



A daily diary study of self-compassion, body image, and eating behavior in female college students



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ABSTRACT

Although self-compassion is associated with healthier body image and eating behavior, these findings have generally emerged at the between-persons level only. The present study investigated the unique contributions of within-person variability in self-compassion, and between-persons differences in self-compassion, to body image and eating behavior. Over seven days, 92 female college students completed nightly measures of self-compassion, self-esteem, dietary restraint, intuitive eating, body appreciation, body satisfaction, and state body image. Multilevel modeling revealed that within-persons, day-to-day fluctuations in self-compassion contributed to day-to-day fluctuations in body image and eating. Between-persons, participants' average levels of self-compassion across days contributed to their average levels of body image and eating over the week. Results generally held when controlling for within- and between-persons self-esteem. Evidently, the eating and body image benefits of self-compassion may come not only from being a generally self-compassionate person, but also from treating oneself more self-compassionately than usual on a given day.

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Introduction

A growing body of literature has found that self-compassion is linked to more adaptive and less maladaptive forms of body image and eating (e.g., Homan & Tylka, 2015; Kelly, Vimalakanthan, & Carter, 2014; Wasylikiw, MacKinnon, & MacLellan, 2012; Webb & Forman, 2013). Neff (2003) defined self-compassion as the tendency to treat oneself with care and kindness at times of distress and disappointment. Gilbert (2005) proposed that self-compassion originates from humans' capacity for caregiving, and involves the courage to face and be moved by one's own suffering, and an active desire to alleviate it. Although self-compassion is a form of positive self-regard like self-esteem, and the two correlate moderately (Leary, Tate, Adams, Batts Allen, & Hancock, 2007; Neff, 2003), there are important differences between the constructs. Self-esteem is a global evaluation of one's attributes, skills, and qualities (Rosenberg, 1965), whereas self-compassion derives from an orientation of care, not evaluation (Gilbert, 2010). Furthermore, whereas self-esteem is associated with the tendency to be defensive and downplay one's role in failures (Kernis & Goldman, 2003), self-compassion is associated with a tendency to

acknowledge one's contribution to failures and a motivation to learn from one's mistakes and self-improve (Leary et al., 2007). Self-compassion and self-esteem account for unique variance in mental and physical health outcomes with several studies suggesting that self-compassion's contribution to eating behavior and body image may be larger (Breines, Toole, Tu, & Chen, 2014; Kelly et al., 2014).

To date, researchers have primarily studied the between-persons relationships between self-compassion and functioning in the body image and eating domain. By this we mean that researchers have looked primarily at whether people who are highly self-compassionate have better body image and more adaptive eating habits than those who are less self-compassionate. Although such findings are informative and interesting, their practical implications are limited: these between-persons results provide no indication as to whether a given individual stands to gain from treating herself more self-compassionately than what is typical for her in a given moment, on a given day, or on a given week. Because self-compassion has primarily been conceptualized and measured as an individual difference variable, it is natural that most studies have focused on exploring differences between people rather than within-persons. It is nevertheless the case that as with most "personality" variables, self-compassion has both trait- and state-like properties (Moskowitz, Brown, & Coté, 1997). Indeed, numerous studies have found that brief experimental manipulations can influence levels of self-compassion (e.g., Adams & Leary, 2007; Kelly & Carter, 2015; Leary et al., 2007), and one daily diary

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study found that self-compassion showed intra-individual variability from one day to the next (Zuroff, Kelly, Leybman, Sadikaj, & Gilbert, 2012).

It is plausible that natural fluctuations in self-compassion levels within a person may influence her eating behavior and body image. Indeed, several experimental studies have found that self-compassion primes and interventions have produced adaptive changes in body image and eating behavior (Adams & Leary, 2007; Albertson, Neff, & Shackleford, 2014; Kelly & Carter, 2015). In day-to-day life, it could also be that when women treat themselves with more self-compassion than usual, they experience better body image and approach eating in a less disordered and more adaptive way. Mindfulness is considered a component of self-compassion (Neff, 2003); therefore, treating oneself more self-compassionately may help an individual to acknowledge and tolerate her negative emotions more than usual, and be less inclined to suppress or distract from them with emotional eating or fixate on feelings of dissatisfaction with one's body. Indeed, responding to a negative body image experience with self-compassion might protect individuals from the temptation to try and alter their shape and weight. According to Gilbert (2005), when an individual practices self-compassion, feelings of safeness and calmness, and an orientation of trust and acceptance, ensue; as a result, feelings of anxiety and shame, and attention to potential threats and dangers, decrease (Depue & Morrone-Strupinsky, 2005; LeDoux, 1998). One might therefore imagine that when an individual treats herself with more self-compassion than usual, she may become more trusting of her body signals to direct her eating, and as such approach eating in a more relaxed and less anxious manner. She might also feel more accepting of her body as it is, and less preoccupied with and threatened by its imperfections.

Only one study to our knowledge has investigated the within-person relationship between naturalistic fluctuations in self-compassion and functioning within the eating and body image realm. Breines et al. (2014) conducted a four-day daily diary study in which female undergraduates reported on their levels of appearance-related self-compassion on days when they had moments of feeling badly about their looks. Results indicated that on days when women responded to their perceived appearance flaws with greater self-compassion, they reported less disordered eating (Breines et al., 2014). This finding held when controlling for daily self-esteem. These preliminary results therefore suggest that having a higher than usual level of self-compassion vis-à-vis one's appearance may protect women from maladaptive eating patterns.

