Asian Journal of Communication
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/rajc20

Effectiveness of health messages to change women's thin-ideal and unhealthy weight control intentions: connecting social norms and social networks approaches
Lu Tang a & Chien-fei Chen b
a Department of Communication Studies, University of Alabama, Tuscaloosa, AL, USA
b Department of Sociology, University of Tennessee, Knoxville, TN, USA

To cite this article: Lu Tang & Chien-fei Chen (2013): Effectiveness of health messages to change women's thin-ideal and unhealthy weight control intentions: connecting social norms and social networks approaches, Asian Journal of Communication, DOI:10.1080/01292986.2012.756045
To link to this article: http://dx.doi.org/10.1080/01292986.2012.756045

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.tandfonline.com/page/terms-and-conditions

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.
ORIGINAL ARTICLE

Effectiveness of health messages to change women’s thin-ideal and unhealthy weight control intentions: connecting social norms and social networks approaches

Lu Tang* and Chien-fei Chen

aDepartment of Communication Studies, University of Alabama, Tuscaloosa, AL, USA; bDepartment of Sociology, University of Tennessee, Knoxville, TN, USA

(Received 16 November 2011; final version received 2 December 2012)

The thin-ideal is becoming increasingly dominant among women in Eastern Asian countries such as China and South Korea. The internalization of the thin-ideal leads to body image disturbance and unhealthy weight-control behaviors. Based on the social networks and social norms approaches, this study tests the effectiveness of normative messages in reducing women’s internationalization of the thin-ideal and weight-control intentions through an experiment among female college students in China. It investigates how the following three factors: content of normative message (psychoeducational or feminist), source of the message (strong ties or weak ties), and characteristics of the recipients (self-weight evaluations) influence women’s body image and weight-control intentions. Results of this study suggest that normative messages with a psychoeducational approach delivered through strong ties are more effective in decreasing women’s internalization of the thin-ideal than the same message delivered through weak ties. In contrast, normative messages with a feminist approach delivered through weak ties are more effective in reducing women’s internalization of the thin-ideal and unhealthy weight-control intentions than the same messages delivered through strong ties. There is an interaction effect between message content and recipients’ self-weight evaluation. The theoretical and practical implications of this study are discussed.

Keywords: body image; social norms; social networks; mainland China

Introduction

The norm of the ‘thin-ideal’ is one of the social factors that can lead to women’s body image disturbance and unhealthy weight-control behaviors. Body image disturbance, i.e., distorted attitudes and feelings about one’s body, is a pervasive phenomenon in modern societies (Nathanson & Botta, 2003; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Body image disturbance has traditionally been considered to be a problem in Western countries; however, it is increasingly becoming a health issue in Eastern Asian countries such China, South Korea, and Singapore (Chia, 2007; Han, 2003; Xue, Zhou, & Zhou, 2003). Body image disturbance often leads to unhealthy weight-control behaviors and eating disorders such as anorexia and bulimia (American Psychiatric Association, 2000). Recently, trends of clinical and

*Corresponding author. Email: ltang1@ua.edu
© 2013 AMIC/SCI-NTU
subclinical eating disorders have been found in Asian countries, such as China, Malaysia, Singapore, and Japan (Prendergast, Yan, & West, 2002).

A fuller body is traditionally preferred in both pre- and post-1949 China, as it signifies prosperity, wealth, and health. However, recent studies have suggested that today the thin-ideal is becoming increasingly popular among young Chinese women, and body image disturbance is gradually becoming a health problem. A survey of a national representative sample in China discovers that women, especially those in their twenties, are very concerned about their weights (Luo, Parish, & Laumann, 2005). Sixty-nine percent of the women in their twenties with a BMI lower than 24 report that they intend to lose weight and the rate rises up to 92% among those who are single. This trend is especially salient among women living in the cities on the east coast, from urban origins, and educated. Lee and Lee (2000) survey female high school students in three locations in China: Hong Kong, Shenzhen (coastal and urban), and Hunan (inland and rural) and find that although the majority of girls are slim with an average BMI below 20, a respective 74%, 61%, and 44.3% of high school girls in these three regions want to be thinner. Another study conducted among girls aged between 12 and 19 in seven cities in China indicates that 80% of them consider weight a rather important issue and feel fat sometimes and 40% of them have been on diet even though less than 5% of the girls are overweight or obese (Huon, Qian, Oliver, & Xiao, 2002). However, this study also finds that very few actually engage in unhealthy weight-control behaviors, such as vomiting (1.8%) and using laxatives (2.2%). Some researchers argue that the actual rate of unhealthy weight-control behaviors might be higher, but eating disorder measurements developed in the Western context have failed to identity them accurately due to the differences between the cultures of China and Western countries (Fan et al., 2010). The prevalence of the thin-ideal and body image disturbance in Eastern Asian countries has been attributed to the influence of Western culture and Western media (e.g., Bissell & Chung, 2009). Other studies indicate that body image is influenced by one’s social networks composed family, friends, and acquaintances (e.g., Goodman, 2005).

