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The Effects of Instagram User Weight and Health Orientation on Perceptions of Food Posts

Alese M. Nelson
University of Wisconsin-Milwaukee

THE EFFECTS OF INSTAGRAM USER WEIGHT AND HEALTH ORIENTATION ON PERCEPTIONS OF FOOD POSTS

by

Alese M. Nelson

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ABSTRACT

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by

Alese M. Nelson

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Past research has shown that social factors, such as social facilitation, influence what and how much people eat (Zajonc, 1965). One key factor seems to be others' weights; people have a tendency to dissociate themselves with obese eaters (Barthomeuf, Rousset, & Droit-Volet, 2012; McFerran, Dahl, Fitzsimons, & Morales, 2010). A pilot study was completed to assess how people viewed food photos posted to Instagram, as well as their social media habits. These findings were used in the design of the present study; the purpose of the present study is to determine whether social factors involved in eating, like others' weight, apply in online settings. This study investigated whether food posts by people of different health orientations ("health journey" vs. no health journey) and weights (control vs. normal weight vs. overweight/obese) were viewed differently in terms of healthiness of the featured food, as well as how likely one was to eat it. It was hypothesized that photos posted by an overweight/obese individual would be rated as less healthy and as having a lower likelihood of being eaten than foods posted by normal weight individuals. It was also hypothesized that photos posted by an overweight/obese person on a health journey would be rated more favorably than an overweight/obese person who was not on a health journey. Ratings of the perceived healthiness and likelihood of eating the foods in the photos were analyzed using 2 (health orientation) X 3 (weight) MANCOVAs.

Results showed a significant main effect of health orientation and a significant health orientation X weight interaction for ratings of healthiness. Follow-up tests showed significant interactions for four food photos. Tests of simple effects suggest that there may be underlying biases against overweight/obese people influencing perceptions of food health, though these findings were relatively inconsistent. Further research is needed to fully understand this relationship.

TABLE OF CONTENTS

Abstract ii
List of Figures vii
List of Tables viii

Section

I. Introduction 1
Personal Factors 1
Social Factors 3
Social Media 8

II. Method: Pilot Study 11
Participants 12
Measures and Procedure 12

III. Results and Discussion: Pilot Study 15

IV. Method: Present Study 18
Participants 18
Materials and Measures 19
Procedure 25

V. Results: Present Study 25
Hypothesis Testing 26
Additional Tests 29

VI. Discussion: Present Study 34
Overall Discussion and Conclusion 39

VII. References 40

VIII. Figures 48

IX. Tables 52

X. Appendices 54
Appendix A: Food Images by Condition (Pilot Study) 54
Appendix B: Photos of Social Media User 56

XI. Curriculum Vita 57

LIST OF FIGURES

Figure 1. Pilot Study Overview 48
Figure 2. Present Study Overview 49
Figure 3. Frequency Distribution Representing BMI 50
Figure 4. Frequency of Exercise 50
Figure 5. Frequency of Making Recipes from the Internet 51
Figure 6. Use of Websites for Recipes 51

LIST OF TABLES

Table 1. Instagram Use Statistics 52
Table 2. Instagram Use Statistics: Females 52
Table 3. Interactions for Health Orientation 52
Table 4. Simple Effects Tests for Perceived Health of Each Photo 53
Table 5. Univariate Analyses of Ratings of Instagram User 54
Table 6. Correlational Analyses for Food Pleasure Orientation and Likelihood of Eating Foods. 54

The Effects of Instagram User Weight and Health Orientation on Perceptions of Food Posts

The rise of the popularity of social media has been a global phenomenon. The Pew Research Center (Smith & Anderson, 2018) reports that 88% of young adults aged 18-29 use social media. Garnering the attention of many psychologists, researchers have found increased social media use to be related to more symptoms of anxiety (Barry, Sidoti, Briggs, Reiter, & Lindsey, 2017; Vannucci, Flannery, & Ohannessian, 2017) and depression (Barry et. al, 2017; Lin et al., 2016). While social media's impact on mental health has been widely studied, the impact of social media on physical health has received less attention. More specifically, the role social media plays in influencing dietary decision-making is under-studied. The purpose of this research is to begin to close this gap and identify social factors that influence people's perceptions of food and health.

Personal Factors

It is first important to address that dietary influences have been studied in offline contexts. One obvious contributing factor is simply one's taste. As is summarized by Chadwick, Crawford, and Ly (2013), humans have a strong preference for sweet flavors (with a general distaste for bitter foods), as well as foods which are calorie-dense. Humans also tend to prefer foods that are familiar. This familiarity and food preference shaping begins very early. Exposures to foods, especially prenatally and during infancy and childhood, have lifelong impacts on people's food preferences. During childhood, food preferences are subject to the influence of adults. Parents who use an authoritative approach to encourage their children to try new foods have more success in helping children make healthy food choices. In adults, food preference may even change with mood; Christensen and Brooks (2006) report that women felt they were more likely to consume sweets after a sad event.

Food preferences may vary depending on how one views different food groups. People tend to view unhealthy food as better tasting and tend to enjoy it more, as compared to healthy foods (Raghunathan, Naylor, & Hoyer, 2006). However, food choices may also be influenced by one's *food pleasure orientation*, which is essentially one's approach to eating (Huang & Wu, 2016). People who have a high *food pleasure orientation* focus more on the enjoyment they get from consuming any given food regardless of health benefits, rather than differentiating between healthy and unhealthy food. This is in contrast to people who tend to think of healthy eating as something they must do (more of a chore) and therefore do not associate good taste with that food. Huang and Wu (2016) found that participants who had a low *food pleasure orientation* rated food labeled as pasta as being tastier than food labeled as salad; in contrast, people with a high *food pleasure orientation* rated salad as being tastier than pasta.

Another important variable in dietary choices is one's propensity to hold "Compensatory Health Beliefs" (CHB; Rabia, Knäuper, & Miquelon, 2006). Essentially, this is a belief system wherein one thinks that if he or she engages in an unhealthy behavior, that behavior can be undone, or compensated for, by engaging in a healthy behavior. People who have a tendency to approach health in this way experience more difficulty in attempting to make behavior changes. A study of English and Swiss women revealed that the relationship between one's CHB and her intention to make healthy choices is moderated by her perceived risk (Radtke, Kaklamanou, Scholz, Hornung, & Armitage, 2014). Women who believed they were more at-risk for adverse consequences of their behavior had more diet-related CHBs, and had stronger intentions to follow a diet. Another study of German and Dutch men and women found that the relationship between CHBs and intention to eat fruits and vegetables was moderated by self-efficacy (Storm et. al, 2017). As was stated by Bandura (1982), self-efficacy is best defined as "judgments of

how well one can execute courses of action required to deal with prospective situations," (p. 122). In the case of the Storm et. al (2017), the researchers found that for people with low self-efficacy, there was a negative relationship between CHBs and intentions. In other words, when people did not believe they were capable of making a behavior change, their intention to eat fruits and vegetable decreased as CHBs increased.

Storm et. al (2017) also found that there was a significant, positive relationship between self-efficacy and intentions to eat healthily, indicating that the relationship between self-efficacy and intentions may exist independently of CHBs. Self-efficacy is not only important in predicting dietary intentions, it is also important in predicting actual dietary behaviors. A study of Finnish men found that self-control predicted self-efficacy, which predicted one's fruit and vegetable consumption intentions and behaviors (Hankonen, Kinnuen, Absetz, & Jallinoja, 2014). This idea is further supported by other research; for example, results of a study of adults in New Zealand indicated that self-efficacy was positively related to both fruit and vegetable consumption (Mainvil, Lawson, Horwath, McKenzie, & Reeder, 2009). Higher diet self-efficacy is also related to greater weight-loss (Choo & Kang, 2015).

Social Factors

One's personal preferences, beliefs, and traits are not the only important factor in determining food consumption; social factors play key roles. For example, a study of food diaries found that people eat more when they are with others (de Castro & de Castro, 1989). More specifically, it was found that meal size is positively correlated with the number of people with whom one is eating. A similar effect has also been found in children; one study showed that children in larger groups tended to eat more than children in smaller groups when they had a long time (> 11 min) to eat their snack (Lumeng & Hillman, 2007). Another study found that

when women eat with others in groups of 2 or 4, whether strangers or friends, they eat more than when they eat alone (Clendenen, Herman, & Polivy, 1994). Furthermore, they tend to eat more desserts when with friends as compared to strangers. Social facilitation provides one possible explanation for why this may be happening. Social facilitation, specifically the co-action effect, is commonly found in eating behaviors of animals (Zajonc, 1965). When animals eat with others, they are engaging in the same activity, which ultimately leads them to engage in that activity longer and in turn eat more.

Social factors involved in eating may extend beyond the realm of social facilitation. One study examined the effects of a confederate on how many crackers a participant would eat (Conger, Conger, Costanzo, Wright, & Matter, 1980). There were four conditions: control (no confederate), no-eat (confederate present, but did not consume crackers), low-eat (confederate eats only one cracker), and high-eat (confederate eats 20 crackers). The researchers found that overall, participants ate more crackers when they were in a condition in which the confederate ate, and that more crackers were eaten when the confederate was of the same sex as the participant. Regardless of their weight, the men consistently ate a similar number of crackers as the confederate. However, compelling differences emerged among normal and overweight females. Specifically, in each of the conditions where the confederate was present, obese females ate fewer crackers than did the normal weight females.

The results of Conger et. al (1980) study have two important implications regarding the social aspects of eating. First, the finding that participants ate more when the confederate ate more suggests that modeling may play a role in amount consumed. Bandura and Huston (1961) found that children imitate models when learning to interact with a new environment. Through seeing an adult make specific choices about how to engage in activities, such as marching or

walking to approach a toy box, children tend to mimic that behavior. Something similar is likely happening in this study; though adults, the participants were in an unfamiliar situation, and looked to the model (whether consciously or not) to learn what to do. The second important implication of this study is that gender and weight may be keys predictors of modeling behaviors. Men closely modeled the confederate's behavior and ate similar amounts of crackers regardless of weight, whereas obese women, while still modeling the confederates' behavior, ate significantly fewer crackers than did normal weight women. This suggests that weight may moderate the effect of gender on modeling behavior.

Some research indicates that the number of people present while eating and how much others eat may not be the only factors in how much a person eats; more specifically, the weight of the others with whom one is eating may play a role in food perceptions. One study examined the effects of the weight of another person on one's desire to eat a given food (Barthomeuf, Rousset, & Droit-Volet, 2012). Researchers presented participants with images of food that featured either a normal weight person or an obese person who was preparing to eat a commonly liked food (such as French bread) or disliked food (such as liver). In the photos, the models were making a face that expressed disgust, neutrality, or enjoyment. Participants were asked to rate their desire to eat the food in the image. Results showed that overall, when people viewed images of disliked food, they indicated they did not have a desire to eat the food. Interestingly, when people viewed images of obese people consuming foods they liked as compared to images of people with a normal weight consuming the same foods, they were less likely to want to eat that food. This was found to be true regardless of whether the obese person was expressing enjoyment of or distaste for the food featured.

