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ORIGINAL ARTICLE

Does this Tweet make me look fat? A content analysis of weight stigma on Twitter

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Abstract
Purpose Weight stigma involves stereotyping individuals based on body size. Individuals with obesity face weight stigma in many areas of their lives, and consequences can include impairment of mental and physical health, relationships, and academic performance. Weight-stigmatizing messages are pervasive in mass media, but the degree and characteristics of its presence within new-media social environments remain comparatively unknown.
Methods This study examined weight stigma on Twitter by coding Tweet content that included the word "fat" within a 4-h timeframe ($N = 4596$). Coding marked demographic characteristics represented in content, messages about weight, and perceived intent of the message.
Results Of all messages, 56.57 % were negative and 32.09 % were neutral. Of those containing weight-stigmatizing messages ($n = 529$), themes relating to fatness included: gluttonous (48.58 %), unattractive (25.14 %), not sexually desirable (2.65 %), sedentary (13.80 %), lazy (5.86 %), and stupid (4.16 %).
Conclusions Weight-stigmatizing messages are evident in the increasingly important arena of social media, and themes appear similar to those that emerge in other forms of media. Prevention and intervention body image programs should consider targeting social networks to help individuals manage societal messages.

Keywords Weight stigma · Content analysis · Twitter · Social media · Prevention

Introduction

Although the majority of adults in the United States meet criteria for overweight or obesity (69 %) [1], the prevalence and intensity of weight stigma are on the rise [2]. Weight stigma involves negative attitudes, stereotyping, or discrimination based on obesity and is associated with negative consequences such as depression, body dissatisfaction, disordered eating, isolation and economic hardship [3]. Unlike other biases, weight stigma might be considered acceptable by many individuals because of the common yet stigmatizing belief that obesity reflects a lack of personal responsibility [4] (e.g., "The more you gain, the more you have to lose" [5]). Individuals with obesity can be—inappropriately—seen by others as stupid or lazy [6] and are subject to weight-based discrimination across many environments, including work, school and the health care system [6, 7]. Weight stigma is pervasive in mass media, including movies, television [8], and even the news [9]. Mass media perpetuates weight stigma through overrepresentation of thin and underweight individuals, underrepresentation of individuals with obesity, and the portrayal of characters with obesity in a stigmatizing or negative light [10].

Weight stigma and other sources of sociocultural pressure to be thin can foster "fat talk," or language referencing body dissatisfaction and eating patterns that degrades an individual's own body shape as well as that of others [11].

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This form of communication has become normative, especially for young adult women [12]. This is concerning, as fat talk perpetuates body dissatisfaction and the thin ideal, particularly when individuals with high social standing engage in it among their peers [13]. Indeed, hearing fat talk can have a negative impact on an individual's own body image and perception [14]. Fat talk and weight stigma occur among peers and in print and video media [15, 16]; however, relatively little research has examined whether it occurs in newer forms of social media.

Social media sites have created new social environments for many individuals. Social media offer acceptance, which can promote honest self-expression; however, they also offer a sense of anonymity, which can encourage communications that would be considered inappropriate or overtly hostile in a face-to-face setting. These types of negative communications are seen in cyber-bullying [17], which is the deliberate and repeated emotional injury of another person through electronic avenues (i.e., e-mail, cell phones, text messages, webpages) with the intent to embarrass or socially exclude [18]. Cyber-bullying, like traditional forms of bullying, can be traumatic because it is repetitive and harms the individuals' perceived social and physical safety. Mishna and colleagues [19] found that in a large sample ($N = 2186$) of middle and high school students, 49.5 % reported experiencing cyber-bullying within a three-month time period; in contrast, fewer students (33.7 %) experienced traditional bullying in the same period. Given the high costs associated with weight stigma and the link between weight and traditional bullying, it is important to understand how weight stigma, cyber-bullying, and anti-fat bias might occur on public social media websites. Research on the positive and negative attributes of self-expression has evaluated popular websites such as MySpace and Facebook [20–22], but the relatively new avenue, Twitter, has received more limited attention [23, 24].