Although Breines et al.'s (2014) study suggests there may be a within-person relationship between self-compassion and eating behavior in women's daily lives, there remain several unanswered questions. First, the study assessed appearance-specific self-compassion, not global self-compassion. As a result, it is unclear whether day-to-day variability in global self-compassion – that is, how compassionately individuals respond to personal difficulties and distress *in general*, not just in the appearance domain – is related to eating behavior. Second, the study only examined the relationship between appearance-based self-compassion and disordered eating on days on which participants felt badly about their appearance. It is therefore possible that Breines et al.'s finding reflects an interaction between feeling unattractive on a given day and being self-compassionate toward one's appearance on that day. As such, it is unclear whether a within-person relationship between self-compassion and disordered eating exists independent of one's daily body image concerns. Third, the authors' only criterion variable was disordered eating. Therefore, it remains unknown whether within-person fluctuations in self-compassion are associated with more adaptive forms of eating, such as intuitive eating, and whether fluctuations in an individual's level of self-compassion are associated with fluctuations in her body image.

The present study sought to build on Breines et al.'s (2014) research and address its aforementioned limitations in a sample of young college women. First, we extended the four-day time frame from their study to seven days, which would allow for a broader time span from which to examine within-person variability. We also assessed daily levels of global self-compassion, rather than appearance-specific self-compassion, and administered various daily measures of eating behavior and body image, which served as our criteria variables. Given the growing emphasis on understanding adaptive functioning in the eating and body image domain (Tylka & Wood-Barcalow, 2015a), we included a measure of body appreciation, which refers to being grateful for and respectful toward one's body (Tylka & Wood-Barcalow, 2015b). We also assessed both dietary restraint, a disordered approach to eating that involves trying to under-eat in order to lose weight or prevent weight gain (Stunkard & Messick, 1985), and intuitive eating, an adaptive approach to eating that involves eating more freely in response to hunger and stopping when full (Tylka, 2006).

The overarching goal of the present study was to determine the unique contribution of day-to-day within-person fluctuations in self-compassion to young women's body image and eating. This within-person predictor was represented by the extent to which an individual's level of self-compassion on a given day deviated from her personal mean level of self-compassion over the study week; we therefore refer to this variable as *daily* self-compassion. Given the robust cross-sectional between-persons association between self-compassion and eating and body image, we also decided to examine the between-persons relationships between self-compassion and our criteria variables. Here, individuals' mean level of self-compassion across the seven days served as our between-persons predictor, and we refer to this variable as *weekly* self-compassion. Of note, ours would be the first study to our knowledge to examine self-compassion as a between-persons predictor using data from one more than assessment point.

We hypothesized that controlling for body mass index (BMI), which is generally positively associated with disordered eating and negatively associated with body image, both daily and weekly self-compassion would predict eating behavior (i.e., less dietary restraint and more intuitive eating) and body image (i.e., higher body satisfaction and appreciation). Specifically, we predicted that body image and eating approaches would be better and more adaptive on days when college women displayed a higher level of self-compassion than usual. We also predicted that women who had higher average levels of self-compassion than others would have more adaptive body image and eating habits over the week. We expected that these relationships would remain when controlling for daily and weekly levels of self-esteem.

A second more exploratory objective was to examine the cross-level interaction between daily and weekly levels of self-compassion. We thought it would be possible for the relationships between daily levels of self-compassion, body image, and eating behavior to vary as a function of individuals' average level of self-compassion over the week. For example, day-to-day fluctuations in self-compassion might be more strongly related to fluctuations in body image and eating behavior among individuals with lower mean levels of self-compassion.

Method

Procedure

The university's research ethics office approved the study and all participants consented to its procedures. The study was advertised as "A Daily Diary Study of Personality, Feelings, and Body Image" and was made available to all female undergraduate

students enrolled in the psychology subject pool. For ethical reasons, potential participants had to be aware that the study would entail regular reporting on body image experiences; however, to minimize demand characteristics, we highlighted additional variables being investigated and did not provide our specific hypotheses. As compensation for their involvement in the study, participants obtained extra credit in one of their psychology courses.

For eight consecutive days at 4:00 pm, participants received an email containing a link to a daily online survey administered via Qualtrics. Instructions were to fill out the survey any time before 11:00 pm that same day and to complete a total of seven surveys within the eight days. The 4:00–11:00 pm time frame was provided to ensure that students with varying course and activity schedules would have an opportunity to report on their daily experiences toward the end of their day.

Participants

We chose to retain data from those participants who completed four or more surveys to more precisely examine within-person variability. Of the 143 individuals who consented to participate, 111 individuals achieved this four-survey minimum. We then removed an additional 15 participants who failed to complete their daily surveys within the required time frame. An additional four participants were removed due to outlying BMIs (above 40). Our final sample consisted of 92 females who completed a mean of 6.67 ($SD = 1.2$) surveys, with 83% of participants completing six or more. Although instructions were to complete seven diaries in eight days, 25% of participants completed surveys on all eight days.

Participants had a mean age of 19.7 ($SD = 1.93$). Their ethnic breakdown was: 50% Caucasian, 21% East Asian, 1.6% Southeast Asian, 4.8% Black/African, 9.7% South Asian, 1.6% Middle Eastern, 1.6% West Indian/Caribbean, 1.6% Aboriginal; 8.1% unknown. Self-reported relationship status was: 52% single, 37% in a relationship, and 11% casually dating.

