



One-year temporal stability and predictive and incremental validity of the Body, Eating, and Exercise Comparison Orientation Measure (BEECOM) among college women



Ellen E. Fitzsimmons-Craft, Anna M. Bardone-Cone*

University of North Carolina at Chapel Hill, Department of Psychology, Chapel Hill, NC, United States

ARTICLE INFO

Article history:

Received 9 February 2013
Received in revised form 28 August 2013
Accepted 3 September 2013

Keywords:

Social comparison
Body dissatisfaction
Eating disorders
Temporal stability
Predictive validity
Incremental validity

ABSTRACT

This study examined the one-year temporal stability and the predictive and incremental validity of the Body, Eating, and Exercise Comparison Measure (BEECOM) in a sample of 237 college women who completed study measures at two time points about one year apart. One-year temporal stability was high for the BEECOM total and subscale (i.e., Body, Eating, and Exercise Comparison Orientation) scores. Additionally, the BEECOM exhibited predictive validity in that it accounted for variance in body dissatisfaction and eating disorder symptomatology one year later. These findings held even after controlling for body mass index and existing measures of social comparison orientation. However, results regarding the incremental validity of the BEECOM, or its ability to predict change in these constructs over time, were more mixed. Overall, this study demonstrated additional psychometric properties of the BEECOM among college women, further establishing the usefulness of this measure for more comprehensively assessing eating disorder-related social comparison.

© 2013 Elsevier Ltd. All rights reserved.

Introduction

Social comparison is the process of thinking about information related to one or more other people in relation to the self (Wood, 1996) and has been described as a pervasive social phenomenon (Suls, Martin, & Wheeler, 2002). In efforts to make accurate and meaningful comparisons, individuals will typically compare themselves to those with whom they are the most similar – that is, with peers (Lin & Kulik, 2002). One very common type of social comparison involves assessing one's own body in relation to the bodies of friends or other peers (e.g., Leahey, Crowther, & Mickelson, 2007; Striegel-Moore, Silberstein, & Rodin, 1986). Yet, frequent engagement in social comparisons with peers (both generally and specific to appearance) has been found to be associated with negative outcomes, such as body dissatisfaction and disordered eating (e.g., Corning, Krumm, & Smitham, 2006; Myers & Crowther, 2009; Thompson, Heinberg, & Tantleff, 1991). Of note are the facts that women also make comparisons with idealized media images and that these may be associated with negative outcomes (e.g., Cattarin, Thompson, Thomas, & Williams, 2000; Halliwell & Dittmar, 2005). However, as suggested by the results of Heinberg and Thompson

(1992), perhaps these negative effects are less so than those experienced as result of comparison with peers. Similarly, Leahey and Crowther (2008) found that amongst body dissatisfied women, upward comparisons with peers were associated with more dieting thoughts than upward comparisons with media images. Given the potentially more damaging effects of social comparison with peers versus media images and the great number of opportunities that present themselves for this sort of comparison behavior on college campuses, we focused on the impact of social comparison with peers in the current study.

Most of the work in this area has assessed social comparison using one of a handful of brief instruments designed to evaluate general or physical appearance/body comparisons (see Table 1). However, until recently, no questionnaire assessed multiple, specific comparison dimensions (i.e., body, eating, exercise) that are theoretically associated with body dissatisfaction and eating pathology. The Body, Eating, and Exercise Comparison Orientation Measure (BEECOM; Fitzsimmons-Craft, Bardone-Cone, & Harney, 2012) filled this gap in the literature. Although likely related to the construct of appearance-related social comparison, eating and exercise comparisons focus on the actions associated with achieving the appearance-related goal gleaned from the body-related comparison (Fitzsimmons-Craft et al., 2012). Based on such comparisons, a woman may conclude that she must behave differently in terms of eating and exercise if she is to achieve her ideal weight/shape. Thus, examining the roles of body, eating, and

* Corresponding author. Tel.: +1 919 962 5989; fax: +1 919 962 2537.

E-mail addresses: fitzsimmonscraft@gmail.com (E.E. Fitzsimmons-Craft), bardonecone@unc.edu (A.M. Bardone-Cone).

Table 1
Existing general and appearance/body social comparison measures.

Measure	Citation	Description	Example item	Evidence of internal consistency from development paper	Evidence of construct validity from development paper
Body Comparison Scale (BCS)	Fisher and Thompson (1998); also see Thompson, Heinberg, Altabe, and Tantleff-Dunn (1999)	Assesses the frequency of comparison for multiple body sites; 36 items rated on a 1 (<i>never</i>) to 5 (<i>always</i>) scale	"When with others, I compare my thighs to those of my peers"	Alpha = .95 in a sample of male and female junior high, high school, and college students	Not published
Body Image Comparison Scale (BICS)	Faith, Leone, and Allison (1997)	Assesses the frequency with which respondents engage in specific appearance-related social comparison behaviors; 5 items; rating scale not specified	"In social situations, I compare my figure (physique) to the figures (physiques) of others"	Not published for the full scale	Not published for the full scale
Iowa-Netherlands Comparison Orientation Measure (INCOM)	Gibbons and Buunk (1999)	Assesses individual differences in general social comparison orientation; 11 items rated on a 1 (<i>I disagree strongly</i>) to 5 (<i>I agree strongly</i>) scale	"If I want to find out how well I have done something, I compare what I have done with how others have done"	Alpha \geq .77 in samples of high school students, college students, adolescents, and adults in the United States and the Netherlands	Significant correlations with neuroticism, self-monitoring, public and private self-consciousness, and social anxiety
Physical Appearance Comparison Scale (PACS)	Thompson et al. (1991)	Assesses the degree to which individuals tend to compare their appearance with others; 5 items rated on a 1 (<i>never</i>) to 5 (<i>always</i>) scale	"The best way for people to know if they are overweight or underweight is to compare their figure to the figure of others"	Alpha = .78 in a sample of college women	Strong correlations with body dissatisfaction and eating disturbance
Upward and Downward Appearance Comparison Scales (UPACS and DACS)	O'Brien et al. (2009)	Assesses tendencies to make upward and downward physical appearance comparisons; 18 items (10 UPACS and 8 DACS) rated on a 1 (<i>strongly disagree</i>) to 5 (<i>strongly agree</i>) scale	"At parties or other social events, I compare my physical appearance to the physical appearance of the very attractive people" (UPACS); "I often compare myself to those who are less physical attractive" (DACs)	Alpha for UPACS = .93 and alpha for DACS = .90 in a sample of college women and men	Significant correlations between the UPACS and DACS and disordered eating

exercise comparisons may be important in terms of coming to a more comprehensive understanding of the ways in which social comparison behavior contributes to eating pathology.

