Refining the Relationships of Perfectionism, Self-Efficacy, and Stress to Dieting and Binge Eating: Examining the Appearance, Interpersonal, and Academic Domains

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ABSTRACT

Objective: This study investigated domain-specific (appearance, interpersonal, and academic) interactive relationships of perfectionism, self-efficacy, and stress to dieting and binge eating, positing that the level of weight/shape self-efficacy would be pivotal in identifying elevated dieting versus elevated binge eating.

Method: Participants were 406 randomly selected undergraduate women. At two time points (T1 and T2), 11 weeks apart, participants completed measures of dieting and binge eating attitudes/behaviors as well as domain-specific measures of perfectionism and self-efficacy (e.g., perfectionism related to appearance). Between T1 and T2, participants completed inventories weekly on the previous week's weight/shape, interpersonal, and academic stressors.

Results: The combination of high interpersonal perfectionism, low interpersonal self-efficacy, high interpersonal stress, and high weight/shape self-efficacy was associated with the most elevated dieting. The hypothesized interactions related to the appearance and academic domains where not supported.

Conclusion: These results highlight the interpersonal context for dieting and the unique relationship between weight/shape self-efficacy and dieting. © 2008 by Wiley Periodicals, Inc.

Keywords: dieting; binge eating; self-efficacy; perfectionism; stress

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Introduction

Although dieting and binge eating can co-occur (e.g., in binge eating/purging anorexia nervosa (AN)), these behaviors can also occur separately (e.g., in restricting AN and binge eating disorder (BED)[1–6]). This suggests that women engaging in these behaviors may share some vulnerabilities, for example, perfectionism,[7,8] but differ on other vulnerabilities. Elucidating the specific etiologies of dieting and binge eating will facilitate refined prevention and intervention of both behaviors. This study investigated how weight/shape self-efficacy may differentially relate to dieting and binge eating in the context of perfectionism and stress combinations. Domain-specific combinations (appearance, interpersonal, and academic) of perfectionism, self-efficacy, and stress were examined.

The combination of high perfectionism, low self-efficacy, and the stress of feeling overweight has been proposed as a vulnerability-stress model for bulimic symptoms and binge eating in particular.[9] Bardone-Cone and colleagues posit that the stress of feeling overweight may lead to binge eating as an escape or affect regulation strategy[10,11] in young women who also hold high standards (i.e., have high perfectionism) but (due to low self-efficacy) feel unable to reach goals, such as a lower weight. This combination has been associated with the highest elevations of binge eating in a non-clinical sample.[9] What would the implications be if a specific type of self-efficacy—self-efficacy about weight and shape—were included in this model? For women with low weight/shape self-efficacy (i.e., low confidence in their abilities to attain a

desired weight/shape), binge eating could be an attempt to reduce negative affect resulting from the confluence of stress, perfectionism, and low self-efficacy. In contrast, women with high weight/shape self-efficacy may turn their attention to altering their weight/shape (e.g., by dieting) as a way to respond to the negative affect. For instance, meticulous meal planning or counting calories may permit escape by narrowing focus to the mechanical and detail oriented.[10] As Tierney[12] notes, "even though an over-concern with food, calories, and kilograms can be exhausting, it is the distracting, preoccupying nature of the condition" (p. 185) that can be so valuable. Women with high weight/shape self-efficacy but low self-efficacy and high perfectionism in other domains may be particularly apt to focus on trying to change their weight or shape (e.g., through dieting) when they experience stress in other domains because by doing so, they can substitute a sense of control or efficacy in the appearance domain for a lack of control or efficacy in other domains.[13]

The degree to which a particular stress (e.g., interpersonal) triggers maladaptive behavior, such as binge eating or restriction, may vary depending on women's self-efficacy and high standards in that same domain (e.g., interpersonal). In this study, perfectionism, self-efficacy, and stress in the appearance, interpersonal, and academic domains were examined. Substantial research points to appearance stress, such as body dissatisfaction and pressure to be thin, being associated with binge eating and dieting.[14–17] In the interpersonal domain, stress has been implicated in the onset of dieting and binge eating.[17,18] Interpersonal stress has also been associated with increased desire to binge among individuals with bulimia nervosa (BN)[19] and higher levels of consumption among restrained eaters (as measured by the Revised Restraint Scale (RRS)[20,21]). It has also been identified as a trigger for binges by non-patients[22] and patients with BN.[23] In contrast, having several good friendships has been identified as a positive influence, predictive of decreases in restrictive behavior[18] and binge eating.[24] In the academic domain, non-patients report that academic stressors trigger binges.[22] In addition, women with BED are more likely than other women to report experiencing school-related stress before BED onset.[17] This suggests that academic stress may play a role in the onset of binge eating. Laboratory studies have found that following an achievement challenge (e.g., mental arithmetic), individuals high in dietary restraint (as measured by the RRS[20]) usually eat more.[25,26]