Measures

With the exception of BMI, all measures listed below were completed on a nightly basis. Instructions for all questionnaires were altered to ask participants to rate items based on their experiences “today.” Items in all scales were thus reworded from the present tense to the past tense.

Body mass index (BMI). Four to six days before beginning the daily diary study, participants were asked to provide their height and weight via an online link, and the research team used these numbers to calculate their BMI (kg/m^2). Mean BMI in the sample, with the abovementioned outliers removed, was 22.62 ($SD = 3.41$), which is within the average range according to the Centers for Disease Control and Prevention website (<http://www.cdc.gov/healthyweight/assessing/bmi/adult.bmi/index.html>).

Self-compassion. The 12-item Self-Compassion Scale – Short Form (SCS-SF; Raes, Pommier, Neff, & Van Gucht, 2011) measured daily self-compassion. The instructions were altered to orient participants toward how they responded toward themselves during difficult times “today,” using a scale from 1 (*almost never*) to 5 (*almost always*) where higher scores indicate a higher level of self-compassion. The SCS-SF is a shortened version of the full 26-item Self-Compassion Scale (Neff, 2003). Six subscales make-up these two scales; three (Self-Kindness, Mindfulness, Common Humanity) consist of positively worded items (e.g., “I tried to be understanding and patient toward those aspects of my personality I don’t like”) and three (Self-Judgment, Over-identification, Isolation) consist of

negatively worded items (e.g., “I was disapproving and judgmental about my own flaws and inadequacies”). Generally, negative items are reverse-scored and the mean of these and the positive items serves as a composite self-compassion score, ranging from 1 to 5, with higher scores reflecting a higher level of self-compassion. Because total scores on the SCS and SCS-SF correlate near perfectly (Raes et al., 2011), and we were not specifically interested in the six subscales whose scores are more reliable with the SCS, we administered the SCS-SF to lower participant burden.

Recent factor analytic studies of both the SCS and SCS-SF suggest that the positive and negative items may represent two factors, with no higher-order self-compassion factor (e.g., B.F. Armstrong III & D.C. Zuroff, personal communication, September 2015; López et al., 2015). In the present study, we therefore examined the global SCS-SF score as a within- and between-persons predictor, and then examined the positive and negative items as separate predictors, without reverse-scoring the latter. These can be conceptualized as indicators of self-compassion and self-criticism respectively (López et al., 2015). Across study days, Cronbach’s alphas ranged from .87 to .91 for the total scale, .78 to .82 for the positive items, and .89 to .92 for the negative items, indicating good internal consistency. Across participants, the mean weekly global score was 3.38 ($SD = 0.58$), for the positive items was 3.14 ($SD = 0.76$) and for the negative items (where higher scores indicate higher self-criticism) was 2.39 ($SD = 0.81$).

Self-esteem. The Rosenberg Self-Esteem Inventory (Rosenberg, 1965), a 10-item self-report measure, assessed participants’ daily levels of self-esteem. Participants rated their agreement with each item from 1 (*strongly disagree*) to 4 (*strongly agree*) based on “today.” Sample items were: “I felt that I was a person of worth” and “I felt I did not have much to be proud of” (reverse-scored). The sum of all items, with negatively worded items reverse-scored, yields scores ranging from 10 to 40 with higher scores reflecting a higher level of self-esteem. Scores on this measure show very good test-retest reliability and internal consistency (Gray-Little, Williams, & Hancock, 1997). Cronbach’s alpha in the present sample ranged for .79 to .86 across study days and participants’ mean weekly score was 33.95 ($SD = 5.51$).

Intuitive eating. The Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013) is a 23-item measure that assessed daily levels of intuitive eating, which is one’s propensity to follow hunger and satiety cues when deciding how much, when and what to eat. Participants rated the IES-2 items from 1 (*strongly disagree*) to 5 (*strongly agree*) based on their experiences “today.” Sample items included: “I trusted my body to tell me when to eat” and, “I found myself eating when I was stressed out, even when I was not physically hungry” (reverse-scored). The IES-2 yields scores on four subscales and an overall scale score, which was the present study’s focus. Mean scores range from 1 to 5 with higher scores indicating a higher level of intuitive eating. Scores on the IES-2 have been shown to have good reliability, internal consistency, and validity (Tylka & Kroon Van Diest, 2013). The total scale’s Cronbach’s alpha in this sample ranged from .87 to .90 across study days. Participants’ mean weekly score was 3.46 ($SD = 0.49$).

Dietary restraint. Dietary restraint was assessed with a one-item measure extracted from the Restraint subscale of the Eating Disorders Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994): “I have been trying to limit the amount and/or types of food I eat to influence my shape or weight (whether or not I have succeeded).” Participants rated this item based on their experiences “today” from 1 (*not at all*) to 5 (*frequently*), with higher scores indicating a higher level of dietary restraint. Due to the large number of questionnaires in the daily diary surveys, we opted to use this

brief one-item measure to lower participant burden. Participants' mean scores over the seven days showed a strong positive correlation of $r = .67$ with scores on the Restraint subscale of the EDE-Q, which was completed four to six days before beginning the daily diary portion of the study. Mean dietary restraint over the week was 2.18 ($SD = 1.03$).

