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## Effects of weight-focused social comparisons on diet and activity outcomes among overweight and obese young women

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### Abstract

**Objective**—To investigate social comparison processes as a potential mechanism by which social networks impact young women's weight control thoughts and behaviors and to examine whether social comparisons with close social ties (i.e. friends) have a greater influence on weight control outcomes relative to more emotionally distant ties.

**Design and Methods**—Using Ecological Momentary Assessment (EMA) overweight young adult women (N=46; *M* age = 19; *M* BMI = 29) reported the nature and effects of weight-focused social comparisons on dieting and exercising intentions and behaviors during their daily routine.

**Results**—Relative to social comparisons to targets of the same weight, weight-focused comparisons to both thinner and heavier individuals led to increased thoughts of dieting and exercising. Moreover, comparisons to thinner targets also increased the likelihood of engaging in actual dieting and exercising behavior. Weight comparisons to friends amplified these effects.

**Conclusions**—Weight-focused social comparisons may be one mechanism by which social networks impact weight control thoughts and behaviors. Obesity interventions with young adults may achieve better outcomes by harnessing social comparison processes in treatment.

### Keywords

social comparison; naturalistic; weight control; overweight; young adults

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## Introduction

Overweight and obesity is associated with negative medical consequences including cardiovascular disease and increased risk for diabetes.<sup>1,2</sup> Young adults are at substantial risk of weight gain<sup>3,4</sup> and forty-nine percent of this population meet criteria for overweight or obesity.<sup>5</sup> Despite the prevalence of overweight and obesity among young adults and the associated health consequences, young adults are less likely to participate in traditional behavioral weight loss interventions<sup>6,7</sup> and, when they do, they lose less weight than older adults.<sup>6</sup> Understanding factors that contribute to young adults' weight loss intentions and behaviors is imperative to developing effective prevention and treatment programs for this high-risk population.

Social influence has been shown to impact a variety of health outcomes in young adults<sup>8,9</sup>; however, very little research has examined the impact of social networks on young adults' obesity risk. Instead, studies have focused on adults of *all* ages (18-70+). Results show that social influence impacts adults' weight status and obesogenic behaviors.<sup>10,11</sup> Specifically, individuals with obesity tend to cluster in social networks and individuals within these friendship groups gain weight over time.<sup>10,12,13</sup> Further, emotionally “close” social ties have more influence on obesity compared to distal social ties.<sup>10,14</sup> Among young adults, specifically, the limited data available suggest that not only are close social contacts important, but individuals with obesity are more likely to have psychologically close social contacts with other individuals with obesity.<sup>15</sup>

Emerging evidence suggests that social ties also may impact healthy weight control behaviors (e.g., portion control, physical activity).<sup>15-18</sup> For example, data indicate that adults with obesity who report more social contacts trying to lose weight also report greater intention to lose weight and greater actual weight loss.<sup>16</sup> Further, there is evidence that social modeling is associated with healthy eating and physical activity.<sup>17</sup> These findings have been replicated with young adult samples<sup>15,18</sup> and data indicate that social norms may be particularly important to this age group's weight loss intentions – social norms may mediate the relationship between social contacts trying to lose weight and young adults' weight loss intentions.<sup>15</sup>

Despite evidence that social ties may contribute to both obesogenic and healthy weight related behaviors, we have a limited understanding of the social-cognitive mechanisms that underlie social influence processes by which weight-control thoughts and behaviors spread through social networks, particularly among young adults.<sup>14</sup> Social Comparison Theory<sup>19</sup> provides a useful framework through which to understand the effects of social networks on weight control thoughts and behaviors. Social Comparison Theory suggests that individuals compare themselves to similar others on salient domains, which results in the desire to reduce perceived discrepancies, leading to behavior change.<sup>19</sup> Individuals can make three types of comparisons: 1) upward comparisons, where the comparison target is perceived to be “better-off” (e.g., overweight (OW) or obese (OB) individual comparing to a normal weight (NW) individual); 2) downward comparisons, where the comparison target is perceived to be “worse-off” (e.g., OW comparing to OB); or 3) lateral comparisons, where the comparison target is perceived to be similar in the salient domain (e.g., OW comparing