Using the BEECOM, Fitzsimmons-Craft et al. (2012) found that tendencies to engage in body, eating, and exercise social comparisons were significantly positively correlated with body dissatisfaction and eating disorder symptomatology in a sample of college women. Further, as a set, the BEECOM subscales (i.e., Body Comparison Orientation, Eating Comparison Orientation, Exercise Comparison Orientation) accounted for variance in body dissatisfaction and eating disorder symptomatology above and beyond the effects of body mass index (BMI), an existing measure of physical appearance social comparison orientation (the Physical Appearance Comparison Scale (PACS); Thompson et al., 1991), and an existing measure of general social comparison orientation (the Iowa-Netherlands Comparison Orientation Measure (INCOM); Gibbons & Buunk, 1999) (Fitzsimmons-Craft et al., 2012). When the BEECOM subscales were pitted against each other, both the Body and Eating Comparison Orientation subscales accounted for unique variance in body dissatisfaction and eating disorder symptomatology above and beyond the related constructs. In contrast, the Exercise Comparison Orientation subscale did not account for unique variance, despite prior work finding that exercise fixation (e.g., finding that one's mind often wanders to thoughts about exercise) is significantly correlated with eating pathology (Ackard, Brehm, & Steffen, 2002). It may be that there are certain, specific eating disorder symptoms that the BEECOM Exercise subscale would predict (e.g., compulsive exercise behavior), but future research is needed to explore this possibility.

In general, there is correlational and experimental evidence to support the associations between social comparison and body dissatisfaction and disordered eating among college women (e.g., Lindner, Hughes, & Fahy, 2008). However, research on the nature of the relationships between these constructs is largely limited to cross-sectional designs. Longitudinal data are needed in order to examine social comparison's role in the development of later body dissatisfaction and disordered eating, which would in turn inform prevention and intervention efforts. Furthermore, while there is evidence to support the trait-like nature of body, eating, and exercise social comparison tendencies over a relatively short interval (i.e., two weeks; Fitzsimmons-Craft et al., 2012), longitudinal designs over longer periods are necessary to determine the longer-term temporal stability of tendencies to engage in body, eating, and exercise social comparisons.

The Current Study

In the current study, we first examined the temporal stability of the BEECOM over the course of one year. We hypothesized that the BEECOM total and subscale scores would exhibit at least a reasonable level of temporal stability in a sample of college women. Second, we examined the predictive and incremental validity of the BEECOM among college women. Our goals were: (1) to assess whether BEECOM subscale scores significantly predicted body dissatisfaction and eating disorder symptomatology one year later (i.e., predictive validity); and (2) to assess whether BEECOM subscale scores significantly predicted body dissatisfaction and eating disorder symptomatology one year later, controlling for baseline

body dissatisfaction/eating disorder symptomatology – that is, we were interested in whether the BEECOM predicted change in these constructs over time (i.e., incremental validity). In order to provide an even more stringent test of the predictive and incremental validity of the BEECOM in this sample, we ran the aforementioned analyses controlling for body mass index (BMI), given that it is a significant predictor of both body dissatisfaction and disordered eating (e.g., Stice, 2002; Striegel-Moore & Bulik, 2007), an existing measure of physical appearance social comparison behavior (the PACS; Thompson et al., 1991), and an existing measure of general comparison orientation (the INCOM; Gibbons & Buunk, 1999). We hypothesized that the BEECOM subscale scores would exhibit predictive validity in this sample of college women even when accounting for the influences of BMI, appearance-related social comparison tendencies, and general social comparison orientation. However, the analyses regarding the incremental validity of the BEECOM subscale scores were considered more exploratory, generating the research question: Will the BEECOM subscales predict change in body dissatisfaction and eating disorder symptomatology both on their own and when including the covariates of BMI, the PACS, and the INCOM?

Method

Participants and Procedure

Female participants were recruited through introductory psychology classes at a large, public Southeastern university. At Time 1 (T1), 441 participants completed an online survey in a private setting as part of a study presented as a study of peers and body image. A link to the survey and consent form were emailed to the participants, followed up by a call from a research assistant to highlight aspects of the consent form and answer any questions about the study. After participants provided electronic consent, they were directed to the questionnaires (which included the BEECOM, the other social comparison measures, and the measures of body dissatisfaction and disordered eating), which were presented in a fixed order and took 45–60 min to complete; they received course credit for completing the survey. Of the 441 participants who completed the initial survey, 352 (79.8%) agreed to be contacted for follow-up research. About one year later, these 352 individuals were contacted and asked to complete an online survey related to peers and body image that contained a subset of the questionnaires included in the initial study. As before, a link to the survey and consent form were emailed to the participants, followed up by a call from a research assistant to highlight aspects of the consent form and answer any questions about the study. After participants provided electronic consent, they were directed to the questionnaires, which were presented in a fixed order and took 30–45 min to complete; they received remuneration (\$5 gift certificate to a coffee shop or a discount department store) for their involvement.

Of the 352 individuals who agreed to be contacted for follow-up research, 237 completed the Time 2 (T2) survey. That is, of the individuals who agreed to be re-contacted, 67.3% completed T2, and overall, of the original 441 participants, 53.7% completed T2. Of note, these follow-up rates are slightly better than that of a study on disordered eating in college women, which involved participants providing data at two time points that were about seven months apart (46.2%; Cooley & Toray, 1996). At T1, the study sample (i.e., the 237 women who completed both T1 and T2) ranged in age from 17 to 24, with a mean age of 18.70 years ($SD = 1.02$), and based on their self-report of current height and weight, participants averaged a BMI of 22.27 kg/m² ($SD = 3.36$; range = 16.76–37.38). At T1, most of these women (69.1%) identified themselves as Caucasian, 7.6% as Black, 11.4% as Latina, 5.5% as Asian, and 6.4% as multiple

racers or ethnicities. Highest parental education was used as a proxy for socioeconomic status and ranged from 7 to 21 years ($M = 17.13$ years, $SD = 2.71$).

Study completers (those who completed both T1 and T2) were compared to study noncompleters (those who only completed T1); these groups were not significantly different from each other on the demographic variables of age, highest parental education, or BMI and were also not significantly different in terms of body, eating, or exercise comparison tendencies, appearance-related social comparison tendencies, general social comparison orientation, body dissatisfaction, or eating disorder symptomatology. The groups did differ in terms of distribution of race/ethnicity with more non-completers (77.9%) than completers (68.8%) identifying as Caucasian ($\chi^2(1, N = 441) = 4.39, p = .036$). However, Caucasian completers did not significantly differ from Caucasian non-completers on any of the aforementioned constructs. Given that completers looked very similar to noncompleters on the core study constructs and most demographic characteristics, the completers appear to be representative of the participants who began the study on the study variables. This minimizes attrition concerns.

Data from the 237 completers were used for all of the current study analyses. This study was reviewed and approved by the university's Institutional Review Board.

Measures

See Table 2 for alphas for the measures used in the current study.

Demographics. Demographic data for age, parents' highest levels of education attained, race/ethnicity, and self-reported height and weight were collected via a set of questions created for this study.