Body appreciation. The Body Appreciation Scale (BAS; [Avalos, Tylka, & Wood-Barcalow, 2005](#)) is a 13-item self-report measure that assesses the frequency with which individuals demonstrate attitudes and behaviors of appreciation and respect toward their bodies from 1 (*never*) to 5 (*always*). Sample items include: "I respected my body" and "My self-worth was independent of my weight or shape." Scores reflect the mean of all items and range from 1 to 5 with higher scores indicating a higher level of body appreciation. Scores on this measure have demonstrated good internal consistency, test-retest reliability, and construct validity ([Avalos et al., 2005](#)). The internal consistency in the present sample was strong with Cronbach's alphas ranging from .95 to .96 across study days. Mean weekly BAS across participants was 3.46 ($SD = 0.76$).

Body areas satisfaction. The Body Areas Satisfaction Scale (BASS) is a 9-item subscale of the Multidimensional Body-Self Relations Questionnaire ([Brown, Cash, & Mikulka 1990; Cash, 2000](#)). Participants rate their level of satisfaction with specific attributes and body areas (e.g., face, hair, weight, lower torso, etc.) from 1 (*very dissatisfied*) to 5 (*very satisfied*). We followed [Giovannelli, Cash, Henson, and Engle's \(2008\)](#) recommendation to omit from scoring the item assessing satisfaction with overall appearance due to its overlap with other items. Mean scores on the BASS range from 1 to 5 with higher scores indicating a greater overall contentment with the size or appearance of most body areas, and lower scores indicating general unhappiness with most body areas. Scores on this measure for females have shown adequate internal consistency and test-retest reliability ([Cash, 2000](#)). Internal consistency for the BASS items in the present sample was adequate with Cronbach's alphas ranging from .82 to .91 across study days. Mean weekly BASS across participants was 3.03 ($SD = 0.63$).

State body image. The Body Image States Scale (BISS; [Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002](#)) is a 6-item scale developed to assess momentary state body image. Using a 9-point bipolar Likert scale, participants rate how negatively versus positively they feel about various aspects of their appearance, including their overall attractiveness, weight, and body shape and size. In the present study, participants rated items based on "today." Mean scores range from 1 to 9 with higher scores indicating better state body image. Scores on the BISS have demonstrated adequate internal consistency and good validity ([Cash et al., 2002](#)). The Cronbach's alpha in the present sample ranged from .83 to .90 across study days. The mean weekly score across participants was 5.11 ($SD = 1.10$).

Analytic Approach

We conducted all analyses using multilevel modeling with maximum likelihood estimation using PROC MIXED in SAS 9.3. Multilevel modeling is the appropriate data analytic approach when data have hierarchical structures as in daily diary studies where days (level-1) are nested within participants (level-2). Multilevel modeling with maximum likelihood estimation uses all available within- and between-persons data to estimate parameters, thereby retaining all data from participants for whom observations are missing, a common occurrence in studies that contain repeated

measurements ([Snijders & Bosker, 2012](#)). When conducting multilevel modeling, [Maas and Hox \(2005\)](#) recommend a sample of 50 or more at level-2 to yield unbiased estimates of regression coefficients, standard errors, and variance components, making the present study adequately powered.

We followed the aggregation and disaggregation procedures recommended by [Snijders and Bosker \(2012\)](#) for dealing with two-level data. First, between-persons, level-2 scores were calculated by taking the mean of participants' self-compassion (or self-esteem) scores over all study days. As such, these scores represented participants' average level of self-compassion (or self-esteem) over the week, which we refer to as "mean" or "weekly." Within-persons level-1 scores were calculated by subtracting participants' mean self-compassion (or self-esteem) score over the week from their self-compassion (or self-esteem) raw score on a given day. This process of disaggregation takes into account the shared variance between a given participant's self-reported scores across study days when examining how their scores on a particular day relate to criteria variables. Therefore, within-persons self-compassion (or self-esteem) scores represented the extent to which an individual's level of self-compassion (or self-esteem) on a given day deviated from her personal mean level over the week; we therefore refer to these scores as "daily."

Results

Preliminary Analyses

Mean scores on all study variables were normally distributed. BMI was initially negatively skewed but when the four outliers (mentioned in the Participants section) were removed, scores showed a normal distribution. Pearson zero-order correlations were calculated between variables at the within- and between-persons level (see [Table 1](#)). As expected, self-compassion and self-esteem were strongly related to one another, sharing roughly 50% of their variance at the within-persons level and roughly 70% of their variance at the between-persons level. At the within-persons level self-compassion was highly correlated with intuitive eating, was moderately correlated with body appreciation and state body image, and was unrelated to dietary restraint and body areas satisfaction. Self-esteem showed a similar pattern. At the between-persons level, self-compassion showed a strong positive correlation with body appreciation, body area satisfaction, state body image, and intuitive eating, and a small to moderate negative correlation with dietary restraint. Self-esteem showed a similar pattern of associations but was not related to restraint.

As one would expect, our three body image measures were highly associated with one another at both the within- and between persons level, but showed stronger relationships at the between-persons level ($r_s = .76-.81$) than at the within-persons level ($r_s = .48-.46$). Interestingly, intuitive eating showed a large negative relationship with restraint at the between-persons level but these two variables were unrelated at the within-persons level. Intuitive eating and dietary restraint had respectively positive and negative associations with body image measures between-persons. Within-persons, intuitive eating was positively related to these variables; however, restraint was unrelated.