A similar study to Barthomeuf and colleagues' (2012) aimed to examine the role of a confederate's weight (thin vs. obese) in the dietary choices of participants, particularly in terms of the volume of unhealthy (M&Ms) vs healthy (granola) food they ate (McFerran, Dahl, Fitzsimons, & Morales, 2010). The researchers used one thin confederate (BMI of 19.2) and manipulated her weight by having her wear an "obesity prosthesis," which gave her the appearance of having a BMI of approximately 33. Prior to beginning the study, researchers measured (by weight) the appropriate amount of snack food to set out. Participants were told they were going to be watching a movie clip and that they could help themselves to the snack offered (either granola or M&Ms). In all 4 confederate conditions (obese + M&Ms, thin + M&Ms, obese + granola, thin + granola), the confederate first took 5 "heaping tablespoons" of the snack and then the participant took what she wanted. Furthermore, there were two no-confederate (control) conditions, where participants were alone and were offered M&Ms or granola. At the end of the study, researchers measured how much (by weight) participants had taken. The researchers found that participants ate more when a confederate was present overall. Moreover, regardless of food type, participants ate more when the confederate was thin than when the confederate was obese.

Priming may explain in part why we see the results in the Barthomeuf et al. (2012) and McFerran et al. (2010) studies. Priming is the mechanism through which one stimulus influences the processing of another stimulus (Baumeister & Bushman, 2011). Obesity is surrounded by stigma. A review of weight stigma research indicated that people who are overweight or obese face discrimination in many aspects of life, including employment, health care, and educational settings (Puhl & Brownell, 2001). In fact, people with a high body mass index (BMI; i.e., those who are overweight or obese) are perceived more negatively overall than people who are of

normal weight; specifically, they are viewed as lazy, sloppy, disagreeable and less competent (Roehling, 1999). In short, obese individuals are perceived as less socially desirable (Puhl & Brownell, 2001; Roehling, 1999). When individuals see obese people represented in the images, the obesity may serve as a prime for these negative societal attitudes. More specifically, seeing images of obese people consuming food reminds people of the perceived undesirable qualities associated with obesity, which influences their ratings of the images, as they want to distance themselves from the socially undesirable person.

These findings (Barthomeuf et. al, 2012; McFerran et. al, 2010) may also be explained in part by social comparison. Festinger (1954) explains that people rely on others to serve as a marker by which they can measure their own abilities and opinions. When people perceive that another individual is very dissimilar in terms of abilities or opinions, they find it difficult to compare themselves to him or her. Evidence suggests that obese people are seen as the less socially desirable group, and that they are viewed as lazy and sloppy (Puhl & Brownell, 2001; Roehling, 1999). If people believe themselves to be dissimilar from this group of people, they may have difficulty associating themselves with the obese person and therefore rate them differentially.

People may also be using social comparison as a means of self-enhancement by making downward social comparisons (Willis, 1981). When obese people are perceived to be part of the outgroup or "less than," people compare themselves to them and in turn, feel better about themselves for not being a part of the less fortunate group. Rating themselves as unlikely to eat the foods featured in images of obese people (Barthomeuf et al., 2012) and eating much less than them (McFerran et al., 2010) may indicate an attempt to establish oneself as having higher status, and to feel good about oneself. People may doing so in an effort to differentiate themselves from

the socially undesirable group of obese people. In short, the participants may have been attempting to associate themselves with the more socially desirable group of normal-weight people.

Participants' concern for self-presentation is the final factor that may have contributed to the results of the Barthomeuf et al. (2012) and McFerran et al. (2010) studies. Self-presentation, a key player in social cognition, is best described as the way in which one behaves to portray a given image to others, or how one communicates the traits he or she wants to outwardly display (Fiske, 1995). Because of the negative associations with obesity, the individuals in the study may be attempting to manipulate their self-presentation to appear as being healthier than the obese individuals. In other words, by indicating that they would not eat the foods featured in photos with an obese person, they are attempting to present themselves as people who value a good diet and who do not support an unhealthy diet that could potentially lead to obesity.

Social Media

While many of these concepts are relevant, few address the fact that we now have new social situations we engage in—social media. For the purposes of these studies, we include Facebook, Twitter, Instagram, Snapchat, YouTube, Reddit, What's App, Tumblr, and Pinterest as social media sites or applications (apps). Though at face value these sites may not seem to play a role in diet, many of these sites are flooded with food-related posts. For example, a search of the hashtag "food" on Instagram yields over 300 million posts. On a weekday afternoon, a search for "food" on Twitter yields 7,430 tweets in the last hour. There are countless YouTube recipe videos, including entire "channels" devoted to food and cooking. For example, media corporation Buzzfeed has a YouTube channel called "Tasty" (n.d.), posting recipes of all sorts. Some channels are more specific. Lauren Toyota runs Hot for Food (n.d.), a vegan cooking

channel. Andrew Rea of Binging with Babish (n.d.) recreates iconic foods from television and film, like Rachel's famously flubbed banana and beef English trifle from *Friends* (Crane, Kauffman, Malins, & Bright, 1999). Social media sites are saturated with food-related content; as such, it is pertinent that we understand its role more deeply. More specifically, we need to determine whether these social and psychological influences on eating translate into social media.

As was previously stated, social media has been linked to more symptoms of anxiety (Barry et. al, 2017; Vannucci et. al, 2017). Upon examining a more specific type of anxiety, however, a different picture emerges. A meta-analysis of social anxiety and internet use found a positive correlation between comfort online and social anxiety, suggesting socially anxious people find the internet to be a safer medium for social interaction (Prizant-Passal, Shechner, & Aderka, 2016). One possible explanation for this is described by Suler (2004) as the online disinhibition effect. In short, this means that people do things on the internet that they would not do in a face-to-face scenario. This sense of disinhibition may be due in part to the anonymity the internet provides. This anonymity removes in-the-moment physical and verbal interaction cues, leaving more open to interpretation (Bargh & McKenna, 2004). It can also help conceal personal characteristics, like race, that may play a role in face-to-face interactions.

Social anxiety is particularly relevant to consider when discussing diet, due to its close link with disordered eating (Levinson & Rodebaugh, 2012). One of the most important predictors in disordered eating is fear of negative evaluation; this fear of negative evaluation is predictive of social anxiety. The results of this study indicated that a fear of negative evaluation was a significant predictor of a drive for thinness. Similarly, in another study of how this fear of negative evaluation relates to diet, one research group found that fear of negative evaluation was

associated with pathology of eating disorders, namely a drive for thinness, body dissatisfaction, and bulimic symptoms (Menatti, DeBoer, Weeks, & Heimberg, 2015). Another study examined overweight and obese individuals, and found that social anxiety is positively correlated with emotional eating and binge eating (Otrovsky, Swencionis, Wylie-Rosett, & Isasi, 2013). Furthermore, the researchers found that those who actually met the criteria for binge eating disorder had significantly higher levels of social anxiety than those who did not meet the criteria. Given the relationship between social anxiety and disordered eating, as well as the relationship between social anxiety and internet use, it is important to consider social anxiety as a possible factor influencing how people perceive and respond to food images posted online.

There has been some research regarding how people use social media in relation to food. One study used focus groups to examine how young adults viewed social media in relation to health (Vaterlaus, Paten, Roche, & Young, 2015). Participants reported that social media was beneficial in helping them expand their food choices; people share recipes, which influences what they make in "real" life. Some participants also expressed that they post food photos on social media as a means of showing off their skills or to make others want to eat it. Some participants indicated that seeing food posts did, in fact, inspire them to eat (or at least, wish they could eat) the foods featured. However, in many cases, that desire to eat the foods did not necessarily translate into action.

One particularly relevant study examined how individuals in different weight categories respond to food posts on social media (Kinard, 2016). The participants were shown a healthy food post from a fake Instagram user; the photo featured a black bean veggie burger. Participants were asked to rate their behavioral intentions relative to subsequent social media activity. They rated statements like "I would 'like' this post on my social media account" and "I would follow

this restaurant on my social media account." In one condition, the post had low activity (no likes or comments), and in the second condition, the post appeared to have high activity (many likes and comments). The results indicated that participants who were obese rated themselves as significantly more likely to interact with the post and account. It was suggested that this may be a result of an attempt to associate oneself with a healthier lifestyle. As was the case in the Barthomeuf et. al. (2012) and McFerran et. al (2010) studies, the participants in this study by Kindard (2016) may be engaging in social comparison. Because obese people are viewed as a less socially desirable group (Puhl & Brownell, 2001; Roehling, 1999), they may be engaging in upward social comparison in an attempt to associate themselves with a more "attractive" group. By engaging positively with a public post displaying healthy food, they are sending the message that they are similar to the healthy, veggie burger-eating crowd. This also ties into self-presentation (Fiske, 1995) and is of particular relevance in social media. People often use social media as a way to display a version of themselves they would like to be seen as, not necessarily as what is most representative (Manago, Graham, Greenfield, & Salimkhan, 2008).

Method: Pilot Study[1]

We conducted a pilot study to begin assessing students' dietary beliefs and practices, as well as their internet and social media behaviors. We aimed to determine whether a food photo posted on social media would be perceived differently than a food photo that was not clearly posted on social media. We also aimed to investigate whether there was a relationship between perceived healthiness of a food and likelihood of eating it. Lastly, we wanted to identify any personal characteristics, such as personality and gender, which could predict dietary habits or beliefs. We hypothesized that participants would rate themselves as more likely to eat foods that

[1] The results of this pilot study are published (Nelson & Fleming, 2019).

was posted on social media than foods that were not. We also predicted perceived health of a food would be related to how likely one was to consume it. Furthermore, we hypothesized that there would be gender differences in food consumption, in that females would eat healthier than men.

Participants

Participants included 189 undergraduate men (n = 26) and women (n = 163) from the University of Wisconsin-Milwaukee. Students' ages ranged from 18-33 (*M* = 21.27 years, *SD* = 2.80). Participants were predominantly white (70.9%), followed by Asian (10.1%), African American (8.5%), Hispanic or Latino/a (5.3%), mixed ethnicity (4.2%), Native American (0.5%), and other (0.5%). The participants were students in psychology classes, and were recruited through the university's online research sign-up system. In exchange for their participation, students were granted one hour of extra credit to count toward a course of their choice.

Measures and Procedure

Upon obtaining informed consent, this survey began with a series of demographic questions asking participants to disclose their age, gender, ethnicity, religion, political party, weight and height (for BMI calculations), community, living situation, dietary restrictions, eating disorder history, and general dietary practices (such as where they shop for groceries, how often they cook and dine out, etc.). This was followed by a series of questionnaires, the first of which was the Ten Item Personality Inventory (TIPI), a measure of the Big-Five personality traits (Gosling, Rentfrow, & Swann, 2003). Next, participants completed the Enjoyment of Sexualization Scale (ESS; Liss, Erchull, & Ramsey, 2011). This scale was developed to measure how women respond to attention from men, to ensure the questionnaire was more gender-neutral,

we reworded the questions so they did not apply to a specific gender. Cronbach's α for the present study was .85. After the ESS, participants were asked to complete the Rosenberg Self-Esteem Scale (RSES), which is a measure of the extent to which participants believe in themselves and their abilities (Rosenberg, 1965). Cronbach's α for the present study was .88. To measure how strongly the participants believed men should follow traditional, masculine gender norms, we presented the Male Role Norms Survey-Short Form (MRNS-SF; Levant, Hall, & Rankin, 2012). We selected three subscales from the questionnaire, including restrictive emotionality (Cronbach's α = .90), dominance (Cronbach's α =.89), and toughness (Cronbach's α = .75) subscales.