These existing studies demonstrate the need to create effective health messages to reduce body image disturbance and prevent unhealthy weight-control behaviors among young women in China. They also call for the development of theories about body image and eating disorder outside the Western context. Drawing upon the theories of social norms and social networks, this study examines the effectiveness of normative messages taking the psychoeducational and feminist approaches delivered through both strong ties (one’s family or close friends) and weak ties (one’s casual acquaintance) on college women’s internationalization of the thin-ideal, overall weight-control intentions, and unhealthy weight-control intentions (UWCIs).

**Literature review**

**Influence of social norms and social networks**

Both social norms and social networks are powerful determinants of health behaviors. The norm of thinness generally increases women’s dissatisfaction with their body size and their likelihood of developing subclinical eating disorders by promoting an unrealistic thin-ideal (Battle & Brownell, 1996; Giles, Helme, & Krcmar, 2007; Mussell, Binford, & Fulkerson, 2000). According to the social norms
approach, when individuals overestimate the prevalence of a certain behavior (i.e., descriptive norm) and the acceptability of this behavior (i.e., injunctive norm), they are more likely to adopt that behavior (Berkowitz, 2003). Evidence from studies of college samples consistently suggests that both actual and perceived norms have significant impacts on individuals' body image (e.g., Bergstrom & Neighbors, 2006). Furthermore, the internalization of the perceived norm of thinness has an even stronger and more enduring effect on body image disturbance than the actual norm (Stice & Shaw, 2004).

Social networks composed of family, friends, and peers also influence people's body image and weight-control behaviors (see Goodman, 2005 for a review). For example, pressure from family is a significant predictor of body image dissatisfaction and dieting (Green & Pritchard, 2003). Parents may increase children's body image disturbance and their likelihood of developing eating disorders by creating high expectations of thinness (Levine, Smolak, Mooodey, Shuman, & Hessen, 1994; Smolak, Levine, & Schermer, 1999). In addition, discussions about body image among peers and friends are likely to put women, especially young women, under the pressure to be thin (Tucker, Martz, Curtin, & Bazzini, 2007). Teasing and criticisms from social networks are especially crucial in creating negative emotions about one's body image and promoting dieting (Fabian & Thompson, 1989; Gleason, Alexander, & Sommers, 2000). Tantleff-Dunn and Gokee (2002) identify three interpersonal processes through which people's social networks shape their body image: reflected appraisal, feedback on physical appearance, and social comparison. A person receives comments from her social ties about her physical appearance (feedback on physical appearance), which, in turn, contributes to her perception about how others think of her (reflected appraisal). Furthermore, her body image is created through comparing her appearance with that of other people around her (social comparison).

Researchers often consider all social contacts as equal in studying the diffusion of normative messages through social networks (Boer & Westhoff, 2006). This assumption is problematic since normative messages diffused through specific types of network ties can produce different effects on one's attitudes and behaviors. For instance, Johnston and White (2003) argue that the effects of group norms on health behaviors are mediated by the extent to which an individual identifies with the reference group. In other words, the influence of norms differs by individuals' connection with friends, family, or a group. To our knowledge, no existing study has explored the impact of normative messages diffused through different types of network ties, such as strong and weak ties, on individuals' body image perception and weight-control behaviors.

The strength of strong ties

Individuals' social networks are composed of strong ties (e.g., family and close friends) and weak ties (e.g., acquaintances, Granovetter, 1973). Strong ties are especially effective in shaping one's health behaviors (Boer & Westhoff, 2006). The effects of strong ties on body image, weight-control behaviors, and other health behaviors have been empirically documented. For instance, Paxton, Schutz, Wertheim, and Muir (1999) find that members of small cliques of girls composed of strong ties often share similar body image perception, unhealthy eating and weight-loss behaviors. Several explanations can be offered to account for the
effectiveness of strong ties. Research on source credibility offers one explanation. Strong ties are ties that allow high-quality interactions and have high credibility (Weenig & Midden, 1991). High source credibility generally leads to high persuasiveness (McGuire, 1985). Thus, information received through strong ties is more persuasive. The social identity theory offers another explanation (Tajfel & Turner, 1986). According to the social identity theory, individuals divide people into different social categories and adopt the identity of the in-group (those belong to the same social category) against that of the out-group. People will actively compare the in-group with the out-group in an effort to maintain their self-esteem. Individuals typically consider their strong ties as in-group members, and have a high level of identification with their strong ties. As a result, a person is likely to be influenced by his/her strong ties (Boer & Westhoff, 2006).

The strength of weak ties

While strong ties are more likely to transmit similar or familiar ideas, weak ties are more likely to provide non-redundant information, i.e., new information or novel idea that is possessed by neither oneself nor one’s strong ties (Granovetter, 1973). Without weak ties, new information and ideas will spread slowly and social systems will become fragmented (Granovetter, 1973). For example, Kincaid (2004) describes how new family planning practices, as a minority practice deviating from the dominant social norms, are diffused through weak ties and gradually become the majority’s practice. Weak ties are also effective in providing social support. Recent studies find that individuals are more likely to seek social support from weak ties such as online health supporting groups than strong ties (i.e., family members) because weak ties tend to provide non-redundant information and objective feedback and are less likely to pose risks and role obligations (Wright, Rains, & Banas, 2010).