[Table 1](#) presents intraclass correlations (ICCs) for each variable. ICCs represent the proportion of total variance that is accounted for by between-persons differences. In this study, ICCs ranged from .56 (restraint) to .77 (body appreciation); therefore, scores on study variables varied more between-persons than they did within-persons from one day to the next. The ICC for global self-compassion was .63, which reveals that roughly one-third of the variance in self-compassion was at the within-person level, supporting our decision

Table 1
Between- and within-persons correlations between study variables and intraclass correlations.

	BMI	Self-compassion	Self-esteem	Intuitive eating	Dietary restraint	Body appreciation	Body areas satisfaction	State body image	ICC
BMI	–	.01	.13	–.14	.33 **	–.25 *	–.18 [†]	–.31 **	–
Self-compassion	–	–	.85 ***	.47 ***	–.24 *	.69 ***	.68 ***	.59 ***	.63
Self-esteem	–	.72 ***	–	.43 ***	–.13	.60 ***	.61 ***	.53 ***	.66
Intuitive eating	–	.47 ***	.39 ***	–	–.48 ***	.62 ***	.53 ***	.44 ***	.66
Restraint	–	–.05	–.12	–.14	–	–.43 ***	–.36 ***	–.39 ***	.56
Body appreciation	–	.29 **	.35 **	.33 **	–.08	–	.81 ***	.76 ***	.77
Body areas satisfaction	–	.07	.14	.21 [†]	–.17	.52 ***	–	.80 ***	.73
State body image	–	.32 **	.46 ***	.42 ***	–.11	.56 ***	.48 ***	–	.57

Note. Between-persons correlations are above the diagonal and within-persons correlations are below the diagonal. BMI = body mass index. ICC = intraclass correlation. Because BMI is a between-person variable assessed only once, there is no ICC and there are no correlations between BMI and within-person variables.

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

to investigate self-compassion as a within-person predictor of eating and body image.

Central Analyses

Criteria variables in multilevel models were raw scores on all available diary entries for intuitive eating, dietary restraint, body appreciation, body areas satisfaction, or state body image. SAS examines within-persons variance in criteria variables when estimating the contribution of within-persons predictors and between-persons variance when estimating the contribution of between-persons predictors. In all models, we included a random effect of intercept, which allowed participants' Day 1 score on the relevant criterion variable to vary.

For each criterion variable, we ran a series of multilevel models (see Table 2). In the first multilevel model, Model 1, fixed effects were our primary predictors, daily (within-persons) self-compassion and weekly (between-persons) self-compassion, and the covariate BMI. In Model 2, daily and weekly self-esteem were added to the original model as covariate fixed effects. The inclusion of these covariates allowed us to determine whether any contribution of self-compassion to criteria variables changed as a function of controlling for self-esteem. We then ran a third multilevel model, Model 3, in which we added the cross-level interaction term Daily Self-Compassion \times Weekly Self-Compassion to explore whether the relationship between daily self-compassion and criteria variables differed as a function of participants' average self-compassion levels over the week.

Given the recent evidence suggesting that a two-factor non-hierarchical structure may best represent the SCS, with its positively-worded items representing self-compassion and its negatively-worded items representing self-criticism (López et al., 2015), we ran one additional multilevel model. In this model, we replaced the daily and weekly SCS self-compassion variables in the original model (Model 1) with four variables representing daily and weekly scores on the positive and negative items of the SCS. Here, negative items were not reverse-scored and thus represented the presence rather than absence of self-criticism. These analyses allowed us to identify whether any effects observed with the global

SCS score were due to self-compassion, self-criticism, or both (see Table 3).

Intuitive eating. In the first multilevel model, daily (within-persons) self-compassion and mean (between-persons) self-compassion both emerged as positive predictors of intuitive eating (see Table 2). When mean and daily self-esteem were added as covariates to the original multilevel model, daily self-compassion remained a significant predictor of intuitive eating and mean self-compassion predicted at a trend-level, $p = .05$. Daily self-esteem was a significant predictor of intuitive eating, but mean self-esteem was not. Finally, the interaction between daily and weekly self-compassion was not significant (see Table 2). When examining the unique contributions of the positive and negative SCS items to intuitive eating, daily self-compassion (positive items) and self-criticism (negative items) emerged as unique within-persons predictors, and weekly self-compassion and self-criticism emerged as unique between-persons predictors (see Table 3).

Dietary restraint. In the first multilevel model (see Table 2), daily self-compassion was negatively predicted restraint at a trend-level, $p = .06$, and weekly self-compassion emerged as a significant negative predictor. When daily and mean self-esteem were added as covariates, the contribution of daily self-compassion became significant and that of weekly self-compassion became a trend (see Table 2). Neither daily self-esteem nor mean self-esteem was significant, $ps = .34$ and $.45$. The interaction between mean self-compassion and daily self-compassion was also non-significant. When examining the positive and negative SCS items as separate predictors (see Table 3), daily self-criticism (negative items) emerged as a significant positive predictor of restraint whereas daily self-compassion (positive items) did not predict, $p = .27$; between-persons, weekly self-criticism was a negative predictor but weekly self-compassion did not predict, $p = .85$.

Body appreciation. Daily and weekly self-compassion were both significant positive predictors of body appreciation in our first multilevel model (see Table 2). When the self-esteem variables were added to the model as covariates, daily self-compassion

Table 2
Unstandardized regression coefficients (Bs) and standard errors for fixed effects in multilevel models.