The Health Locus of Control Survey (HLC) was completed next. This survey asks participants to rate the extent to which they believe they can control their own health outcomes (Wallston, Wallston., Kaplan, & Maides, 1976). Higher scores indicate an external locus of control. Cronbach's α for the present study was .67. This was followed by the Social Comparison Scale, a measure that asks them to rate themselves relative to others on typically socially desirable traits (Allan & Gilbert, 1995). Cronbach's α for the present study was .91.

To assess participants' actual eating habits, we gave participants questions from the Eating Habits Questionnaire, which asks participants to rate the frequency with which they consume foods from each of the food groups (EHQ; Dana-Farber Cancer Institute, n.d.). Portions of the 2014 Food and Drug Administration (FDA) Health and Diet Survey (Lin, Zhang, Carlton, & Lo, 2016), which asks about participants' health and nutrition knowledge, as well as their own nutrition-based decision-making, followed this.

After participants had finished the self-report questionnaires, we asked them to rate a series of food photos. These images were actual photos that had been posted on the social media

app Instagram by real users. Instagram is a photo-based app through which users exclusively post images or videos, which they have the option to caption. Photo content often includes "selfies" (photos of oneself), landscapes, and/or food. Other users and one's followers have the option to "like"—represented by tapping a heart-shaped icon—and/or comment on posts. Our images were selected by searching through publicly shared posts for foods that represented one of three categories: healthy, neutral, and unhealthy. Foods considered healthy were those that contained fruits and vegetables, fish, white meat, and/or little fat. Examples of healthy foods included a papaya, salmon with vegetables, and granola with strawberries. Unhealthy foods were high in fat or carbs, and/or contained red meat or sugar. Examples of unhealthy foods included cheeseburgers, grilled cheese, and donuts. Neutral foods were those that did not clearly meet the healthy or unhealthy criteria, such as tacos (filling unclear), a roast beef sandwich, and squash soup topped with bacon. After collecting photos, research assistants selected photos they perceived to be the 10 healthiest, 10 unhealthiest, and 5 most neutral photos. Once we had selected the 25 photos for the study, we edited the photos to create four conditions: (1) photo only-cropped so there was no sign of having been posted to Instagram, (2) heart visible-cropped so it was clearly from Instagram, (3) likes visible-cropped so participants could see how many likes it had received, and (4) caption visible-cropped so participants could see entire post; usernames were blocked. For an example of the variance in how the photos were cropped, see Appendix A.

When the participants clicked the survey link, they were randomly redirected and assigned to one of these 4 conditions. The order for all 25 photos was initially randomized and all participants, regardless of condition, saw the same order. For each photo, participants were asked to rate how likely they were to eat the food featured using a Likert-type scale ranging from

1 (“I would never eat this”) to 7 (“I would definitely eat this”). We also asked them to rate how healthy they perceived each food to be using a similar 7-point Likert-type scale ranging from 1 (extremely unhealthy) to 7 (extremely healthy). After rating photos, participants completed the Attitudes subscale from the Media and Technology Usage and Attitudes Scale (MTAUS; Rosen, Whaling, Carrier, Cheever, & Rokkum, 2013). This 16-item scale measures positive and negative attitudes about technology, as well as dependence on technology and preferences for frequently switching tasks.

We also asked participants to rate how frequently they use popular social media sites (including Facebook, Twitter, Snapchat, Instagram, YouTube, Pinterest, Tumblr, Reddit, and What’s App). We measured this using a 10-point Likert-type scale ranging from 1 (never/no account) to 10 (all the time). We also asked participants to rate how much time they spend on those sites each time they visit, using a similar 10-point Likert-type scale ranging from 1 (none or N/A) to 10 (over an hour). Lastly, we asked participants about how they use the internet for recipes, including whether they use the recipes, which sites they find recipes on, and whether they use recipes shared in video format. Finally, participants were debriefed and the study was completed. See Figure 1 for procedure overview.

Results and Discussion: Pilot Study

Cronbach’s alpha was used to test the internal consistency of each of the food categories. This test indicated that there was sufficient internal consistency for ratings of healthiness for healthy foods ($\alpha = .79$) and unhealthy foods ($\alpha = .79$), as well as for ratings of likelihood of eating healthy ($\alpha = .81$) and unhealthy ($\alpha = .83$) foods. As such, we calculated new variables based on the food image categories. Ratings of how likely participants were to eat each food and

how healthy it was perceived to be were averaged together for each category (healthy, unhealthy, and neutral), creating 6 new variables.

Next, we used 2 two-way multivariate analyses of variance (MANOVAs) to test whether there were any gender or condition differences between ratings of healthiness of and likelihood of eating the foods pictured. When testing ratings of healthiness of the healthy, unhealthy, and neutral foods, the MANOVA indicated there was no significant main effect of condition, nor was there a significant gender by group interaction. There was, however, a significant main effect of gender, F (3, 167) = 2.60, p = .05; Wilks' Λ = .954. Follow-up univariate tests indicated that after using a Bonferroni-adjusted alpha level, there were significant differences in ratings of healthiness of unhealthy foods, in that men (M = 2.45, SE = 0.15) rated unhealthy foods as significantly healthier than did women (M = 2.04, SE = .06), F(1, 169) = 6.46, p = .012. When testing ratings of likelihood of eating healthy, unhealthy, and neutral foods, the second MANOVA indicated there was no significant main effects of gender or of condition, nor was there a significant gender by group interaction.

These findings indicate that a photo having been posted on social media does not significantly impact people's perception of the food featured. However, this does not necessarily rule out the possibility that social media plays a role. All photos participants saw were from different accounts, and they knew nothing about the person or page who made the post. Essentially, knowing nothing about the person who made the post strips away the "social" aspect of social media. Further research is needed to determine whether knowledge about the user impacts how participants rate food photos.

To test whether there were relationships between "how likely" and "how healthy," we used bivariate Pearson's correlations. Because we found gender differences in our previous

analysis, we ran separate analyses for men and women. We found that for men, there was not a relationship between perceived healthiness of a food and likelihood of eating it for any of the food categories (healthy, unhealthy, or neutral) This suggests that for young men, the health benefits (or lack thereof) of food do not play a role in dietary decision-making. For women, we ran the same analyses and found that for healthy foods, there was a significant, positive relationship between how healthy a food was perceived to be and how likely participants were to eat it, $r(155) = .211$, $p = .008$. There was no relationship between health perception and likelihood perception for neutral foods, $r(158) = .138$, $p = .08$. Similarly, there was no relationship between perceived health and likelihood to eat unhealthy foods, $r(155) = .058$, $p = .473$. This suggests that while female participants want to eat healthy foods, perhaps health is not an important factor in determining whether they will eat an unhealthy food. Of course, because this data is correlational, it is difficult to draw conclusions. It is unclear whether women want to eat healthy food *because* it is healthy, or because they happened to like the healthy foods featured.

Next, we assessed participants' social media use. The most commonly used social networking sites were Facebook and YouTube; only 7% of participants indicated they never use these sites or do not have an account. This was closely followed by Snapchat (7.6% never use it or do not have an account) and Instagram (12.9% never use it or do not have an account). To determine if there were any gender differences in how much people use these 4 most commonly used websites, we ran a one-way MANOVA. The test indicated there were significant gender differences in social media use, $F(4, 180) = 7.79$, $p < .001$; Wilks' $\Lambda = .852$. Follow-up univariate tests indicated that after using a Bonferroni-adjusted alpha level, there were no significant gender differences in Facebook use, $F(1, 183) = 2.88$, $p = .09$, or YouTube use, $F(1,$

183) = 0.70, p = .40. However, women (M = 7.50, SE = 0.19) reported using Snapchat significantly more than men (M = 5.42, SE = 0.47), F(1, 183) = 16.56, p < .001. Likewise, there were significant gender differences in Instagram use in that females (M = 6.59, SE = 0.19) reported using Instagram more than men (M = 4.04, SD = 0.48), F(1, 183) = 24.29, p < .001. Of those who use Instagram, 24.7% say they use it several times a day. See Table 1 for frequency of use statistics. When examining females only, 81.2% indicated that they use Instagram at least once a day. See Table 2 for frequency of use statistics for females.

Method: Present Study

In the present study, we aimed to investigate whether the source of a social media post influences how its content is perceived. More specifically, our goal was to determine whether the weight ("normal" weight vs. overweight/obese) of the person who was posting (the "user's") food photos influences how participants viewed the healthiness of foods featured, and whether the user impacted how likely the person is to eat the food. Furthermore, we aimed to study whether the motivation for the post (on a "health journey" not on a health journey) interacted with the user's weight. We hypothesized that participants would rate food photos shared by the overweight/obese user as less healthy and that they would be less likely to eat the foods featured. We also hypothesized that healthy foods shared by an overweight/obese person who is on a "health journey" would viewed more favorably than those posted by the overweight/obese person who is not on a health journey.

Participants

Participants included 183 female, undergraduate psychology students ranging in age from 18-45 (M = 22.03, SD = 4.84). We required that participants were at least 18 years of age, identified as women, and had an active Instagram account. Participants were recruited via the

university's online research management system and were offered extra credit for a course of their choosing in exchange for their participation.

Materials and Measures

Demographics and self-esteem. We began the survey by collecting demographic information, including participants' age, weight and height, and year in school. This was followed by a series of questionnaires, the first of which was the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), a 10-item measure of one's perception of herself, using a 4-point Likert scale ranging from "strongly agree" to "strongly disagree." Participants rated their agreement with statements such as "I feel I have a number of good qualities" and "I wish I could have more respect for myself." Negatively worded items were reverse scored, and higher scores suggest higher self-esteem. Cronbach's α for the present study was .89.

Social comparison. The Social Comparison Scale, used to measure the way in which people view themselves on a variety of traits as compared to others (Allan & Gilbert, 1995). The measure uses a 10-point Likert scale ranging from 1 (representing the undesirable end of the trait spectrum) to 10 (representing the desirable end of the spectrum). For example, participants were asked to rate whether they tend to feel weaker (1) or stronger (10), and unattractive (1) or more attractive (10) in relation to others. Cronbach's α for the present study was .88.