Connecting content of normative messages with networks

The effectiveness of health messages is influenced not only by their contents but also source characteristics, delivery channels, and recipient’s characteristics (Perloff, 1993). Stice and Shaw (2004) conduct a meta-analysis of 51 eating disorder intervention programs and conclude that combining proper message contents with the optimal delivery format and audience characteristics will produce the most effective eating disorder prevention programs.

The majority of the existing health intervention programs on body image disturbance and eating disorders have taken either a psychoeducational or a feminist approach (Peterson, Tantleff-Dunn, & Bedwell, 2006). The psychoeducational approach generally emphasizes the delivery of educational information on healthy weight, nutrition, healthy weight-control techniques, and risks of extreme weight-control behaviors and eating disorders. This approach assumes that once individuals have the necessary knowledge, they will change unhealthy weight-control behaviors (Stice & Shaw, 2004). The messages of the psychoeducational approach are scientifically based, objective, and can be empirically verified. Source credibility is an important predictor of the persuasiveness of such health messages. Source credibility includes two major dimensions: source expertise and source trustworthiness (Mills & Jellison, 1967). Ideally, highly trustworthy sources (e.g., one’s family members or close friends) with high source expertise (e.g., family members or friends
who are also physicians) will produce the most effective health messages. However, 
individuals are often exposed to health information from their non-expert ties that 
might not have the source expertise. In this context, source trustworthiness becomes 
the primary determinant of source credibility and the persuasiveness of the message. 
As strong ties are typically considered as more trustworthy than weak ties, they tend 
to be more credible than weak ties. Consequently, psychoeducational information 
delivered through strong ties is likely to be more effective in changing individual’s 
internalization of the thin-ideal and weight-control intentions. These arguments lead 
to the following two hypotheses:

H1a: Normative messages with a psycho-educational approach delivered through strong 
ties are more effective in reducing the internalization of the thin-ideal than the same 
message delivered through weak ties.

H1b: Normative messages with a psycho-educational approach delivered through strong 
ties are more effective in reducing the overall weight-control intentions than the same 
message delivered through weak ties.

Feminist messages, on the other hand, are ideology-based information that offers an 
alternative interpretation of the norm of thinness. This approach generally 
emphasizes ‘the importance of gender role, objectification and the loss of voice in 
the development of the spectrum of negative body image and disordered eating for 
girls and women’ (Levine & Smolak, 2006, p. 164). A woman who lives in a society 
where the majority values the thin-ideal is more likely to receive new or radical 
information rejecting the traditional norm of thinness from weak ties than from 
strong ties. Minority views such as feminism received through weak ties are going to 
be more effective than the same message from strong ties because people are more 
likely to believe that their weak ties or out-group members possess these radically 
different ideas. These arguments lead to the following hypotheses:

H2a: Normative messages with a feminist approach delivered through weak ties are 
more effective in reducing the internalization of the thin-ideal than the same messages 
delivered through strong ties.

H2b: Normative messages with a feminist approach delivered through weak ties are 
more effective in reducing the overall weight-control intentions than the same messages 
delivered through strong ties.

Furthermore, the effectiveness of health messages is moderated by recipients’ 
characteristics such as self-esteem or self-evaluation of weight status. Research 
shows that girls with low self-esteem at age 11–12 are at a greater risk of developing 
the more severe signs of eating disorders, as well as other psychological problems, by 
the age of 15–16 (Button, Sonuga-Barke, Davies, & Thompson, 1996). Another study 
finds low self-esteem to be one of the significant predictors of the development of 
eating pathology (Cervera et al., 2003). Thus, it is important to investigate how 
individuals’ self-weight evaluation affects the way they respond to the normative 
messages against the thin-ideal. This leads to the following research question:

RQ: Will the effectiveness of normative messages delivered through networks differ by 
recipients’ self-weight evaluation?
Another important goal of this study is to examine how normative messages delivered through networks influence women’s unhealthy weight-control behaviors, which include excessive dieting and exercise, fasting, vomiting, and using laxatives (Levine & Smolak, 2006). Engaging in unhealthy weight-control behaviors is associated with negative physical, psychological, and pathological conditions (Wal, 2011). Based on earlier discussion on the general weight control intention, this study proposes the following hypotheses in the context of UWCIs:

H3: Normative messages with a psycho-educational approach delivered through strong ties are more effective in reducing UWCIs than the same message delivered through weak ties.

H4: Normative messages with a feminist approach delivered through weak ties are more effective in reducing UWCIs than the same messages delivered through strong ties.

Methods
Participants
A total of 127 female undergraduate students from a large southeastern university in China participated in this study. A complete-case approach was used for data analysis and, as a result, 18 participants with missing posttest data were excluded from the data analysis. This yielded a total of 109 valid cases. A missing value analysis of all the independent and dependent variables indicated that the data were missing at random, Little's MCAR test: $\chi^2(103) = 123.82, p = \text{ns}$. In addition, there were no significant differences in overall weight-control intentions, $F(1, 121) = 1.05, p = \text{ns}$, UWCIs, $F(1, 121) = 2.05, p = \text{ns}$., eating habit $F(1, 121) = 0.68, p = \text{ns}$., body satisfaction $F(1, 121) = 2.97, p = \text{ns}$., and support of feminism $F(1, 121) = 1.77, p = \text{ns}$., in terms of the missing cases in the posttest.