	Model 1	Model 2	Model 3
Intuitive eating			
Intercept	2.72 (.40)***	2.68 (.40)***	2.68 (.40)***
BMI	−0.02 (.01) [†]	−0.02 (.01) [†]	−0.02 (.01) [†]
Daily self-compassion	0.24 (.03)***	0.13 (.04) [†]	0.13 (.04) [†]
Weekly self-compassion	0.38 (.08)***	0.27 (.16) [†]	0.27 (.16) [†]
Daily self-esteem		0.02 (.00)**	0.02 (.00)**
Weekly self-esteem		0.02 (.02)	0.02 (.02)
Daily SC × weekly SC			−0.07 (.06)
Dietary restraint			
Intercept	1.37 (.88)	1.35 (.88)	1.35 (.88)
BMI	0.10 (.03)***	0.10 (.03) [†]	0.10 (.03) [†]
Daily self-compassion	−0.18 (.10) [†]	−0.26 (.13) [†]	−0.26 (.13) [†]
Weekly self-compassion	−0.44 (.17)**	−0.56 (.34) [†]	−0.56 (.34) [†]
Daily self-esteem		0.01 (.01)	0.01 (.01)
Weekly self-esteem		0.01 (.04)	0.01 (.04)
Daily SC × weekly SC			−0.02 (.18)
Body appreciation			
Intercept	1.73 (.50)***	1.72 (.49)***	1.72 (.49)***
BMI	−0.06 (.02)***	−0.06 (.02)***	−0.06 (.02)***
Daily self-compassion	0.28 (.04)***	0.08 (.05) [†]	0.08 (.05) [†]
Weekly self-compassion	0.87 (.09)***	0.68 (.19)***	0.68 (.19)***
Daily self-esteem		0.03 (.01)***	0.03 (.01)***
Weekly self-esteem		0.02 (.02)	0.02 (.02)
Daily SC × weekly SC			0.07 (.07)
Body areas satisfaction			
Intercept	1.37 (.46)**	1.32 (.45)***	1.32 (.45)***
BMI	−0.04 (.02) [†]	−0.04 (.02) [†]	−0.04 (.02)
Daily self-compassion	0.19 (.04)***	0.05 (.05) [†]	0.05 (.05) [†]
Weekly self-compassion	0.73 (.09)***	0.51 (.17)**	0.51 (.17)**
Daily self-esteem		0.02 (.01)***	0.02 (.01)***
Weekly self-esteem		0.03 (.02)	0.03 (.02)
Daily SC × weekly SC			−0.04 (.06)
State body image			
Intercept	3.44 (.81)***	3.39 (.79)***	3.39 (.79)***
BMI	−0.10 (.03)***	−0.11 (.03)***	−0.11 (.03)***
Daily self-compassion	0.60 (.09)***	0.26 (.12) [†]	0.26 (.12) [†]
Weekly self-compassion	1.14 (.15)***	0.87 (.32)**	0.87 (.32)**
Daily self-esteem		0.06 (.01)***	0.06 (.01)***
Weekly self-esteem		0.03 (.03)	0.03 (.03)
Daily SC × weekly SC			0.02 (.17)

Note. Unstandardized coefficients are presented outside of parentheses, and standard errors are presented within parentheses. Degrees of freedom for within-person (daily) effects ranged from 424 to 428 and for between-persons (weekly) effects ranged from 83 to 85. SC = self-compassion. BMI = body mass index. SC = self-compassion.

[†] $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

predicted at a trend-level, $p = .07$, and mean self-compassion remained a significant predictor. In addition, daily self-esteem emerged as a significant predictor, but mean self-esteem did not, $p = .64$. Finally, there was no interaction between daily and weekly self-compassion. When examining the positive and negative SCS items as unique predictors of body appreciation, daily self-compassion (positive items) and self-criticism (negative items) were both significant, as were weekly self-compassion and self-criticism (see Table 3).

Body areas satisfaction. Both daily and weekly self-compassion were positive predictors of body areas satisfaction in our first multilevel model. When daily and weekly self-esteem were added as covariates, daily self-compassion predicted at a trend-level and weekly self-compassion remained a significant predictor (see Table 2). Daily self-esteem was also a significant positive predictor, but weekly self-esteem was not, $p = .31$. There was no interaction between mean and daily self-compassion, $p = .18$. An examination of the positive and negative SCS items separately (see Table 3) revealed that daily self-compassion (positive items) and self-criticism (negative items) were unique within-person predictors and weekly self-compassion and self-criticism were unique between-persons predictors.

State body image. Daily self-compassion and weekly self-compassion were both positive predictors of state body image in our first multilevel model (see Table 2). When daily and weekly self-esteem were added as covariates, daily and weekly self-compassion remained significant predictors. In addition, daily self-esteem emerged as a significant predictor, but mean self-esteem did not, $p = .43$. There was no interaction between daily and weekly self-compassion, $p = .79$ in predicting state body image. An examination of the positive and negative SCS items separately revealed that at the within-persons level, daily self-criticism (negative items) negatively predicted state body image but daily self-compassion (positive items) was not a predictor, $p = .55$ (see Table 3). At the between-persons level, weekly self-compassion and self-criticism were both unique predictors of state body image.

Discussion

Although self-compassion has increasingly been linked to healthier body image and eating behavior, studies to date have primarily been cross-sectional and examined the between-persons relationships between these variables. The present seven-day daily diary study was the first to examine the unique contribution of day-to-day within-person variability in global self-compassion to

Table 3
Unstandardized regression coefficients (Bs) and standard errors from multilevel models examining the unique contributions of the positive (self-compassion) and negative (self-criticism) items of the Self-Compassion Scale (SCS) to criteria variables.