Body, eating, and exercise social comparison. Body, eating, and exercise social comparison tendencies were assessed using the Body, Eating, and Exercise Comparison Orientation Measure (BEECOM; Fitzsimmons-Craft et al., 2012). This scale consists of 18 items that are rated on a 7-point scale ranging from 1 (*never*) to 7 (*always*). Three subscales, each with six items, are generated:

Table 2
Descriptive statistics and alphas for the measured variables at T1 and T2 ($N = 237$).

Measure	<i>M</i>	<i>SD</i>	Possible range	Alpha
Body, Eating, and Exercise Comparison Orientation Scale (BEECOM), Body T1	26.25	8.25	6–42	.93
BEECOM, Body T2	26.02	8.06	6–42	.95
BEECOM, Eating T1	21.28	8.73	6–42	.94
BEECOM, Eating T2	21.33	8.62	6–42	.94
BEECOM, Exercise T1	18.29	8.50	6–42	.93
BEECOM, Exercise T2	18.48	8.62	6–42	.94
BEECOM, Total T1	65.52	22.83	18–126	.96
BEECOM, Total T2	65.67	22.30	18–126	.96
Physical Appearance Comparison Scale (PACS), T1	16.72	3.57	5–25	.74
Iowa-Netherlands Comparison Orientation Measure (INCOM), T1	39.02	6.57	11–55	.84
Eating Disorder Examination-Questionnaire (EDE-Q), Weight Concern/Shape Concern, T1	2.26	1.63	0–6	.95
EDE-Q, Weight Concern/Shape Concern, T2	2.15	1.59	0–6	.95
Eating Attitudes Test-26 (EAT-26), T1	7.57	8.20	0–78	.87
EAT-26, T2	6.99	7.99	0–78	.87
Body mass index (BMI), T1	22.27	3.36	Actual range: 16.76–37.38	–

Body Comparison Orientation, Eating Comparison Orientation, and Exercise Comparison Orientation. Example items are, “I compare my body shape to that of my peers,” “During meals, I compare what I am eating to what others are eating,” and “When I am exercising (e.g., at the gym, running outdoors), I pay attention to the length of time that those around me work out.” Additionally, responses to the 18 items are summed to create a total BEECOM score, with higher scores indicating a greater tendency to engage in eating disorder-related social comparison. Indeed, [Fitzsimmons-Craft et al. \(2012\)](#) found that the three BEECOM subscales loaded onto a higher-order factor, suggesting that it is appropriate to use the total BEECOM score as an indicator of an overarching eating disorder-related social comparison orientation. Evidence of construct validity in a female college sample is suggested by the BEECOM’s (total score’s and subscales’) significant positive correlations with measures of general social comparison orientation, physical appearance social comparison behavior, body dissatisfaction, and eating disorder symptomatology ([Fitzsimmons-Craft et al., 2012](#)).

Physical appearance social comparison. Appearance-related social comparison tendencies were assessed using the Physical Appearance Comparison Scale (PACS; [Thompson et al., 1991](#)). This measure assesses an individual’s tendency to compare her own appearance to the appearance of others and consists of five items, which are rated on a 5-point scale ranging from 1 (*never*) to 5 (*always*). Responses to the five items are summed to create a total PACS score, with higher scores indicating a greater tendency to engage in appearance comparisons. An example item is, “At parties or other social events, I compare my physical appearance to the physical appearance of others.” Construct validity is demonstrated by strong correlations between the PACS and measures of body dissatisfaction and eating disturbance in a female sample ([Thompson et al., 1991](#)). [Thompson et al. \(1991\)](#) found adequate internal consistency (coefficient alpha = .78) in a sample of college women.

General social comparison. General social comparison behavior was measured using the Iowa-Netherlands Comparison Orientation Measure (INCOM; [Gibbons & Buunk, 1999](#)). This scale consists of 11 items that are rated on a 5-point scale ranging from 1 (*I disagree strongly*) to 5 (*I agree strongly*). Responses are summed to create a total INCOM score, with higher scores indicating a greater tendency to engage in social comparisons across life domains. An example item is, “I always pay a lot of attention to how I do things compared with how others do things.” Evidence of construct validity in American adolescent and college samples is suggested by the measure’s significant relationships with neuroticism, self-monitoring, public and private self-consciousness, and social anxiety in these samples ([Gibbons & Buunk, 1999](#)). [Gibbons and Buunk \(1999\)](#) found that estimates of internal consistency ranged from .78 to .85 in American college students.

Body dissatisfaction. Body dissatisfaction experienced over the past 28 days was assessed via the Weight Concern and Shape Concern subscales of the Eating Disorder Examination-Questionnaire (EDE-Q; [Fairburn & Beglin, 2008](#)), which is one of the most commonly used measures of disordered eating attitudes and behaviors in clinical and community populations ([Anderson & Williamson, 2002](#)). These two subscales focus on weight and shape dissatisfaction and the degree to which one’s self-worth and acceptance of oneself are defined by weight or shape, and were combined since previous work has indicated that these two subscales load onto one underlying factor ([Peterson et al., 2007](#)). In particular, the 12 items, rated on a 7-point scale ranging from 0 to 6 (with items either rated on a *no days to everyday* scale or a *not at all to markedly* scale), were averaged to reflect body dissatisfaction. These subscales contain explicit items related to weight dissatisfaction and shape dissatisfaction and research has indicated that the Weight Concern and Shape Concern subscales of the EDE-Q are highly correlated with an existing measure of body dissatisfaction (i.e., the Body Shape

Questionnaire; [Cooper, Taylor, Cooper, & Fairburn, 1987](#)) ([Celio et al., 2000](#)), providing additional support for their use as a measure of this construct. An example item is, “How dissatisfied have you been with your weight?” The Weight Concern and Shape Concern subscales have yielded evidence of internal consistency (alphas of .89–.93; [Luce & Crowther, 1999](#)) and convergent validity ([Fairburn & Beglin, 1994](#); [Grilo, Masheb, & Wilson, 2001](#)) among samples of college women and community and patient groups.

Eating disorder symptomatology. The Eating Attitudes Test-26 (EAT-26; [Garner, Olmsted, Bohr, & Garfinkel, 1982](#)) was used to assess general eating disorder symptoms. The EAT-26 is one of the most widely used standardized measures of eating disorder attitudes and behaviors ([Garner, 2002](#)) and is comprised of 26 items that are rated on a 6-point scale ranging from 1 (*never*) to 6 (*always*). An example item is, “Find myself preoccupied with food.” [Garner et al. \(1982\)](#) have recommended that items endorsed as 1, 2, or 3 receive a score of “0,” while items marked as 4, 5, or 6 receive scores of “1,” “2,” and “3,” respectively. The 26 items are summed to create a total EAT-26 score, with higher scores reflecting greater eating pathology. Studies have found the measure to be effective as a screening measure, with a cutoff score of 20 indicating a probable eating disorder ([King, 1989, 1991](#)), and good internal consistency (alpha = .83–.90) and two-week test-retest reliability ($r = .84$) have been demonstrated in samples of young women ([Carter & Moss, 1984](#); [Garner et al., 1982](#)).