Twitter, launched in 2006, is a free and public online platform allowing a maximum of 140 characters per public message or "Tweet." Users can post unlimited Tweets, can "follow" others without asking permission, and can "re-Tweet" others' messages. Therefore, one person's Tweets can impact both followers and non-followers [25]. Certain characteristics make Tweets more likely to be shared, which would in turn increase their potential audience [24, 26]. Tweets related to obesity are more likely to be re-Tweeted when they are humorous as opposed to serious, focus on individual-level causal factors as opposed to societal-level causal factors, and draw an emotional response from the reader [24]. Derogatory Tweets (e.g., those using ridicule or stereotyping) related to obesity are more likely to be shared than non-derogatory messages [23, 24]. These characteristics of shared messages suggest that weight-stigmatizing attitudes are likely present on Twitter.

In 2013, Twitter had more than 215,000,000 active users who sent on average 500,000,000 Tweets per day [27]. Twitter "users" include individuals and also corporations, brands, celebrities, athletes, sports teams, and other public entities. Because Twitter has such reach, topics and individual Tweets can become "viral" in mere hours. This degree of publicity and disclosure might exacerbate the negative impact of weight stigma and cyber-bullying, making this platform worthy of further study. Indeed, while Chou and colleagues [23] report that Twitter and Facebook posts are both more likely to include negative commentary about weight than less widely used social media platforms such as blogs or forums, they suggest that Twitter might be particularly damaging because of users' focus on social commentary as opposed to the self-referential posts more commonly seen in Facebook.

Tweets can be considered implicit conversation (someone will view the message) or explicit conversation (two-way communication). Appearance-related issues seem to be a frequent Tweet topic, and some of this discussion is overtly hostile. For example, in October 2013, a user group devoted a week to "fat shaming." Users posted negative comments about others followed by "#FatShamingWeek." This tag allowed users to view all 1372 Tweets with this hashtag together. For example: "Fat people have the same type of mental disorder as trannies, and it's called delusion #FatShamingWeek". These and similar Tweets perpetuate weight stigma and allow discriminating comments to disseminate globally in seconds.

As previously mentioned, "fat" is a commonly used term with a negative connotation, is easily understood by a majority of people, and has been largely used in research on "fat stigma" and "fat talk" [28]. One study found that among other words that describe individuals with obesity, participants most readily identified "fat" as a familiar and negative term for weight [29]. Chou and colleagues [23] report that across popular social media channels, including Twitter, the term "fat" is used far more frequently than "obesity" or "overweight." To begin examining the characteristics of fat talk and weight stigma in new media, the current study investigated use of the word "fat" on Twitter. We hypothesized that this term would commonly appear on Twitter, as with previously examined social media avenues [21, 22], and further hypothesized that "fat" would be associated with weight-stigmatizing Tweets.

Methods

Sample

The current study was exempt from ethical review because it examined retrospective, publicly-available data. Tweets

containing the word "fat" ($N = 4596$) were collected within a 4-h period (12–4 pm) on May 31, 2013. This is estimated (based on Twitter-reported daily averages [27]) to be 5.5 % of the Tweets in that time frame. The term "fat" was chosen to explore the use of a popular, negative slang term for individuals with obesity. All Tweets quoted in this manuscript were left intact without changes to grammar or content.

Coding

Eight research assistants (undergraduate students at a public, urban, Mid-Atlantic University) helped to develop the initial coding manual under the supervision of the first and second authors. Categories were developed using the literature on weight bias (e.g., [30]) and work evaluating weight-related content in other media sources (e.g., [10, 31, 32]). The manual was designed for an iterative process of coding. Research assistants coded an initial 100 tweets each to pilot the coding manual for accuracy of the categories and to ways to improve the coding system. A second meeting clarified coding categories, discussed discrepancies, and added new categories as needed (e.g., creating distinct categories for "pro-eating-disorders" and "pro-thinness" messages). Three expert coders (graduate students) then used the final manual to code all Tweets and double-code 10 % of Tweets to evaluate interrater reliability. Final codes and categories are presented in Table 1. Frequencies and kappa agreement statistics are presented in Table 2. One variable, "positive" had only slight agreement, and was not included in analyses.

