continue to communicate weight-related prejudice, through responsible reporting, they can just as easily be a source for eliminating

negative societal perceptions of persons with higher weight. News media require ongoing and targeted reforms to incorporate the use of appropriate, respectful representations of persons with higher weight and eliminate content that communicates stigma.

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Appendix1 - Codebook

1. **URL**
   Copy and paste the link
2. **News source**
   Enter the news source
3. **Title of the story**
   Copy and paste the title
4. **Date the article was published**
   Enter the date of the article in MM/DD/YY format
5. **Story topic**
   Read the article and enter 1 (Present) or 0 (Absent) upon finding one or more of the following topics in the article. The descriptions for each topic are given below.

1. Obesity prevalence	Discusses national or international rates of obesity, or obesity rates within a specific population using numbers or words (i.e., "rates have doubled" or "percentage of those obesity have risen")
2. Childhood obesity	Discusses anything related to obesity in children or youth
3. Weight loss how-to	Discusses any methods for weight loss, including diets and exercise recommendations, but not surgery
4. Food/diet	Discusses food, specific foods, dieting, specific diets, or the mention of food/diet is a recurring theme
5. Exercise/fitness	Discusses exercise of any kind, physical activity, or fitness, or the mention of exercise/fitness is a recurring theme
6. Weight loss surgery	Discusses any surgery or medical procedure for the purpose of weight loss or obesity treatment
7. Weight loss drugs	Discusses any drugs, pills, or medicines related to weight loss, obesity treatment, or treatment of conditions related to obesity
8. Health consequences	Discusses any health consequence or outcome of being overweight or obese (e.g., high blood pressure, asthma, sleep apnea, early death, cardiovascular diseases, etc.), except diabetes (Diabetes is its own category)
9. Weight loss success story	Describes or features a person who has successfully lost weight – not just mentioned (i.e., "John lost 20 pounds"), but more of a story associated with weight loss
10. Genetics/heredity	Discusses the genetic components of body weight and obesity, or how obesity may be inherited from parents, or may run in families
11. Food/beverage industry	Discusses the food or beverage industry (restaurants, specific food products, beverages, or food companies), or advertising of these products and/or restaurants
12. Beverage/food taxes	Discusses the issue of taxation of food or beverages.
13. Community initiatives	Discusses obesity prevention, treatment, weight loss, exercise, fitness, or dietary programs that are on a community level – does not include government agencies of any kind local or national. E.g. *group of people volunteering to teach kids or new moms to cook nutritious food*
14. School-based initiatives	Discusses obesity prevention, treatment, weight loss, exercise, fitness, or dietary programs that are based in a school or school district (e.g., improving school food, or school-based physical education). This is similar to community initiatives expect that it focuses on schools, not the community at large. It could be by the general public or the government
15. Weight stigma/ discrimination	Discusses weight-based or obesity-related stigma, prejudice, discrimination, or the social consequences of obesity
16. Contributors to obesity	Discusses any causes or contributors to obesity as causes, not mentioned as means to alleviate obesity
17. Healthcare spending/costs	Discusses health care costs related to obesity or obesity-related conditions, or health insurance costs/ premiums with relation to the government or the individual or both
18. Diabetes	Mentions diabetes

(*Continued*)

(Continued)

19. Government policy	Discusses policy changes regarding obesity prevention, treatment, weight loss, exercise, fitness, or dietary programs at a local or national level and involves government officials. E.g. banning junk food advertising on TV or in parks, or requiring calorie counts be displayed on restaurant menus. (Note: taxes and school-related policies are their own separate categories)
20. Pregnancy	Discusses obesity in the mother or the child in relation to pregnancy.
21. TV/computer/video game/ screen time	Discusses TV, computer, video games, screen time, or any electronic devices as a cause of obesity or alleviating any of these as a potential treatment for obesity
22. Other	Any other topic related to obesity that is not described above.

6. **Image**

a. Image or Video: 1 = Image, 2 = Video
b. Number of Images: Enter the number of images in the article
c. Image Credit: Copy and paste the source of the image. If it is not provided, enter 99
d. Image Type: 1 = Photograph, 2 = Graphic

7. **Individuals in the image**

a. Are there individuals in this image: 1 = Yes, 0 = No
b. Number of individuals: Enter the number of individuals in the image. Enter 99 if NA.
c. Is it a group or people? If ≥ 3 people are present, code as a group.1 = Yes, 0 = No
d. If it is group, is there a main focus in the image? If only a single person (or two people) is focused on or one or two persons occupy most of the image, code for that person(s) in the following columns. If no one in the group is singled out or focused on particularly, code as group. 1 = Yes, 0 = No

