Running Head: INTUITIVE AND RESTRAINED EATING

Is Intuitive Eating the Same as Flexible Dietary Control?

Their Links to Each Other and Well-being Could Provide an Answer

Tracy L. Tylka[a*]

The Ohio State University, USA

Rachel M. Calogero[b]

University of Kent, UK

Sigrún Daníelsdóttir[c]

Directorate of Health, Iceland

This is the **accepted version** of this paper.

The **final definitive version** can be found here:

Tylka, T.L., Calogero, R.M., & Danielsdottir, S. (2015). Intuitive eating and dietary restraint: Oxymoron or tautology? Their links to one another and wellbeing could provide an answer. *Appetite, 95,* 166-175.

*Corresponding author.

[a]Department of Psychology; The Ohio State University; 225 Psychology Building; Columbus, OH 43210, U.S.A. E-mail: tylka.2@osu.edu. Phone: (740) 725-6384. Fax: (614) 292-5817.
[b]School of Psychology, University of Kent, Canterbury, United Kingdom.
[c]Directorate of Health, Reykjavik, Iceland.

Abstract

Researchers have found that rigid dietary control is connected to higher psychological distress, including disordered and disinhibited eating. Two approaches have been touted by certain scholars and/or health organizations as healthier alternatives: intuitive eating and flexible control—yet these approaches have not been compared in terms of their shared variance with one another and psychological well-being (adjustment and distress). The present study explored these connections among 382 community women and men. Findings revealed that intuitive eating and flexible control are inversely related constructs. Intuitive eating was related to lower rigid control, lower psychological distress, higher psychological adjustment, and lower BMI. In contrast, flexible control was strongly related in a positive direction to rigid control, and was unrelated to distress, adjustment, and BMI. Further, intuitive eating incrementally contributed unique variance to the well-being measures after controlling for both flexible and rigid control. Flexible control was positively associated with psychological adjustment and inversely associated with distress and BMI only when its shared variance with rigid control was extracted. Collectively, these results suggest that intuitive eating is not the same phenomenon as flexible control, and that flexible control demonstrated substantial overlap and entanglement with rigid control, precluding the clarity, validity, and utility of flexible control as a construct. Discussion addresses the implications of this distinction between intuitive eating and flexible control for the promotion of healthy eating attitudes and behaviors.

Keywords: intuitive eating, flexible control, rigid control, eating disorders, food preoccupation, psychological well-being

Is Intuitive Eating the Same as Flexible Dietary Control?

Their Links to Each Other and Well-being Could Provide an Answer

Eating restraint, defined as a continued attempt to cognitively control eating behavior in order to lose weight or prevent weight gain (Stunkard & Messick, 1985), has been widely studied in its connections to disordered eating and body mass. In general, eating restraint does not lead to long-term weight reduction, a trend that is especially noticeable within methodologically sound studies (Mann et al., 2007). Some inconsistent findings have emerged, however. Longitudinal designs have shown that eating restraint increases weight gain and disordered eating among children (Birch & Fisher, 2005; Birch, Fisher, & Davison, 2003), adolescents (Neumark-Sztainer et al., 2006; Neumark-Sztainer, Wall, Haines, Story, & Eisenberg, 2007), and adults (Chaput et al., 2009; van Strien, Herman, & Verheijden, 2014), leading the researchers of these studies to warn against prescribing eating restraint to control food intake and weight. Yet, select interventions promoting caloric restriction have recently been found to decrease binge eating, thin-ideal internalization, negative affect, weight gain, and other bulimic symptoms among female participants (Stice, Marti, Spoor, Presnell, & Shaw, 2008; Stice, Shaw, Burton, & Wade, 2006), prompting the researchers of these studies to advocate for prescribing eating restraint.

What could account for these discrepant findings? Perhaps the answer lies in how eating restraint is conceptualized and measured. Eating restraint is most often considered as a unitary construct, with little regard for differences in levels or forms of restraint. Yet, in as early as 1991, Westenhoefer (1991) argued that eating restraint is not a homogenous construct, and instead divided it into two forms: rigid control and flexible control. *Rigid control* is an all-or-nothing approach to eating—operationalized by behaviors such as actively avoiding and refusing desired calorie-dense foods (and if such foods are consumed, overeating and guilt may follow), regimented calorie counting and dieting to control weight, eating diet foods to avoid weight gain,

and skipping meals (Westenhoefer, Stunkard, & Pudel, 1999). In contrast, *flexible control* is generally considered a balanced approach to eating—operationalized by behaviors such as taking smaller than desired servings of food to control weight, being conscious of foods eaten, taking weight into account when making food choices, and engaging in compensation (i.e., intentionally eating less and/or healthier alternatives at the next meal) if too much is eaten (or less healthy options are chosen) at the previous meal (Westenhoefer et al., 1999).

Dividing eating restraint into rigid and flexible control holds promise for understanding some of the conflicting data in the restraint field. Research has shown that rigid control and flexible control are related in opposite directions to some health-related and well-being indices in various populations. Specifically, rigid control was positively related to disinhibited eating and body mass index (BMI), whereas flexible control was inversely related to disinhibited eating and BMI among both U.S. and German adult women and men in weight reduction programs (Smith, Williamson, Bray, & Ryan, 1999; Westenhoefer, 1991; Westenhoefer et al., 2013; Westenhoefer, von Falck, Stellfeldt, & Fintelmann, 2004), U.S. and German community women and men (Shearin, Russ, Hull, Clarkin, & Smith, 1994; Smith et al., 1999; Westenhoefer et al., 1999), and U.S., U.K., and German college women and men (Timko & Perone, 2005; Westenhoefer, Broeckmann, Münch, & Pudel, 1994; Westenhoefer et al., 2013). Rigid and flexible control were also differentially linked to binge eating and overeating among U.S. and German community adults (Smith et al., 1999, Westenhoefer et al., 1999), with rigid control positively linked and flexible control inversely linked to these behaviors.

As a result of their findings, Westenhoefer et al. (1999) have recommended that flexible control strategies be applied in lieu of rigid control strategies to promote health. This recommendation is also consistent with prominent health organizations advocating for the universal adoption of flexible control strategies (e.g., monitoring portion sizes, eating smaller

amounts and lower calorie versions of comfort foods, staying within a predetermined daily calorie range, and self-monitoring weight; CDC, 2013).