to OW). Research with women of NW shows that upward body comparisons are associated with increased dieting and other weight control behaviors.<sup>20-22</sup> In contrast, downward comparisons may be associated fewer weight control behaviors among women of NW<sup>21</sup> and subsequent weight gain.<sup>10</sup> Little is known about the impact of lateral body comparisons on subsequent weight-related cognitions and behaviors; however, given that a discrepancy is less likely to be perceived between similar individuals, Social Comparison Theory would suggest that lateral comparisons will have less impact on weight-related thoughts and behaviors than upward or downward comparisons. Notably, to our knowledge, no one has examined how the three types of social comparisons (i.e., upward, downward, lateral) differentially impact weight-related thoughts and behaviors in young adult women. Moreover, no one has explicitly examined whether emotionally close social ties (e.g. friendship ties) may increase the impact of social comparisons on weight-related thoughts and behaviors. Such an examination will help elucidate the processes by which social networks impact obesity among young adults, which can contribute to the development of more tailored and effective intervention programs.

Using Ecological Momentary Assessment (EMA), thereby maximizing external validity, this study examined the impact of social comparison processes on the weight-related thoughts and behaviors of young adult women with overweight or obesity, and explored whether social comparison effects were moderated by whether the target was a friend. It was hypothesized that (1) relative to lateral comparisons (i.e., comparing to a similar target), upward body comparisons (i.e., comparing to a thinner target) would be associated with increases in weight control cognitions and behaviors (e.g., intention to diet, dieting behaviors); (2) relative to lateral comparisons, downward comparisons (i.e., comparing to a heavier target) would be associated with decreases in weight-related cognitions and behaviors; and (3) that comparisons to close social contacts (i.e., friends) would magnify the effect of both upward and downward body comparisons on weight-related cognitions and behaviors.

## Method

### Participants

In order to be consistent with previous studies targeting young adults for weight control, the National Institutes of Health definition of “young adult” (i.e., age 18-35) was used for this study.<sup>23-25</sup> Participants included in the current analyses were selected from a larger data set of individuals who had completed an EMA study<sup>26</sup> and met the age (i.e., young adult) and BMI criteria (i.e., OW/OB) of the present research. Of the 639 females who completed screening for the original study, a total of 159 were between the ages of 18-35 and met criteria for overweight or obesity (BMI  $\geq$  25) based on their self-reported height and weight. Fifty-three of these young adult women agreed to participate. Seven participants did not report any weight-related comparisons over the course of the study. The final sample included 46 young adult women with overweight or obesity (age:  $M = 19.02$ ,  $SD = 2.61$ ; BMI:  $M = 29.15$ ,  $SD = 3.32$ ) who were enrolled undergraduate students. The ethnic composition of the sample was 82.6% Caucasian ( $n=38$ ), 8.7% African-American ( $n=4$ ), and 2.2% Hispanic/Latina ( $n=1$ ). Three participants chose not to report their race (6.5%). There

were no significant differences between participants who did and did not engage in social comparisons in terms of age or BMI, and the racial distribution was comparable across both groups.

### Design and procedure

EMA methodology with stratified random time sampling was used. This approach was selected because: (1) fixed interval time samples assumes that the phenomena of interest routinely occur at specific time points, which is an improbable assumption for weight-focused social comparisons; (2) pure random sampling does not allow for equal distribution of assessments across the sample period, which could result in missing crucial time intervals during which weight-focused comparisons occur; and (3) potential fatigue effects associated with the use of event-based sampling of a phenomenon (i.e., weight-related comparisons) that is presumed to occur with high frequency among young adult women are minimized.