To ascertain whether any differences can be explained by one's social comparison *orientation*, or the tendency to compare oneself to others, we used the Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999). To complete this 11-item measure, participants rated the extent to which they agreed with statements such as, "I often compare myself with others with respect to what I have accomplished in life" and, "I always like to know what others in a similar situation would do." Participants rated their agreement with the

statements on a Likert scale ranging from 1 (I disagree strongly) to 5 (I agree strongly). Cronbach's α for the present study was .81.

Depression. Next, we measured depression using the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is a 21-item self-report measure of one's feelings of depression. Participants were asked to select the statement they most identify with out of a pool of 4 statements. Each of these 4 statements is associated with a number ranging from 0 to 3. Statements not associated with depressive symptoms are scored with a 0, whereas the most strongly associated with depressive symptoms are scored with a 3. For example, in one item participants may select "0-I don't get more tired than usual," "1-I get tired more easily than I used to," "2-I get tired from doing almost anything," or "3-I am too tired to do anything." Scores range from 0-63. Higher scores indicate more depressive symptoms. Scores over 40 indicate extreme depression. Cronbach's α for the present study was .92.

Social anxiety. To measure social anxiety, we next included the Liebowitz Social Anxiety Scale (Liebowitz, 1987). This questionnaire has 24 items that participants are to rate on two scales: fear or anxiety (ranging from 0-none to 3-severe) and avoidance (ranging from 0-never to 3-usually). Eleven items are social interaction situations and 13 items are performance situations. Examples of social situations include "talking to a person in authority" and "meeting strangers." Examples of performance situations include "eating in public places" and "working while being observed." Participants were instructed to indicate how fear or anxiety-inducing each situation is, and then indicate how often they avoid the situation. Scores were summed across items. Higher scores indicate more social anxiety. Cronbach's α for the present study was .93 for fear and .92 for avoidance.

Manipulation. After completing the self-report measures, we presented a series of photos that were posted on a fake Instagram account. The participants were told that the account was real, that photos were posted to this person's Instagram account over a period of 3 months, and that they a\were to rate the photos. They were told that we aimed to study whether Instagram post content is predictive of how many followers that person has. We also told participants that identifying information had been withheld to protect the user's anonymity. The first photo people saw was of a woman; participants saw a different photo depending on the condition into which they had been sorted. There were a total of 6 conditions: (1) normal weight woman-no health journey, (2) normal weight woman-health journey, (3) overweight/obese woman-no health journey, (4) overweight/obese woman-health journey, (5) control-no health journey (no photo of user), and (6) control-health journey (no photo of user). Participants only saw posts from one user. The photo was selected via pixabay.com and was free for commercial use. The photo featured a woman whose back was to the camera as she walked on the beach. To create different weight conditions, we manipulated the appearance of the woman in the photo using Adobe Photoshop (version 19.1.0). The photos used can be found in Appendix B.

Along with the photo of the woman, participants saw a summary of information that they were told was from the user's "bio." On Instagram, this is a short section on one's profile where a user briefly describes him or herself. Users rarely use complete sentences, and often include emojis that they feel describe them or their hobbies. Because it is difficult to create a realistic bio that is still controlled for an experiment, we did not include a screenshot of the bio. Instead, described the bio. Those in the health journey conditions saw a statement that said, "this person's bio states that she is a young woman, she is living in a metro area, and she is on a health journey." Those who in the non-health journey condition saw a statement that said, "this person's

bio states that she is a young woman and she is living in a metro area." This was followed by the photo of the normal weight woman or the overweight/obese woman (or no photo, if control). Based off of this photo and bio summary alone, participants were asked to provide a rating of how likely they were to follow this account. The question stated, "based on this information, would you follow this account," and participants replied using a 7-point Likert-type scale ranging from 1 (No, definitely not) to 7 (Yes, definitely). This was to help ensure that participants are reading the captions and actively considering the user.

After participants rated the photo or statement about the user, the conditions were the same. Participants were presented with a total of 10 food photos. These photos were selected from the pool of 25 photos presented in the pilot study. We selected 4 healthy photos (falafel Buddha bowl, berries with granola, chicken fajita bowl, and salmon with asparagus and tomatoes), 4 unhealthy photos (cookies with ice cream, deep dish pizza, grilled cheese, and fried gyoza), and 2 neutral photos (squash soup with bacon, and tacos). The healthy food photos all had a mean health rating of 5.55 or higher (based on the 7-point Likert-type scale used in the pilot study ranging from 1-"I would never eat this" to 7-"I would definitely eat this"). The unhealthy food photos all had a mean health rating that was less than 2.5. The neutral food photos had mean health ratings of 4.12 and 3.63. All photos had mean likelihood of eating ratings ranging from 4.96 (gyoza) to 6.18 (berries with granola), again based off the 7-point Likert-type scale used in the pilot study. This scale ranges from extremely unhealthy (1) to extremely healthy (7). Because we told participants that these photos were posted on this person's Instagram over the course of 3 months, these food photos also included the heart and other icons (used to "like" the photo), but participants were not able to see the number of likes or captions. Besides the fact that we found no significant differences in ratings between photos with

just the heart visible vs. the number of likes visible in the pilot study, it would not be believable that there were zero likes on any photos over the course of 3 months.

For each food photo, participants were asked to rate how likely they were to eat each food featured on the same 7-point Likert-type scale that was used in the pilot study. For each photo, they were also asked to rate how healthy they perceive the food to be, again using the same 7-point Likert-type scale from the pilot study. The order in which the photos appear was randomized for each participant to control for any possible order effects.

Once participants rated all the food photos, they were asked to answer a series of questions regarding their perceptions of the user. This included, "how likely are you to follow this account," "how healthy is this person," "how knowledgeable is she about health," and "would you trust this person's health advice?" Participants answered these questions using a 7-point Likert-type scale ranging from 1 (low) to 7 (high). Because we did find a positive relationship between conscientiousness and ratings of how likely participants were to eat health foods in the pilot study, we will also ask participants to rate their perceptions of the user on each of the Big 5 personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism).

Food pleasure orientation. We also measured *food pleasure orientation* using the same 6 items used by Huang and Wu (2016). These 6 items were originally developed as a part of a larger scale by Rozin, Fischler, Imada, Sarubin, and Wrzesniewski (1999). This shortened version includes a series of questions regarding participants' food-related attitudes, such as positivity toward food and preference for eating (as compared to other activities), as well as memories associated with food. Participants respond to statements like, "Enjoying food is one of the most important pleasures in my life" and, "I have fond memories of family food occasions,"

using a Likert scale that ranges from 1 (strongly disagree) to 7 (strongly agree). High scores indicate high food pleasure orientation. Cronbach's α for the present study was .79.

Health knowledge. After participants finished assessing the user, they answered a brief series of questions pulled from the 2014 FDA Health and Diet Survey (Lin et. al, 2016), which asks about participants' health and nutrition knowledge, as well as their own nutrition-based decision-making. We asked participants to indicate whether they have heard of cancer and heart disease being related to diet, whether they consider nutrition labels and serving sizes when making decisions about what to eat, how they define a serving size, how many calories they think they should be consuming, and how they perceive their own health and health knowledge. This measure provides a short summary of how participants think about health, as well as how knowledgeable they are on the subject. This survey was originally administered as a telephone-based survey and we adapted it to written format for participant use in an online survey.

Social media anxiety. This was followed by the Social Anxiety Scale for Social Media Users (SAS-SMU; Alkis, Kadirhan, & Sat, 2017). This is a 21-item measure that participants use to rate their anxiety relative to their social media experiences. The scale consists of 4 subscales which target anxiety surrounding different aspects of social media-related activity. These subscales include: shared content anxiety (e.g., "On social media, I am concerned about the fact that the content I share will not be liked by others"), privacy concern anxiety (e.g., "On social media, the possibility of having my private information shared publicly makes me anxious"), interaction anxiety (e.g., "On social media, I feel uneasy while making new friends"), and self-evaluation anxiety (e.g., "On social media, I feel anxious about making a negative impression on people"). Anxiety is rated on a scale ranging from 1 (never) to 5 (always). For each of the subscales, shared content anxiety (Cronbach's α = .89), privacy concern anxiety (Cronbach's α =

.90), interaction anxiety (Cronbach's α = .94) and self-evaluation anxiety (Cronbach's α = .94), reliability was high.

Additional demographic information. The last self-report information included more demographic question. These questions were located at the end of the survey to ascertain they do not serve as a prime for the rest of the study. We asked participants about their eating disorder history, special diets they follow (such as vegan/vegetarian, low-carb, low-fat, etc.), and exercise habits. We closed the survey with a manipulation check (asking participants what they thought was the purpose of the study, then asking them to rate the weight of the person they saw as underweight, normal weight, overweight, or obese).

Procedure

This study took place entirely online. Participants signed up through the university's research system, and after doing so were provided a link to the study that was be accessible until they completed the study or the date for participation expired. This survey link randomly redirected them to one of the 6 conditions. Upon completion of the survey, participants were automatically granted credit. See Figure 2 for overview of the procedure.

Results: Present Study

Manipulation Check

First, we did a manipulation check. We found that overall, the majority of participants rated the weight of the person they saw in a way that was consistent with their condition. Of the 64 participants who were in the control conditions (saw no photos), 91% rated the model as normal weight. Of the 58 participants who saw a normal weight model, 88% rated the model as normal weight. Of the 61 participants who saw an overweight/obese model, 67% rated the model as overweight or obese. However, it should be noted that approximately 33% of participants

rated this model as normal weight. We examined self-report measures to determine whether there were any differences among the people who rated this model as normal weight as compared to those who rated her as overweight or obese. One-way analyses of variance (ANOVAs) indicated that there were no significant between-group differences in ratings of shared content anxiety, privacy concern anxiety, self-evaluation anxiety, depression, social comparison, BMI, *food pleasure orientation*, ratings of model's healthiness, health knowledge, or trustworthiness, nor likelihood of following the account. The interaction anxiety subscale of the SAS-SMU (Alkis et. al, 2017) was near significant, $F(1, 58) = 3.88$, $p = .054$. Those who rated the model as overweight or obese had higher interaction anxiety ($M = 2.92$, $SD = 1.11$) than those who rated the model as normal weight ($M = 2.36$, $SD = 0.86$).

We tested the internal consistency of each of our food categories (healthy, unhealthy, and neutral) on the healthiness and likelihood of eating scales developed in the pilot. We found there was low internal consistency among ratings of perceived health of healthy (Cronbach's $\alpha = .62$) and unhealthy (Cronbach's $\alpha = .70$) foods. Similarly, there were low internal consistency ratings of perceived likelihood of eating healthy (Cronbach's $\alpha = .51$) and unhealthy (Cronbach's $\alpha = .57$) foods. As such, we did not average together the healthy or unhealthy variables.