This study examined how perfectionism, self-efficacy, and stress in specific domains interact to identify dieting and binge eating elevations, with weight/shape self-efficacy proposed to be pivotal. In the appearance domain, it was predicted that high weight/shape perfectionism, high weight/shape stress, and *high* weight/shape self-efficacy would be associated with the highest level of dieting, while high weight/shape perfectionism, high weight/shape stress, and *low* weight/shape self-efficacy would be associated with the highest level of binge eating. That is, women with high weight/shape standards (high weight/shape perfectionism), who experienced a high level of weight/shape stress, were predicted to diet at the most elevated level if they thought they probably could change their weight/shape (high weight/shape self-efficacy), but were predicted to binge eat at the most elevated level if they thought they probably could not change their weight/shape (low weight/shape self-efficacy). In the interpersonal domain, high interpersonal perfectionism, high interpersonal stress, and low interpersonal self-efficacy were predicted to be associated with the highest level of dieting in women with *high* weight/shape self-efficacy, but with the highest level of binge eating in women with *low* weight/shape self-efficacy. In the academic domain, high academic perfectionism, high academic stress, and low academic self-efficacy were predicted to be associated with the highest level of dieting in women with *high* weight/shape self-efficacy, but with the highest level of binge eating in women with *low* weight/shape self-efficacy.

Method

Participants

Participants were 426 undergraduate women at a Midwestern university. Following random selection from introductory psychology classes, potential participants were contacted and offered course credit for participation in a "women's health study." The descriptive statistics and analyses presented refer to the 406 participants who completed the study (95.3% retention rate). These participants ranged in age from 17 to 25 ($M = 18.60$ years, SD $= 0.97$ years). Highest parental education ranged from 9 to 21 years, with the mean equivalent to a 4-year college degree. According to self-report, 92.4% of the participants were Caucasian, 3.2% Asian, 2.0% Hispanic, 1.2% African American, and 1.1% other ethnicities. Results from this sample have been previously reported.[11,27,28]

Procedure

At time 1 (T1) and time 2 (T2), spaced 11 weeks apart, participants completed questionnaires related to person-

ality and disordered eating. Between T1 and T2, participants completed inventories weekly on assigned dates for 10 weeks, reporting on their previous week's weight/shape, interpersonal, and academic stressors. Informed written consent was obtained, and all aspects of this study were reviewed and approved by the university's Institutional Review Board.[a]

Measures

Perfectionism. Perfectionism was measured at T1 using the perfectionism subscale (6 items; 1 = never to 6 = always) of the Eating Disorder Inventory (EDI)[32] modified to reflect perfectionism in the domains of interest. The original phrasing was kept as intact as possible (e.g., the original item "I have extremely high goals" was changed to "I have extremely high goals for body weight and shape" for the appearance domain). The psychometric properties of the EDI are well-established[32]; in this study, the coefficient α for EDI-Perfectionism modified for a weight/shape focus was 0.81, for an interpersonal focus, 0.78, and for an academic focus, 0.82.

Self-Efficacy. Self-efficacy was measured at T1 using the general subscale (17 items; 1 = disagree to 5 = agree) of the Self-Efficacy Scale[33] modified to reflect self-efficacy in the domains of interest. The original phrasing was kept as intact as possible (e.g., "I feel insecure about my ability to do things" was changed to "I feel insecure about my ability to develop my desired body weight and shape" for the appearance domain). The general self-efficacy subscale has demonstrated good reliability (Cronbach's α of 0.86) and validity.[33,34] In this study, the coefficient α for self-efficacy modified for a weight/shape focus was 0.93, for an interpersonal focus, 0.90, and for an academic focus, 0.90.