Table 1 Coding categories

Code descriptor	Coding system
Gender referenced	0 = none, 1 = male, 2 = female
Race referenced	0 = no, 1 = yes
Age referenced	0 = no, 1 = yes
Tone	0 = neutral, 1 = positive, 2 = negative
Person directed at	0 = none, 1 = self, 2 = other
Body dissatisfaction	0 = no, 1 = yes
Pro-attitude	0 = no attitude, 1 = pro-thinness, 2 = pro-eating disorders, 3 = pro-fat, 4 = any size OK
Weight stigma	0 = no weight stigma, 1 = unattractive, 2 = not sexually desirable, 3 = sedentary, 4 = lazy, 5 = stupid, 6 = gluttonous

Results

Coding marked demographics represented in Tweet content, messages about weight, and the valence and perceived intent of the message (for all frequencies, see Table 2). Of all messages, 56.57 % were negative; 32.09 % were neutral. For example, this message was coded as negative: "I'm not saying shes fat, I'm just saying if I had to pick five of the fattest people i know, She'd be three of them".[1] An example of a neutral message is: "You need to burn approximately 3500 calories to lose a pound of fat." Negative messages were critical of others (64.0 %) or the self (31.0 %). Some Tweets were overtly pro-thinness (62.25 %; e.g., "A 7-min workout that to shred fat and get in shape, no equipment necessary; thank you science!") or pro-anorexia (0.20 %; e.g., "I think drinking a lot of water make the fat come off easier when starving. Idk. Maybe" and "Feeling really fat right now. Not eating again until next Tuesday"), while others were pro-fat (7.33 %; e.g., "This steak fat & juicy. The way I like all my women") or posited that any body size was acceptable (3.20 %; e.g., "Someone wrote in the girls bathroom: If you're not a size 0–4 you're fat. Really? What a sad, insecure life you live"). Of those containing weight-stigmatizing messages ($n = 529$), categories relating to fatness included: gluttonous (48.58 %; e.g., "Some people become fat because they eat a lot. They eat fast food which contains a lot of oil. And some because they were born like this"), unattractive (25.14 %; e.g., "Just saw a fat black girl wearing a cut up shirt #ew #kms"), not sexually desirable (2.65 %; e.g., "I hate imagining fat girls have sex ??????????"), sedentary (13.80 %; e.g., "Fat ppl who don't workout sud be made to pay more tax because some of them look like two ppl in one…lol. #MeanTrainer"), lazy (5.86 %; e.g., "How fat are we that we are too lazy to hold our own hamburgers?"), and stupid (4.16 %; e.g., "You dumb. I'm fat and you're my friend. So we can be fat friends together").

Chi squares assessed gender differences in Tweets referencing males ($n = 488$) or females ($n = 835$). For these analyses, Tweets that referenced both or neither gender were excluded. Neutral Tweets were more likely to reference men than women, $\chi^2(1) = 59.81$, $p < 0.001$, Cramer's $V = 0.213$, but negative Tweets were more likely to reference women than men, $\chi^2(1) = 21.22$, $p < 0.001$, Cramer's $V = 0.127$. Gender did not significantly influence whether a Tweet was likely to reference the self, $\chi^2(1) = 2.52$, $p = 0.113$, Cramer's $V = 0.050$, but Tweets referencing others were more likely to reference women, $\chi^2(1) = 7.13$, $p = 0.008$, Cramer's $V = 0.085$. Tweets referencing women were also more likely than Tweets referencing men to have an overtly pro-thinness message [$\chi^2(1) = 9.60$, $p = 0.002$, Cramer's $V = 0.085$], pro-fat

[1] All Tweets quoted in this manuscript were left intact without changes to grammar or content.