Study procedures were approved by a local institutional review board and informed consent was obtained from all participants. After providing consent, participants were oriented to the EMA procedures. Participants were instructed to complete a diary whenever the pre-programmed personal digital assistant (PDA) alarm sounded. Over a 5 day period (3 weekdays, 2 weekend days) participants were signaled at six randomly selected times each day within the following time blocks: 9 AM to 12 PM, 12-3 PM, 3-5 PM, 5-7 PM, 7-9 PM, and 9-11 PM. When the alarm sounded, participants were asked if they had engaged in a weight-related comparison since the last alarm. If so, they recorded the direction and effects of the comparison in their diaries (see below). At the end of the 5 day EMA period participants received credit toward their undergraduate psychology research experience course requirement.

### Apparatus

**Royal Personal Data Assistant (PDA); model DM3070**—All participants were given a preprogrammed Royal brand PDA that sounded an alarm whenever they were to complete a diary.

### Measures

**Social comparison diary**—Participants responded to PDA signals by completing a diary assessing the frequency, nature, and effects of weight-focused social comparisons. Weight-focused comparisons were described as thoughts involving comparing one's own weight or shape to that of another individual. At each signal participants first were asked whether they compared their weight/shape to another individual. If participants endorsed social comparisons, they were asked how many comparisons they made. They were then asked to consider their most recent comparison and indicate whether their weight/shape was Much Worse, Worse, Same, Better, or Much Better relative to the comparison target. Responses were later categorized as upward, downward, or lateral comparisons. "Worse" and "Much Worse" were coded as upward comparisons. "Better" and "Much Better" responses were coded as downward comparisons. "Same" responses were coded as lateral comparisons. Participants also were asked to report whether the weight-related comparison target was a friend. All other targets (e.g., media image) were coded as distal social ties (i.e., non-friend)

for the purpose of this study. After describing their most recent social comparison experience, participants responded to questions assessing thoughts of dieting and exercising, as well as occurrences of these behaviors. This social comparison diary approach was piloted in earlier work and subsequently has been used successfully to capture and assess the impact of social comparison processes on young adults' weight-related cognitions and behaviors.<sup>26-28</sup>

**Social comparison diary: Dieting and exercising thoughts**—Questions assessing thoughts of dieting and exercising were adapted from a well-validated measure<sup>29</sup> and were successfully used in previous diary research.<sup>26</sup> To assess dieting cognitions in response to weight-related comparisons, participants responded to the question: “Since making the comparison, have you thought about trying to restrict the amount of food you eat in order to influence your shape or weight?” To assess exercise cognitions in response to weight-related comparisons, participants responded to the prompt: “Since making the comparison, have you thought about exercising as a means of controlling your weight, altering your shape or amount of fat, or burning off calories?” All questions were answered using a 7-point Likert scale ranging from 0=*not at all* to 6=*very much*. These responses were included as continuous outcomes of the extent to which participants had thought about dieting or exercising post-comparison.

**Social comparison diary: Dieting and exercising behaviors**—After reporting their thoughts of dieting and exercising participants were asked to indicate if they had engaged in actual restriction of calories or exercise since the last alarm (“Yes” responses were coded as 1 and “No” responses were coded as 0). These responses were included as binary outcomes of whether the participant engaged in either dieting or exercising behavior post-comparison.

## Data analysis

Preliminary descriptive statistics were calculated to evaluate the frequency and type of weight-focused comparisons and comparison target (i.e., friend versus non-friend). Given the nested nature of the data (i.e., time within person) Hierarchical Linear Modeling version 6.06<sup>30</sup> was used to test study hypotheses. All predictors were grand mean centered to improve interpretability of results and decrease multicollinearity within the model. The Level 1 model included social comparison direction (i.e., upward, downward) as a predictor of each dependent variable (i.e., dieting thoughts, exercise thoughts, dieting behavior, exercise behavior). To examine the effects of upward and downward comparisons relative to lateral comparisons on participants' weight-related thoughts and behaviors, lateral comparisons were included as the Level 1 intercept. The Level 2 model included friendship status of the comparison target (1=comparison to friend; 0=comparison to non-friend), which allowed for an examination of whether comparisons to a friend moderated the effects of social comparison direction on outcomes. Dieting and exercise cognitions were included as continuous outcomes. A Bernoulli model was used for dichotomous behavioral outcomes (i.e., actual dieting and exercising behaviors; coded 1 for “Yes” or 0 for “No”).