Procedure and materials
This study used a 2 (network characteristics: strong vs. weak ties) × 2 (message frame: psychoeducational vs. feminist frame) between subject factorial design. The procedure included baseline assessment, experimental interventions, and posttest. One week prior to the experiment, participants were asked to fill out a paper-and-pencil questionnaire that established the baseline data. The pretest measured demographics, self-esteem, self-weight evaluation, ideal weight, body satisfaction, eating behaviors, weight-control behaviors, support of feminism, internalization of the thin-ideal, overall weight-control intentions and UWCIs. At the end of the pretest, participants were asked to provide the email addresses of five strong ties and five weak ties: family members, friends, classmates or acquaintances. They were told that these email addresses would be used to recruit their contacts to participate in an online survey on body image. We created a fictitious online survey on Survey Monkey and sent out invitations to those email addresses provided. The goal of this fictitious survey was to increase the credibility of manipulated information, which was going to include participants’ strong and weak ties’ attitudes toward women’s body image and weight-control behaviors. Participants received a small gift after participating in the pretest.
One week later, participants were randomly assigned to one of the four experimental conditions or the control condition. Participants assigned to the experimental conditions were asked to read one of four fictitious information sheets ostensibly for the purpose of evaluating the quality of manipulated normative messages: strong ties’ disapproval of weight-control behaviors based on the psychoeducational approach, strong ties’ disapproval of weight-control behaviors based on the feminist approach, weak ties’ disapproval of weight-control behaviors based on the psychoeducational approach, and weak ties’ disapproval of weight-control behaviors based on the feminist approach. Specifically, the manipulated messages included: (1) participants’ strong or weak ties’ negative attitudes towards the thin-ideal, (2) statistics indicating that low percentage of these strong or weak ties are engaging in weight-control behaviors, and (3) strong or weak ties’ reasons for disapproving the thin-ideal based on either feminist or psychoeducational arguments. The participants in the control condition read a political news article unrelated to body image and weight-control behaviors. After reading the messages, participants filled out a questionnaire assessing their body satisfaction, ideal weight, body esteem, internalization of the thin-ideal, overall weight-control intentions and UWCIs and other confounding variables. Debriefing information was provided to explain the real purpose of this study. Participants also received additional information about healthy eating. Measurement scales used in this experiment will be discussed next.

**Behavioral intentions**

Seven items were created to measure overall weight-control intentions. Participants rated their likelihood of engaging in various weight-control behaviors over the next 30 days. Ratings were based on a 7-point Likert scale ranging from ‘highly unlikely’ (1) to ‘highly likely’ (7), with higher score indicating a higher intention to lose weight. One example from the overall weight-control intentions scale was ‘how likely is it that you will plan to eat less to lose weight over the next 30 days?’ The pretest Cronbach’s alpha was 0.75 and the posttest alpha was 0.73. Three items regarding the intentions of engaging in fasting, vomiting, and using laxatives from this scale were created to measure the UWCIs. The pretest and posttest Cronbach’s alpha values for this measure were 0.67 and 0.53, respectively.

**Internalization of the thin-ideal**

Internalization of the thin-ideal was measured using the Sociocultural Attitudes Toward Appearance Questionnaire-Internalization, an 11-item subscale designed to measure the acceptance of societal standards of thinness and attractiveness (SATAQ-I, Heinberg, Thompson, & Stormer, 1995). Respondents rated to what extent they agreed or disagreed with the statements about their appearance on a 5-point Likert scale. The scale ranged from completely disagree (1) to completely agree (5). One example from the Internalization subscale was ‘I would like my body to look like the women who appear in TV shows and movies.’ Total score was obtained by averaging all of the items. Higher scores indicated higher levels of internalization. The Cronbach’s alpha was 0.50 at the pretest and 0.70 at the posttest.
Feminist attitude

Measurement of the support of feminism was adapted from the Feminist Identity Development Scale (FIDS; Bargad & Hyde, 1991). The FIDS scale was a 37-item Likert-type scale (1 = strongly disagree to 5 = strongly agree) with subscales measuring five stages of feminist identity development including passive acceptance, revelation, embeddedness-emanation, synthesis and active commitment. One example from the FIDS was 'Particularly now, I feel most comfortable with women who share my feminist point of view.' High scores indicate greater endorsement of the corresponding feminist identity stage. The FIDS has been demonstrated to have high reliability and high test–retest reliabilities (Moradi & Subich, 2002). Some items not relevant in the Chinese context, for instance, 'I don’t think there is any need for an Equal Rights Amendment; women are doing well,' were excluded. The Cronbach’s alpha at the pretest was 0.76.

Unhealthy weight-control behaviors

Dutch Eating Behavior Questionnaire-restraint Scale (DEBQ-R, van Strien, Frijters, Bergers, & Defares, 1986) was used to measure eating disorder behaviors. DEBQ-R scale was widely used to measure restrained eating behaviors with high levels of internal consistence, construct validity, convergent validity, and discriminate validity (van Strien, 2002; van Strien et al., 2007). The respondents rated the frequency of engaging in various types of weight-control behaviors on a 5-point Likert scale. The scale ranges from never (1), seldom (2), sometimes (3), often (4) to always (5). One example from this scale was, ‘How often do you refuse food or drink offered because you are concerned about your weight?’ Total score was obtained by averaging all the items with a higher score indicating higher tendency of eating disorder. The Cronbach’s alpha at the pretest was 0.93.