Analytic Strategy

One-year temporal stability of the BEECOM total and subscale scores was determined at the level of the latent factor. Latent variables using the BEECOM subscale scores as indicators of the total (i.e., eating disorder-related social comparison orientation) were created, and the T2 total score latent variable was regressed on the T1 total score latent variable in order to obtain a BEECOM total score temporal stability coefficient. Similarly, latent variables using the BEECOM items as indicators of the subscales (i.e., Body Comparison Orientation, Eating Comparison Orientation, Exercise Comparison Orientation) were created, and the T2 subscale latent variables were regressed on the T1 subscale latent variables in order to obtain BEECOM subscale score temporal stability coefficients. Linear regression analyses were used to examine the predictive validity of the BEECOM; we examined whether the BEECOM subscale scores at T1 predicted variance in body dissatisfaction and eating disorder symptomatology at T2. Hierarchical linear regression analyses were used to examine the incremental validity of the BEECOM; we examined whether the BEECOM subscale scores at T1 predicted variance in body dissatisfaction and eating disorder symptomatology at T2, after controlling for body dissatisfaction and eating disorder symptomatology at T1. In order to more stringently examine the predictive and incremental validity of the BEECOM, we also ran the aforementioned analyses controlling for BMI, appearance-related social comparison tendencies, and general social comparison orientation. Lastly, while our main focus was on the BEECOM subscales, we also examined the predictive and incremental validity of the total BEECOM score, as well.

Results

Preliminary Analyses

[Table 2](#) contains means, standard deviations, ranges, and coefficient alphas for the study variables. Given the potential for a high degree of inter-correlation between predictors in the regression models, we checked the assumption of collinearity by examining the variance inflation factors (VIFs) and tolerance statistics for each

of the independent variables in all of our regression models. It has been suggested that VIF values greater than 10 and tolerance statistics below .2 are worthy of concern (Menard, 1995; Myers, 1990). None of the predictors in any of the models displayed values beyond these thresholds; thus, the level of correlation between independent variables in the current study should not be problematic.

Temporal Stability

We hypothesized that the BEECOM total and subscale scores would exhibit at least a reasonable level of temporal stability in a sample of college women. This hypothesis was supported, as one-year temporal stability was high for the total BEECOM score ($\beta = .80$), as well as for the subscales (Body Comparison Orientation: $\beta = .75$; Eating Comparison Orientation: $\beta = .72$; Exercise Comparison Orientation: $\beta = .68$). All coefficients were significant at the $p < .001$ level.

Predictive Validity of the BEECOM Subscale Scores

In assessing predictive validity, separate linear regression analyses were conducted to assess the relationship between the BEECOM subscale scores at T1 and body dissatisfaction and eating disorder symptomatology at T2 (see Table 3). We hypothesized that the BEECOM subscale scores would exhibit predictive validity in this sample of college women even when accounting for the influences of BMI, appearance-related social comparison tendencies, and general social comparison orientation. As a set, scores on the BEECOM subscales at T1 predicted variance in both body dissatisfaction ($R^2 = .39$) and eating disorder symptomatology ($R^2 = .30$) at T2. Further, after considering the contribution of BMI and existing measures of appearance-related social comparison tendencies (the PACS) and general social comparison orientation (the INCOM), as a set, the T1 BEECOM subscales still predicted variance in both body dissatisfaction (ΔR^2 at Step 3 = .12) and eating disorder symptomatology (ΔR^2 at Step 3 = .15) at T2. Thus, our hypothesis was supported. Examination of the significance of the β s for each

Table 3
Predictive validity of the BEECOM subscale scores ($N = 237$).

	Cumulative R^2	Adjusted R^2	ΔR^2	$\Delta F(df)$	β	$t(df)$
Dependent variable: body dissatisfaction (Weight Concern/Shape Concern) at T2						
<i>Predictive validity</i>						
Step 1	.39	.38	.39	44.93 (3,215)***		
BEECOM Body T1					.52***	6.72 (3,215)
BEECOM Eating T1					.07	0.80 (3,215)
BEECOM Exercise T1					.07	0.80 (3,215)
<i>Predictive validity – Controlling for BMI, PACS, and INCOM at T1, overall $F(6,188) = 24.75, p < .001$</i>						
Step 1	.12	.11	.12	26.01 (1,193)***		
BMI T1					.35***	5.10 (1,193)
Step 2	.33	.32	.21	29.27 (2,191)***		
BMI T1					.29***	4.85 (3,191)
PACS T1					.42***	5.84 (3,191)
INCOM T1					.06	0.90 (3,191)
Step 3	.44	.42	.12	12.99 (3,188)***		
BMI T1					.23***	4.03 (6,188)
PACS T1					.02	0.23 (6,188)
INCOM T1					-.04	-0.58 (6,188)
BEECOM Body T1					.50***	4.77 (6,188)
BEECOM Eating T1					.05	0.56 (6,188)
BEECOM Exercise T1					.06	0.72 (6,188)
Dependent variable: eating disorder symptomatology (EAT-26) at T2						
<i>Predictive validity</i>						
Step 1	.30	.29	.30	26.99 (3,187)***		
BEECOM Body T1					.25**	2.89 (3,187)
BEECOM Eating T1					.14	1.35 (3,187)
BEECOM Exercise T1					.22*	2.25 (3,187)
<i>Predictive validity – Controlling for BMI, PACS, and INCOM at T1, overall $F(6,164) = 15.31, p < .001$</i>						
Step 1	.06	.05	.06	10.61 (1,169)**		
BMI T1					.24**	3.26 (1,169)
Step 2	.21	.20	.16	16.48 (2,167)***		
BMI T1					.18**	2.64 (3,167)
PACS T1					.41***	4.95 (3,167)
INCOM T1					-.02	-0.20 (3,167)
Step 3	.36	.34	.15	12.35 (3,164)***		
BMI T1					.13, $p = .05$	1.98 (6,164)
PACS T1					.04	0.35 (6,164)
INCOM T1					-.14	-1.83 (6,164)
BEECOM Body T1					.29*	2.38 (6,164)
BEECOM Eating T1					.15	1.44 (6,164)
BEECOM Exercise T1					.22*	2.19 (6,164)

Note. Weight Concern/Shape Concern = combined subscales from the Eating Disorder Examination-Questionnaire; EAT-26 = Eating Attitudes Test-26; BEECOM = Body, Eating, and Exercise Comparison Orientation Measure; BMI = body mass index; PACS = Physical Appearance Comparison Scale; INCOM = Iowa-Netherlands Comparison Orientation Measure.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

of the BEECOM subscales revealed that the BEECOM Body Comparison Orientation subscale scores at T1 accounted for unique variance in body dissatisfaction at T2 (both with and without accounting for the influence of T1 BMI, PACS, and INCOM). However, when predicting eating pathology, an inspection of the β s

indicated that both the T1 Body Comparison Orientation subscale and the T1 Exercise Comparison Orientation subscale accounted for unique variance in eating disorder symptomatology at T2, both with and without accounting for the influence of T1 BMI, PACS, and INCOM.

