

WEIGHT MISPERCEPTION AT TEXAS STATE UNIVERSITY

HONORS THESIS

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by

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Abstract

While some individuals accurately assess their body weight, others may perceive that they are heavier or lighter than they really are. This phenomenon is known as “weight misperception” and may act as a barrier to health-related lifestyle changes that use weight as an indicator of potential health. To investigate the prevalence of this phenomenon at Texas State University, including what portions of the university population are most affected, a survey was sent out via the Honors College asking for basic demographic information, as well as weight, height, and perception of weight status. The responses were analyzed; due to a lack of diversity in gender, race, and ethnicity in the sample, little insight was gained into weight misperception beyond the perspective of white, non-Hispanic, women, who comprised the majority of survey respondents and who largely perceived their weight accurately. Considering this, recommendations on how a more complete and more diverse picture of weight misperception at Texas State University can be gained, and how such data can be analyzed and addressed, are suggested.

Introduction

Accurate body image perception is important for weight management in all segments of the population regardless of weight status. Recently, however, most studies investigating body image perception and weight have focused on eating disorders such as anorexia and bulimia, and the tendency of certain underweight or normal weight individuals to overestimate their weight status and see themselves as heavier than they are (Leonhard & Barry, 1998). In particular, much research has been conducted on body image of females ages 18-22, who are at elevated risk of developing these eating disorders. Clearly, this population cannot represent the population as a whole based on the unique pressures they face (Leonhard & Barry, 1998).

However, not all research has focused exclusively on eating disorders and their relationship to body weight misperception. Older studies often also looked at body perception in the overweight and obese (Leonhard & Barry, 1998), while simultaneously studying body image issues associated with anorexia and bulimia (Bell, Kirkpatrick, & Rinn, 1986). Both these older studies and the small number of newer ones point to a particular phenomenon in body image misperception: people tend to mentally adjust their size towards a healthy weight (Bell et al., 1986). Specifically, underweight individuals tend to overestimate body size (Bell et al., 1986; Kuchler & Variyam, 2003), and overweight and obese individuals tend to underestimate their body size (Madrigal et al., 2000; Sutcliffe, Schultz, Brannock, Giardiello, & Platz, 2015).

Obesity substantially increases the health risks of an individual. Indeed, obesity has been associated with over 60 diseases, including 12 different cancers (Mueller, Hurt, Abu-Lebdeh, & Mueller, 2014), type 2 diabetes, hypertension, coronary heart disease,

stroke, and kidney disease (Duncan et al., 2011). Underweight individuals face their own set of health risks, such as anemia, low bone density, decreased mental function, decreased fertility, hair loss, a weakened immune system, and poor wound healing (Uzogara, 2016). While many health campaigns encourage the adoption of healthier behaviors to combat these dangers (Sutcliffe et al., 2015), body misperception can interfere with these campaigns, and they therefore fail to reach their target audiences (Duncan et al., 2011). Indeed, overweight or obese people who under-estimate their weight may not recognize the campaign as targeted at them (Mueller et al., 2014), whereas underweight or healthy weight people who over-estimate their weight may be negatively impacted by messages of obesity-related health risks and adopt even more unhealthy behaviors out of fear (Kuchler & Variyam, 2003). Consequently, one strategy to help individuals most at risk of weight misperception is to identify them and provide assistance accurately determining their weight status, either through more specific campaigns (Sutcliffe et al., 2015), or through the viable methods of direct clinician education (Mueller et al., 2014).

As previously mentioned, college-aged white females are most at risk for over-estimating their weight status (Bell et al., 1986; Kuchler & Variyam, 2003). As far as under-estimating goes, minority men are most at risk, especially those with lower incomes and/or less education. Black, Hispanic, and Pacific Islander men all tend to view themselves as being less overweight than indicated by body mass index (BMI) (Brewis, McGarvey, Jones, & Swinburn, 1998; Paeratakul, White, Williamson, Ryan, & Bray, 2002). Minority women also tend to be more likely than white women to under-estimate their weight status, although less likely than men of the same ethnicity (Paeratakul et al.,

2002). White men are also more likely to under-estimate their weight status than are white women (Paeratakul et al., 2002). Part of this discrepancy is correlated with limited access to education on healthy lifestyles, part with the interaction of poverty and expenses associated with healthy behaviors (Kuchler & Variyam, 2003), and part due to cultural influences (Brewis et al., 1998; Paeratakul et al., 2002). Taking these studies into consideration, when considering the phenomena of body weight misperception, the roles of ethnicity, gender, and socioeconomic status cannot be discounted.

Analysis of the phenomenon of weight misperception cannot be explained solely by race, gender, and income, however. Specifically, there is a general trend towards more people misperceiving their weight status, with more people misperceiving their weight status in every race, ethnicity, gender, and age category than in years past (Duncan et al., 2011). Indeed, an analysis of 8-15-year old children conducted by the National Center for Health Statistics from 2005-2012 showed that even children are misperceiving their weight status, and at higher rates than adults, a misperception that may carry forward into adulthood (Sarafrazi, Hughes, Borrud, Burt, & Paulose-Ram, 2014). Clearly, not only is weight misperception not going away, it is in fact worsening. There are several reasons why an increase in weight misperception may be occurring.