Stress. Weekly stress was assessed using an inventory developed for this study. The inventory used a four-point scale from "not at all" to "extremely." The degree of problems, setbacks, or failures for the item "body weight and shape" composed the weight/shape stress measure used in this study, and the item "academics (schoolwork)" composed the academic stress measure. The items "family relationships," "romantic relationships," "same sex friendships (not romantic)," and "opposite sex friendships (not romantic)" were combined to form a composite interpersonal stressor to parallel the single indices of weight/shape and academic stress. For each domain, an average across the 10 weeks of data was computed.

Body Mass Index. At T1, participants reported their current height and weight, which were used to compute body mass index (BMI). Participants' BMIs ranged from 14.76 kg/m^2 to 40.35 kg/m^2, with a mean of 22.00 kg/m^2 (SD = 3.01 kg/m^2). In this sample, 6.2% were underweight (BMI < 18.5), 82.2% were normal weight (BMI, 18.5–24.9), and 11.6% were overweight (BMI ≥ 25).[35]

Dieting. Dieting was measured at T2 with the cognitive restraint subscale (21 items; true–false and Likert response scales) of the Three Factor Eating Questionnaire (TFEQ-R).[3] High dieters based on this subscale have been found to consume fewer calories,[36] and TFEQ-R scores are highest for individuals with chronic AN, followed by those partially recovered, those fully recovered, then controls,[37,38] supporting the TFEQ-R as a measure of actual dieting. High reliability and test–retest reliability have been demonstrated[7]; in this study, the coefficient α at T2 is 0.93.

Binge Eating. Binge eating was measured at T2 using the bulimia subscale of the EDI,[32] which focuses on binge eating behavior and attitudes (rather than purging) and which has been used for screening to detect populations at risk for eating disorders and to differentiate levels of severity of bulimia.[39] The subscale was scored by summing item responses, as done in prior work.[29] Research indicates that this is the most valid scoring approach when using the EDI in nonclinical samples.[40] In this study, the coefficient α for the binge eating measure at T2 is 0.79.

Results

Overview of Data Analytic Strategies

To test the hypotheses presented, a series of hierarchical multiple regression analyses was conducted according to the guidelines of Cohen et al.[41] with outcome variables of T2 dieting and T2 binge eating. The same data analytic approach has been used in all prior work to date on similar interactive models,[30,42] permitting this work to be easily compared with existing work. Based on the strong recommendation by Cohen et al.[41] to center continuous predictors entering into higher order interactions, perfectionism, self-efficacy, and stress were centered before the regression analyses. Centering also addressed multicollinearity.[43b]

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[a]The 11-week period was chosen to allow data to be collected within 1 college semester. Of note, past research on interactive models related to the current model have used varying time lags (5 weeks, 9 months, 2.5 years) with similar findings.[29–31]

[b]All analyses were also conducted with BMI as a covariate in the first step to control for the potential influence of BMI seen in other work on dieting[44] and binge eating.[45] In addition, for each outcome variable, analyses were conducted including the other eating behavior measure as a covariate (e.g., when dieting was being predicted, binge eating was included as a covariate) to control for the potential influence of these behaviors on each other.[2] The same patterns of results emerged when these covariates were included. Thus, for the sake of conciseness, only the results for the analyses without covariates will be reported.

TABLE 1. Means, standard deviations, and intercorrelations of the independent variables and outcome variables

	1	2	3	4	5	6	7	8	9	10	11
1. Time 1 W/ShPerf	M = 15.25 SD = 5.58										
2. Average W/ShStress	0.43***	M = 1.71 SD = 0.68									
3. Time 1 W/ShSE	0.06	−0.19***	M = 54.18 SD = 14.24								
4. Time 1 IntPerf	0.52***	0.26***	−0.07	M = 19.17 SD = 5.73							
5. Average IntStress	0.15**	0.35***	−0.10*	0.24***	M = 1.32 SD = 0.28						
6. Time 1 IntSE	−0.08	−0.15**	0.33***	−0.03	−0.19***	M = 65.79 SD = 11.22					
7. Time 1 AcPerf	0.39***	0.15**	−0.17**	0.45***	0.07	−0.14**	M = 23.89 SD = 5.66				
8. Average AcStress	0.12*	0.37***	−0.14**	0.25***	0.45***	−0.15**	0.12*	M = 1.95 SD = .52			
9. Time 1 AcSE	−0.11*	−0.23***	0.31***	−0.18***	−0.33***	0.42***	0.08	−0.39***	M = 66.55 SD = 9.33		
10. Time 2 TFEQ-R	0.51***	0.45***	0.05	0.30***	0.11*	−0.03	0.17**	0.04	0.01	M = 8.95 SD = 6.13	
11. Time 2 EDI-B	0.38***	0.44***	−0.19***	0.16**	0.12*	−0.21***	0.15**	0.15**	−0.20***	0.34***	M = 9.83 SD = 3.06