Yet, these recommendations may be ill-advised, as data do not uniformly uphold a positive link between flexible control and health. Some studies have found no association between flexible control and well-being; more specifically, flexible control was unrelated to emotional distress (i.e., anxiety, depression, impulsiveness, and body image disturbance) in U.S. college women and men (Timko & Perone, 2005), eating pathology in U.S. college women (Timko & Perone, 2005), and disinhibited eating and body measurements (i.e., BMI, body fat, waist circumference) in Canadian adult men (Provencher et al., 2003). Yet other studies have found positive associations between flexible control and psychological distress; for instance, flexible control has been positively linked to eating disorder symptomatology in U.S. adult women with personality disorders (Shearin et al., 1994), impaired working memory in U.K. women enrolled in a weight loss program (Westenhoefer et al., 2013), and eating pathology in U.S. college men (Timko & Perone, 2005). Among a large sample of Australian women participating in a 2-year longitudinal study on women's health, flexible control strategies promoted, instead of prevented, weight gain (Williams, Germov, & Young, 2007). For instance, after adjusting for baseline BMI and other confounds, reducing portion sizes was associated with an average weight gain of 1.25kg, and reducing fats and sugars was linked to an average weight gain of 1.21kg over the 2-year period. Williams et al. concluded that "doing nothing" (i.e., not using any weight control strategy) yielded more effective weight maintenance than following flexible control strategies. Collectively, these findings challenge scholars' and public health organizations' universal recommendations to engage in dietary strategies characteristic of flexible control, as these strategies do not consistently promote healthier eating behavior, well-being, and weight maintenance.

Furthermore, flexible control has been found to be strongly related to rigid control in a positive direction among U.S. and German college samples (r = .77, Timko & Perone, 2005; r = .63, Westenhoefer et al., 1994), German and U.K. men and women enrolled in weight loss programs (r = .54, Westenhoefer, 1991; r = .47, Westenhoefer et al., 2013), and U.S. women with personality disorders (r = .87, Shearin et al., 1994).[1] These correlations call into question Westenhoefer et al.'s (1999) proposition that flexible control is distinct from rigid control, as their shared variance appears to be substantial. Increasing flexible control strategies in the absence of facilitating rigid control strategies may not be feasible. Therefore, recommendations to increase flexible control may need to be re-evaluated, and other alternatives considered.

Intuitive eating may be a viable alternative to dietary restriction strategies such as flexible control. *Intuitive eating* entails eating mainly in response to physiological hunger and satiety cues—those who eat intuitively are attuned to and trust their hunger and satiety signals to guide their eating (Tylka, 2006). If such individuals eat more at one meal, they may naturally eat less at the next meal because they are less hungry; therefore, intuitive eating has been described as a flexible and adaptive eating behavior (Tribole & Resch, 2012). Tribole and Resch assert that individuals who eat intuitively are less likely to be preoccupied with food or dichotomize food as good or bad—instead, they often choose foods for the purposes of satisfaction (i.e., taste), health, energy, stamina, and performance.

Evidence upholds intuitive eating's positive links to health and well-being (Van Dyke & Drinkwater, 2013). Among adult women and men from the U.S., France, Germany, and New Zealand, intuitive eating has been found to be (a) inversely related to eating disorder symptomatology, disinhibited eating, BMI, body fat, cardiovascular risk, triglyceride levels,

[1] Westenhoefer et al. (1999) and Smith et al. (1999) did not report a correlation coefficient between rigid and flexible control for their samples of German community women and men and U.S. college students, respectively, but indicated that flexible and rigid control were correlated at $p < .001$.

food-related anxiety, thin-ideal internalization, body dissatisfaction, body preoccupation, body shame, self-silencing, and negative affect; and (b) positively related to high density lipoprotein cholesterol, interoceptive sensitivity, enjoyment of food, body appreciation, self-compassion, life satisfaction, positive affect, proactive coping, and self-esteem (Augustus-Horvath & Tylka, 2011; Camilleri et al., 2015; Denny, Loth, Eisenberg, & Neumark-Sztainer, 2013; Hawks, Madanat, Hawks, & Harris, 2005; Herbert, Blechert, Hautzinger, Matthias, & Herbert, 2013; Madden, Leong, Gray, & Horwath, 2012; Schoenefeld & Webb, 2013; Shouse & Nilsson, 2011; Smith & Hawks, 2006; Tylka, 2006; Tylka & Wilcox, 2006).

Moreover, several studies have examined the impact of intuitive eating interventions on health, BMI, and well-being, with positive results (Schaefer & Magnuson, 2014). An intervention group grounded in intuitive eating and size acceptance was compared against a dieting-based weight loss intervention group which emphasized flexible dietary control strategies; both groups of U.S. adult female chronic dieters received six months of the respective intervention and two follow-up assessments at one year (Bacon et al., 2002) and two years (Bacon, Stern, Van Loan, & Keim, 2005) post-intervention. The group receiving the intuitive eating-based intervention decreased total cholesterol, low-density lipoprotein cholesterol, triglycerides, and systolic blood pressure at the 1- and 2-year follow ups as well as decreased physical hunger, disinhibited eating, bulimic symptomatology, drive for thinness, body dissatisfaction, poor interoceptive awareness, and depression at the 2-year follow-up. Whereas the dieting-based intervention group lost weight and showed initial improvements at the 1-year follow up, only one improvement (i.e., lower disinhibited eating) was sustained at the 2-year follow up. Furthermore, attrition was higher in the dieting group compared to the intuitive eating-based intervention (Bacon et al., 2005). Among U.S. female adult employees (or partners of employees) at a university, a group who received a 10-week intuitive eating intervention

reported lower disordered eating and body dissatisfaction and higher body appreciation and mindfulness compared to a wait-list control group at 10-weeks post intervention; in fact, the intuitive eating group was 3.5 times more likely to be asymptomatic for disordered eating than the control group (Bush, Rossy, Mintz, & Schopp, 2014).

Conceptually, intuitive eating and flexible control should be distinct constructs. Intuitive eating relies on internal hunger and satiety cues, and compensation occurs naturally (e.g., not being hungry after a large meal; Tribole & Resch, 1995, 2012), whereas flexible control relies on external cues for eating (e.g., portion control, weight, and nutritional information), and compensation is conscious and effortful (Westenhoefer, 1991). Yet, as reviewed above, they are both connected positively to health and well-being for select samples. Moreover, it is plausible that intuitive eating could reflect some form of dietary restraint, as intuitive eaters theoretically refrain from eating when physiological hunger cues are not present. It may not matter empirically, therefore, if an individual uses internal or external cues to "restrain" eating.

To date, intuitive eating and flexible dietary control strategies have not been compared to determine if they are qualitatively distinct (i.e., represent different constructs), quantitatively distinct (i.e., represent different levels of the same "restraint" construct), or neither qualitatively nor quantitatively distinct (i.e., represent similar levels of the same construct) within the same sample. These comparisons are necessary to determine whether eating based on internal or external cues is differentially linked to well-being (conceptualized broadly as adjustment and distress), and hence whether we should emphasize intuitive eating, flexible control, both, or neither within public health and clinical interventions.