Hypothesis Testing

Food ratings. We hypothesized that foods posted by the normal weight woman would be rated as healthier than those posted by overweight/obese woman, and that posts overweight/obese women on a health journey would be rated as healthier than posts by their non-health journey counterparts. To test these hypotheses, we used 2 (health orientation: health journey or no health journey) X 3 (weight: no photo, fit, overweight/obese) MANCOVAs to assess whether there were any between-group differences in ratings of the healthy, unhealthy,

and neutral food images in terms of healthiness and likelihood of eating, while controlling for participant BMI and social media-related anxiety (specifically, the self-evaluation subscale of the SAS-SMU; Alkis et. al, 2017). We chose to control for social media anxiety due to evidence that anxiety is linked with internet use (Barry et. al, 2017; Prizant-Passal et. al, 2016; Vannucci, et. al, 2017) and disordered eating (Levinson & Rodebaugh, 2012; Menatti et. al, 2015; Otrovsky et. al, 2013). We chose to control for BMI given that obese people may interact differently with food content on social media (Kinard, 2016).[2]

When analyzing ratings of healthiness of all 10 photos, results of the MANCOVA showed that participants' BMI was not a significant covariate [$F(10, 126) = 0.77$, $p = .65$; Wilks' $\Lambda = .942$], but self-evaluation anxiety was a significant covariate, $F(10, 126) = 2.26$, $p = .024$; Wilks' $\Lambda = .848$. There was no main effect of weight, $F(20, 252) = 0.69$, $p = .832$; Wilks' $\Lambda = .899$. As such, our first hypothesis (that foods posted by the normal weight woman would be rated as healthier than those posted by the overweight/obese woman) was not supported. However, there was a significant main effect of health orientation [$F(10, 126) = 1.91$, $p = .05$; Wilks' $\Lambda = .869$], as well as a health journey by weight interaction, $F(20, 252) = 2.59$, $p = .001$; Wilks' $\Lambda = .695$.

To follow up our significant interaction, we examined interactions for individual food photos. Results indicated that there were significant interactions for squash soup with bacon, grilled cheese, chicken salad, and salmon (see Table 3 for test statistics for all food photos). We used tests of simple effects of health orientation to examine these effects further. Overall, we found inconsistent responses in terms of ratings of perceived health between groups depending on the food selected. See Table 4 for means and univariate tests.

[2] One person reported a weight of 60lbs, which seemed to be in error given her height was 5'5", and she was therefore excluded from these analyses.

We hypothesized that foods posted by the overweight/obese models would be rated as less likely to be eaten as compared to those posted by the normal weight model. The results of the MANCOVA analyses for likelihood of eating foods indicated that there were no significant effects. Neither BMI [$F(10, 126) = 0.45$, $p = .92$; Wilks' $\Lambda = .966$] nor self-evaluation anxiety [$F(10, 126) = 1.11$, $p = .36$; Wilks' $\Lambda = .919$] were significant covariates. There were not significant main effects of health orientation [$F(10, 126) = 0.61$, $p = .81$; Wilks' $\Lambda = .954$] and weight [$F(20, 252 = 0.54$, $p = .95$; Wilks' $\Lambda = .919$], nor was there a significant interaction, $F(20, 252) = 1.03$, $p = .42$; Wilks' $\Lambda = .854$. These findings suggest that the Instagram user had no effect on participants willingness to eat the foods presented.

Instagram User Ratings. We asked participants to rate how likely they were to follow the account before (Time 1) and after (Time 2) they had viewed the food photos. At Time 1, participants had seen the image of the account user (or no photo if control) and had read the account bio description. The scale ranged from 1 (low) to 7 (high). We ran a two-between (health orientation and weight), one-within (time) repeated measures ANOVA to assess whether there were differences in ratings of likelihood of following the account at Times 1 and 2 among groupings. Results showed there was a significant effect of time, with likelihood of following the account significantly increasing from Time 1 ($M = 3.17$, $SD = 1.63$) to Time 2 ($M = 4.22$, $SD = 1.92$), $F(1, 177) = 55.54$, $p < .001$. Additionally, we found a significant main effect of weight, $F(2, 177) = 3.27$, $p = .04$. Follow-up Tukey tests indicated that there were no differences in likelihood of following the account among those who saw the model who was overweight/obese ($M = 3.73$, $SE = 0.19$) as compared to the control ($M = 4.01$, $SE = 0.19$) or normal weight ($M = 3.32$, $SE = 0.20$) conditions. However, those who saw the control account were significantly more likely to follow the account than those who saw the normal weight model, $p = .031$. There

was no significant effect of health orientation [$F(1, 177) = 0.13$, $p = .72$], nor was there a significant health orientation by weight interaction, $F(2, 177) = 0.62$, $p = .54$.

We also asked participants to rate the models in terms of the models' perceived healthiness, perceived health knowledge, and overall whether they would trust that person's health advice. We found no significant effects. See Table 5 for analyses.

Additional Testing

Participant data. Participants were asked a series of questions regarding their own health and exercise habits.

Body Mass Index (BMI and weight). We asked participants to report their weight in pounds and height in inches, and calculated BMI based off this data (using the formula BMI = 703*weight/height^2). BMI ranged from 9.98 – 48.95, though the 9.98 seems to be a result of errored reporting from the participant. Therefore, 16.44 is a more accurate minimum value. The average BMI was 25.40 (median being 24.08). This indicates that on average, our participants fell into the very low end of the "overweight" category, and median would indicate they fell in to the high end of the "normal" range. However, it should be noted that this distribution was right-skewed, and the largest proportion of participants fell in the normal range. See Figure 3 for the frequency distribution (excluding the lowest extreme—9.98).

Though BMI is a better indicator of health than weight alone, it should be noted that we were missing data for 37 participants. The missing BMI data is a direct result of participants' failure to report height We asked for height in inches, and reminded participants that 5 feet is equal to 60 inches. We suspect the failure to report height is a result of not understanding how to convert their height to inches. Participants weight ranged from 60-322 pounds, though again, we

suspect that 60 pounds was erroneous and therefore 94 pounds is a more accurate minimum value. On average, participants weight 151.39 pounds (median being 143.00).

Eating disorders. Participants were asked to report whether they had ever been diagnosed with an eating disorder. Approximately 88% of participants indicated they had not received a diagnosis. Approximately 2% selected that they preferred not to answer, and 10% indicated they had received a diagnosis. Of those who had received an eating disorder diagnosis, the most common diagnosis was anorexia nervosa ($N = 12$), followed by bulimia nervosa ($N = 5$) and body dysmorphic disorder ($N = 5$). Other diagnoses included binge eating disorder ($N = 3$) purging disorder ($N = 2$), night eating disorder ($N = 2$), orthorexia ($N = 1$), rumination disorder ($N = 1$), avoidant restrictive food intake disorder ($N = 1$), and other ($N = 1$).

Dieting. We asked participants to select any and all specific diets they followed. Most participants did not follow a diet. The most frequently followed diets were vegetarian ($N = 18$), low carb ($N = 13$), intermittent fasting ($N = 11$), pescatarian ($N = 8$), and low fat or low cholesterol ($N = 7$).

Exercise. We asked participants to report how frequently they exercised, with choices ranging from "never" to "daily." Approximately 14% of participants indicated they never exercise, indicating that 18% exercised at least once per month. See Figure 4 for details.

We also asked participants to report the types of exercise they do. While we received diverse responses, the most frequently reported were walking ($N = 112$), running ($N = 87$), weight lifting ($N = 73$), yoga ($N = 57$), and cycling ($N = 35$). Most participants (51%) indicated that each exercise period lasts between 30 and 60 minutes, with 35.5% exercising for an hour or more (and 13.5% exercising less than 30 minutes).

Health questions. We used a series of analyses to assess relationships among participants' health beliefs.

Perceived health of own diet. We asked participants to report how healthy they perceived their diet to be overall. We asked twice: at Time 1, prior to answering questions about their own health (including health knowledge, eating disorders, and exercise habits), and once after, at Time 2. A simple linear regression was done to test whether participant BMI predicted perceived health of one's own diet at Time 1. Results showed that one's own BMI did predict ratings of perceived healthiness of one's own diet, with perceived health decreasing as BMI increased, R = .42, R^2 = .17, $F(1, 144) = 30.01$, $p < .001$. Similar results were found at Time 2, $R = .43$, $R^2 = .18$, $F(1, 143) = 32.00$, $p < .001$.

Perceived overall health of self. A multiple regression was used to assess whether participants' own BMI and frequency of exercise predicted perceived health overall. Results indicated that as a set, BMI and frequency of exercise significantly predicted perceived overall health, $R = .51$, $R^2 = .26$, $F(2, 143) = 24.94$, $p < .001$. Both BMI ($\beta = -.46$, $t = -6.29$, $p < .001$, $pr = .47$, $sr = .45$) and frequency of exercise ($\beta = .17$, $t = 2.40$, $p = .018$, $pr = .20$, $sr = .17$) had significant unique contributions.

Perceived health knowledge. We asked participants to rate their perceived ability to select healthy foods. In response to the statement "I am confident that I know how to choose healthy foods" (Lin et. al, 2016), approximately 39% indicated that they "strongly agree. And additional 51% indicated that they "somewhat agree," while only 10% indicated they "somewhat disagree." No participants selected "strongly disagree," suggesting most had at least some confidence in their ability to choose healthy foods.

In response to the statement "I generally know which menu items in a restaurant have more calories and which have less calories" (Lin et. al, 2016), people had less confidence, with 31% reporting "strongly agree," 46% reporting "somewhat agree," 18% reporting "somewhat disagree," and 5% reporting "strongly disagree."

Health knowledge. We asked participants to indicate whether they had heard anything about the things people eat or drink being related to heart disease and cancer (Lin et. al, 2016). The overwhelming majority of participants indicated that they had heard of heart disease being related to diet (approximately 97%), whereas fewer had heard that cancer was related to diet (approximately 68%).

We also asked whether participants believed all adults faced the same chances of getting high blood pressure (Lin et. al, 2016). Approximately 87% of participants indicated that they did *not* believe all adults face the same chance of getting high blood pressure, whereas 13% thought the risk was equal for all adults. Participants held similar beliefs about children and the risk for high blood pressure.

Health practices. We asked participants to report the frequency with which they read nutrition information on a product they are using for the first time (Lin et. al, 2016). Most participants indicated they often (40%) or sometimes (34%) read the label, and less than half rarely (19%) or never (7%) read it. That being said, this does not necessarily translate into action; only about 53% of participants report often (22% or sometimes (31%) using the serving size information on the labels, while 47% rarely (32%) or never (15%) use this guidance.

Food Pleasure Orientation. We asked participants a series of questions regarding their *food pleasure orientation* (Huang &Wu, 2016, Rozin et. al, 1999). Those with high *food pleasure orientation* tend to get equal enjoyment out of healthy and unhealthy foods, whereas

those with low food pleasure orientation tend to view healthy eating as a chore. We ran bivariate Pearson correlational analyses to test whether *food pleasure orientation* was related to likelihood of eating each of the 10 foods featured. Results indicated that, unexpectedly, there were significant, positive correlations between *food pleasure orientation* and likelihood of eating most neutral and unhealthy foods, but there were no associations with healthy foods. See Table 6 for details.

Internet usage. Because this study was related to internet and health practices, we also collected data regarding social media use.