W/Sh, weight/shape; Int, interpersonal; Ac, academic; Perf, perfectionism; SE, self-efficacy; TFEQ-R, cognitive restraint subscale of the Three-Factor Eating Questionnaire; EDI-B, bulimia subscale of the Eating Disorder Inventory. For each variable, higher scores reflect higher levels of the variable.

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

TABLE 2. Interpersonal perfectionism, interpersonal stress, interpersonal self-efficacy, weight/shape self-efficacy and the four-way interaction with time 2 TFEQ-R as the outcome measure

Order of entry of predictors	F change for set	t for within set predictors	df for each test	ΔR^2
1. Main effects	10.67**		4, 397	0.10
Interpersonal perfectionism		5.98**	397	
Interpersonal stress		0.76	397	
Interpersonal self-efficacy		−0.54	397	
Weight/shape self-efficacy		1.73	397	
2. Two-way interactions	1.43		6, 391	0.02
IntPerf × IntStress		−0.95	391	
IntPerf × IntSE		0.28	391	
IntPerf × W/ShSE		0.95	391	
IntStress × IntSE		1.24	391	
IntStress × W/ShSE		−0.19	391	
IntSE × W/ShSE		−1.83	391	
3. Three-way interactions	1.63		4, 387	0.02
IntPerf × IntStress × IntSE		0.85	387	
IntPerf × IntSE × W/ShSE		0.18	387	
IntPerf × IntStress × W/ShSE		−0.44	387	
IntStress × IntSE × W/ShSE		−2.44*	387	
4. Four-way interaction	4.69*		1, 386	0.01
IntPerf × IntStress × IntSE × W/ShSE		−2.17*	386	

Interpersonal perfectionism (IntPerf), interpersonal self-efficacy (IntSE), and weight/shape self-efficacy (W/ShSE) refer to time 1 assessments. Interpersonal stress (IntStress) refers to average interpersonal stress based on weekly reports between times 1 and 2. TFEQ-R refers to the cognitive restraint subscale of the Three Factor Eating Questionnaire and was assessed at time 2. ΔR^2 = change in R^2 with the addition of each step in the regression.

* $p < 0.05$.
** $p < 0.001$.

Descriptive Analyses

Table 1 provides the means, standard deviations, and intercorrelations for the independent and outcome variables. The mean of dieting ($M = 8.95$) approached that previously found for individuals who formerly had AN (e.g., $M = 9.9$)[37] who, although no longer meeting DSM-IV criteria, often persist in dieting.[46] This is striking, given that most participants were normal weight. The mean of binge eating ($M = 9.83$) is slightly higher than scores reported for similar samples (e.g., $M = 7.13$, 7.54).[29]

Of note, weight/shape self-efficacy and binge eating were significantly negatively correlated, whereas weight/shape self-efficacy and dieting were positively (although nonsignificantly) correlated. The correlation between self-efficacy in the different domains was moderate (0.31–0.42), suggesting that these constructs are related but not interchangeable. Also, the correlation between dieting and binge eating (0.34) indicates that women engaging in one behavior are not necessarily engaging in the other behavior.

The Appearance Domain

The three-way interaction of T1 weight/shape perfectionism × average weight/shape stress × T1 weight/shape self-efficacy was not associated with T2 dieting [$t(397) = −0.11$, $p = 0.910$, $\Delta R^2 = 0.00$]

or T2 binge eating [$t(397) = −0.50$, $p = 0.621$, $\Delta R^2 = 0.00$)].[c]

The Interpersonal Domain

The four-way interaction of T1 interpersonal perfectionism × average interpersonal stress × T1 interpersonal self-efficacy × T1 weight/shape self-efficacy was significantly associated with T2 dieting [$t(386) = −2.17$, $p = 0.031$, $\Delta R^2 = 0.01$; see **Table 2**]. As shown in **Figure 1** (derived from the regression equation with high and low values of the independent variables based on one standard deviation above and below the mean, respectively), the significant results conformed to prediction, with the highest level of dieting associated with high interpersonal perfectionism, high interpersonal stress, low interpersonal self-efficacy, and high weight/