Therefore, in the present study, we investigated the relationships of flexible control and intuitive eating to each other, rigid control, BMI, and several indices of well-being including psychological adjustment and psychological distress to discern their independence as constructs.

Life satisfaction, positive affect, and body appreciation were chosen to represent indicators of psychological adjustment due to their consistent links to the affective and cognitive appraisals of general and body-related positive psychological health (Avalos, Tylka, & Wood-Barcalow, 2005; Pavot & Diener, 1993). Negative affect, poor interoceptive awareness, binge eating, and food preoccupation were chosen as indicators of psychological distress due to their consistent links with eating disorder pathology and negative emotional states (Dakanalis et al., 2014; Tapper & Pothos, 2010; Tylka & Kroon Van Diest, 2013). We sampled community adult women and men to improve generalizability of findings across age.

Specific hypotheses were generated and examined:

H1: Intuitive eating would be inversely related to flexible control given their conceptual differences, namely in their approach to self-regulation: intuitive eating relies on internal hunger and satiety cues to self-regulate, whereas flexible control relies on external (e.g., portion size, current weight, calorie consumption) cues to self-regulate.[2] This finding would yield preliminary evidence that high levels of intuitive eating are not equivalent to high levels of flexible control. Because of the strong positive relationships between flexible and rigid control documented in previous research, we predicted that flexible control's correlation with rigid control would be stronger than its correlation with intuitive eating, which would suggest that flexible control is more conceptually similar to rigid control than it is to intuitive eating.

H2a: Intuitive eating would be positively associated with adjustment and inversely associated with distress. Given the mixed findings regarding flexible control's associations with well-being reviewed above, we do not offer a hypothesis for its connection to adjustment and distress. H2b: We predicted that the correlations between intuitive eating and each well-being index would be significantly different from the correlation between flexible control and each well-being index

[2] This hypothesis was exploratory given that no extant research has compared the two approaches.

(e.g., the correlation between intuitive eating and life satisfaction would be significantly different from the correlation between flexible control and life satisfaction). If upheld, these findings would highlight that intuitive eating and flexible control have a different pattern in their connection to well-being, providing further evidence that they are not similar constructs.

H3: Intuitive eating would be inversely associated with BMI (given the mixed findings for flexible control, we do not offer a hypothesis for its connection to BMI in the present study). We predicted that the correlation between intuitive eating and BMI would be significantly different from the correlation between flexible control and BMI, further upholding the construct differentiation between intuitive eating and flexible control.

H4: Intuitive eating would account for unique variance in each index of psychological well-being and BMI, above and beyond the variance contributed by flexible control, providing evidence that (a) intuitive eating and flexible control are *qualitatively* distinct, and (b) intuitive eating is an important and unique eating-related characteristic of well-being. We further considered the variance in well-being and BMI contributed by rigid control, which helped us also determine flexible control's unique links to well-being and BMI after rigid control's variance is removed.

Method

Participants

Data from 382 online community participants (192 women and 190 men) from 45 U.S. states were analyzed. Participants' average age was 33.80 (*SD* = 11.08). They identified as White (71.9%), African American (8.4%), Asian (9.2%), Latin American (6.3%), Native American (0.5%) or multiracial (3.6%). Their highest degree was a doctorate (1.0%), masters' (7.6%), bachelor's (31.4%), associate (13.6%), or high school (16.8%) degree; the remaining participants reported some graduate (4.1%) or undergraduate (28.3%) education or did not complete high school (0.3%). Median household income fell in the $45,000-$60,000 category. Average body

mass, calculated from self-reported height and weight via the formula offered by the CDC (2010), was 26.82 (*SD* = 7.30) for women and 26.54 (*SD* = 5.96) for men.

Measures

Intuitive eating. The 23-item Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013) assessed participants' tendency to trust in and eat in response to their internal hunger and satiety cues, while choosing foods they enjoy and work well with their body (e.g., "I rely on my hunger signals to tell me when to eat," "I allow myself to eat what food I desire at the moment," "I mostly eat foods that give my body energy and stamina"). The items are rated along a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and averaged, with higher scores indicating greater intuitive eating. Its second-order factor structure, internal consistency reliability, 3-week test-retest reliability, construct validity, incremental validity, and discriminant validity have been upheld in samples of college women and men (Tylka & Kroon Van Diest, 2013). Cronbach's alpha was .90 in the present study.

Flexible control. We used the 12-item Flexible Control subscale of the Cognitive Restraint Scale (Westenhoefer et al., 1999) to measure flexible control. Each item (e.g., "If I eat a little bit more during one meal, I make up for it at the next meal" for more items see Table 3) receives one point if the participant provides a response indicative of flexible control.[3] Points are summed, and thus total scores range from 0 to 12. Upholding its validity, the Flexible Control subscale was related to lower self-reported energy intake and greater weight loss among members engaged in a 1-year weight reduction program (Westenhoefer et al., 1999) and higher self-regulated eating (i.e., defined by eating "in moderation"; Stotland, 2012). Items on this measure do not assess disinhibited eating, weight history, and weight fluctuations (Westenhoefer

[3] We modified the item, "I pay attention to my figure, but I still enjoy a variety of foods" to "I pay attention to my figure (or body build), but I still enjoy a variety of foods" to make it applicable for both women and men.

et al., 1999). Cronbach's alpha was .87 in the present study.

Rigid control. The 16-item Rigid Control subscale of the Cognitive Restraint Scale (Westenhoefer et al., 1999) was used to estimate rigid control. Each item (e.g., "Sometimes I skip meals to avoid gaining weight," "Without a diet plan I wouldn't know how to control my weight") receives one point if a participant provides a response indicative of rigid control, and points are summed to arrive at a total score ranging from 0 to 16. The Rigid Control subscale was positively correlated with disinhibited eating, BMI, and more frequent and severe binge eating among members engaged in a 1-year weight reduction program, upholding its validity (Westenhoefer et al., 1999). Cronbach's alpha was .85 in the present study.

Life satisfaction. The 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffen, 1985) assessed participants' life satisfaction. The items (e.g., "In most ways my life is close to ideal") are rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and averaged; higher scores reflect greater life satisfaction. This scale has demonstrated evidence of internal consistency reliability, 2-month test-retest reliability, and construct validity (e.g., via its strong relationships to positive affect and self-esteem) among samples of college students (Diener et al., 1985). Cronbach's alpha was .94 in the present study.