Regarding under-perception of weight, one possibility is that with rising obesity around the world, larger sizes are becoming normalized. In this case, someone is far less likely to perceive their “normal weight” as actually overweight or obese if surrounded by others who are also overweight or obese (Duncan et al., 2011). Another likely contributor is the fashion industry, which has adopted “vanity sizing” for many clothing products. Vanity sizing occurs when designers scale down their sizes over time, so that a size 10

today may be a size 8 tomorrow. This can affect weight perception as many people monitor their weight by clothing size (Duncan et al., 2011). Finally, parents of children may underestimate the weight status of their children (Conolly & Neave, 2016; O et al., 2001). If an overweight/obese child grows up hearing that he or she is of normal weight instead of overweight or obese, it is likely they will fail to perceive their weight as unhealthy when they are adolescents or adults.

Regarding over-perception, the main culprit seems to be the media emphasis on certain body types (Lim & Wang, 2013). Young women who spend more time in front of a screen are more likely to be over-perceivers, seeking the slender body type which is portrayed as ideal in television, movies, and advertising (Lim & Wang, 2013). On a related note, young men of healthy weight status are more likely to be under-perceivers due to the emphasis on muscular men (Lim & Wang, 2013). In addition, stress, depression, and anxiety are common among over-perceivers, suggesting that there is a large mental health component to a person perceiving their weight status as being higher than it is (Lim & Wang, 2013). Eating disorders are commonly associated with this misperception, but people can be underweight and fail to recognize it for many reasons beyond eating disorders (Lim & Wang, 2013; Uzogara, 2016).

Taken together, both over-perception and under-perception of body weight pose serious health risks to society, risks that are only exacerbated by a variety of social signals from peers, from parents, and from the media (Conolly & Neave, 2016; Duncan et al., 2011; Lim & Wang, 2013; O et al., 2001). Considering the need to investigate misperception of body weight in a college environment, a study was conducted at Texas

State University to try to get a grasp on the prevalence of weight misperception at the school, how widespread it was, and what populations are most likely affected.

Methods

A seven-question survey asking height, weight, age, race, gender, ethnicity, and perception of self as underweight, healthy weight, overweight, or obese was sent out to a random selection of 1,000 Honors College Students at Texas State University. One hundred and two students responded. One response was discarded due to inaccurate weight entry. Body Mass Indexes were calculated and assigned a number of one to four, with one corresponding to an underweight BMI, two to a healthy BMI, three to an overweight BMI, and four to an obese BMI. Participants' perceptions of weight were ranked and the differences between the two were calculated along with the mean difference score, the standard deviation, and the t-statistic. Responses were then categorized by gender, ethnicity, and race. The mean difference scores between perception and reality were also calculated for within these categories, along with the standard deviation for each. T-statistics were not calculated for these subcategories due to an unexpected lack of diversity within the sample resulting in small subcategory sample sizes, with only 12% of the sample being male, 23% being Hispanic, and 23% non-Caucasian. Age was not used in any analysis and only used to verify that respondents were of college age. The range was 18 - 26 years of age. Socioeconomic status was not included due to the difficulty of accurately assessing socioeconomic status for college students.

Results

Weight misperception was calculated as the difference between perceived BMI and actual BMI, therefore, a negative number indicates an underestimation of weight, and a positive number indicates an overestimation of weight. Weight misperception in males was -0.5 (SD = 0.52). Weight misperception in females was 0.03 (SD = 0.64). Weight misperception by race was: Caucasians = 0.10 (SD= 0.66); Asians = -0.33 (SD = 0.58); Native Americans = 0 (SD = 0.71); Black or African American = 0.13 (SD = 0.35); Native Hawaiian/Pacific Islander = 0 (SD = 0). Weight misperception in ethnicities was: Hispanics = 0.13 (SD = 0.69); non-Hispanics = 0.09 (SD = 0.68). The mean weight misperception of all participants was 0.08 (SD = 0.64). The t-statistic was t (df=101) = 1.24, $p = 0.22 > .05$, indicating no significant difference between total participant perceived weight and actual BMI.