Table 4
Incremental validity of the BEECOM subscale scores ($N = 237$).

	Cumulative R^2	Adjusted R^2	ΔR^2	$\Delta F(df)$	β	$t(df)$
Dependent variable: body dissatisfaction (Weight Concern/Shape Concern) at T2						
Incremental validity, overall $F(4,214) = 106.28, p < .001$						
Step 1	.66	.66	.66	424.20 (1,217)***		
Body Dissatisfaction T1					.82***	20.60 (1,217)
Step 2	.67	.66	.00	.76 (3,214)		
Body Dissatisfaction T1					.76***	13.37 (4,214)
BEECOM Body T1					.09	1.40 (4,214)
BEECOM Eating T1					.01	0.12 (4,214)
BEECOM Exercise T1					-.04	-0.56 (4,214)
Incremental validity – Controlling for BMI, PACS, and INCOM at T1, overall $F(7,187) = 58.89, p < .001$						
Step 1	.68	.68	.68	410.98 (1,193)***		
Body Dissatisfaction T1					.83***	20.27 (1,193)
Step 2	.68	.68	.00	.01 (1,192)		
Body Dissatisfaction T1					.83***	18.37 (2,192)
BMI T1					.00	-0.07(2,192)
Step 3	.68	.67	.00	.09 (2,190)		
Body Dissatisfaction T1					.82***	14.54 (4,190)
BMI T1					.00	-0.02 (4,190)
PACS T1					-.01	-0.08 (4,190)
INCOM T1					.02	0.40 (4,190)
Step 4	.69	.68	.01	1.44 (3,187)		
Body Dissatisfaction T1					.77***	12.16 (7,187)
BMI T1					.00	0.03 (7,187)
PACS T1					-.08	-1.19 (7,187)
INCOM T1					.00	-0.02 (7,187)
BEECOM Body T1					.17*	2.02 (7,187)
BEECOM Eating T1					.00	0.03 (7,187)
BEECOM Exercise T1					-.03	-0.52 (7,187)
Dependent variable: eating disorder symptomatology (EAT-26) at T2						
Incremental validity, overall $F(4,166) = 61.89, p < .001$						
Step 1	.59	.59	.59	244.86 (1,169)***		
EAT-26 T1					.77***	15.65 (1,169)
Step 2	.60	.59	.01	.96 (3,166)		
EAT-26 T1					.72***	11.08 (4,166)
BEECOM Body T1					.03	0.43 (4,166)
BEECOM Eating T1					-.05	-0.55 (4,166)
BEECOM Exercise T1					.11	1.30 (4,166)
Incremental validity – Controlling for BMI, PACS, and INCOM at T1, overall $F(7,147) = 28.86, p < .001$						
Step 1	.53	.53	.53	174.30 (1,153)***		
EAT-26 T1					.73***	13.20 (1,153)
Step 2	.55	.55	.02	6.19 (1,152)*		
EAT-26 T1					.71***	12.94 (2,152)
BMI T1					.14*	2.49 (2,152)
Step 3	.56	.55	.01	1.36 (2,150)		
EAT-26 T1					.70***	10.98 (4,150)
BMI T1					.13*	2.25 (4,150)
PACS T1					.09	1.29 (4,150)
INCOM T1					-.10	-1.51 (4,150)
Step 4	.58	.56	.02	2.33 (3,147)		
EAT-26 T1					.63***	8.91 (7,147)
BMI T1					.11, $p = .05$	1.96 (7,147)
PACS T1					-.02	-0.19 (7,147)
INCOM T1					-.14*	-2.06 (7,147)
BEECOM Body T1					.12	1.10 (7,147)
BEECOM Eating T1					.00	-0.02 (7,147)
BEECOM Exercise T1					.14	1.61 (7,147)

Note. Weight Concern/Shape Concern = combined subscales from the Eating Disorder Examination–Questionnaire; EAT-26 = Eating Attitudes Test-26; BEECOM = Body, Eating, and Exercise Comparison Orientation Measure; BMI = body mass index; PACS = Physical Appearance Comparison Scale; INCOM = Iowa–Netherlands Comparison Orientation Measure.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Incremental Validity of the BEECOM Subscale Scores

In investigating incremental validity, separate hierarchical linear regression analyses were conducted to assess the relationship between the BEECOM subscales at T1 and body dissatisfaction and eating disorder symptomatology at T2, controlling for T1 body dissatisfaction/eating disorder symptomatology (see Table 4). These analyses were considered more exploratory and thus no specific hypotheses were made. Results indicated that, as a set, scores on the BEECOM subscales at T1 did not predict body dissatisfaction or eating disorder symptomatology at T2, after controlling for baseline levels, regardless of the inclusion of BMI and PACS and INCOM scores at T1 as covariates. Of note, the correlations between the T1 measures of body dissatisfaction and eating disorder symptomatology and the T2 measures of these constructs were high ($r = .81$ and $r = .75$, respectively, $p < .001$). Thus, a large amount of the variance in body dissatisfaction/eating disorder symptomatology at T2 was already accounted for by body dissatisfaction/eating disorder symptomatology at T1, leaving little to be accounted for by the BEECOM.

Predictive and Incremental Validity Analyses Using the Total BEECOM Score

We also ran the predictive and incremental validity analyses using the total BEECOM score, rather than the BEECOM subscale scores. The total BEECOM score at T1 predicted variance in both body dissatisfaction ($R^2 = .34$, $p < .001$) and eating disorder symptomatology ($R^2 = .30$, $p < .001$) at T2. When controlling for T1 BMI, T1 PACS scores, and T1 INCOM scores, the total BEECOM score at T1 still predicted variance in both body dissatisfaction (ΔR^2 at Step 3 = $.08$, $p < .001$) and eating disorder symptomatology (ΔR^2 at Step 3 = $.14$, $p < .001$) at T2. Regarding the incremental validity of the total BEECOM score, results indicated that the total BEECOM score at T1 did not predict body dissatisfaction ($p = .455$) or eating disorder symptomatology ($p = .185$) at T2, after controlling for T1 body dissatisfaction/eating disorder symptomatology. When also controlling for T1 BMI, T1 PACS scores, and T1 INCOM scores, results indicated that the total BEECOM score at T1 did not significantly predict variance in body dissatisfaction at T2 ($p = .383$) after controlling for T1 body dissatisfaction. However, the total BEECOM score at T1 did significantly predict variance in eating disorder symptomatology at T2 ($p = .015$), after controlling for T1 eating disorder symptomatology, T1 BMI, T1 PACS scores, and T1 INCOM scores.