Instagram. As per our exclusion criteria, all participants had an Instagram account. This website was one of the most heavily used—approximately 85% of participants indicate that they use Instagram at least once per day. Most frequently, participants cited they use Instagram several times a day (37%), all the time (14%), and several times an hour (13%).

In terms of duration of use, most participants indicated they spend 5-10 minutes on the site each time they use the app (34%),. The majority of others spend 1-5 minutes (24%) or 10-20 minutes (16%) each time they use the app.

Other accounts. We asked about frequency of use of other social media sites as well. Most popular were YouTube (95% use it at least once per month) Facebook (93% use at least once per month), and Snapchat (90% use at least once per month). Given the nature of these sites, people tend to spend more time on YouTube per visit (with 75% spending *at least* 10 minutes each time) than they do on Facebook (65% spending 10 minutes or less per visit) or Snapchat (74% spending 10 minutes or less per visit).

Using the internet for recipes. Approximately 98% of participants had used the internet to find a recipe, and 97% had actually made a recipe from the internet. See Figure 5 for details regarding distribution.

We asked participants to select all websites they use for recipes. Most popular were food blogs written by an individual (50% of participants use this), followed by Pinterest (49%), community food blogs (44%), Food Network (43%) and Facebook (42%). See Figure 6 for all websites.

Discussion: Present Study

The goal of the present study was to determine whether weight (normal weight vs. overweight/obese) and health orientation (on a health journey vs. not on a health journey) significantly impacted perceptions of food posted, both in terms of health and one's likelihood of eating. We hypothesized that food photos posted by those were overweight/obese would be rated as less healthy and that people would rate themselves as less likely to eat them as compared to those posted by the normal weight model. We also hypothesized that foods posted by an overweight/obese woman who was on a health journey would be rated more favorably than foods posted by an overweight/obese woman who was *not* on a health journey. We found that after controlling for participant BMI and social media-related self-evaluation anxiety, there was no main effect of the user's weight on perceptions of foods posted. We did find that there was a significant main effect of health orientation and a weight by health orientation interaction. Upon further examination, we found that 4 food photos showed significant interactions. However, tests of simple effects for those 4 food photos showed inconsistent results. There was no effect of the Instagram user on participants' perceived likelihood of eating foods.

Past research shows that overall, people who are obese face social stigma and are perceived as less desirable (Puhl & Brownell, 2001; Roehling, 1999), and furthermore suggests that people's eating behaviors are influenced by the weight of others (Barthomeuf et. al, 2012). More specifically, Barthomeuf and colleagues (2012) found that people rate food images that feature obese people as less desirable. Our study did not show any outright bias (as measured by main effect of weight) against Instagram users in any weight category, neither in terms of the perceived healthiness of the foods being posted, nor in terms of participants' likelihood of eating the foods. Our results also indicated that there were no differences in perceived overall health of the model, her perceived health knowledge, nor in her trustworthiness between conditions. These findings do not reflect Barthomeuf's and colleagues' (2012) findings that people are less likely to eat foods if they are being consumed by an obese person (based on ratings of food photos in which an obese person was preparing to eat the food). This contrast may be due to the fact that we did not feature the model *in* the food photos as Barthmeuf et. al; rather, we presented her *before* the food photos.

We did find that that there were differential ratings of perceived healthiness of foods depending on the weight and health orientation of the model. However, it was difficult to distinguish an overall pattern of food ratings due to inconsistency in significant findings. For the effects that were significant, we found that those in the normal weight and control conditions rated foods posted by someone on a health journey as being healthier than those that were posted by someone not on a health journey. In contrast, for those who were obese, being on a health journey resulted in lower ratings of perceived healthiness of foods posted. These findings could suggest that the obesity stigma described by Roehling (1999) and Puhl and Brownell (2001) is being reflected more subtly. More specifically, participants were seemingly more critical of the

dietary choices of the overweight/obese person when she was claiming to be on a health journey, rating her food as overall less healthy. This indicates that while people are able to keep overt bias out of their responses, it may surface as food choice scrutiny. That being said, it is not possible to draw definitive conclusions, giving that these effects were found inconsistently.

One possible explanation for the inconsistency in food ratings is that the foods were too obviously categorical. As an example, participants largely agreed that ice cream was an unhealthy food. It is arguable that the health status of ice cream is common knowledge, and therefore, it would take substantial effort to convince someone otherwise. In contrast, when examining bacon squash soup (squash is healthy, but does bacon negate that?), there was greater variation among the ratings between groups, specifically in terms of mean ratings of perceived health. This suggests that perhaps a better metric would be ambiguous photos; the more difficult it is to classify, the more subject it is to influence of others. Informational influence, or conformity due to the perception that others have more information (Franzoi, 2016), may play a role here. If the participant is uncertain whether the food is healthy, she may be more likely to rely on other cues from the Instagram user (such as appearance or health orientation) to determine the status of that food.

Another possible explanation for these findings is that many of our participants (approximately one third) did not view our model as overweight/obese, and categorized her as "normal weight." It is unclear whether this was due to the participants truly not believing she was overweight/obese, or if they chose to label her as "normal" for another reason. For example, it may be that participants were hesitant to assign this label due to the stigma associated with being overweight/obese (Puhl & Brownell, 2001; Roehling, 1999). Another possible cause is exposure to obesity; past research indicates this exposure can serve as a primer for perceptions of

others' weight (Robinson & Kirkham, 2014). More specifically, seeing images of someone who is obese leads people to rate overweight people as being a healthy weight. If our participants have had more exposure to obese bodies, this may play a role in how they perceived the model in this study. However, based on the data we collected, we are unable to determine the exact causes of the inaccurate categorization.

Overall, we found that our participants had a basic knowledge of diet-related health practices, with most indicating they had heard of diet being related to risk for heart disease and cancer. Additionally, the majority of our participants indicated that they understood the risk for high blood pressure was not equal among all adults and children. We also found that most of our participants *did not* participate in fad diets, and *did* exercise at least once per month. This further suggests that our participants had fairly accurate baseline knowledge about health.

One interesting finding was that *food pleasure orientation* (Huang & Wu, 2016, Rozin et. al, 1999). was significantly and positively related to perceived likelihood of eating neutral and unhealthy foods, but we did not find any significant relationships between *food pleasure orientation* and healthy foods. These findings conflict with Huang's and Wu's (2016) findings that people who were high in *food pleasure orientation* rated a meal labeled as a salad as tastier than when it was labeled as pasta. It is unclear why there is such a stark contrast between our findings and Huang's and Wu's (2016) findings. It may be a result of methodology; Huang and Wu only showed participants one photo (the same photo in each condition), and that photo was either presented as pasta or salad. Our participants saw 10 photos, both healthy and unhealthy. It is possible that when presented with a variety of options, the context (i.e., having other foods to compare to) influences how participants rate food.

After measuring use of several social media sites, we found that participants were heavy social media users. This is consistent with Smith's and Anderson's (2018) findings that the vast majority of young adults are social media users. Our study showed that the majority used Instagram at least once per day, and also frequently used YouTube, Facebook, and Snapchat. Not only are they using social media frequently, they are using it for recipes. We found that approximately half our participants who had used the internet for recipes had used Pinterest. These findings provide further support to our overarching theory that social media users' diets may be subject to the influence of others.

This study was limited in regard to the model we used as the supposed Instagram user. First, we used the same model in all four experimental conditions, and simply manipulated her weight using Adobe photoshop (version 19.1.0). While this allowed us to control for individual characteristics that may influence the outcome, it may make findings less generalizable. Furthermore, the model we used was white, and we did not examine the role of race in this study. Due to cultural differences in perceived ideal body weight (e.g., a 2014 study by Lynch and Kane found that African American women do not consider overweight bodies to be "too fat"), race may play a key role in perceptions.

Future research should examine the role of social influence in perceptions of health, specifically in regard to more ambiguous health information. Informational influence has been shown to be predictive of health behaviors, especially among women (Holt et. al, 2010). As such, it would be beneficial to explore the role of it in health perceptions. More specifically, it would beneficial to investigate how perceptions of ambiguous foods are impacted by the influence of another person.

In addition to examining different foods, it may be prudent to investigate how variations in the model influence the outcome. First, it would be beneficial to examine the role of race in users perceptions of the model due to the aforementioned cross-cultural differences in perceptions of healthy bodies (Lynch & Kane, 2014). Second, future research should focus on the impact of weight distribution influences perception of health and ratings of the Instagram user. Having a large waist-hip ratio, i.e., carrying weight around the waist, is predictive of myocardial infarction risk, particularly among women (Cao et. al, 2018). BMI alone is not a sufficient predictor of health and risk for obesity-related disease. As such, it would be beneficial to understand how one's weight distribution influences others' perceptions of health.

Overall Discussion and Conclusion

Overall, it is clear that social media plays an big role in many women's lives. Both our pilot and primary studies show that participants are spending a substantial portion of their time using the sites. Not only are they online often, but many use social media sites (namely Pinterest, Facebook, and YouTube) as a source for recipes. The fact that these sites subject people to what others are posting, implies that there is a certain degree of social influence going into our food choices. Furthermore, the present studies have hinted that people's perceptions of foods may be influenced by others, specifically in regards to their weight and health orientation, but the results are inconclusive. Future research should examine broader populations and aim to investigate how these findings directly translate in live social media settings. It is imperative that we understand the extent to which social media and the people who use it influence the perceptions and health of others.