## Results

### Preliminary analyses

On average, participants engaged in 6.65 ( $SD = 4.18$ ) weight-focused comparisons. The majority of these comparisons were upward comparisons (68%). The frequency of downward (16.91%) and lateral comparisons (15.09%) were similar. Participants' comparison target was identified as a friend 36.06% of the time.

### Impact of social comparisons on thoughts of dieting and exercising

Relative to social comparisons with targets of the same weight (i.e., lateral comparisons), upward comparisons were associated with increased thoughts of dieting and exercising ( $Y = .95, p < .001$ ;  $Y = 1.36, p < .001$ ; Figure 1). Contrary to study hypotheses, downward comparisons also were associated with increased thoughts of exercising ( $Y = .86, p = .032$ ; Figure 1). Downward comparisons were not associated with thoughts of dieting ( $Y = .64, p = .08$ ).

Whether the target was a friend moderated these effects. When engaging in an upward comparison to a friend, participants had more thoughts of exercising compared to when the target of the upward comparison was not a friend ( $Y = 1.03, p = .031$ ). When engaging in a downward comparison to a friend, participants also reported more thoughts of dieting ( $Y = 2.68, p = .006$ ) and exercising ( $Y = 2.13, p = .024$ ) as compared to when targets were non-friends. Upward comparison to a friend were not associated with thoughts of dieting ( $Y = .60, p = .10$ ).

### Impact of social comparisons on actual dieting and exercising behaviors

In terms of actual behaviors, relative to social comparisons to targets of the same weight (i.e., lateral comparisons), upward comparisons were associated with an increased likelihood of engaging in dieting and exercise behaviors ( $Y = 1.20, p = .003$ ;  $Y = .87, p = .01$ ; Figure 2). Contrary to study hypotheses, downward comparisons also were associated with an increased likelihood of engaging in dieting behavior ( $Y = 1.40, p = .009$ ; Figure 2), as compared to lateral comparisons; however, downward comparisons did not impact the likelihood of engaging in exercise behavior ( $Y = -.18, p = .72$ ).

Whether the target was a friend moderated the effects of social comparisons on dieting and exercise behaviors. For both upward and downward comparisons, participants had a significantly greater likelihood of restricting their food intake following comparisons to a friend than a non-friend ( $Y = 3.00, p < .001$ ;  $Y = 4.22, p = .002$ ). Similarly, upward comparisons with friends were associated with an increased likelihood of engaging in exercise behaviors ( $Y = 1.62, p = .009$ ). Friendship target did not moderate the association between downward comparisons and exercise behavior ( $Y = -1.0, p = .90$ ).

## Discussion

Social networks are important to young adults' weight and weight-related behaviors.<sup>10,15,16,18</sup> This study sought to extend the social network literature by examining social comparisons as a possible mechanism of weight-related contagion among young adult

women who met criteria for overweight or obesity. Current findings are consistent with both cross-sectional and experimental results from the broader literature examining social comparisons and weight-related concerns.<sup>31,32</sup> Both upward and downward body comparisons emerged as important factors in the weight-related cognitions and dieting behaviors of young women with overweight or obesity. Further, as hypothesized, friendship moderated the impact of weight-focused comparisons by increasing the impact of social comparisons on weight-related cognitions and dieting. These findings have important implications for integrating peers and social context into prevention and treatment efforts targeting young adult women with overweight or obesity.

Consistent with Social Comparison Theory, comparisons to thinner targets were associated with increases in dieting and exercise cognitions, as well as actual behaviors. Further, social comparisons to emotionally close social ties (i.e. friends) amplified the effects of upward comparisons on exercise thoughts and weight-related behaviors. Incorporating healthy role models, especially those who may be close social contacts, into young adult obesity treatment programs may be a plausible method to improve intervention outcomes.