Table 2 Frequencies of codes

Code descriptor	Frequency (%)	Kappa	Kappa description[a]
Gender			
Male	632 (13.8 %)	0.584	Moderate
Female	979 (21.3 %)	0.726	Substantial
Race	192 (4.2 %)	0.793	Substantial
Age	148 (3.2 %)	0.759	Substantial
Tone			
Positive	455 (9.9 %)	0.160	Slight
Negative	2600 (56.6 %)	0.456	Moderate
Neutral	1475 (32.1 %)	0.452	Moderate
Person			
Self	997 (21.7 %)	0.618	Substantial
Other	2254 (49.0 %)	0.473	Moderate
Weight attitude			
Body dissatisfied	607 (13.2 %)	0.662	Substantial
Pro-thinness	2861 (62.2 %)	0.617	Substantial
Pro-eating disorders	9 (0.2 %)	na	
Pro-fat	337 (7.3 %)	0.362	Fair
Any size OK	147 (3.2 %)	0.498	Moderate
Weight stigma			
Unattractive	133 (2.9 %)	0.614	Substantial
Not sexually desirable	14 (0.3 %)	na	
Sedentary	73 (1.6 %)	0.888	Almost perfect
Lazy	31 (0.7 %)	0.455	Moderate
Stupid	22 (0.5 %)	na	
Gluttonous	257 (5.6 %)	0.736	Substantial

Total Tweets = 4596; frequencies are total counts from all coded Tweets. Categories were allowed to overlap

[a] Kappa descriptions of agreement based on Viera and Garrett [38] categories. Kappa for pro-eating disorders, not sexually desirable, and stupid is not available (na) because the randomly selected 10 % of Tweets for co-coding did not have sufficient frequency to test agreement

message [$\chi^2(1) = 15.29$, $p < 0.001$, Cramer's $V = 0.108$], or to portray an attitude that any body size was acceptable [$\chi^2(1) = 16.11$, $p < 0.001$, Cramer's $V = 0.110$]. Tweets referencing men were more likely than those referencing women *not* to contain these attitudes, $\chi^2(1) = 85.37$, $p < 0.001$, Cramer's $V = 0.254$. There were no gender differences within Tweets identified as containing weight-stigmatizing messages and a reference to gender ($n = 149$): sedentary [$\chi^2(1) = 0.92$, $p = 0.336$, Cramer's $V = 0.079$], lazy [$\chi^2(1) = 2.31$, $p = 0.129$, Cramer's $V = 0.124$], stupid [$\chi^2(1) = 0.43$, $p = 0.835$, Cramer's $V = 0.017$], and gluttonous [$\chi^2(1) = 3.65$, $p = 0.056$, Cramer's $V = 0.156$]. However, there were gender differences for stigma related to unattractiveness [$\chi^2(1) = 4.38$, $p = 0.036$, Cramer's $V = 0.172$] such that women were targets of stigmatizing comments more often than men, and sexual desirability [$\chi^2(1) = 4.01$, $p = 0.045$, Cramer's $V = 0.164$], which was only directed at women, not men.

Discussion

Weight stigma is pervasive across settings, including the increasingly important arena of social media. Twitter is a popular social media site, yet has been the focus of little research compared with other sites such as Facebook [20–22]. Findings of this study show that weight-stigmatizing messages are present on Twitter, with themes similar to other forms of media, including other social media. It is important for health providers to address weight stigma with patients because experiences of weight discrimination are associated, among adults, with decreased motivation to lose weight [33], increased depression and anxiety [34], and among youth, with more frequent binge-eating and less physical activity [34]. Although there are many sources of weight stigma [7], Twitter may be a particularly relevant source of influence for some individuals because of its emphasis on the social over the individual [23]. Knowing that Twitter is a potential source

of exposure to weight-stigmatizing messages could help clinicians assess for distress associated with use of this and other social media sites. Additionally, prevention work aimed at reducing the influence of weight-stigmatizing messages on individuals could benefit from using material from Twitter to increase relevance for youth in particular.

The majority of the 4596 Tweets collected were contextually negative, as expected given the connotation of "fat." Women were more likely than men to be referenced in negative Tweets, and were also more likely to be referenced in Tweets about others. Examples include: "Ladies, Know what will taste better than that cookie? The drinks desperate men will buy you when you're not fat" and "To the abundance of fat girls trying to look sensual by wearing minimal clothing. Don't." Given the brevity of Tweets, gender was not always mentioned explicitly, although it appears that female gender was often implied. Potential examples include, "If you're fat, please don't post very revealing photos… #please" and "I don't want to see your overally fat stomach omg pls stop and don't wear crop tops."