	Daily within-persons		Weekly between-persons	
	Positive SCS items	Negative SCS items	Positive SCS items	Negative SCS items
Eating behaviors				
Intuitive eating	0.15 (.03)***	−0.11 (.02)***	0.10 (.06) [†]	−0.29 (.06)***
Restraint	−0.10 (.09)	0.21 (.07)**	0.02 (.12)	0.46 (.13)***
Body image				
Body appreciation	0.12 (.04)**	−0.14 (.03)***	0.46 (.07)***	−0.35 (.08)***
Body areas satisfaction	0.09 (.03)**	−0.09 (.03)***	0.35 (.06)***	−0.36 (.07)***
State body image	0.05 (.09)	−0.44 (.07)***	0.58 (.11)***	−0.50 (.12)***

Note. Unstandardized coefficients are presented outside of parentheses, and standard errors are presented within parentheses. Scores on the negative Self-Compassion Scale items were not reverse-scored in these analyses to facilitate interpretation of the results as indicating the contributions of self-compassion and self-criticism to criteria variables. Degrees of freedom for within-person (daily) effects ranged from 424 to 428 and for between-persons (weekly) effects ranged from 83 to 85.

[†] $p < .05$.
** $p < .01$.
*** $p < .001$.

women's eating and body image. We found that on days when college women treated themselves more self-compassionately than usual, they approached eating more intuitively and with less restraint, and also reported feeling more appreciative of and satisfied with their bodies and body areas. We also found that young adult women's average level of self-compassion over the week predicted their average levels of body image and eating behavior over the week. These results generally held when controlling for daily and weekly self-esteem.

Thus far, researchers have primarily conceptualized and studied self-compassion as an individual difference variable and indeed, two-thirds of the variance in self-compassion in the present study was at the between-persons level. Self-compassion nevertheless displayed a non-trivial amount of variability within-persons. ICCs for our criteria variables ranged from .56 (restraint) to .77 (body appreciation), indicating that half to three-quarters of their variance was at the between-persons level. Therefore, although eating and body image were relatively stable over the week, levels did fluctuate – for some variables more than for others – and daily levels of self-compassion contributed to this within-person variance. According to our findings, then, it is not simply that those women who tend to be highly self-compassionate enjoy more adaptive eating habits and better body image than women who are less self-compassionate. Additionally important, among young adult women, is how self-compassionately a woman treats herself on a given day relative to what is typical for her.

The present findings complement and extend work by Breines et al. (2014) who found that over a four-day period, college women engaged in less disordered eating on days when they were more self-compassionate toward their perceived appearance-related flaws. In the present study, we found that within-person variability in global levels of self-compassion was related to how college women approached eating. On days when women responded to their general distress, disappointments, and perceived shortcomings with more self-compassion than usual, they reported less dietary restraint and more intuitive eating. These findings therefore suggest that it is not just day-to-day variability in appearance-specific self-compassion that contributes to a young woman's eating habits, but also variability in a more general self-compassionate orientation. We additionally found that this variability in self-compassion was related to women's body image, with higher self-compassion on a given day corresponding to a greater appreciation of one's body, and a more positive and less negative attitude toward one's body parts and overall body. Although self-compassion has been linked to greater body appreciation and less body image dissatisfaction at the between-persons level (e.g., Wasylikiw et al., 2012), this is the first study to demonstrate relationships between these variables both at the between- and within-persons level.

It is interesting to note that for nearly all of the findings reported above, both the negative and positive SCS items contributed uniquely to criteria variables. That is, the tendency to display a high level self-compassion, captured by the positive items, and to have low levels of self-criticism, captured by the negative items, were each important in contributing to within- and between-persons differences in eating and body image. The only exceptions were that daily self-compassion as measured by the positive items did not predict state body image, although it did predict our two other body image variables, and neither daily nor weekly self-compassion (positive items) predicted restraint. This latter finding is interesting and suggests that restraint may be more tied to one's tendency to be highly self-critical – compared to other people or compared to one's typical level – than to one's tendency to display little self-compassion. Of all our criteria variables, restraint is the one that taps most into pathological processes. Its relation to only the negative items of the SCS may therefore stem from the

fact that the latter also represent the presence of more pathological ways of relating to oneself and one's distress.

It should be noted that when we controlled for self-esteem in our analyses, most of the self-compassion effects remained. However, the contribution of daily self-compassion to body appreciation and body areas satisfaction became a trend, whereas daily self-esteem was a significant predictor of both of these criteria variables. Therefore, on days when young adult women reported feeling generally better about their attributes, skills, and qualities, they also felt better about their bodies. The self-evaluative aspect inherent in both self-esteem and body image may partly explain these findings. Taken together, results suggests that within-person fluctuations in general positive self-attitudes may be more relevant to how a young woman feels about her body on a given day rather than simply her daily level of self-compassion in particular.