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Figures

Figure 1

Pilot Study Overview

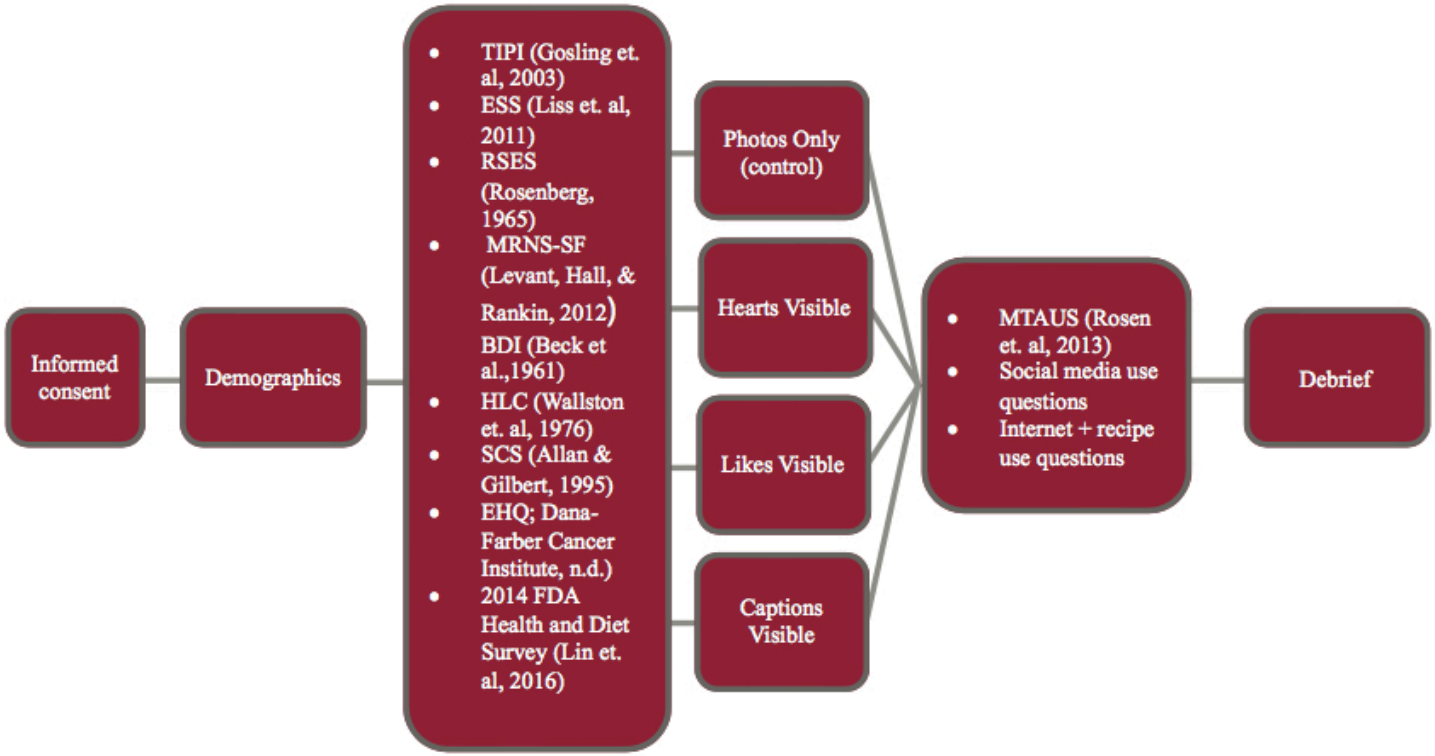


Figure 2

Present Study Overview

Figure 3

Frequency Distribution of BMI

Figure 4

Frequency of Exercise

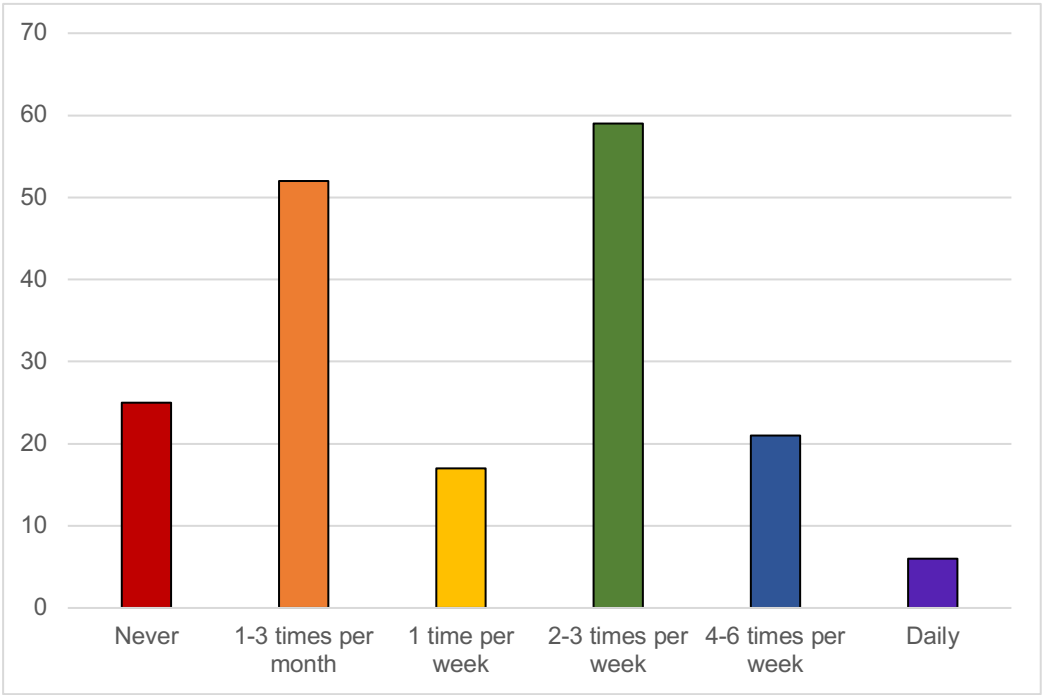


Figure 5

Frequency of Making Recipes from the Internet

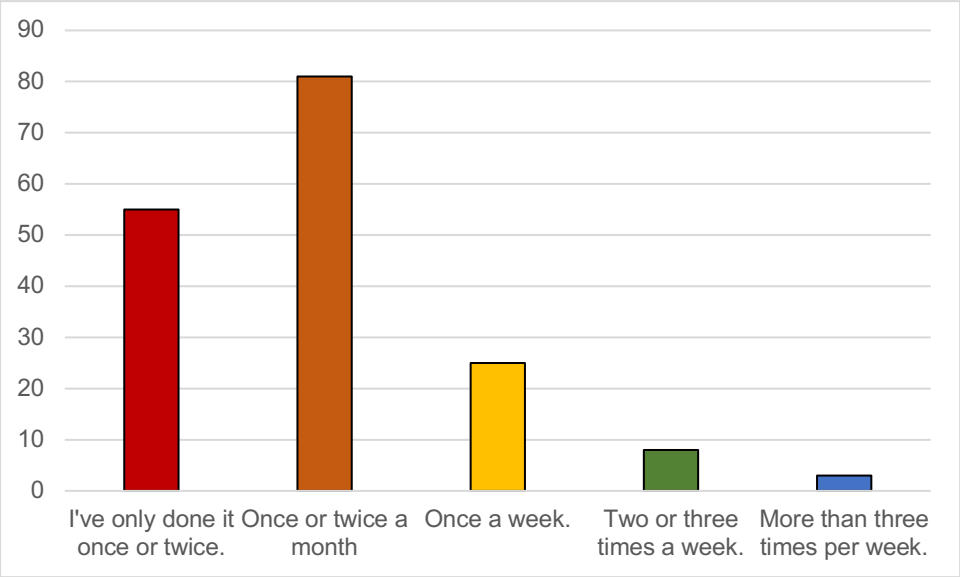
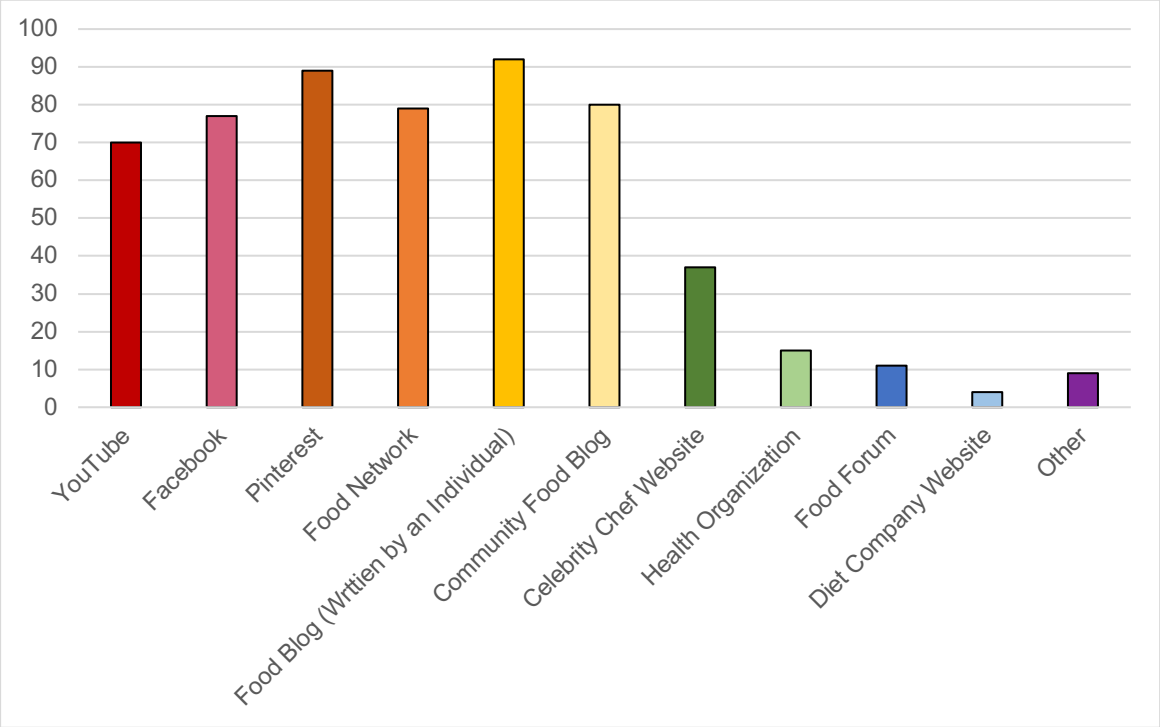


Figure 6

Use of Websites for Recipes



Note: Data represents number of participants who use each site.

Tables

Table 1

Instagram Use Statistics

Frequency	%
Never/No account	7.0
Once a month	7.5
A few times a month	4.3
Once a week	1.1
A few times a week	8.1
Once a day	14.5
Several times a day	31.7
Once an hour	7.0
Several times an hour	5.9
All the time	12.9

Note: Represents males and females. Six did not answer.

Table 2

Instagram Use Statistics: Females

Frequency	%
Never/No account	8.8
Once a month	1.3
A few times a month	1.3
Once a week	1.3
A few times a week	6.3
Once a day	15.0
Several times a day	39.4
Once an hour	10.0
Several times an hour	5.6
All the time	11.3

Note: Five did not answer.

Table 3

Interactions for Health Orientation

Neutral	*F*	*p*
Tacos	0.87	.422
Squash soup with bacon	6.53	.002**
Unhealthy		
Deep dish pizza	2.50	.086
Grilled cheese	3.41	.036*
Fried gyoza	0.57	.564
Ice cream	0.86	.918
Healthy		
Falafel Buddha bowl	0.21	.980
Berries with granola	2.84	.062
Chicken fajita bowl	3.46	.034*
Salmon	4.26	.016*

Note: All df = (2, 135).). *$p < .05$, **$p < .01$.

