Published in final edited form as:

Int J Eat Disord. 2012 January ; 45(1): 43–50. doi:10.1002/eat.20897.

Examining the Interpersonal Model of Binge Eating and Loss of Control Over Eating in Women

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Abstract

Objective—This study examined the interpersonal model of binge eating (Wilfley et al., *Interpersonal Psychotherapy for Group*, New York: Basic Books, 2000; Wilfley et al., *Arch Gen Psychiatry*, 8, 713–721, 2002; Elliott et al., *Behav Res Ther*, 48, 424–428, 2010) which posits that interpersonal problems lead to negative affect which, in turn, triggers disordered eating.

Method—The model was tested using data from 350 women obtained via an internet assessment method. Analyses examined direct and indirect effects, via depressive/negative affect, of interpersonal problems, including domains of affiliation and dominance on loss of control over eating, binge eating, and eating disorder psychopathology.

Results—Interpersonal problems showed significant effects on binge eating and eating disorder psychopathology that were statistically mediated by depressive/negative affect. Affiliation showed significant effects on binge eating and eating disorder psychopathology with low affiliation effects statistically mediated by depressive/negative affect and high affiliation effects independent of depressive/negative affect.

Discussion—These findings support the interpersonal model of binge eating and highlight the importance of examining specific types of interpersonal problems in understanding heterogeneity of individuals with eating disorder psychopathology.

Keywords

binge eating; eating disorders; interpersonal problems; affiliation; negative affect

Introduction

Problems associated with social interactions are thought to play a role in eating disorders.^{1–3} In particular, interpersonal problems or deficits⁴ and maladaptive methods for coping with negative affect⁵ have been posited to play roles in the development and maintenance of eating disorders and various forms of disordered eating such as binge eating. Building on interpersonal theory originally articulated by Sullivan⁶ and expanding in the focal interpersonal psychotherapy developed initially for depression,⁷ Wilfley et al. developed¹ and tested² Interpersonal Psychotherapy (IPT) for the treatment of problems with binge eating.

Binge eating, defined as eating unusually large amounts of food while experiencing a sense of Loss Of Control (LOC) over the eating, is a feature of certain eating disorders, including bulimia nervosa and binge eating disorder.⁸ The IPT model posits that interpersonal problems and deficits result in negative affect which, in turn, trigger binge eating behaviors (or other features of eating disorders). Figure 1 schematically shows the IPT model of binge eating. IPT trials have produced data consistent with the theoretical framework including significant improvements in interpersonal functioning as assessed by the Inventory of Interpersonal Problems (IIP^{9,10}) during the course of treatment² and IIP scores predict treatment outcomes.¹¹ A recent study by Elliott et al.³ appears to represent the first independent direct test of the IPT model for loss of control eating problems. Elliott et al.³ tested the model in a sample of 217 children and adolescents using LOC over eating as the primary dependent variable (LOC over eating is thought to represent a developmental precursor to binge eating seen in adults). Parental ratings of social problems in the children and adolescents were significantly associated with LOC and this relationship was mediated by negative affect. Surprisingly, except for impressive IPT treatment findings,² there exists a dearth of empirical data regarding the putative model itself. Further research is needed to determine the applicability of the model in adults and whether specific types of interpersonal behaviors are mediated by negative affect in predicting binge eating.

Current conceptualizations of interpersonal theory describe an individual's interpersonal traits, problems or behaviors along two orthogonal dimensions: agency/dominance (also termed assertiveness or control) and communion/affiliation (also termed warmth or love).^{12,13} Interpersonal theory proposes that these two interpersonal styles can comprehensively describe specific interpersonal styles, behaviors and problems within a two dimensional Euclidian framework, described as a circumplex. Agentic or dominant interpersonal behavior ranges from assertive-dominant to unassertive-submissive and refers to the assertion of status relative to others. Communal or affiliative behavior ranges from warm-agreeable to detached-uninterested and refers to the promotion of relationships and interpersonal ties. Interpersonal problems may result in negative affect or emotion dysregulation and specific types of interpersonal problems may exacerbate symptoms or affect outcome of psychopathology.