Affect. The Positive and Negative Affect Schedule-Expanded (Watson, Clark, & Tellegen, 1988) measured participants' levels of positive affect (10-item subscale; e.g., "inspired," "proud") and negative affect (10-item subscale, e.g., "nervous," "distressed"). Participants were asked to rate the degree they experienced each emotion "in general, that is, on the average" along a 5-point scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Subscale items are averaged. Higher subscale scores indicate higher levels of positive and negative affect, respectively. Both subscales have garnered evidence of internal consistency reliability, 2-month test-retest reliability and construct validity (e.g., via their correlations with

symptoms of depression and anxiety) among college students (Watson et al., 1988). Cronbach's alphas were .91 for the Positive Affect subscale and .92 for the Negative Affect subscale in the present study.

Body appreciation. The 10-item Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015) assessed individuals' acceptance of, favorable opinions toward, and respect for their bodies. Items (e.g., "I respect my body") are rated along a 5-point scale that ranges from 1 (*never*) to 5 (*always*) and averaged; higher scores reflect greater body appreciation. The BAS-2's internal consistency reliability, 3-week test-retest reliability, and construct validity (via inverse relationships with body shame and body dissatisfaction) have been supported among college samples (Tylka & Wood-Barcalow, 2015). Cronbach's alpha was .97 in the present study.

Poor interoceptive awareness. The 10-item Interoceptive Awareness subscale of the Eating Disorder Inventory-2 (Garner, 1991) assessed participants' disconnection to their internal body states, such as emotions, hunger, and satiety. These items are rated along a 6-point scale that ranges from 1 (*never true of me*) to 6 (*always true of me*). Rather than using Garner's original method of truncated scoring in clinical samples, we retained the continuous scoring and averaged these responses. Higher scores reflect poorer interoceptive awareness. This subscale's internal consistency reliability, 3-week test-retest reliability, and construct validity (e.g., via its link to alexithymia) have been upheld in college student samples (Tylka & Subich, 2004; Wear & Pratz, 1987). Cronbach's alpha was .89 in the present study.

Binge eating. We used the 16-item Binge Eating Scale (Gormally, Black, Daston, & Rardin, 1982) to assess participants' behaviors (e.g., eating large amounts of food), emotions (e.g., guilt after overeating), and cognitions (e.g., perceived lack of control when eating) associated with binge eating. Each item ranges in severity from 0 to 3, with higher levels indicating more severe binge eating symptoms. Item scores are summed. Its internal consistency

and construct validity (e.g., via correlations with other measures of binge eating) have been upheld in adult samples (Gormally et al., 1982; Marcus, Wing, & Hopkins, 1988; Telch & Agras, 1994). Cronbach's alpha was .93 in the present study.

Food preoccupation. The 3-item Frequency subscale of the Food Preoccupation Questionnaire (Tapper & Pothos, 2010) was used to assess the extent participants thought about food. These items (e.g., "I often find myself thinking about food") are rated along a 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*) and averaged. Higher scores reflect greater food preoccupation. The internal consistency reliability, 1-week test-retest reliability, and construct validity (via links to food cravings and binge eating) for this subscale were supported among college students (Tapper & Pothos, 2010). Cronbach's alpha was .93 in the present study.

Procedure

After IRB approval was granted from a large university in the Midwestern United States, data were collected from adult community members on Amazon Mechanical Turk (MTurk). Increasingly used in psychological research, MTurk is an online website whereby participants receive monetary compensation for completing work-related tasks, referred to as "hits," which can include completing surveys. Data gathered from MTurk are more diverse and nationally representative, but just as psychometrically sound, when compared to data gathered from college student samples (Buhrmester, Kwang, & Gosling, 2011).

This study was described to potential participants on the MTurk worker hit website as "an investigation of eating behaviors and personality." Access was restricted to U.S. citizens who completed ≥100 hits and had an average ≥98% acceptance rating, which is based on other experimenters' approval of their prior work. The latter two restrictions ensured that participants were experienced users of MTurk and increased the likelihood that they would be conscientious when taking our survey. Restricting the survey to U.S. citizens ensured that geographical

variations in culture and knowledge of the English language would not influence the results.

The Flexible Control subscale was administered separately from the Rigid Control subscale to prevent potentially elevated correlations between these subscales due to their proximity. More specifically, rigid control items were entered on one survey page and flexible control items were entered on another survey page. All measures were then randomized via SurveyMonkey, so that each participant received a unique ordering of the surveys to control for order and proximity effects. Participants each received $1.50 as remuneration.

Participants were excluded from the analyses if they failed at least one of five embedded validity questions gauging attentiveness (e.g., "Please do not provide an answer for this item," n = 27), terminated early (n = 11), or had significant missing data (n = 8). Data from 382 participants remained and were analyzed.

Results

Preliminary Analyses

Across all measures, the count for individual missing data points across all items was low, ranging from 0 to 1.3% (M = 0.33%). Thus, we used available item analysis to handle missing data, the recommended method when the percentage of items missed is low and scales are internally consistent (Parent, 2013). All measures were normally distributed, and skewness and kurtosis values did not violate the assumptions of our analyses (Kline, 2005). No outliers were detected. Variable means, standard deviations, and correlations are presented in Table 1.

Tests of Hypotheses

As hypothesized (H1), intuitive eating was inversely related to flexible control (see Table 1), and their conceptual overlap (i.e., r^2) was 7.0% for women and 11.7% for men. These findings provide preliminary evidence that intuitive eating and flexible control are not similar constructs because (a) high levels of intuitive eating do not correspond with high levels of

flexible control and (b) their degree of conceptual overlap was not large. Conversely, there was a great deal of conceptual overlap between flexible and rigid control, which were positively correlated (i.e., r^2 = 50.4% for women and 51.8% for men). A Fisher's *r* to *z* correlational comparison, which examines the significance of the difference between two correlation coefficients, revealed that flexible control was more closely related (i.e., conceptually similar) to rigid control than intuitive eating, $z = 18.28$, $p < .001$.

Furthermore, intuitive eating and flexible control were differentially related to the indices of well-being (see Table 1). Intuitive eating was positively related to psychological adjustment (life satisfaction, positive affect, and body appreciation) and inversely related to psychological distress (negative affect, poor interoceptive awareness, binge eating, and food preoccupation) for both women and men, thus upholding H2a. In contrast, flexible control was unrelated to psychological adjustment and distress, except for its rather small positive correlations with poor interoceptive awareness and binge eating for men, and food preoccupation for women and men.

Fisher's *r* to *z* correlational comparisons determined whether the correlations between intuitive eating and each well-being index were significantly different from the correlations between flexible control and each well-being index—for example, the intuitive eating and life satisfaction correlation was compared to the flexible control and life satisfaction correlation. Because the pattern of correlations was generally similar between women and men (Table 1), we combined women and men and set the *p*-value at .007 (.05/7) to control for the seven comparisons. These correlational comparisons were significantly different for life satisfaction ($z = 4.78$), negative affect ($z = -4.98$), body appreciation ($z = 9.86$), poor interoceptive awareness ($z = -10.67$), binge eating ($z = -12.79$), and food preoccupation ($z = -11.88$; all ps < .001), but similar for positive affect ($z = 2.07$, $p = .019$). Thus, these findings largely support H2b and, collectively, provide evidence that intuitive eating and flexible control have a different pattern in

their connection to well-being, providing further evidence that they are quantitatively dissimilar.