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[c]In the appearance domain, the two-way interactions involving weight/shape self-efficacy were examined post hoc in an attempt to replicate at some level the relationship that has been found between binge eating and the interaction of the key variable of interest, self-efficacy, with other weight/shape variables. The interaction of T1 weight/shape perfectionism × T1 weight/shape self-efficacy was significantly associated with T2 binge eating [$t(401) = −3.33$, $p = .001$, $\Delta R^2 = 0.02$]. The highest level of binge eating was found with high weight/shape perfectionism and low weight/shape self-efficacy. The interaction of average weight/shape stress × T1 weight/shape self-efficacy was not significantly associated with T2 binge eating [$t(401) = −1.40$, $p = 0.162$, $\Delta R^2 = 0.004$].

FIGURE 1 Time 2 TFEQ-R scores as a function of the interaction among time 1 interpersonal perfectionism, average interpersonal stress, time 1 interpersonal self-efficacy, and time 1 weight/shape self-efficacy.
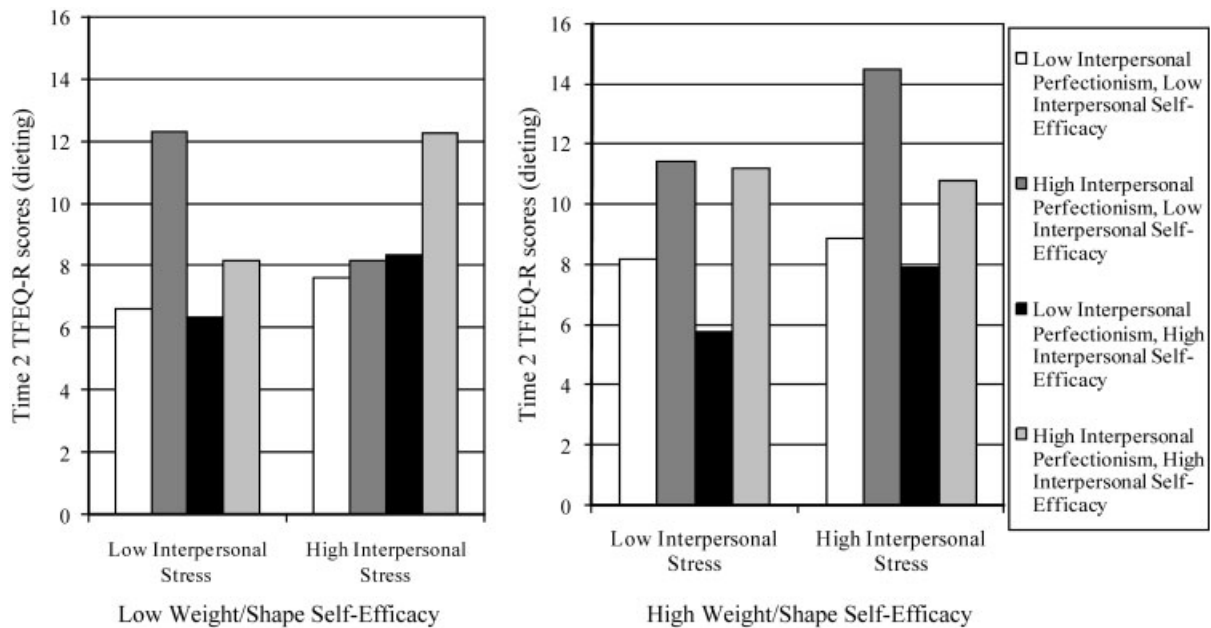
shape self-efficacy. This interaction was not significantly associated with T2 binge eating [$t(386) = -0.46$, $p = 0.645$, $\Delta R^2 = 0.00$)].

The Academic Domain

The four-way interaction of T1 academic perfectionism $\times$ average academic stress $\times$ T1 academic self-efficacy $\times$ T1 weight/shape self-efficacy was not significantly associated with T2 dieting [$t(388) = 0.33$, $p = 0.744$, $\Delta R^2 = 0.00$)] or T2 binge eating [$t(388) = -.84$, $p = 0.401$, $\Delta R^2 = 0.00$)].