As noted in the results section, a number of Tweets blatantly promoted disordered eating. Websites that provide inspiration to individuals with eating disorders to continue engaging in destructive behavior (e.g., "pro-ana" or "thinspiration" sites) have proliferated over past decades [35]. Exposure to this content is associated with unhealthy eating behavior changes, even in individuals without eating disorders [36]. Our findings indicate this type of content is also present on Twitter.

Many of the weight-stigmatizing Tweets examined in this study might be inspired by a belief that inducing shame leads to behavior change, a belief that has also been promoted in traditional media (e.g., [33]). As the introductory post to the account responsible for #FatShamingWeek reads, "Hurting people's feelings is the quickest way to get them to change." However, research suggests shaming has deleterious effects on health behavior change [33]. Increased awareness of the harmful nature of weight stigma could help reduce its prevalence on Twitter. Also, body image prevention programs could target social networks, for example, by the development of "Twitter chats" focused on positive messaging.

Tweet content is clearly shaped by individuals' attitudes, which are developed outside this platform. It is important to remember that targeting pervasive attitudes such as weight stigma requires prevention work at multiple levels, which could include social media, mass media, and everyday interactions. Messages promoting acceptance of a variety of body sizes, and the separation of health from body weight, is needed at each of these levels.

Strengths, limitations, and future research

Our research is among the first to investigate weight stigma empirically on Twitter, and it examined and coded a large sample of Tweets. This research was limited, however, by privacy constraints inherent to Twitter. Specifically, characteristics of the person writing the Tweet were not known. Although observation of Tweet content as it occurred spontaneously is a strength, unbiased by limits to ecological validity that occur when participants create content in laboratory settings, the fact that person characteristics remain unknown leaves a gap in our understanding. Future research could address this limitation by creating a controlled setting when known writers were encouraged to write messages that would subsequently be coded for themes in their content. Other limitations of the current research included the use of a limited sample of Tweets. Future studies could code larger samples or randomly select Tweets over a longer period to obtain a more representative sample. Furthermore, all Tweets were collected using a single search word, "fat." The purpose of this constricted search was to evaluate how the word "fat" was used, and describe whether weight-stigmatizing messages were occurring. It is more likely, however, that users would read messages that had far greater content variety when reading Tweets in their feed, so although the current research describes the occurrence of weight stigma, results cannot generalize to describe the pervasiveness of weight-stigmatizing messages, or the influences such messages have on readers. Future research using a different method of systematically capturing Tweets (such as re-Tweeted messages [24]) could begin to address these applications. Another consideration in the interpretation of the current study findings is the subjective nature of the coding process. While multiple coders and double-coding enhanced coding accuracy, some Tweets might have been misinterpreted. Indeed, humor, an important construct for weight stigma research, was particularly challenging to assess. Future research could focus specifically on the measurement and role of humor on Twitter using a detailed and iterative process to operationalize the construct for this form of media.

As our research describes the occurrence of weight stigma on Twitter, extensions of our work could examine the effects of exposure to weight stigmatizing Tweets on viewers. Specifically, future studies should examine whether exposure to Tweets has the same effects as other forms of fat talk or cyber-bullying, such as lowered self-esteem, disordered eating, and distorted perceptions of body image [14]. As Twitter allows for both indirect and direct communication, it is possible that audience characteristics, rather than only Tweet characteristics, could influence the effects of Tweet content. For example, individuals viewing

Tweets from people they do not personally know, such as by following a specific hashtag, might be influenced by messages with weight stigma themes in a similar manner to people who view weight-loss advertisements (e.g., [37]), whereas individuals viewing Tweets from peers and friends they follow, may show a pattern of influence more similar to cyber-bullying (e.g., [19]) or fat talk (e.g., [14]). Understanding the influence of Tweets is a necessary next step in this work, because this can help us understand to what degree eating disorder and obesity prevention and treatment efforts should focus on weight-stigmatizing messages on Twitter to improve the quality of life of individuals with obesity.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval This article does not contain any studies with human subjects according to the Office of Human Research Protections' definition of a human subject, § 45 CFR 46.102(f) (i.e., a living individual about whom an investigator conducting research obtains data through intervention or interaction with the individual, or identifiable private information), as all data were retrospective and non-identifiable.

Informed consent For this type of study, formal consent is not necessary.

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