Intuitive eating was inversely associated with BMI to a moderate degree for women and men. Flexible control, however, was not related to BMI for women or men. Indeed, Fisher's *r* to *z* correlational comparisons revealed that intuitive eating and flexible control were differentially associated with BMI for women ($z = -4.45$, $p < .001$) and men ($z = -4.37$, $p < .001$). These findings uphold H3, in that intuitive eating's connection to BMI is different than flexible control's connection to BMI.

Next, we conducted a set of hierarchical regressions to determine whether intuitive eating accounted for unique variance in each well-being index and BMI above and beyond the variance contributed by flexible control (see Table 2). Also, given the large positive correlation found between flexible and rigid control, we examined whether flexible control was associated with these criteria once its shared overlap with rigid control was excluded. Therefore, for each regression, rigid control was entered at Step 1, flexible control at Step 2, and intuitive eating at Step 3, in the prediction of each well-being index and BMI. Because of the similar correlational values between women and men (Table 1), we combined their data in the analyses and adjusted the *p*-level to .006 (.05/8) to control for Type I error. At each step, tolerance and variance inflation factor (VIF) values were acceptable (i.e., tolerance = .486, .640, and .610; VIF = 2.06, 1.56, and 1.63, for each step, respectively), indicating that multicollinearity was not an issue, and the individual predictors could be interpreted with confidence (Allison, 1998).

These regressions revealed that intuitive eating predicted unique variance (i.e., range 5.5% - 17.7%) in each psychological well-being index and BMI above and beyond flexible and rigid control (see Table 2). Therefore, in support of H4, intuitive eating is qualitatively different from flexible control (i.e., they are not simply different levels of the same restraint construct), demonstrating that intuitive eating is both an important and unique eating-related characteristic

of well-being and is uniquely associated with lower BMI.

Furthermore, in these regressions, we noted that flexible control was positively associated with the indices of adjustment, with the exception of life satisfaction, and inversely associated with the indices of psychological distress and BMI (see Table 2). These findings stand in contrast to the bivariate correlations which demonstrated that flexible control was unrelated to psychological well-being and BMI (see Table 1). The difference between these analyses was that, in the regressions, the variance flexible control shared with rigid control was excluded from consideration. Therefore, flexible control was positively related to most indices of adjustment and negatively related to psychological distress and BMI *only* when flexible control's sizeable conceptual overlap (r^2 >50%) with rigid control was removed.

These latter findings prompted us to question whether certain flexible control items are related in an adaptive direction to well-being or negatively linked to BMI without being linked to rigid control—if so, these items may reveal positive aspects of flexible control that are uncontaminated by rigid control. Thus, we performed a post-hoc canonical correlation analysis to explore the multivariate shared variance between the 12 flexible control items (the first variable set) and the seven well-being indices, BMI, and rigid control (the second variable set). The overall model was significant, Wilks' $\lambda = .249$. As illustrated in Table 3, two pairs of canonical variates accounted for the significant relationships between the two variable sets, and together accounted for 88.33% of the total variance. With an interpretive cutoff correlation of |.45| (Sherry & Henson, 2005), correlations with the first canonical variate indicated that participants reporting higher rigid control also reported higher flexible control on all items except Item 9 ("I pay attention to my figure [or body build], but I still enjoy a variety of foods"). After removing the shared variance from the first canonical variate, the second canonical variate revealed that higher positive affect and body appreciation, as well as lower food preoccupation, binge eating,

and BMI, were related to higher levels of flexible control Items 1 ("When I have eaten my quota of calories, I am usually good about not eating any more"), 9 ("I pay attention to my figure [or body build], but I still enjoy a variety of foods"), and 10 ("I prefer light foods that are not fattening"). Therefore, Item 9 was the only flexible control item that did not share substantial variance with rigid control *and* was associated positively with body appreciation and inversely with binge eating, food preoccupation, and BMI.

Discussion

Intuitive eating and flexible control have been touted by scholars as adaptive approaches to eating that stand in contrast to rigid restriction of food intake (Tribole & Resch, 2012; Tylka & Kroon Van Diest, 2013; Westenhoefer et al., 1999). Seemingly similar in some behaviors (e.g., eating less to compensate for a large meal), yet theoretically different (e.g., following internal versus external cues to eating), intuitive eating and flexible control have never been positioned together in the same study to determine their unique contributions to well-being. In this study, we compared intuitive eating with flexible control to determine whether they are qualitatively distinct (i.e., represent different constructs), quantitatively distinct but qualitatively similar (i.e., represent different levels along a restraint continuum), or neither qualitatively nor quantitatively distinct (i.e., represent similar levels of the same construct). Two main conclusions emerged.

First, intuitive eating is not the same as flexible control. These constructs are qualitatively distinct and independent. Largely, this conclusion was derived from our finding that intuitive eating contributed unique variance to eight indices of well-being (psychological distress and adjustment) and BMI, above and beyond the variance contributed by flexible control. Additional analyses excluded other possibilities, such as that intuitive eating and flexible control are mirror constructs or that they represent different levels of the same underlying construct. Because they are inversely related, and the degree of conceptual overlap between intuitive eating and flexible

control (via their correlations with one another) was quite low for both women (7%) and men (11.7%), we conclude that intuitive eating and flexible control are not conceptually the same construct. Also, because intuitive eating and flexible control were significantly different from one another in their bivariate associations with six of the seven well-being indices and BMI, we are confident that intuitive eating and flexible control do not simply represent different levels of the same construct.

Second, flexible control was intertwined with rigid control at both the scale and item levels. At the scale level, our analyses demonstrated that flexible and rigid control were positively related and shared a substantial percentage of variance (i.e., slightly over 50%), which was unsurprising due to the strong positive correlation between flexible and rigid control documented in some previous studies (Timko & Perone, 2005; Westenhoefer, 1991; Westenhoefer et al., 1994, 2013). Our findings further revealed that this strong positive relationship suppressed flexible control's associations with well-being. Flexible control was unrelated with psychological well-being and BMI within bivariate correlations. When its shared variance with rigid control was removed in the multiple regression analyses, however, flexible control was positively related to most indices of adjustment and negatively related to psychological distress and BMI. Thus, researchers would need to remove flexible control's shared variance with rigid control in order to be able to assess an adaptive version of flexible control. At the item level, a canonical correlation analysis revealed that 11 of the 12 flexible control items were positively related to rigid control. After excluding the items' shared variance with rigid control, three flexible control items were associated positively with body appreciation and inversely with binge eating, food preoccupation, and BMI. Of these three, only "I pay attention to my figure [or body build], but I still enjoy a variety of foods" was not substantially linked to rigid control, suggesting that it may tap into an adaptive version of flexible control by

itself.