Conclusion

This study investigated the association between the interaction of perfectionism, self-efficacy, and stress in different domains and dieting and binge eating. Weight/shape self-efficacy was predicted to be the critical factor distinguishing these eating behaviors. There was some support for the interpersonal interactive models, with level of weight/shape self-efficacy operating as hypothesized, but no support for the appearance or academic interactive models.

Results suggest that high weight/shape self-efficacy may direct eating behavior toward elevated dieting when combined with high interpersonal perfectionism, high interpersonal stress, and low interpersonal self-efficacy. Thus, although there is some evidence that low general self-efficacy may be related similarly to both dieting and binge eating,[14,47] it appears that self-efficacy related to weight/shape in particular may have a unique relationship to dieting. Focusing on the weight/shape domain may allow women to quiet their distress from interpersonal situations they feel little ability to improve. Women's beliefs about the influence of weight on relationships may also be relevant. According to Gerner and Wilson,[48] believing that being thin improves friendships motivates dietary restraint. It could be that increased dietary restraint in this study was not only a way to establish some sense of control or efficacy in a domain in which participants felt highly efficacious but also a way to try to resolve interpersonal stress.

Targeting weight/shape self-efficacy in an effort to achieve a healthy level rather than a markedly high level (e.g., by discussing difficulties with reaching weight goals through continued dieting and by explaining genetic constraints related to weight) could benefit normal-weight or underweight women who are dieting at extreme levels (e.g., women with AN). The nature of the significant interaction found also suggests that decreasing interpersonal perfectionism, decreasing interpersonal stress, and/or increasing interpersonal self-efficacy might contribute to reduce food restriction. At a bivariate level, there was a significant negative

relation between weight/shape self-efficacy and binge eating. Increasing weight/shape self-efficacy (e.g., by facilitating healthy weight loss or maintenance through healthy eating and exercise) may thus be a helpful treatment goal for women who are binge eating.

This study has several strengths. First, it is one of a limited number of studies to examine how potential risk factors differentially relate to dieting and binge eating. Second, hypotheses were developed using a theoretically derived multivariate model with empirical support (i.e., the interactive model of perfectionism, self-efficacy, and stress[9]). This model was further refined to examine specific domains. This study also examined more acute stressors than prior related work, which is a better fit with the vulnerability-stress model proposed. Finally, retention rate was excellent (95.3%).

In terms of measurement, research further establishing the psychometric properties of the domain-specific measures of perfectionism and self-efficacy is warranted, although internal consistencies were excellent in this study (and in a separate study using weight/shape self-efficacy, α were 0.89 and 0.92),[49] and these measures were adapted from well-established measures.[29,30] Relatedly, the stress measure developed for this study, although strong in face validity, was limited in terms of psychometric evidence. Replication with multi-item measures of stress that would more comprehensively assess types of interpersonal stress is recommended. Methodologically, larger samples would increase power, and clinical samples would permit the ability of these interactive models to predict onset of and change in dieting and binge eating across time to be assessed. Transitions from high to low weight/shape self-efficacy (perhaps precipitated by a perceived failure in dieting) may help explain the emergence of binge eating out of a context of dieting, and transitions from low to high weight/shape self-efficacy may help explain (the less common) transitions from binge eating to more exclusively dieting behavior. Future work could also benefit from measures that do not rely on self-report, especially given the recent debate on whether self-report measures, such as the TFEQ-R, measure actual dieting.[50–52] In general, using multiple methods is recommended for establishing validity,[53,54] corroborating findings, and revealing inconsistencies (e.g., with self-report vs. reports from informants[55]). Conceptually, multidimensional perfectionism (e.g., adaptive and maladaptive perfectionism[56]) and other variables that may account for additional variance (e.g., impulsivity[57]) should be considered. Also, negative affect should be tested as a potential mediator between the interacting independent variables and the eating behavior outcomes. Finally, given the empirical support for interpersonal psychotherapy for BN,[58] it is surprising that no significant interpersonal interaction was found for binge eating. Future research should explore the interactive role of these interpersonal variables in samples with higher frequency binge eating and BN.

In summary, this study identified a unique pathway to dieting. In the interpersonal domain, high perfectionism, low self-efficacy, and high stress, in conjunction with high weight/shape self-efficacy, were associated with the highest dieting levels. Level of weight/shape self-efficacy was related to dieting in a manner distinct from previous work on self-efficacy and binge eating, suggesting a role for weight/shape self-efficacy in transitions between the different types of eating behavior.

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