Body esteem

Body esteem was measured by the Body Esteem Scale for Adolescents and Adults (BESAA; Mendelson, Mendelson, & White 2001). BESAA was a 23-item scale measuring three dimensions of body image including appearance (e.g., I wish I looked better), weight and body-shape (e.g., I’m proud of my body, I like what I weigh) and body esteem attribution (e.g., other people consider me good looking). The participants rated the statements based on a 5-point response scale with 1 meaning ‘never’ and 5 meaning ‘always.’ Items for body esteem were averaged for each subscale to create a total score. Previous research demonstrated good reliability and validity of the BESAA among young people (Mendelson, Mendelson, & White, 2001). The Cronbach’s alpha at the pretest was 0.72.

Self-weight evaluation

One question was created to ask participants to evaluate their weights based on the five categories including ‘too heavy,’ ‘a little too heavy,’ ‘just right,’ ‘a little too thin,’ and ‘too thin.’
Ideal weight

One open-ended question was used to assess participants’ ideal weights, ‘what is your ideal weight.’ Participants were asked to write down actual numbers in kilograms.

Manipulation checks

In order to determine if the intervention was effective, participants were asked to estimate the percentages of their strong ties and weak ties engaging in various weight-control behaviors, such as eating less, using laxatives, and so on. In addition, participants rated the likelihood that the majority of their strong and weak ties would approve these weight-control behaviors using a 7-point Likert scale. For example, one of the statements asked, ‘the majority of my weak ties think it’s acceptable to use laxatives to lose weight.’

Data analyses

Assumptions

All measures were factor analyzed by principal component analyses with Varimax rotation to assess content validity before further analysis. A Multivariate Analysis of Covariance (MANCOVA) and an Analysis of Covariance Analysis (ANCOVA) were conducted to test hypotheses with experimental conditions and self-weight evaluation entered as fixed factors, the pretest variable(s) entered as covariate(s) and the posttest variable(s) entered as dependent variable(s). ANCOVA and MANCOVA were the preferred methods over repeated measures ANOVA with the difference between pretest and posttest scores (i.e., gain scores) because gain scores could be misleading. A few scholars suggested that it was more appropriate to use the pretest scores as a covariate control (e.g., Dimitrov & Rumrill, 2003; Garson, 2008). When significant or near significant effects emerged from MANCOVA and ANCOVA, planned orthogonal contrasts were further conducted to determine how different normative messages affected women’s internalization of the thin-ideal and their overall weight-control intentions and UWCIs. Because eating disorder behaviors and support of feminism could be potential confounding variables, these two variables were introduced as the covariates besides the pretest measures of major variables.

Prior to hypothesis testing, the data were examined for violations of the essential assumptions associated with MANCOVA and ANCOVA including multivariate normality, outliers, homogeneity of variances and covariances. Specifically, we first examined the potential correlation of two dependent variables (overall weight-control intention and internalization of the thin-ideal) and found no significant relationship between these two variables. This result suggested that these two dependent variables measured different constructs. Second, the linear relationships among covariates and the dependent variables were confirmed. Third, Box’s M test showed that the assumption of equality of covariance matrices among the dependent variables was not violated. Finally, Levene’s test was not significant indicating that the data met the assumption of equality of variances among different conditions.
Confounding variables

Chi-square test was used to examine whether there were differences in categorical variables across conditions. Although chi-square statistic revealed that there was some significant difference among groups in different year in college, there were no significant differences in the main variables of body shape and self-weight evaluations across groups. In addition, ANOVA tests confirmed that participants in the five conditions did not differ on any of the following variables (for all $F$ values, $p > .20$): age, body mass index (BMI), UWCIs, weight-control intentions, body satisfaction, internalization of the thin-ideal, eating disorder behaviors, and support of feminism. Additional MANCOVA test also confirmed that self-weight evaluation in the pretest had no effect on overall weight-control intentions and UWCIs. These results increased our confidence that the results of this experiment were based on the treatment effects and were not attributable to the aforementioned confounding variables.

Results

Descriptive statistics

The mean age of this sample was 19.9 ($SD = 1.2$; range 17–22). The average weight was 51.35 kg (113 pounds) and the ideal weight for this group was 47.5 kg (104.5 pounds). Overall, participants had a low level of UWCIs ($M = 1.33$, $SD = 0.63$), a low level of overall weight-control intentions ($M = 2.55$, $SD = 0.94$) based on a 7-point scale but a moderate level of eating disorder behaviors ($M = 2.34$, $SD = 0.93$) based on a 5-point scale. Among the participants, 4.6% considered themselves as ‘too heavy,’ 46.8% considered themselves as ‘a little too heavy,’ 43.1% evaluated their weights as ‘just right,’ 4.6% of them considered themselves as ‘a little too thin,’ and 0.9% categorized themselves as ‘too thin.’ In addition, subjects in this sample expressed a lower level of self-esteem ($M = 1.74$, $SD = 0.41$), but a moderate support of feminism ($M = 3.58$, $SD = 0.48$).