Preliminary examinations of types of interpersonal problems in other forms of eating pathology suggest that these dimensions may be relevant to understanding, and perhaps expanding, upon the interpersonal model of binge eating. Initial studies on interpersonal theory and eating pathology examined the association between the Structural Analysis of Social Behavior (SASB) and patient groups with bulimia and anorexia nervosa^{14,15} and found that patient groups differed in the interpersonal patterns with family members. Specifically family interactions are characterized by more hostility and more conflicted patterns over control and autonomy.¹⁴⁻¹⁶ Subsequently, Wonderlich and Swift¹⁷ found no differences in interpersonal patterns using the SASB model when depressed mood was statistically controlled. In a recent study, individual differences in interpersonal problems with submissiveness were most common in individuals hospitalized for eating disorders. Over the course of hospital treatment, social avoidance predicted worse outcome for subgroups with bulimia while dominance predicted worse outcome for anorexia.¹⁸ Diverse types of interpersonal problems were found in a sample of college students with bulimic symptoms, and interpersonal problems incremented bulimic symptoms in predicting depression in this sample.¹⁹ Variability in interpersonal problems was also identified in a separate sample of college students with bulimic features. In this sample, affiliation moderated restraint in predicting bulimic symptoms and dominance moderated neuroticism in predicting bulimic symptoms.²⁰ Further research on the types of interpersonal problems associated with binge eating and overall eating psychopathology is needed.

In the present study, we examined the theorized association of interpersonal problems on loss of control over eating (including binge eating) and eating disorder psychopathology and the mediating indirect effect via negative affect in a non-clinical sample of adult women. Our strategy to consider both loss of control over eating (LOC) and overeating unusually large quantities of food while experiencing LOC [i.e., objective bulimic episodes (OBEs)] follows emerging consistent empirical evidence that LOC represents a clinically-meaningful behavior with prognostic significance in a variety of studies (see Ref. 21). In addition, we sought to expand upon the interpersonal model to include specific types of interpersonal problems. Therefore, we examined the direct and indirect effects of specific types of interpersonal problems, dominance and affiliation, in association with negative affect and eating pathology. It was hypothesized that interpersonal problems would have indirect but no direct effects in predicting eating pathology. These indirect effects would be mediated by negative affect. In addition, it was hypothesized that dominance and affiliation would have direct and indirect effects on eating pathology. It may be that unaffiliative individuals experience loss of control and binge eat in response to negative affect while affiliative individuals experience loss of control and binge eat for reasons (e.g., interpersonal demands or stressors) that are independent of negative affect. This information would be useful not only for increasing the specificity of the interpersonal model of binge eating but also for treatment planning based on individual differences in interpersonal problems.

Method

Participants

Participants were 350 female adult community volunteers who responded to online advertisements requesting participation in a research study on eating and dieting. Data reported here were gathered in a specific wave of data collection conducted between December 2008 and May 2009. Data include responses from all female participants who completed the study measures in their entirety (73.5% of respondents). Advertisements were placed on Craigslist internet classified ads and on Google banners, and contained a link to an external website with questionnaires. An attempt was made to sample from a variety of geographic regions by advertising on Craigslist in major cities throughout the United States. The advertisement appeared as a Google banner when users entered the following keywords: “weight gain; body image; binge eating; compulsive eating; obesity; obesity epidemic; obesity test; obesity studies; obesity quiz; weight questionnaire; weight quiz; weight studies; eating test; eating questionnaire.” To ensure geographic distribution, participants were asked to provide their residential zip code. Analysis based on US postal service classifications demonstrated that geographic variability was achieved: in the current sample, 22.9% of participants were from the South, 29.1% from the Northeast, 17.7% from the Midwest, and 29.1% from the West. The study received IRB approval. The racial/ethnic distribution was: 78.6% ($n = 275$) Caucasian, 5.1% ($n = 18$) Hispanic, 4.6% ($n = 16$) African American, 6.9% ($n = 24$) Asian, and 4.3% ($n = 15$) reporting “other.” Two individuals did not provide a response. The mean age was 35 years ($SD = 12$) and the mean body mass index (BMI) was 29.5 ($SD = 8.5$).

Procedure

Participants completed the self-report questionnaires through the online data gathering website SurveyMonkey (<http://www.surveymonkey.com>). Survey Monkey is a research-based web server with secure 128-bit data encryption. Participants were required to affirm willingness to participate and to provide informed consent prior to accessing the questionnaires. No personal identifying information was collected. Participants who completed the questionnaire could choose to enter a drawing for a \$50 gift certificate.