Discussion

Most respondents to this survey were white, non-Hispanic females enrolled in college, and the results of the overall statistical analysis reflect this. This demographic is the least likely to under-perceive their weight status, and this is reflected by the data gathered in this survey (Paeratakul et al., 2002). While the overall survey shows no significant degree of weight misperception among those surveyed, not much beyond that can be said. Too little data was gathered from other race, ethnicity, and gender categories to allow for accurate conclusions. For instance, it seems the two groups most likely to under-perceive their weight status based on this survey are male and Asian participants. However, there were only eleven male responders, and three Asian responders, providing sample sizes that were too small to analyze. Furthermore, based on this data it would appear Native Hawaiian/ Pacific Islanders are the best at accurately perceiving their

weight, which would appear to contradict previous research (Brewis et al., 1998; Paeratakul et al., 2002). However, with only two responses in that category, all that can be said is that those two individuals had very accurate perceptions of their weight. In all, a sample so biased by gender, race, ethnicity, and education level, can be used to analyze dominant groups in the survey, but very few conclusions about weight misperception at Texas State University in general can be drawn.

Conclusion

Weight misperception is a sensitive topic in our society today, but one we must come to grips with if we are going to get healthier as a society. Whether it comes in the form of people not realizing how overweight they are, how underweight they are, or that they are at a healthy weight, that fact that society is sending out constant contradictory messages about beauty and health without understanding how people are internalizing these messages in relation to their own weight is dangerous (Duncan et al., 2011; Lim & Wang, 2013; Sutcliffe et al., 2015). Both anorexia and obesity are on the rise and weight misperception will only exacerbate these issues (Duncan et al., 2011; Halmi, 2009; Paeratakul et al., 2002). Yes, it is important for public health campaigns to send out messages about what a healthy size is, but there needs to be a greater focus on making sure they are reaching their target audiences instead of missing under-perceivers entirely while potentially increasing the fears and misconceptions of over-perceivers.

The starting point for a better understanding of this issue and how it affects Texas State University would be to look at a broader cross-section of the population, making certain to include students of all genders, ethnicities, and races. In addition to looking at those factors, it could be helpful to also look at the different majors represented to see

which majors have higher or lower incidences of weight misperception, and whether under- or over-perception is the greater risk for those in a major. From there it would be beneficial to determine if standard messaging concerning health on campus affects those who do misperceive their weight. Are the current messages around health enough to break through these misperceptions? How does an impersonal advertising campaign compare with a one-on-one conversation with a doctor or dietician? If the university wants to address weight misperception and associated health risks this would be important additional information to factor in to any plan. Finally, if standard health messaging on campus is not effective in encouraging those who misperceive their weight to adopt healthier practices, the question is, what is? This study cannot even begin to answer these questions, but they are questions that should be addressed when discussing the promotion of health at Texas State University.

Appendix A

Informed Consent



Laurel Woodman, an honors student at Texas State University, is conducting a research study as part of her thesis research to analyze the prevalence of weight misperception among college students at Texas State. You are being asked to complete this survey because you are a student here at Texas State.

Participation is voluntary. The survey will take approximately 30 minutes or less to complete. You must be at least 18 years old to take this survey.

The only foreseeable risk for this survey is the discomfort that can be caused by the topic of personal weight. As such, there is a chance the questions might trigger difficult emotions; if this is the case, please contact the Counseling Center, located in LBJ 5-4.1, (512) 245-2208. We ask that you try to answer all questions; however, if there are any items that make you uncomfortable or that you would prefer to skip, please leave the answer blank. Your responses are anonymous.

If you have any questions or concerns, feel free to contact Laurel Woodman or her faculty advisor:

Laurel Woodman, honors student
Honors College
(512) 554-2768
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Sylvia Crixell, Professor
Family and Consumer Science
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This project #2018052 was approved by the Texas State IRB on April 1, 2018. Pertinent questions or concerns about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB chair, Dr. Denise Giobert 512-245-8351 – (dgiobert@txstate.edu) or to Monica Gonzales, IRB Regulatory Manager 512-245-2334 - (meg201@txstate.edu).

If you would prefer not to participate, please do not fill out a survey.

If you consent to participate, please complete the survey.



Appendix B

IRB Approval



In future correspondence please refer to 2018052

April 1, 2018

Laurel Woodman
Texas State University
601 University Drive
San Marcos, TX 78666

Dear Ms. Woodman:

Your IRB application 2018052 titled "Weight Misperception at Texas State University" was reviewed and approved by the Texas State University IRB. It has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is not required as participation implies consent; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data; (3) Appropriate safeguards are included to protect the rights and welfare of the subjects. (4) Compensation is not provided for participation.

This project is therefore approved at the Exempt Review Level

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments, please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Research Integrity and Compliance.

Report any changes to this approved protocol to this office. All unanticipated events and adverse events are to be reported to the IRB within 3 days.

Sincerely,

A handwritten signature in cursive script that reads "Monica Gonzales".

Monica Gonzales
IRB Regulatory Manager
Office of Research Integrity and Compliance

CC: Dr. Sylvia Crisell

OFFICE OF THE ASSOCIATE VICE PRESIDENT FOR RESEARCH

601 University Drive | JCK #489 | San Marcos, Texas 78666-4616

Phone: 512.245.2314 | fax: 512.245.3847 | WWW.TXSTATE.EDU

This letter is an electronic communication from Texas State University-San Marcos, a member of The Texas State University System.

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