Manipulation checks

A series of ANOVAs were conducted to examine whether the manipulations were successful. For example, ANOVA results reported that there was a significant difference in the internalization of the thin-ideal among four experimental conditions and the control condition, $F(12, 109) = 2.86$, $p < .05$. Overall, following the intervention, participants in experimental conditions reported a lower level of internalization than those in the control condition.

The statement of ‘the majority of my weak ties think it’s acceptable to use laxatives to lose weight’ was used for one of the manipulation check measures. The ANOVA results showed that participants in the weak-tie condition were more likely to disagree with this statement ($M = 5.88$, $SD = 1.08$) than those in the strong-tie conditions ($M = 5.08$, $SD = 0.58$), $F(12, 109) = 2.86$, $p < .05$. When asked to estimate the percentage of acquaintances eating less to lose weight, participants in the weak-tie conditions reported a lower percentage of acquaintances eating less to lose weight (42.72%) than those in the strong-tie conditions (54.68%). These findings
indicated that the intervention messages were effective in manipulating participants’ perception of the norm.

**Internalization of the thin-ideal and overall weight-control intentions**

A MANCOVA was conducted to determine whether there were differences across conditions on the internalization of the thin-ideal and overall weight-control intentions, and whether experimental results would differ based on self-weight evaluations. The reason for using MANCOVA over multiple ANCOVA tests to assess multiple dependent variables was that MANCOVA took into account the inter-relationship between dependent variables. The goal of MANCOVA cannot be achieved through a series of ANCOVAs (Raykov & Marcoulides, 2008, p. 209). Specifically, the MANCOVA was conducted with conditions and self-weight evaluations entered as fixed factors and the posttest of overall weight-control intentions and internalization of the thin-ideal entered as dependent variables while controlling for the pretest measurements of weight-control intentions and internalization of the thin-ideal, eating disorder behaviors, support of feminism, age, year in school and BMI.

H1a and H1b predicted that normative messages with the psychoeducational approach received through strong ties were more effective in reducing the internalization of the thin-ideal and overall weight-control intentions than the same message from weak ties. MANCOVA results indicated an omnibus main effect for conditions Wilks’s $\lambda = 0.83$, $F(8, 109) = 3.22$, $p < .05$, partial $\eta^2 = 0.09$ and an interaction effect between conditions and self-weight evaluations, Wilks’s $\lambda = 0.79$, $F(12, 109) = 3.86$, $p < .05$, partial $\eta^2 = 0.11$. When examining the univariate tests (at an adjusted alpha level of 0.025 to correct for multiple tests), no main effect for conditions on overall weight-control intentions was found, but level of the internalization of the thin-ideal differed significantly among conditions, $F(4, 109) = 3.51$, $p < .01$, partial $\eta^2 = 0.14$. A planned contrast test ($p < .01$) indicated that participants who were in the psychoeducational strong-tie condition reported lower internalization of the thin-ideal ($M = 2.97$, $SD = 0.19$) than those who were in the psychoeducational weak-tie condition ($M = 3.04$, $SD = 0.13$). In sum, H1a was supported, but H1b was not supported.

In addition, another planned contrast test ($p < .01$) demonstrated that individuals who considered themselves ‘too heavy’ and were in the psychoeducational strong-tie condition reported lower internalization of the thin-ideal ($M = 2.91$, $SD = 0.13$) than those who had the same self-weight evaluation but were in the psychoeducational weak-tie condition ($M = 3.02$, $SD = 0.15$). Planned contrast test also revealed that among those who evaluated their weights as ‘just right,’ participants in the psychoeducational strong-tie condition reported lower internalization of the thin-ideal ($M = 2.63$, $SD = 0.13$) than those in the psychoeducational weak-tie condition ($M = 2.89$, $SD = 0.18$).

H2a and H2b predicted that feminist messages received through weak ties were more effective in reducing the internalization of the thin-ideal and overall weight-control intentions than the same message from strong ties. The same MANCOVA model for H1a and H1b was used to test the H2a and H2b. Therefore, the results of multivariate and univariate tests were the same as those in H1. However, the results of planned contrast tests were different. Specifically, the planned contrast test ($p < .01$) indicated that people who were in the feminist weak-tie condition reported
lower internalization of the thin-ideal ($M = 2.94$, $SD = 0.11$) than those in the feminist strong-tie condition ($M = 3.31$, $SD = 0.15$). Therefore, H2a was supported, but H2b was not supported.

Another planned contrast test ($p < .01$) demonstrated that individuals who considered themselves ‘too heavy’ and were in the feminist weak-tie condition reported lower internalization of the thin-ideal ($M = 2.66$, $SD = 0.15$) than those who had the same self-weight evaluation but were in the feminist strong-tie condition ($M = 3.36$, $SD = 0.16$). However, among participants who considered their weights as ‘just right,’ those in the feminist strong-tie condition reported lower internalization of the thin-ideal ($M = 2.80$, $SD = 0.15$) than those in the feminist weak-tie condition ($M = 3.22$, $SD = 0.16$). Compared with the other three types of messages, feminist messages through weak-ties were more effective to lower the level of internalization of thin-ideal for people who considered themselves as ‘too heavy’ ($M = 2.66$, $SD = 0.15$) whereas psychoeducational messages through strong ties were more effective for those who considered their weights as ‘just right’ ($M = 2.63$, $SD = 0.13$; see Figure 1 for the interaction effect).