Our findings therefore call into question the clarity and utility of flexible control. The adaptive properties of flexible control are not revealed unless researchers remove its shared variance with rigid control. It would be impractical for researchers to assess adaptive flexible control by measuring both flexible and rigid control and excluding the variance contributed by rigid control. Even if researchers proceeded to assess adaptive flexible control in this manner, it is not clear what adaptive flexible control *is* in the absence of rigid control, as both are intertwined within 11 of the 12 flexible control items. We can look to the one item unrelated to rigid control for guidance on defining adaptive flexible control; however, this single item would likely not yield a comprehensive understanding of adaptive flexible control as a construct. For the study of adaptive flexible control to continue, researchers need to explore a different operationalization of this construct—one that emphasizes external self-regulation yet does not overlap conceptually or empirically (via shared variance) with rigid control and is linked to indices of well-being and health in a beneficial direction. We are uncertain if such an operationalization is feasible. Indeed, it seems to be the exertion of external control over eating that underlies rigid and flexible control patterns of eating, and distinguishes them from intuitive eating. Whether or not this "control" can ever be adaptive in the context of eating behavior remains an open question.

It is likely that the flexible control strategies advocated by some professionals and health organizations inadvertently emphasize rigid control, as these strategies are similar to the item content of Westenhoefer et al.'s (1999) Flexible Control subscale. As such, we discourage professionals and health organizations from advocating that community adults adopt flexible control strategies to promote health and well-being, as Westenhoefer et al. (1999) has recommended. Our data suggest that this recommendation may be impractical and potentially

harmful: if professionals and health organizations follow this recommendation and utilize the operationalization of flexible control proposed by Westenhoefer et al. (1999), they may be inadvertently promoting rigid control as well.

In contrast to flexible control, intuitive eating appears to be an adaptive and stand-alone construct useful for researchers and clinicians. Researchers do not need to extract intuitive eating's shared variance with rigid and/or flexible control (or any other variable) for intuitive eating to be positively associated with psychological adjustment and inversely associated with psychological distress and BMI. The measures of intuitive eating available—the original IES and the newer IES-2—yield reliable and valid scores for women and men, and their items clearly and comprehensively represent the intuitive eating construct (Tylka, 2006; Tylka & Kroon Van Diest, 2013), which is a benefit to researchers. Instead of being strongly related to higher levels of rigid control (like flexible control), intuitive eating is more moderately related to lower levels of rigid control. Thus, it is highly unlikely that promoting intuitive eating will promote rigid control. Indeed, Bacon et al. (2005) found that their Health at Every Size® intuitive eating intervention group significantly lowered participants' eating restraint from baseline to post-treatment, and sustained this change at a 2-year follow-up. Bush et al. (2014) found that their intuitive eating intervention group was 3.5 times more likely to be asymptomatic for disordered eating than a wait-list control group at 10-weeks post intervention. Hence, intuitive eating interventions are not likely to promote eating pathology and may even lessen it (Schaefer & Magnuson, 2014; Tylka et al., 2014).

It is important to acknowledge the present study's limitations, which reveal avenues for future research. We used a cross-sectional, correlational design which precludes conclusions regarding causal direction. From our data, we cannot argue that intuitive eating increases psychological adjustment or decreases psychological distress and BMI—we can only conclude

that intuitive eating is related to well-being in an adaptive fashion as well as related to lower BMI. Perhaps psychological well-being promotes attention to and trust in internal bodily signals, which facilitates intuitive eating, rather than the opposite direction. Longitudinal studies are needed to examine intuitive eating and well-being patterns across time.

Participants self-selected to complete this study, which may have led to biases in the sample, such that only U.S. citizens with access to the Internet and both interested in and curious about eating habits provided their responses. Although our sample was more diverse than the typical U.S. college student female sample, there is still a need to examine whether our findings are generalizable across participants of various social and cultural identities, many of which may not have easy access to the Internet. Furthermore, we relied upon self-report data, and thus it is possible that participants did not accurately report their responses. The anonymous nature of the survey may have minimized overt misreporting.

Conclusions

The present study garnered considerable support for intuitive eating as an adaptive and distinct construct from flexible control among community women and men. Conversely, the present study did not support flexible control's conceptual independence from rigid control, and this overlap with rigid control clouded our understanding of flexible control as a construct and confounded its associations with well-being. Importantly, intuitive eating does not appear to be another variety or form of restraint. Collectively, our findings caution against promoting flexible control (as it is currently operationalized and assessed) within clinical and public health contexts while further substantiating efforts to promote intuitive eating among adults within these contexts.

References

Allison, P. (1998). *Multiple regression: A primer.* New York: Sage.

Augustus-Horvath, C. L., & Tylka, T. L. (2011). The acceptance model of intuitive eating: A comparison of women in emerging adulthood, early adulthood, and middle adulthood. *Journal of Counseling Psychology, 58,* 110-125. doi: 10.1037/a0022129

Avalos, L. C., Tylka, T. L., & Wood-Barcalow, N. (2005). The Body Appreciation Scale: Development and psychometric evaluation. *Body Image, 2,* 285-297. doi: 10.1016/j.bodyim.2005.06.002

Bacon, L., Keim, N. L., Van Loan, M. D., Derricote, M., Gale, B., Kazaks, A., & Stern, J. S. (2002). Evaluating a 'non-diet' wellness intervention for improvement of metabolic fitness, psychological well-being and eating and activity behaviors. *International Journal of Obesity, 26,* 854-865. doi: 10.1038/sj.ijo.0802012

Bacon, L., Stern, J. S., Van Loan, M. D., & Keim, N. L. (2005). Size acceptance and intuitive eating improve health for obese, female chronic dieters. *Journal of the American Dietetic Association, 105*, 929-936. doi: 10.1016/j.jada.2005.03.011

Birch, L. L., & Fisher, J. O. (2005). Maternal influences on daughters' restrained eating behavior. *Health Psychology, 24*, 548-554. doi: 10.1037/0278-6133.24.6.548

Birch, L. L., Fisher, J. O., & Davison, K. K. (2003). Learning to overeat: Maternal use of restrictive feeding practices promotes girls' eating in the absence of hunger. *American Journal of Clinical Nutrition, 78,* 215-220.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3-5. doi: 10.1177/1745691610393980