Findings related to downward comparisons were unexpected. Contrary to the study hypothesis, downward social comparisons actually *increased* weight control thoughts and dieting behaviors. Elaborations of social comparison theory and recent research suggest that downward comparisons (i.e. comparisons to “worse-off” others) may communicate that one’s status could decline to that of the “worse-off” target,<sup>33</sup> thereby increasing motivation for health behavior change.<sup>34,35</sup> For example, young adult women of NW exposed to an unfit peer actually increased the duration of their exercise<sup>36</sup> and diabetes patients exposed to a vignette of another patient with poor glycemic control reported increased motivation for diabetes self-management behaviors.<sup>34</sup> Moreover, our findings also showed that downward comparisons to friends further increased weight control thoughts and dieting behaviors. These results are consistent with findings that downward comparison targets who are 1) emotionally close or 2) perceived to be similar may increase the impact of these “worse-off” comparisons on motivation for health behavior change.<sup>37</sup>

This research contributes to the literature by further elucidating the social influence processes by which social networks impact young adult women with overweight or obesity’s diet and exercise thoughts and behaviors. Strengths of the study include the use of an ecologically valid methodological approach and inclusion of both weight control intentions, as well as actual weight control behaviors. Such an approach allows for a naturalistic examination of the effects of social influence processes on important weight control outcomes in daily life. Study limitations include the all-female, predominantly White sample, self-reported weight and height, and the assumptions that body comparisons were primarily driven by weight, as opposed to body shape, and that participants were making accurate perceptions about both their own and others’ weight status. Given the propensity of weight misperception by young adults,<sup>38,39</sup> it will be important to assess how weight misperception of both self and others may positively or negatively impact social comparison processes on weight-related outcomes. Future research also should use a more fine-grained assessment of dieting and exercise behaviors to capture the extent to which these approaches are healthy or unhealthy, as well as identify antecedents to body comparisons. Findings

support existing literature with a broader adult population that demonstrates the importance of social networks and close social contacts on individuals' weight-related outcomes.<sup>10,12,13</sup> Further, this research has clinical implications. Results suggest that prevention and treatment programs for young adult women that integrate close social network members into treatment (i.e., friends) may be particularly effective at leveraging social influence for weight loss, thereby maximizing treatment effects in this otherwise difficult to treat population.

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Diana Rancourt conceived of the reported research. Tricia Leahey and Janis Crowther conceived of the original study and collected the data. Tricia Leahey analyzed the data. All authors were involved in the interpretation of the findings and critical revision of the manuscript. All authors had final approval of the submitted version of this manuscript.

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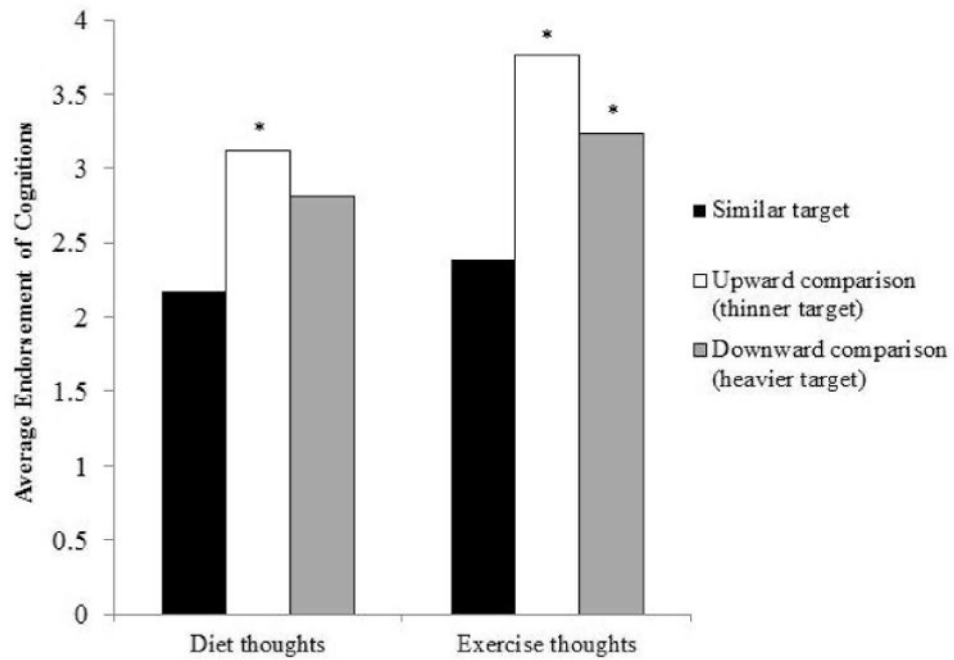
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**What is already known about this subject?**