**UWCIs**

An ANCOVA was conducted to test the effect of experiment conditions on UWCIs and to determine whether this effect differed by self-weight evaluations. UWCIs

![Figure 1](image-url)
included the intentions of using laxatives, vomiting, and fasting to lose weight. For the ANCOVA model, conditions and self-weight evaluations were entered as fixed factors and the posttest of UWCIs was entered as the dependent variable while controlling for UWCIs, eating disorder behaviors and support of feminism, age, year in school and BMI, which were all measured in the pretest.

H3 predicted that normative messages with the psychoeducational approach received through strong ties were more effective in reducing UWCIs than the same messages received through weak ties. A significant main effect of conditions was observed in the ANCOVA results, \( F(2, 109) = 3.72, p < .05, \) partial \( \eta^2 = 0.11 \). In addition, there was a significant interaction effect between conditions and self-weight evaluations, \( F(7, 109) = 3.42, p < .05, \) partial \( \eta^2 = 0.16 \). Result of a planned contrast test (\( p < .05 \)) suggested participants in the psychoeducational strong-tie condition reported higher UWCIs (\( M = 1.39, SD = 0.14 \)) than those who were in the psychoeducational weak-tie condition (\( M = 1.22, SD = 0.11 \)). Therefore, H3 was not supported. However, the difference of the UWCIs between these two conditions was small.

H4 predicted that normative messages with the feminist approach received through weak ties were more effective in reducing UWCIs than same messages received through strong ties. The same ANCOVA model in the H3 was used to test H4. A significant main effect of conditions was observed in the results, \( F(2, 109) = 4.72, p < .05, \) partial \( \eta^2 = 0.11 \). Results of a planned contrast test (\( p < .05 \)) revealed participants in the feminist weak-tie condition reported lower UWCIs (\( M = 1.13, SD = 0.16 \)) than those in the feminist strong-tie condition (\( M = 1.41, SD = 0.14 \)). Therefore, H4 was supported.

In addition, there was a significant interaction effect between conditions and self-weight evaluations, \( F(7, 109) = 4.42, p < .05, \) partial \( \eta^2 = 0.16 \). An additional planned contrast test demonstrated that participants who considered their weights as ‘just right’ and were in the feminist weak-tie condition reported a lower level of UWCIs (\( M = 1.19, SD = 0.13 \)) than those who had the same self-weight evaluations but were in the feminist strong-tie condition (\( M = 1.37, SD = 0.12 \)) (see Figure 2). Similarly, among participants who considered themselves as ‘a little too heavy,’ those in the feminist weak-tie condition indicated lower UWCIs (\( M = 1.19, SD = 0.13 \)) than those in the feminist strong-tie condition (\( M = 1.27, SD = 0.13 \)). However, people who considered themselves as ‘too heavy’ and were in the feminist-strong tie condition reported the lowest UWCIs (\( M = 0.69, SD = 0.14 \)) compared with the participants in other three conditions. The relationships between the categories of weight-evaluation of ‘too thin’ and ‘a little too thin’ and UWCIs were not significant.

**Discussion and conclusion**

Previous research has demonstrated that both social norms and social networks influence people’s health-related attitudes and behaviors (e.g., Giles et al., 2007; Goodman, 2005). What’s missing is the further understanding of the complicated interaction between social norms and social networks (Boer & Westhoff, 2006). The current study fills in this gap in the literature by examining the effectiveness of health messages framed as norms among one’s strong or weak ties on women’s internalization of the thin-ideal and their UWCIs. This study reaches several significant findings.
First, this study finds normative messages delivered through social networks can effectively decrease the internalization of the thin-ideal. Psychoeducational messages delivered as norms among one’s strong ties are more effective than the same messages framed as norms among one’s weak ties. This could be caused by the fact that strong ties are often given high credibility and trustworthiness, and thus are more effective when they present scientifically based information such as those used in the psychoeducational approach. On the other hand, normative messages with the feminist approach delivered through one’s weak ties are more effective than the same messages delivered through strong ties. This difference could be attributed to the fact that people are less likely to believe that their strong ties hold a radical view and tend to accept a non-conventional view or new information, such as the feminist approach, from their weak ties.

Second, the effectiveness of normative messages on women’s internalization of the thin-ideal is moderated by their self-weight evaluation. This study suggests that people do not respond to health messages about the norms of the thin-ideal and weight-control behaviors uniformly. For people who consider themselves ‘too heavy,’ feminist messages through weak ties are more effective in lowering their internalization of the thin-ideal. In contrast, psychoeducational messages through strong ties
are more effective for those who evaluate their weights as ‘just right.’ One possible explanation to this phenomenon is that those who consider themselves as ‘too heavy’ are more conscious about weight issues and might have been stigmatized and, thus, are more likely to respond well to feminist messages that are critical of the traditional thin-ideal. On the other hand, those who consider themselves as ‘just right’ (who are actually underweight in this sample) have not been subjected to social sanctions and thus are less likely to respond to feminist message, and tend to respond better to psychoeducational messages.