Bush, H. E., Rossy, L., Mintz, L. B., & Schopp, L. (2014). Eat for life: A work site feasibility

571 study of a novel mindfulness-based intuitive eating intervention. *American Journal of*
572 *Health Promotion, 28*, 380-388. doi: 10.4278/ajhp.120404-QUAN-186
573 Camilleri, G. M., Méjean, C., Bellisle, F., Andreeva, V. A., Sautron, V., Hercberg, S., & Péneau,
574 S. (2015). Cross-cultural validity of the Intuitive Eating Scale-2. Psychometric evaluation
575 in a sample of the general French population. *Appetite, 84*, 34-42. doi:
576 10.1016/j.appet.2014.09.009
577 Centers for Disease Control and Prevention (2010). Calculating BMI. Retrieved from
578 http://collab.nlm.nih.gov/webcastsandvideos/drew/teachingresources/obesity/F3BMI.pdf
579 Centers for Disease Control and Prevention (2013). Healthy weight - it's not a diet, it's a
580 lifestyle! Healthy eating for a healthy weight. Retrieved September 15 from
581 http://www.cdc.gov/healthyweight/healthy_eating/
582 Chaput, J. P., Leblanc, C., Pérusse, L., Després, J. P., Bouchard, C., & Tremblay, A. (2009). Risk
583 factors for adult overweight and obesity in the Quebec Family Study. Have we been
584 barking up the wrong tree? *Obesity, 17*, 1964-1970. doi: 10.1038/oby.2009.116
585 Dakanalis, A., Timko, C. A., Carrà, M., Zanetti, M. A., Riva, G., & Caccialanza, R. (2014).
586 Testing the original and the extended dual-pathway model of lack of control over eating
587 in adolescent girls. A two-year longitudinal study. *Appetite, 82*, 180-193. doi:
588 10.1016/j.appet.2014.07.022
589 Denny, K. N., Loth, K., Eisenberg, M. E., & Neumark-Sztainer, D. (2013). Intuitive eating in
590 young adults. Who is doing it, and how is it related to disordered eating behaviors?
591 *Appetite, 60*, 13-19. doi: 10.1016/j.appet.2012.09.029
592 Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale.
593 *Journal of Personality Assessment, 49,* 71-75. doi:10.1207/s15327752jpa4901_13
594 Garner, D. M. (1991). *Eating Disorder Inventory-2 manual.* Odessa, FL: Psychological

595 Assessment Resources.
596 Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity
597 among obese persons. *Addictive Behaviors, 7*, 47-55. doi: 10.1016/0306-4603(82)90024-
598 7
599 Hawks, S., Madanat, H., Hawks, J., & Harris, A. (2005). The relationship between intuitive
600 eating and health indicators among college women. *American Journal of Health*
601 *Education, 36*, 331-336. doi: 10.1080/19325937.2005.10608206
602 Herbert, B. M., Blechert, J., Hautzinger, M., Matthias, E., & Herbert, C. (2013). Intuitive eating
603 is associated with interoceptive sensitivity. Effects on body mass index. *Appetite, 70*, 22-
604 30. doi:
605 Kline, R. B. (2005). *Principles and practices of structural equation modeling* (2nd ed.). New
606 York: Guilford Press.
607 Madden, C. E. L., Leong, S. L., Gray, A., & Horwath, C. C. (2012). Eating in response to hunger
608 and satiety signals is related to BMI in a nationwide sample of 1601 mid-age New
609 Zealand women. *Public Health Nutrition, 15*, 2272-2279. doi:
610 10.1017/S1368980012000882
611 Mann, T., Tomiyama, A. J., Westling, E., Lew, A-M., Samuels, B., & Chatman, J. (2007).
612 Medicare's search for effective obesity treatments: Diets are not the answer. *American*
613 *Psychologist, 62*, 220-233. doi: 10.1037/0003-066X.62.3.220
614 Marcus, M., Wing, R., & Hopkins, J. (1988). Obese binge eaters: Affect, cognitions, and
615 response to behavioral weight control. *Journal of Consulting and Clinical Psychology,*
616 *56*, 433-439. doi:10.1037//0022-006x.56.3.433
617 Neumark-Sztainer, D., Wall, M., Guo, J., Story, M., Haines, J., & Eisenberg, M. (2006). Obesity,
618 disordered eating, and eating disorders in a longitudinal study of adolescents: How do

619 dieters fare 5 years later? *Journal of the American Dietetic Association, 106*, 559-568.
620 doi: 10.1016/j.jada.2006.01.003
621 Neumark-Sztainer, D., Wall, M., Haines, J., Story, M., & Eisenberg, M. E. (2007). Why does
622 dieting predict weight gain in adolescents? Findings from Project EAT-II: A 5-year
623 longitudinal study. *Journal of the American Dietetic Association, 107*, 448-455. doi:
624 10.1016/j.jada.2006.12.013
625 Parent, M. C. (2013). Handling item-level missing data: Simpler is just as good. *The Counseling*
626 *Psychologist, 41*, 568-600. doi:10.1177/0011000012445176
627 Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Psychological*
628 *Assessment, 5*, 164-172. doi: 10.1037//1040-3590.5.2.164
629 Provencher, V., Drapeau, V., Tremblay, A., Després, J.-P., & Lemieux, S. (2003). Eating
630 behaviors and indexes of body composition in men and women from the Québec family
631 study. *Obesity Research, 11*, 783-792. doi: 10.1038/oby.2003.109
632 Schaefer, J. T., & Magnuson, A. B. (2014). A review of interventions that promote eating by
633 internal cues. *Journal of the Academy of Nutrition and Dietetics, 114*, 734-760. doi:
634 10.1016/j.jand.2013.12.024
635 Shearin, E. N., Russ, M. J., Hull, J. W., Clarkin, J. F., & Smith, G. P. (1994). Construct validity
636 of the Three-Factor Eating Questionnaire: Flexible and rigid control subscales.
637 *International Journal of Eating Disorders, 16*, 187-198. doi: 10.1002/1098-
638 108x(199409)16:2<187::aid-eat2260160210>3.0.co;2-u
639 Sherry, A., & Henson, R. K. (2005). Conducting and interpreting canonical correlation analysis
640 in personality research: A user-friendly primer. *Journal of Personality Assessment, 84*,
641 37-48. doi: 10.1207/s15327752jpa8401-09
642 Schoenefeld, S. J., & Webb, J. B. (2013). Self-compassion and intuitive eating in college