Discussion

The goal of the current study was to examine the one-year temporal stability and predictive and incremental validity of the BEECOM, a measure of three eating disorder-related social comparison dimensions (i.e., body, eating, exercise), in a sample of college women. Results indicated that the BEECOM total and subscale scores exhibited high levels of temporal stability over the course of one year, providing further evidence for the trait-like nature of body, eating, and exercise social comparison tendencies among college women. Predictive validity of the BEECOM in the current sample was demonstrated, as well. Specifically, the BEECOM total score and subscale scores (as a set) were found to predict variance in body dissatisfaction and eating disorder symptomatology one year later both on their own and when controlling for the contribution of BMI and existing measures of appearance-related social comparison tendencies and general social comparison orientation.

Interestingly, in examining the significance of the β s for each of the BEECOM subscales, the BEECOM Body Comparison Orientation

subscale scores accounted for unique variance in body dissatisfaction one year later and the BEECOM Body and Exercise Comparison Orientation subscale scores accounted for unique variance in eating disorder symptomatology one year later (both with and without accounting for the influence of BMI and the existing social comparison measures). These findings build on prior work, which has found body/appearance-related social comparison tendencies to be concurrently associated with body dissatisfaction and disordered eating (e.g., Thompson et al., 1991), by demonstrating that body-related social comparison behavior prospectively predicts unique variance in these negative outcomes. It is interesting that exercise-related comparison tendencies prospectively predicted unique variance in eating disorder symptomatology but not body dissatisfaction. These results suggest that exercise comparisons may be one “warning sign” for eating disorder symptomatology in particular and are in line with research tying exercise fixation and obligatory exercise to eating pathology (e.g., Ackard et al., 2002; Brehm & Steffen, 1998). As aforementioned, it may be that exercise comparisons provide a woman with information that she then uses in altering her behavior with the aim of achieving her ideal weight/shape; thus, such comparisons may be more closely tied to disordered eating behaviors than more general discontent with the body. Interestingly, prior work on comparison (albeit focused on body comparison) suggests that the relation between both reward sensitivity and sensitivity to punishment and the dependent variables of obligatory exercise and eating pathology is mediated by frequency of comparison (Mussap, 2007), thus providing support for linkages among comparison, exercise, and disordered eating. However, one must keep in mind that these findings are somewhat in contrast to those of Fitzsimmons-Craft et al. (2012) who found that the BEECOM Body and Eating Comparison Orientation subscales accounted for unique variance in concurrent levels of body dissatisfaction and eating disorder symptomatology, while the Exercise Comparison Orientation subscale did not. Thus, across studies, it appears that body-related social comparison orientation is a unique and consistent predictor of both concurrent and prospective eating pathology, while the explanatory power of eating- and exercise-related social comparison behavior is more variable.

Results regarding the incremental validity of the BEECOM were somewhat mixed. While we found no support for the BEECOM subscales predicting change in body dissatisfaction or eating pathology across one year's time, there was some support for a role for the BEECOM total score in accounting for change in eating pathology, but only after accounting for variance due to BMI and other measures of social comparison. It is interesting that the BEECOM showed some possibility of incremental validity only for eating disorder symptomatology and not for body dissatisfaction. As previously discussed in the context of exercise-related social comparison tendencies prospectively predicting unique variance in eating disorder symptomatology but not body dissatisfaction, this may suggest that, when multiple eating disorder-related social comparison dimensions (i.e., body, eating, and exercise comparisons) are examined at once, this more comprehensive consideration of comparisons plays more of a role in disordered eating behaviors than feelings of dissatisfaction with the body.

One factor to keep in mind when considering these incremental validity findings is that the correlations between the T1 measures of body dissatisfaction and eating disorder symptomatology and the T2 measures of these constructs were high (both higher than .70). Thus, on average, participants' scores on these measures were very constant over time, which is consistent with past research showing that both body dissatisfaction and disordered eating are very stable during the college years (e.g., Cooley & Toray, 1996, 2001; Tiggemann, 2004). In general, research has indicated that body dissatisfaction is very stable across the lifespan (e.g., Tiggemann, 2004)

and that behaviors related to disordered eating are often well-established prior to arrival at college (Vohs, Heatherton, & Herrin, 2001). Therefore, the stability of body dissatisfaction and disordered eating across the course of one year in the current sample of college women is not surprising and, as a result, leaves little variability in body dissatisfaction and disordered eating to be explained above and beyond baseline levels. The fact that the BEECOM total score showed some possibility of incremental validity for eating disorder symptomatology suggests that eating disorder-related social comparison orientation may be an important predictor of change in such symptoms over time.

Given that most research on the link between social comparison and eating pathology has been cross-sectional in nature, the major strength of the current study is the examination of the prospective relation between these constructs. Additionally, the BEECOM is a relatively new measure that more comprehensively assesses the types of social comparison that may be associated with eating pathology, in contrast to measures focused on general- or appearance-related social comparisons. The current study expands upon earlier psychometric work of this measure (Fitzsimmons-Craft et al., 2012) by providing information regarding long-term stability and prospective validity. A further strength of the current study is that we examined the predictive and incremental validity of the BEECOM while controlling for BMI and existing social comparison measures. Such analyses provide a rigorous test of these psychometric properties of the BEECOM.

Results of the current study should be interpreted while keeping study limitations in mind. For example, the generalizability of the current findings is limited to similar samples (i.e., college women). However, high levels of body dissatisfaction and eating disorder symptomatology among college women (e.g., Berg, Frazier, & Sherr, 2009; Neighbors & Sobal, 2007) underscore the importance of examining factors (e.g., social comparison) that predict or maintain such pathology. Thus, the focus on college women in the current study may be conceptually appropriate. Additional limitations include the fixed order of the study questionnaires, as order effects could not be controlled for, and the relative homogeneity of the current sample with regard to race/ethnicity. Future research may wish to examine the psychometric properties of the BEECOM in more racially/ethnically diverse samples and to test whether the BEECOM or a modified version relates to body dissatisfaction and eating disorder symptomatology among males.

The current findings are suggestive of many avenues for future research. As aforementioned, across studies (i.e., the current one; Fitzsimmons-Craft et al., 2012), results regarding the role of the BEECOM Eating and Exercise Comparison Orientation subscales have been mixed. It would be interesting for future research to examine the conditions under which the Eating and Exercise Comparison Orientation subscales uniquely predict concurrent or prospective levels of body dissatisfaction and eating disorder symptomatology. For instance, it may be that the Exercise Comparison Orientation subscale would uniquely predict variance in body dissatisfaction for those who endorse high levels of excessive or compulsive exercise. Perhaps the Eating Comparison Orientation subscale would predict unique variance in body dissatisfaction and eating disorder symptomatology for chronic dieters or those with a diagnosable eating disorder. Future research should also ascertain if there are certain samples (e.g., those with a diagnosable eating disorder) for whom the BEECOM would consistently exhibit incremental validity. It would additionally be interesting for future research to investigate whether eating disorder-related social comparison tendencies play more of a role in the onset or maintenance of eating pathology and if, using an ecological momentary assessment approach, there are certain variables (e.g., eating disorder symptomatology, appearance-contingent self-worth, trait anxiety) that trait levels of comparison (e.g., the BEECOM) may interact with

to predict especially high levels of in-the-moment eating disorder-related social comparison behavior. Finally, future research may wish to use other approaches for studying incremental validity, such as modeling the time-varying effect of the BEECOM on body dissatisfaction and disordered eating or using a parallel growth model.