Table 4

Simple Effects Tests for Perceived Health of Each Photo

Neutral	Condition	*F*	*p*	No HJ: Mean (*SE*)	Yes HJ: Mean (*SE*)
Tacos	C	0.18	.670	3.85 (0.23)	3.72 (0.20)
	N	0.04	.846	3.52 (0.21)	3.58 (0.21)
	O	1.92	.169	3.27 (0.21)	3.69 (0.22)
Squash soup with bacon†	C	9.35	.003**	3.67 (0.23)	4.60 (0.20)
	N	1.49	.224	4.38 (0.21)	4.02 (0.21)
	O	2.17	.143	4.45 (0.21)	4.00 (0.22)
Unhealthy					
Deep dish pizza	C	1.69	.196	2.00 (0.22)	1.61 (0.20)
	N	0.27	.603	1.84 (0.20)	1.99 (0.21)
	O	6.61	.011*	2.26 (0.20)	1.50 (0.22)
Grilled cheese†	C	0.39	.534	2.43 (0.24)	2.23 (0.22)
	N	5.69	.018*	1.84 (0.22)	2.59 (0.22)
	O	0.99	.322	2.28 (0.22)	1.95 (0.24)
Fried gyoza	C	0.01	.937	2.75 (0.23)	2.73 (0.21)
	N	1.64	.203	2.54 (0.21)	2.93 (0.22)
	O	1.47	.228	2.66 (0.21)	3.04 (0.23)
Ice cream	C	0.30	.582	1.54 (0.16)	1.41 (0.15)
	N	0.04	.844	1.37 (0.15)	1.32 (0.15)
	O	0.001	.981	1.43 (0.15)	1.43 (0.16)
Healthy					
Falafel Buddha bowl	C	0.46	.499	6.22 (0.22)	6.42 (0.20)
	N	0.21	.649	6.59 (0.20)	6.72 (0.20)
	O	0.18	.673	6.19 (0.20)	6.31 (0.21)
Berries with granola	C	1.98	.162	6.04 (0.21)	6.43 (0.19)
	N	3.89	.051*	6.28 (0.19)	5.76 (0.19)
	O	0.001	.970	6.07 (0.19)	6.06 (0.20)
Chicken fajita bowl†	C	0.81	.371	5.54 (0.23)	5.82 (0.20)
	N	3.48	.064	6.16 (0.20)	5.61 (0.21)
	O	6.91	.010*	6.09 (0.21)	5.29 (0.22)
Salmon†	C	4.88	.029*	5.41 (0.19)	5.98 (0.17)
	N	0.64	.425	5.75 (0.17)	5.55 (0.18)
	O	2.94	.089	5.90 (0.18)	5.45 (0.19)

Note: C = Control. N = Normal weight. O = Overweight/obese. All df = (1, 135). †Significant interaction. *$p < .05$, **$p < .01$.

Table 5

Univariate Analyses of Ratings of Instagram User

Ratings of Healthiness	df	*F*	*p*
Health Orientation	1, 177	0.13	.72
Weight	2, 177	0.08	.93
Health Orientation*Weight	2, 177	0.76	.47
Ratings of Health Knowledge			
Health Orientation	1, 177	1.63	.20
Weight	2, 177	1.24	.29
Health Orientation*Weight	2, 177	0.05	.96
Ratings of Trust			
Health Orientation	1, 177	0.37	.54
Weight	2, 177	0.15	.86
Health Orientation*Weight	2, 177	1.06	.35

Note: Scale ranged from 1 (low) to 7 (high). Data represents main and interaction effects for each univariate analysis of variance (ANOVA).

Table 6

Correlational Analyses for Food Pleasure Orientation and Likelihood of Eating Foods

Neutral	*r*	*p*
Tacos	.190	.010**
Squash soup with bacon	.207	.005**
Unhealthy		
Deep dish pizza	.226	.002**
Grilled cheese	.047	.525
Fried gyoza	.223	.003**
Ice cream	.222	.003**
Healthy		
Falafel Buddha bowl	-.027	.718
Berries with granola	-.055	.460
Chicken fajita bowl	.031	.679
Salmon	.023	.757

Note: High scores indicate high *food pleasure orientation*. **$p \leq .01$.

APPENDIX A:

Food Images by Condition (Pilot Study)

Condition 1: Photo Only

Condition 2: Heart Visible

Condition 3: Likes Visible

Condition 4: Caption Visible

APPENDIX B:

Photos of Social Media User

1 (Normal weight woman)

2 (Overweight woman)

Alese M. Nelson

EDUCATION

May 2020 **Ph.D. in Psychology**
University of Wisconsin-Milwaukee
Specialization: Health and Social Psychology
Departmental minors: Quantitative Methods, Cognition and Perception
Dissertation: The Effects of Instagram User Weight and Health Orientation on Perceptions of Food Posts

May 2017 **M.S. in Psychology**
University of Wisconsin-Milwaukee
Specialization: Health and Social Psychology
Thesis: Effects of Laugher on Psychophysiological Reactivity

May 2015 **B.S., Cum Laude**
University of Wisconsin-Green Bay
Majors: Psychology, Human Development
Senior Thesis: Women with Tattoos: The Impact of Body Art on Perceptions of Personality, Behaviors, and Career

PUBLICATIONS

Nelson, A. M., & Fleming, R. (2019). Gender differences in diet and social media: An explorative study. *Appetite*, *142*. doi: 10.1016/j.appet.2019.104383

Gurung, R. A. R., Stoa, R., **Nelson, A.**, & Schultz, D. (2018). The influence of T-shirt graphics on perceptions and behavioral intentions. *The Journal of Social Psychology, 158*(5), 1-12. doi: 10.1080/00224545.2018.1491471

MANUSCRIPTS

Submitted

Chen, W., **Nelson, A. M.**, Johnson, H. B., & Fleming, R. (Under review). Effects of self-affirmation on emotion and cardiovascular responses.

In Preparation

Nelson, A. M., & Fleming, R. (In preparation). Stress, social support, and depression over time: A hierarchical linear modeling approach.

Chen, W., Johnson, H. B., **Nelson, A. M.**, & Fleming, R. (In preparation). Effects of cardiovascular arousal on emotional responses.

PRESENTATIONS

Wanninger, E., Schaller, S., Xiong, S., Zimmermann, H., **Nelson, A. M.**, & Fleming, R. (2019). Investigating diet through a social media lens: An explorative study. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Zimmermann, H., Xiong, S., Schaller, S., Wanninger, E., **Nelson, A. M.**, & Fleming, R. (2019). Effects of finger tapping on physiological responses to stress. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Wanninger, E., Rafalski, L., Kursel, H., **Nelson, A. M.**, & Fleming, R. (2018). Effects of simple motor movement on physiological activity. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Nelson, A. M. (2017, November). *#NoFilter: How social networking changes the way we think, behave, and feel.* University of Wisconsin-Green Bay, Green Bay, WI.

Gonzalez, R. M., Greer, C. D., **Nelson, A. M.**, & Fleming, R. (2017). Effects of laughter on self-reported and psychophysiological measures of stress. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Gonzalez, R. M., Nachreiner, C. M., **Nelson, A. M.,** & Fleming, R. (2017). Effects of laughter on self-reported and psychophysiological measures of stress. Poster presented at the annual meeting of the University of Wisconsin-Milwaukee Association of Graduate Students in Psychology Symposium, Milwaukee, WI.

Nelson, A. M. (2017, February). *#NoFilter: How social networking changes the way we think, behave, and feel.* University of Wisconsin-Green Bay, Green Bay, WI.

Carroll, E., Badalamenti, V., **Nelson, A.**, & Gurung, R. A. R. (2016). Art appreciation. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Carroll, E., **Nelson, A.**, Badalamenti, V., Gurung, R. A. R. (2016). The power of stereotypical art on racial attitudes and prejudicial behaviors. Poster presented at the University of Wisconsin-Green Bay Academic Excellence Symposium, Green Bay, WI.

Klefstad, G. G., **Nelson, A. M.**, Jones, A., & Martin, R. C. (2016). In the moment anger experiences: A new method in data collection. Poster presented at the University of Wisconsin-Green Bay Academic Excellence Symposium, Green Bay, WI.

Klefstad, G. G., **Nelson, A. M**., Jones, A., & Martin, R. C. (2016). In the moment anger experiences: A new method in data collection. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Nelson, A. M., & Gurung, R. A. R. (2016). Women with tattoos: The impact of body art on perceptions of personality, behaviors, and careers. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Schultz, D., Badalamenti, V., Busko, S., **Nelson, A.**, & Gurung, R. A. R. (2016). Perceptions and behaviors based upon clothing. Poster presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.

Nelson, A. M. (2015, December). *#NoFilter: How social networking changes the way we think, behave, and feel.* University of Wisconsin-Green Bay, Green Bay, WI.

TEACHING EXPERIENCE

Instructor
Marquette University
Milwaukee, WI

- PSY 3201: Introductory Social Psychology
    - Course level: Undergraduate
    - Fall 2019, Spring 2020
    - Course topics: Self, social cognition, attitudes, persuasion, helping, prejudice, discrimination, social influence, group behavior, relationships, aggression,

Instructor
University of Wisconsin-Milwaukee
Milwaukee, WI

- PSY 101: Introduction to Psychology
    - Course level: Undergraduate
    - Fall 2019, Spring 2020
    - Course topics: Research methods, biological psychology, perception, stress and health, conditioning and learning, thinking and intelligence, memory, development, social psychology, personality, mental illness and treatment
- PSY 610: Experimental Design
    - Course level: Graduate
    - Spring 2019
    - Course topics: Correlation/regression, hierarchical regression, interactions with categorical and continuous variables, factor analysis/principal components analysis, logistic regression
- PSY 510: Advanced Psychological Statistics
    - Course level: Graduate
    - Fall 2018
    - Course topics: t-tests, one-way analysis of variance (ANOVA), follow-up tests, two-way ANOVA, main effects and interaction effects, repeated measures ANOVA, mixed two-factor ANOVA

Instructor
Mount Mary University
Milwaukee, WI

- PSY 324: Health Psychology
    - Course level: Undergraduate
    - Spring 2018
    - Course topics: Culture and health, models of behavior change, health behaviors, stress and coping, psychophysiology, pain and pain management, social support
- PSY 103: Introduction to Psychology
    - Course level: Undergraduate
    - Fall 2017
    - Course topics: See above

Teaching Assistant
University of Wisconsin-Milwaukee
Milwaukee, WI

- Course: PSY 510: Advanced Psychological Statistics
  - Professor: Dr. Raymond Fleming
  - Course level: Graduate
  - Fall 2017, Fall 2018, Fall 2019
  - Course topics: See above
- Course: PSY 610: Experimental Design
  - Professor: Dr. Raymond Fleming
  - Course level: Graduate
  - Spring 2018, Spring 2019, Spring 2020
  - Course topics: See above
- Course: PSY 656: Psychophysiology
  - Professor: Dr. Raymond Fleming
  - Course level: Undergraduate
  - Fall 2016, Spring 2017
  - Course topics: Cardiovascular psychophysiology, electrodermal activity, sleep, electroencephalography, emotion regulation, stress responses

HONORS AND AWARDS

2018	UW-Milwaukee Department of Psychology Graduate Student Summer Research Fellowship
2018	UW-Milwaukee Graduate Student Travel Award
2017	UW-Milwaukee Graduate Student Travel Award

MEMBERSHIPS AND AFFILIATIONS

2017-Present	American Psychological Association; Graduate student affiliate Division 2-The Society for the Teaching of Psychology Division 38-Health Psychology
2016-Present	Midwestern Psychological Association
2013-Present	UW-Green Bay chapter of Psi Chi International Honor Society

STAISTICAL SOFTWARE

Statistical Package for the Social Sciences (SPSS)
Statistical Analysis System (SAS)
Hierarchical Linear and Nonlinear Modeling (HLM)