Assessments and Measures

Participants provided basic demographic information, including self-reported height and current weight, and completed a battery of self-report measures. The Inventory of Interpersonal Problems-Short Circumplex (IIP-SC^{9,10}) is a 32-item short version of the inventory of interpersonal problems.^{10,22} The IIP-SC assesses distressing interpersonal behaviors the respondent identifies as “hard to do” (i.e., behavioral inhibitions) or “does too much” (i.e., behavioral excesses) on a Likert scale ranging from 0 (not at all) to 4 (extremely). In addition to the total score, the IIP-SC is commonly scored using the octant subscales. However, the structural summary method for the interpersonal circumplex provides an integrated summary of an individual’s interpersonal profile with scores on the underlying dominance and affiliation dimensions.^{23–25} This method reduces the redundancy of octant scale scores and increases reliability by computing scores on the dominance and affiliation axes that are independent of total score. The IIP-SC has established reliability (subscale alpha coefficients ranging from 0.66 to 0.83 and total scale reliability of 0.89) and validity.⁹ The Eating Disorder Examination-Questionnaire (EDE-Q;²⁶), is the self-report version of the eating disorder examination interview²⁷ which focuses on the previous 28 days and assesses features of eating disorder psychopathology including frequency of different forms of overeating characterized by loss of control (LOC): Objective Bulimic Episodes (OBEs; defined as eating unusually large amounts of food while experiencing a sense of loss of control over the eating) and subjective bulimic episodes (SBEs; defined as eating quantities of food not considered objectively large but while experiencing a sense of loss of control). The EDE-Q also generates four scales (dietary restraint, eating concerns, weight concerns, and shape concerns) and an overall global score reflecting eating disorder psychopathology (excludes the behavioral measures of binge eating and purging). The EDE-Q has received psychometric support, including good convergence with the EDE Interview in studies with diverse subject groups^{28–32} and good test-retest reliability.³³ The Beck Depression Inventory (BDI³⁴) is a widely-used self-report measure of depressive symptoms with well-established reliability and validity.³⁵ Higher scores reflect higher levels of depression and, more broadly, negative affect³⁶ and are an efficient marker for broad psychopathology.³¹

Data Analysis

To test the proposed model (Fig. 1), ordinary least squares and logistic hierarchical regressions were performed as appropriate for the eating disorder pathology variables using SPSS 17.0. Analyses considered the following variables: binge eating (OBEs) and LOC considered both categorically (i.e., absence or presence above once-weekly average frequency) and continuously (i.e., frequency of OBEs and LOC episodes over the previous 28 days), EDE-Q subscales, and EDE-Q global score. Regression analyses were employed to test *a*, *b*, *c*, and *c'* pathways. In all regression analyses, IIP-SC total (or specific dimension) score was entered in the first step and BDI score was entered on the second step. To test the significance of the indirect effects of interpersonal problems on eating disorder psychopathology, we employed the approach by Preacher and Hayes³⁷ involving the SPSS INDIRECT bootstrapping macro. As indirect effects do not meet the normal assumptions, bootstrapping was used to estimate the significance of the indirect effects. Bias corrected and accelerated 95% confidence intervals (CI) were computed using 5,000 bootstrap resamples for each indirect effect point estimate. CIs which do not contain a zero value indicate a significant indirect effect.

Results

Table 1 shows the means, standard deviations, and zero-order correlations for all study variables. Given skewed distributions in the OBE and LOC frequency variables, square root

transformations were performed and the transformed variables were used in all subsequent analyses. Zero-order correlations between IIP-SC total and the affiliation and dominance dimensions were minimal as expected, supporting the examination of these dimensions in the model in addition to the total IIP-SC score. However, the magnitudes of the correlations between dominance and BDI and between dominance and eating disorder psychopathology variables (less than 0.05) did not support the further analysis of indirect effects. Therefore only affiliation and total IIP were examined for direct and indirect effects in the proposed model.