Given that the current findings suggest that eating disorder-related social comparisons predict later body dissatisfaction and eating disorder symptomatology, such comparison behavior should be the focus of eating disorder and body dissatisfaction intervention and prevention efforts. Indeed, Fairburn (2008) suggests that social comparison behavior should be addressed in cognitive-behavioral therapy for eating disorders given that comparison-making actively maintains concerns about weight and shape. For example, body, eating, and exercise comparisons could be addressed in treatment by having individuals self-monitor their engagement in this type of behavior. Research indicates that simply becoming more aware of one's social comparison behavior may be associated with a decrease in comparison-making (Leahey, Crowther, & Ciesla, 2011). However, it would likely also be useful for clinicians to then aid their clients in coming to an understanding of the triggers, consequences, and functions of such behavior. Clinicians may wish to help their clients become more aware of the biases apparent in their social comparisons, as well; for example, clinicians could alert their clients to the fact that individuals tend to selectively compare themselves to others whom they regard as being "better off" in some way (e.g., thinner, eats less, exercises more; Cash, 2008). This combination of strategies may prove useful in terms of decreasing body, eating, and exercise comparisons and their negative effects (e.g., body dissatisfaction, disordered eating); however, research should specifically test the efficacy of such an intervention in the future.

In conclusion, the current study provided additional psychometric support for the BEECOM in a sample of college women. The BEECOM exhibited high levels of one-year temporal stability, providing evidence for the trait-like nature of tendencies toward body, eating, and exercise social comparison behavior. Although results regarding the incremental validity of the BEECOM in the current sample were mixed, the measure was found to exhibit predictive validity with its prospective relations to body dissatisfaction and eating disorder symptomatology one year later. Thus, this study's psychometric findings for the BEECOM in a sample of college women further establishes the usefulness of this measure for more comprehensively assessing the types of social comparisons that impact eating pathology.

References

- Ackard, D. M., Brehm, B. J., & Steffen, J. J. (2002). Exercise and eating disorders in college-aged women: Profiling excessive exercisers. *Eating Disorders*, *10*, 31–47. <http://dx.doi.org/10.1080/106402602753573540>
- Anderson, D. A., & Williamson, D. A. (2002). Outcome measurement in eating disorders. In W. W. IsHak, T. Burt & L. I. Sederer (Eds.), *Outcome measurement in psychiatry: A critical review* (pp. 289–301). Washington, DC: American Psychiatric Press.
- Berg, K. C., Frazier, P., & Sherr, L. (2009). Change in eating disorder attitudes and behavior in college women: Prevalence and predictors. *Eating Behaviors*, *10*, 137–142. <http://dx.doi.org/10.1016/j.eatbeh.2009.03.003>
- Brehm, B. J., & Steffen, J. J. (1998). Relation between obligatory exercise and eating disorders. *American Journal of Health Behavior*, *22*, 108–119.
- Carter, P. L., & Moss, R. A. (1984). Screening for anorexia and bulimia nervosa in a college population: Problems and limitations. *Addictive Behaviors*, *9*, 417–419. [http://dx.doi.org/10.1016/0306-4603\(84\)90045-5](http://dx.doi.org/10.1016/0306-4603(84)90045-5)
- Cash, T. F. (2008). *The body image workbook* (2nd ed.). Oakland, CA: New Harbinger Publications.
- Cattarin, J. A., Thompson, J. K., Thomas, C., & Williams, R. (2000). Body image, mood, and televised images of attractiveness: The role of social comparison. *Journal of Social and Clinical Psychology*, *19*, 220–239. <http://dx.doi.org/10.1521/jscp.2000.19.2.220>
- Celio, A. A., Winzelberg, A. J., Wilfley, D. E., Eppstein-Herald, D., Springer, E. A., Dev, P., & Taylor, C. B. (2000). Reducing risk factors for eating