Theoretical and Practical Implications

The last few years have witnessed an explosion of research on self-compassion and its link to body image and eating behavior. Although many theories about the role of self-compassion in body image and eating behavior imply within-person relationships – that is, if a given individual treats herself with more self-compassion, she will enjoy better body image and more intuitive eating – studies to date have focused almost exclusively on between-persons relationships. The present study supports the relevance of this latter research but also reveals that there is merit to conceptualizing self-compassion, and its associated eating- and body image benefits, at the within-persons level. Indeed, the within-person findings from our study are consistent with research studies showing that experimental primes and interventions that build self-compassion can improve a given individual's body image and eating behavior (e.g., Adams & Leary, 2007; Albertson et al., 2014; Kelly & Carter, 2015).

One possible mechanism behind the within-person relationship between self-compassion and more adaptive eating and body image is the greater distress tolerance that self-compassion affords (Schoenefeld & Webb, 2013; Webb & Forman, 2013). By facilitating a calmer, more accepting reaction to negative feelings, self-compassion may prevent emotionally-driven urges to under- or over-eat. In addition, the act of relating to oneself self-compassionately is thought to stimulate feelings of safety and security (Gilbert, 2005), which should facilitate intuitive eating and an appreciative stance toward one's body. Self-compassion is also thought to tone down threat centers in the brain responsible for threat-focused attention, feelings, and behaviors (Depue & Morrone-Strupinsky, 2005; Gilbert, 2005; LeDoux, 1998); this process might help to explain why on days when participants were more self-compassion, they exhibited less dietary restraint and body dissatisfaction.

From a practical standpoint, the within-person relationships we observed between self-compassion and functioning in the eating and body realm suggests that encouraging and teaching an individual to treat herself more self-compassionately than what is typical for her may help her feel more positively toward her body, and may help her to approach eating in a more intuitive and less restrictive manner. Importantly, the fact that there was no interaction between a woman's mean level of self-compassion and her daily deviation in self-compassion suggests that women who are generally high and low in self-compassion alike are likely to gain from learning to respond to their daily distress and disappointments with more sensitivity and compassion than what is typical for them.

Given that daily fluctuations in self-esteem were also related to better body image and more adaptive approaches to eating, it is possible that helping women experience greater self-esteem on a particular day should also help them appreciate their bodies more

and approach eating more adaptively. There is nevertheless growing apprehension about the utility of programs aimed at building self-esteem (Baumeister, Campbell, Krueger, & Vohs, 2003) due in part to the harm that can arise from attempts to increase personal levels of self-esteem (Crocker & Park, 2004). The pursuit of self-esteem generally involves making one's self-worth contingent on performance in a particular domain, such as appearance or academics. Therefore, the boost in self-esteem that results from successful performance is fragile in nature because it relies on continued success in that domain. An individual may then come to develop a pronounced fear of failure, because of the threat failure poses to their self-worth, and this fear can fuel and maintain obsessive, maladaptive behaviors such as those seen in individuals who have eating disorders (Blaine & Crocker, 1993; Kernis & Goldman, 2003). By contrast, the pursuit of self-compassion has no such documented downsides. Rather, self-compassion is an unconditional form of positive regard that helps individuals acknowledge, accept, and tolerate failures, and learn to value and care for themselves at times of disappointment (Neff, 2003). There is therefore more reason to believe that helping young adult women strive toward greater self-compassion on a given day may be more promising and less harmful over the long-term than guiding them to strive for greater self-esteem. Of course, it will be important to subject this suggestion to empirical testing within the body image and eating domain.

There are several approaches that might be effective at increasing one's level of self-compassion on a given day. Compassion-focused therapy (CFT; Gilbert, 2005) teaches individuals to cultivate their "compassionate self" – the part of themselves that feels a great deal of compassion for other people – and to relate to themselves from this perspective during difficult times. Several of CFT's exercises may prove useful at the daily or momentary level, such as deliberately recalling times when one has been compassionate in order to facilitate compassion for self, visualizing an ideal compassionate image responding to one's suffering, and writing oneself a letter from the "compassionate self" perspective. Mindfulness meditation is another approach individuals can use to try and cultivate self-compassion on a given day. Both meditation and CFT-based interventions have proven effective at raising self-compassion levels over time (Gilbert, 2005; Kozasa et al., 2015; Leaviss & Uttley, 2015), but it will be important for future research to examine their contribution to self-compassion levels on a particular day.

Limitations

There were several limitations to the current study. First, it was correlational, meaning one must exercise caution about interpreting the observed relationships between self-compassion and criteria variables as causal in nature. Second, this was a homogeneous sample of female undergraduate students. Replicating the findings in other demographic groups would shed light on the generalizability of our results to the population at large. Third, we relied exclusively on self-report measures. In future research, it would be interesting to include more objective indicators of eating behavior in addition to assessing self-reported approaches to eating. A fourth related limitation is that our measure of dietary restraint consisted of one-item which. Although it is face valid and scores displayed concurrent validity in our sample, longer, standardized measures would be preferable in future research.

Finally, the present study examined the within-person relationships between variables on a day-to-day basis but body image and eating attitudes can fluctuate over shorter time periods than this (e.g., Colautti et al., 2011). To shed further light on the within-person relationships between study variables, future research would benefit from examining their relationships at a momentary

level. This type of design would also make it possible to identify real-time situational factors, such as failures or interpersonal stress, that might moderate the within-person relationships between self-compassion, body image, eating.

Conclusions

Findings from the present study indicate that women's body image and approaches to eating over the course of a week depend both on their average level of self-compassion across the days of the week and on their level of self-compassion on a given day relative to their personal mean level. These findings suggest that there may be value in developing and testing strategies that can help women employ more self-compassion in their day-to-day lives.

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