- Social networks impact weight control behaviors and obesity among young adults.
- Our previous research showed that social norms are one mechanism by which social networks impact obesity-related thoughts and behaviors.

**What this study adds?**

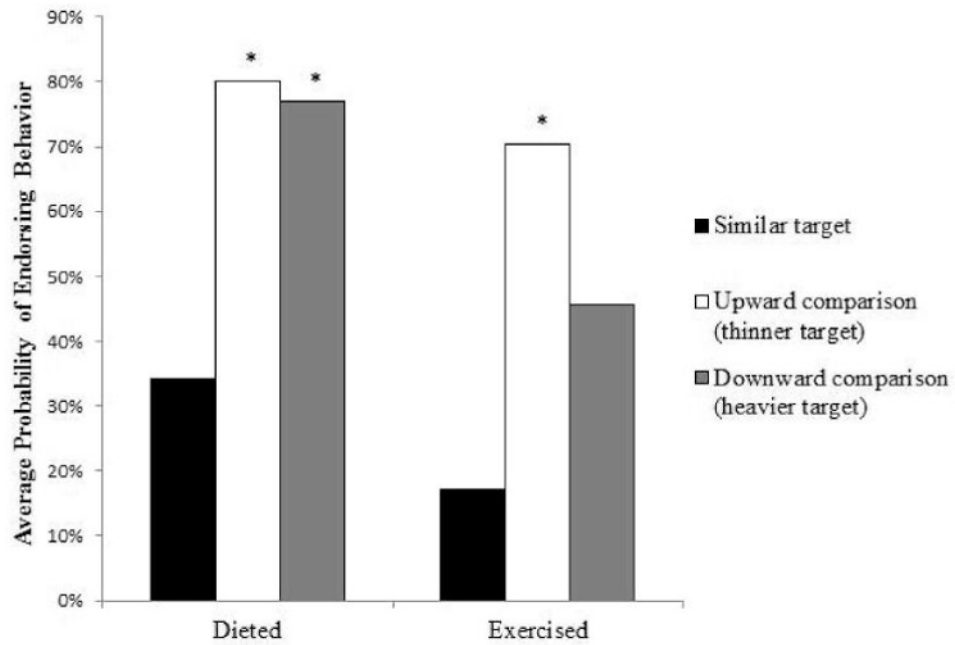
- Results from this study elucidate weight-focused social comparisons as another mechanism by which social networks may impact weight-related thoughts and behaviors.
- Moreover, weight-focused social comparisons with close social ties (i.e. friends) were shown to have a greater impact on weight control intentions and behaviors than weight comparisons with less emotionally “close” social contacts.



**Figure 1.**

Effects of upward and downward weight-focused comparisons relative to lateral comparisons on dieting and exercise thoughts.

*Note:* Scales range from 0-6. Within each dependent variable, asterisks indicate significant differences between social comparisons to similar targets and social comparisons to either thinner (upward) or heavier (downward) targets ( $p < .05$ ).



**Figure 2.** Probability of lateral, upward and downward weight-focused comparisons being followed by actual dieting and exercise behaviors.  
*Note.* Scale is probability of engaging in dieting or exercising behavior after engaging in a social comparison. Within each dependent variable, asterisks indicate significant differences between social comparisons to similar targets and social comparisons with thinner (upward) or heavier (downward) targets ( $p < .05$ ).