643 women: Examining the contributions of distress tolerance and body image acceptance
644 and action. *Eating Behaviors, 14*, 493-496. doi: 10.1016/j.eatbeh.2013.09.001
645 Shouse, S. H., & Nilsson, J. (2011). Self-silencing, emotional awareness, and eating behaviors in
646 college women. *Psychology of Women Quarterly, 35,* 451-457.
647 doi:10.1177/0361684310388785
648 Smith, C. F., Williamson, D. A., Bray, G. A., & Ryan, D. H. (1999). Flexible vs. rigid dieting
649 strategies: Relationship with adverse behavioral outcomes. *Appetite, 32*, 295-305. doi:
650 10.1006/appe.1998.0204
651 Smith, T., & Hawks, S. R. (2006). Intuitive eating, diet composition, and the meaning of food in
652 healthy weight promotion. *American Journal of Health Education, 37*, 130-136.
653 Stice, E., Marti, C. N., Spoor, S., Presnell, K., & Shaw, H. (2008). Dissonance and healthy
654 weight eating disorder prevention programs: Long-term effects from a randomized
655 efficacy trial. *Journal of Consulting and Clinical Psychology, 76*, 329-340. doi:
656 10.1037/0022-006X.76.2.329
657 Stice, E., Shaw, H., Burton, E., & Wade, E. (2006). Dissonance and healthy weight eating
658 disorder prevention programs: A randomized efficacy trial. *Journal of Consulting and*
659 *Clinical Psychology, 74*, 263-275. doi: 10.1037/0022-006X.74.2.263
660 Stotland, S. (2012). Moderation: An alternative to restraint as a mode of weight self-regulation.
661 *Eating Behaviors, 13*, 406-409. doi: 10.1016/j.eatbeh.2012.07.001
662 Stunkard, A. J., & Messick, S. (1985). The Three-Factor Eating Questionnaire to measure dietary
663 restraint, disinhibition, and hunger. *Journal of Psychosomatic Research, 29*, 71-83. doi:
664 10.1016/0022-3999(85)90010-8
665 Tapper, K., & Pothos, E. M. (2010). Development and validation of a Food Preoccupation
666 Questionnaire. *Eating Behaviors, 11*, 45-53. doi: 10.1016/j.eatbeh.2009.09.003

667 Telch, C., & Agras, W. (1994). Obesity, binge eating and psychopathology: Are they related?
668 *International Journal of Eating Disorders, 15*, 53-61. doi: 10.1002/1098-
669 108x(199401)15:1<53::aid-eat2260150107>3.0.co;2-0
670 Timko, C. A., & Perone, J. (2005). Rigid and flexible control of eating behavior in a college
671 population. *Eating Behaviors, 6*, 119-125. doi: 10.1016/j.eatbeh.2004.09.002
672 Tribole, E., & Resch, E. (1995). *Intuitive eating*. New York: St. Martin's Griffin.
673 Tribole, E., & Resch, E. (2012). *Intuitive eating: A revolutionary program that works* (3rd ed.).
674 New York: St. Martin's Press.
675 Tylka, T. L. (2006). Development and psychometric evaluation of a measure of intuitive eating.
676 *Journal of Counseling Psychology, 53,* 226-240. doi: 10.1037/0022-0167.53.2.226
677 Tylka, T. L., Annunziato, R. A., Burgard, D., Daníelsdóttir, S., Shuman, E., Davis, C., &
678 Calogero, R. M. (2014). The weight-inclusive vs. weight-normative approach to health:
679 Evaluating the evidence for prioritizing well-being over weight loss. *Journal of Obesity*.
680 doi: 10.1155/2014/983495
681 Tylka, T. L., & Kroon Van Diest, A. M. (2013). The Intuitive Eating Scale-2: Item refinement
682 and psychometric evaluation with college women and men. *Journal of Counseling*
683 *Psychology, 60*, 137-153. doi: 10.1037/a0030893
684 Tylka, T. L., & Subich, L, M. (2004). Examining a multidimensional model of eating disorder
685 symptomatology among college women. *Journal of Counseling Psychology, 51,* 314-328.
686 doi: 10.1037/0022-0167.51.3.314
687 Tylka, T. L., & Wilcox, J. A. (2006). Are intuitive eating and eating disorder symptomatology
688 opposite poles of the same construct? *Journal of Counseling Psychology, 53*, 474-485.
689 doi: 10.1037/0022-0167.53.4.474
690 Tylka, T. L., & Wood-Barcalow, N. L. (2015). The Body Appreciation Scale-2: Item refinement

and psychometric evaluation. *Body Image, 12*, 53-67. doi: 10.1016/j.bodyim.2014.09.006

Van Dyke, N., & Drinkwater, E. J. (2013). Relationships between intuitive eating and health indicators: Literature review. *Public Health Nutrition, 17*, 1757-1766. doi: 10.1017/S1368980013002139

van Strien, T., Herman, C. P., & Verheijden, M. W. (2014). Dietary restraint and body mass change. A 3-year follow up study in a representative Dutch sample. *Appetite, 76*, 44-49. doi: 10.1016/j.appet.2014.01.015

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and evaluation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54,* 1063-1070. doi: 10.1037/0022-3514.54.6.1063

Wear, R. W., & Pratz, O. (1987). Test-retest reliability for the Eating Disorder Inventory. *International Journal of Eating Disorders, 6,* 767-769.

Westenhoefer, J. (1991). Dietary restraint and disinhibition: Is restraint a homogeneous construct? *Appetite, 16*, 45-55. doi: 10.1016/0195-6663(91)90110-e

Westenhoefer, J., Broeckmann, P., Münch, A., & Pudel, V. (1994). Cognitive control of eating behaviour and the disinhibition effect. *Appetite, 23*, 27-41. doi: 10.1003/appe.1994.1032

Westenhoefer, J., Engel, D., Holst, C., Lorenz, J., Peacock, M., Stubbs, J…Raats, M. (2013). Cognitive and weight-related correlates of flexible and rigid restrained eating behaviour. *Eating Behaviors, 14*, 69-72. doi: 10.1016/j.eatbeh.2012.10.015

Westenhoefer, J., Stunkard, A. J., & Pudel, V. (1999). Validation of the flexible and rigid control dimensions of dietary restraint. *International Journal of Eating Disorders, 26*, 53-64. doi: 10.1002/(sici)1098-108x(199907)26:1<53::aid-eat7>3.0.co;2-n

Westenhoefer, J., von Falck, B., Stellfeldt, A., & Fintelmann, S. (2004). Behavioral correlates of successful weight reduction over 3 y. Results from the lean habits study. *International*

715 *Journal of Obesity, 28*, 334-335. doi: 10.1038/sj.ijo.0802530

716 Williams, L., Germov, J., & Young, A. (2007). Preventing weight gain: A population cohort

717 study of the nature and effectiveness of mid-age women's weight control practices.

718 *International Journal of Obesity, 31*, 978-986. doi: 10.1038/sj.ijo.0803550