For Person 1

8. **Gender**: 1 = Male, 2 = Female, 3 = Could not be determined, 99 = NA
9. **Age**: 1 = Youth, 2 = Adult, 3 = Baby, 4 = Toddler, 5 = Could not be determined, 99 = NA (The term baby is used for 0–12-month-olds, toddler for 1–3-year-olds, youth for 4–19/20-year-olds (includes teenagers), and adult for the rest including seniors.)
10. **Race**: 1 = White, 2 = Black, 3 = Latino, 4 = Asian, 5 = Could not be determined, 99 = NA
11. **How is the individual shown in the image?**

a. Is the person side-facing? 1 = Yes, 0 = No, 99 = NA
b. Is the person rear-facing? 1 = Yes, 0 = No, 99 = NA
c. Is the person side-facing? 1 = Yes, 0 = No, 99 = NA

12. **Weight of the individual**: 1 = Lower Weight, 2 = Higher Weight, 3 = Pregnant, 4 = Could not be determined, 99 = NA
13. **Emphasis on isolated body parts**:

(a) Is the full body shown? 1= Yes, 0 = No, 99 =NA
(b) Was the face isolated? 1 = Yes, 0 = No, 99 =NA
(c) Was the Abdomen/Midsection isolated? 1 = Yes, 0 = No, 99 =NA
(d) Was the Lower body isolated? 1 = Yes, 0 = No, 99 =NA
(e) Were the Feet isolated? 1 = Yes, 0 = No, 99 =NA
(f) Was any other body part isolated? 99 = NA, else specify the body part
(g) Was the head partially or fully cut out of the image? 1 = Yes, 0 = No, 99 =NA

14. **Clothing**

a. How is the person clothed? 1 = Fully clothed, 2 = Partially Clothed, 3 = Mostly Unclothed, 4 = Not clothed, 5 = Could not be determined, 99 = NA
b. Clothing Style: 1 = Professional, 2 = Casual, 3 = Exercise, 4 = Other, 99 = NA
c. Is the fit of clothes appropriate: 1 = Yes, 0 = No, 99 =NA
d. Is the fit of clothes tight (a size or two too small): 1 = Yes, 0 = No
e. Is the fit of clothes sloppy of disheveled: 1 = Yes, 0 = No, 99 =NA

15. **Main activity**

Identify all of the activities you see the individuals engaged in. Enter a 1 in the box if the activity is engaged in, enter a 0 if it is not. Descriptions of the specific codes for activities are as follows:

Being interviewed	A person is being interviewed by a reporter or is speaking on camera
"person on the street"	Refers to a person or people in any public space (generally being filmed without their knowledge), e.g., walking down the street or sidewalk, in a park, at a café, on a playground, in a shopping mall, etc.
Exercising	A person is engaged in any type of exercise, physical activity, or play
Researcher/expert/ advocate	A person is a researcher, scientist, expert on a particular topic, advocate for a group of people or social cause, or representative from a group or social cause
Journalist/reporter	A person is a journalist, reporter, news broadcaster
Patient	A person appears in a doctor's office, nurse's office, hospital, or clinic, or is being treated by any type of health professional, or the person is described as a patient
Politician	This includes any current politicians (governor, president, etc.) or government officials
Teacher/principal	This includes teachers, principals, instructors (e.g., fitness, karate), tutors
Health professional	A person is any type of health professional, doctor, nurse, exercise physiologist, dietitian, or clinician
Weight loss success story	A person is shown or described as having successfully lost weight
Eating/drinking	A person is eating or drinking, or it is implied that they are eating/drinking because of their proximity to food or drink (e.g. food is on the table in front of them, or drink is in their hand)
Proximity to food	A person is in the proximity of food, restaurant, or food store (e.g. shopping for food, cooking food, waiting in line for food, or standing in or outside of a restaurant, etc.
Sedentary behavior	A person is engaged in behavior that is sedentary such as watching TV, playing video games, board games, or sitting/laying down, etc.
Body parts	A person is shown in the video in order to emphasize particular parts of their body. For example, their heads are cut out of the shot, or the camera focuses on their abdomen, rear end, etc. This should NOT be automatically checked every time that "headless" people are shown.
Celebrity	Anyone who is famous (e.g., Shaq or other professional athletes, models, actors, actresses, singers, etc.) other than news anchors
Other	The person or people in the video are engaged in activities that are not mentioned above. Only enter a 0 in this box if no other 1s are entered above.

Repeat 6 – 15 for Person 2

16. **Presence of Foods**

a. Is there an object present: 1 = Yes, 0 = No, 99 = NA
b. Is junk food present: 1 = Yes, 0 = No, 99 = NA
c. Are healthy foods present: 1 = Yes, 0 = No, 99 = NA
d. Are sugary drinks present: 1 = Yes, 0 = No, 99 = NA
e. Does the image have a weighing scale: 1 = Yes, 0 = No, 99 = NA
f. Does the image show a weighing scale with someone on it: 1 = Yes, 0 = No, 99 = NA
g. If any other object is present, enter the name of the object. If not, enter 99.

17. **Group of people**

a. Does the group have kids? 1 = Yes, 0 = No
b. Does the group have adults? 1 = Yes, 0 = No
c. Is there diversity in gender? 1 = Yes, 0 = No
d. Is there diversity in race? 1 = Yes, 0 = No
e. Is there diversity in weight? 1 = Yes, 0 = No