- disorders: Comparison of an internet- and a classroom-delivered psychoeducational program. *Journal of Consulting and Clinical Psychology*, 68, 650–657. <http://dx.doi.org/10.1037/0022-006X.68.4.650>
- Cooley, E., & Toray, T. (1996). Disordered eating in college freshman women: A prospective study. *College Health*, 44, 229–235.
- Cooley, E., & Toray, T. (2001). Body image and personality predictors of eating disorder symptoms during the college years. *International Journal of Eating Disorders*, 30, 28–36. <http://dx.doi.org/10.1002/eat.1051>
- Cooper, P. J., Taylor, M. J., Cooper, Z., & Fairburn, C. G. (1987). The development and validation of the Body Shape Questionnaire. *International Journal of Eating Disorders*, 6, 485–494. [http://dx.doi.org/10.1002/1098-108X\(198707\)6:4<485::AID-EAT2260060405>3.0.CO;2-O](http://dx.doi.org/10.1002/1098-108X(198707)6:4<485::AID-EAT2260060405>3.0.CO;2-O)
- Corning, A. F., Krumm, A. J., & Smitham, L. A. (2006). Differential social comparison processes in women with and without eating disorder symptoms. *Journal of Counseling Psychology*, 53, 338–349. <http://dx.doi.org/10.1037/0022-0167.53.3.338>
- Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. New York: Guilford.
- Fairburn, C. G., & Beglin, S. (2008). Eating Disorder Examination Questionnaire (EDE-Q 6.0). In C. G. Fairburn (Ed.), *Cognitive behavior therapy and eating disorders* (pp. 309–313). New York: Guilford.
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16, 363–370.
- Faith, M. S., Leone, M. A., & Allison, D. B. (1997). The effects of self-generated comparison targets BMI, and social comparison tendencies on body image appraisal. *Eating Disorders*, 5, 128–140. <http://dx.doi.org/10.1080/10640269708249216>
- Fisher, E., & Thompson, J. K. (1998). *Social comparison and body image: An investigation of body comparison processes using multidimensional scaling*. Unpublished manuscript, University of South Florida.
- Fitzsimmons-Craft, E. E., Bardone-Cone, A. M., & Harney, M. B. (2012). Development and validation of the Body Eating, and Exercise Comparison Orientation (BEECOM) among college women. *Body Image*, 9, 476–487. <http://dx.doi.org/10.1016/j.bodyim.2012.07.007>
- Garner, D. M. (2002). Measurement of eating disorder psychopathology. In C. G. Fairburn & K. D. Brownell (Eds.), *Eating disorders and obesity: A comprehensive handbook* (pp. 141–146). New York, NY: Guilford Press.
- Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. *Psychological Medicine*, 12, 871–878. <http://dx.doi.org/10.1017/S0033291700049163>
- Gibbons, F. X., & Buunk, B. P. (1999). Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology*, 76, 129–142. <http://dx.doi.org/10.1037/0022-3514.76.1.129>
- Grilo, C. M., Masheb, R. M., & Wilson, G. T. (2001). A comparison of different methods for assessing the features of eating disorders in patients with binge eating disorder. *Journal of Consulting and Clinical Psychology*, 69, 317–322. <http://dx.doi.org/10.1037/0022-006X.69.2.317>
- Halliwel, E., & Dittmar, H. (2005). The role of self-improvement and self-evaluation motives in social comparisons with idealized female bodies in the media. *Body Image*, 2, 249–261. <http://dx.doi.org/10.1016/j.bodyim.2005.05.001>
- Heinberg, L. J., & Thompson, J. K. (1992). The effects of figure size feedback (positive vs. negative) and target comparison group (particularistic vs. universalistic) on body image disturbance. *International Journal of Eating Disorders*, 12, 441–448.
- King, M. B. (1989). Eating disorders in general practice population: Prevalence, characteristics and follow-up at 12 to 18 months. *Psychological Medicine, Monograph Supplement*, 14, 1–34. <http://dx.doi.org/10.1017/S0264180100000515>
- King, M. B. (1991). The natural history of eating pathology in attenders to primary medical care. *International Journal of Eating Disorders*, 10, 379–387. [http://dx.doi.org/10.1002/1098-108X\(199107\)10:4<379::AID-EAT2260100402>3.0.CO;2-I](http://dx.doi.org/10.1002/1098-108X(199107)10:4<379::AID-EAT2260100402>3.0.CO;2-I)
- Leahey, T. M., & Crowther, J. H. (2008). An ecological momentary assessment of comparison target as a moderator of the effects of appearance-focused social comparisons. *Body Image*, 5, 307–311. <http://dx.doi.org/10.1016/j.bodyim.2008.03.002>
- Leahey, T. M., Crowther, J. H., & Ciesla, J. A. (2011). An ecological momentary assessment of the effects of weight and shape comparisons on women with eating pathology, high body dissatisfaction, and low body dissatisfaction. *Behavior Therapy*, 42, 197–210. <http://dx.doi.org/10.1016/j.beth.2010.07.003>
- Leahey, T. M., Crowther, J. H., & Mickelson, K. D. (2007). The frequency, nature, and effects of naturally occurring appearance-focused social comparisons. *Behavior Therapy*, 38, 132–143. <http://dx.doi.org/10.1016/j.beth.2006.06.004>
- Lin, L. F., & Kulik, J. A. (2002). Social comparison and women's body satisfaction. *Basic and Applied Social Psychology*, 24, 115–123.
- Lindner, D., Hughes, A., & Fahy, R. (2008). Eating pathology and social comparison in college females. *North American Journal of Psychology*, 10, 445–462.
- Luce, K. H., & Crowther, J. H. (1999). The reliability of the Eating Disorder Examination – Self-report Questionnaire Version (EDE-Q). *International Journal of Eating Disorders*, 25, 349–351. [http://dx.doi.org/10.1002/\(SICI\)1098-108X\(199904\)25:3<349::AID-EAT15>3.0.CO;2-M](http://dx.doi.org/10.1002/(SICI)1098-108X(199904)25:3<349::AID-EAT15>3.0.CO;2-M)
- Menard, S. (1995). *Applied logistic regression analysis: Sage University series on quantitative applications in the social sciences*. Thousand Oaks, CA: Sage.
- Mussap, A. J. (2007). Motivational processes associated with unhealthy body change attitudes and behaviours. *Eating Behaviors*, 8, 423–428. <http://dx.doi.org/10.1016/j.eatbeh.2006.12.001>
- Myers, R. (1990). *Classical and modern regression with applications* (2nd ed.). Boston: Duxbury.
- Myers, T. A., & Crowther, J. H. (2009). Social comparison as a predictor of body dissatisfaction: A meta-analytic review. *Journal of Abnormal Psychology*, 118, 683–698. <http://dx.doi.org/10.1037/a0016763>
- Neighbors, L. A., & Sobal, J. (2007). Prevalence and magnitude of body weight and shape dissatisfaction among university students. *Eating Behaviors*, 8, 429–439. <http://dx.doi.org/10.1016/j.eatbeh.2007.03.003>
- O'Brien, K. S., Caputi, P., Minto, R., Peoples, G., Hooper, C., Kell, S., & Sawley, E. (2009). Upward and downward physical appearance comparisons: Development of scales and examination of predictive qualities. *Body Image*, 6, 201–206. <http://dx.doi.org/10.1016/j.bodyim.2009.03.003>
- Peterson, C. B., Crosby, R. D., Wonderlich, S. A., Joiner, T., Crow, S. J., Mitchell, J. E., & le Grange, D. (2007). Psychometric properties of the Eating Disorder Examination-Questionnaire: Factor structure and internal consistency. *International Journal of Eating Disorders*, 40, 386–389. <http://dx.doi.org/10.1002/eat.20373>
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin*, 128, 825–848. <http://dx.doi.org/10.1037/0033-2909.128.5.825>
- Striegel-Moore, R. H., & Bulik, C. M. (2007). Risk factors for eating disorders. *American Psychologist*, 62, 181–198. <http://dx.doi.org/10.1037/0003-066X.62.3.181>
- Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist*, 41, 246–263. <http://dx.doi.org/10.1037/0003-066X.41.3.246>
- Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect? *Current Directions in Psychological Science*, 11, 159–163. <http://dx.doi.org/10.1111/1467-8721.00191>
- Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/103710312-000>
- Thompson, J. K., Heinberg, L. J., & Tantleff, S. (1991). The Physical Appearance Comparison Scale (PACS). *Behavior Therapist*, 14, 174.
- Tiggemann, M. (2004). Body image across the adult life span: Stability and change. *Body Image*, 1, 29–41. [http://dx.doi.org/10.1016/S1740-1445\(03\)00002-0](http://dx.doi.org/10.1016/S1740-1445(03)00002-0)
- Vohs, K. D., Heatherton, T. F., & Herrin, M. (2001). Disordered eating and the transition to college: A prospective study. *International Journal of Eating Disorders*, 29, 280–288. <http://dx.doi.org/10.1002/eat.1019>
- Wood, J. V. (1996). What is social comparison and how should we study it? *Personality and Social Psychology Bulletin*, 22, 520–537. <http://dx.doi.org/10.1177/0146167296225009>