Although the normative messages through networks in this study do not show a significant effect on overall weight-control intentions, they have influenced individuals’ UWCIs. The ineffectiveness of the messages on participants’ overall weight-control intentions might be caused by the fact that the sample is consisted of college women who are already thin with an average weight of 113 pounds and a very low percentage of the participants consider themselves to be ‘too heavy’ (4.6%) initially. As a whole, the participants are not very concerned with weight-control and have low overall weight-control intentions to start with. Consequently, there is little room for further reduction of such intentions.

However, this study finds that normative messages are effective in reducing women’s UWCIs. This result indicates knowing individuals’ network ties’ disapproval of unhealthy weight control behaviors will make individuals less likely to adopt such behaviors. Contradictory to H3, psychoeducational messages delivered through weak ties were more effective in reducing UWCIs than the same messages through strong ties. However, feminist messages delivered through weak ties were the most effective in reducing UWCIs among all four types of messages. The influence of psychoeducational messages delivered through strong ties, in fact, is quite similar to that of feminist messages through weak ties. This finding supports the argument of the strength of weak ties (Granovetter, 1973). Again, the influence of health messages on UWCIs is moderated by recipients’ self-weight evaluations. For example, feminist messages delivered through weak ties are most effective for those who evaluated their weights as ‘a little too heavy’ or ‘just right.’

On the practical level, this study suggests that health intervention messages should be constructed with an eye on the information diffusion through one’s networks ties, when using the psychoeducational or feminist messages, at least for female college students. With regard to health intervention, knowing women’s initial self-weight evaluation will help identify the targeted audience for eating disorder intervention and the type of interventions that should be used.

Another contribution of this study is that, to our knowledge, it is the first study to test the effectiveness of health messages in reducing the internalization of the thin-ideal and UWCIs in China. Most of the existing studies on body images and eating disorder prevention are conducted in the Western context. Little is known about how health messages can potentially reduce body image disturbance and unhealthy weight control behaviors in China, which has different culture and socioeconomic conditions from Western countries. Although unhealthy weight control behaviors commonly examined in the Western contexts are not very common in China currently, Chinese women display a high prevalence of body image disturbance and might practice unhealthy weight control behaviors not identified in the measurement scales developed in the Western context. Past research shows that body image disturbance and eating disorder are correlated with a country’s level of economic
development and its acceptance of the Western culture (Holmqvist & Frisen, 2010). As China’s economy continues to grow and its population is further exposed to the Western culture, the prevalence of body image disturbance and eating disorder is likely to increase. This further calls for studies that examine how health messages can be developed and distributed to decrease women’s body image disturbance and unhealthy weight control behaviors in China. This study demonstrates that using normative messages about what weight control behaviors are practiced and accepted among their social ties can effectively reduce women’s internationalization of the thin-ideal and intentions to engage in unhealthy weight control behaviors.

Certain limitations must be considered in interpreting this research. First, our study had a small sample size, which might have made it difficult to conclude certain significant relationships. Regardless, this study had found moderate to strong effect sizes for some variables (i.e., partial $\eta^2$ between 0.11 and 0.18). As a rule of thumb, the value of a partial $\eta^2$ greater than 0.14 indicates a large effect (Brace, Kemp, & Snelgar, 2006). Second, the majority of participants (about 65%) had low BMIs, were relatively satisfied with their weights, and had low intentions of losing weights at the pretest. This might be another reason that our experiment did not predict well on overall weight-control intentions for this particular group. Future research should conduct a similar experiment in a more diverse population. Third, the cultural transferability of measurement instruments might pose another limitation of this study. This study used existing scales with good reliability in the body image literature; yet some of the measures may not be suitable for measuring people who live in China. With translation, the validity of scales could be a potential problem. Future research should develop cultural specific measurements for examining the issue of body image in China. Furthermore, the influence of culture on the findings of this study is likely to be beyond the cultural transferability of measurement scales. Compared to Western societies, China has a highly collectivist culture, which is characterized by a greater emphasis on the in-group, which typically includes one’s family members and friends (Gomez, Kirkman, & Shapiro, 2000). It would be interesting to replicate this study in a highly individualistic society to determine whether the findings will hold true. Finally, the dependent variables in this study measured weight-control intentions instead of actual weight-control behaviors. It is unknown exactly how well these intentions predict actual weight-control behaviors. Kim and Hunter (1993), however, have suggested intentions are closely associated with actual behavior. Finally, this study only examined the short-term effect of the normative messages. A longitudinal research should be conducted in order to test the long-term effect of normative influence on body image and unhealthy weight-control behaviors.

Notes on contributors
Lu Tang (PhD, University of Southern California) is an assistant professor at the Department of Communication Studies, University of Alabama, USA. Her research interest includes theoretical and empirical examinations of the role of culture in health communication.

Chien-fei Chen (PhD, Washington State University) is an adjunct research assistant professor at the Department of Sociology, University of Tennessee, Knoxville, USA.
References