To investigate the model's validity in predicting the presence of OBE and LOC, OLS and logistic regression analyses were conducted and findings are presented in Table 2. Odds ratios and their 95% confidence intervals are presented for the logistic regressions and unstandardized coefficients are presented for OLS regression. IIP-SC total was positively associated with BDI negative affect (Path *a*) and with OBE and LOC occurrence (Path *c*). When BDI was entered as a mediator, BDI was significantly and positively associated with binge eating and LOC (Path *b*). However, IIP-SC total was no longer significantly associated with OBE or LOC (Path *c'*). There was a significant and positive indirect effect for IIP-SC total on OBE and LOC occurrence.

The interpersonal dimension of affiliation was significantly negatively associated with BDI negative affect (Path *a*) but was not associated with OBE or LOC occurrence (Path *c*). However, models of indirect effects do not require an initial association between the independent variable and the dependent variable as long as there is an association with the proposed mediator.^{38,39} This allows for the examination of the suppression of direct effects by the mediating relationship. In the case of affiliation, the inclusion of BDI negative affect in the model highlights a suppressed direct effect. Negative affect (BDI) was positively associated with OBE and LOC occurrence (Path *b*). The indirect effect ($a \times b$) for affiliation on OBE and LOC occurrence was negative, indicating that lower affiliation increases the probability of occurrence of OBE or LOC. However, when BDI is included in the model, the direct effect (Path *c'*) of affiliation on OBE and LOC occurrence was positive, indicating that greater affiliation is associated with increased probability of occurrence of OBE or LOC independent of depressive affect. Thus, lower affiliation is associated with OBE or LOC via negative affect while high affiliation is associated with OBE or LOC independent of negative affect.

Table 3 presents the unstandardized coefficients for the model using OLS regression. R^2 for the models indicate a significant portion of variance in the OBE and LOC frequencies and eating pathology are predicted by IIP-SC and BDI (range 0.11–0.39). In all models, IIP-SC total was positively related to BDI (Path *a*) and BDI was significantly positively associated with eating disorder pathology (Path *b*). When BDI was included in the model, the direct effects of IIP-SC were not significant (Path *c'*). The indirect effects of IIP-SC were all significant as determined by the 95% CI; indicating that greater interpersonal problems were associated with greater eating pathology, more frequent OBE and more frequent LOC via depressed affect. Scores on the affiliation dimension were entered into the mediation model and resulting unstandardized coefficients are presented in Table 3. R^2 for the models indicate a significant portion of variance in the OBE and LOC frequencies and eating disorder psychopathology are predicted by the affiliation dimension and BDI (range 0.11–0.39).

In all models, affiliation was negatively related to BDI (Path *a*) and BDI was significantly positively associated with eating disorder pathology (Path *b*). When BDI was included in the model, the direct effects of affiliation were significant and positive for OBE and LOC frequency, eating concern and weight concern (Path *c'*). This indicates that greater

affiliation was associated with more frequent OBE and LOC as well as greater eating and weight concern, independent of depressed affect. The indirect effects of affiliation were significant as determined by the 95% CI for the majority of eating variables indicating that lower affiliation was associated with greater eating disorder pathology, more frequent OBE and more frequent LOC via depressed affect.

Given the cross-sectional nature of this analysis, we tested an alternative model to the primary theoretical model presented in Figure 1 to examine the specificity of the findings. Specifically, we examined whether depressive/negative affect is statistically mediated by interpersonal problems in its association with eating disorder psychopathology. This model is particularly important given that BDI and IIP were assessed simultaneously in this study. Although interpersonal problems are theoretically hypothesized to increase depressive/negative affect, it is feasible that depressive/negative affect increases interpersonal problems (e.g., distancing oneself from others) and that this leads to problematic eating. This model was tested for all eating disorder psychopathology variables (OBE, LOC, EDE-Q scales). In no instance was the model significant (e.g., interpersonal problems did not mediate associations of depressive/negative affect with eating disorder psychopathology).

Discussion

This study sought to examine the interpersonal model binge eating in a nonclinical sample of adult women. The IPT model posits that interpersonal problems and deficits result in negative affect which, in turn, trigger disordered eating behaviors. Consistent with the IPT theory, interpersonal problems in women had significant indirect associations with loss of control, binge eating, and eating disorder psychopathology via depressive/negative affect. When negative affect was in the model, direct effects of interpersonal problems were not significant and values indicate a full mediation of interpersonal problems. This finding supports the interpersonal model of binge eating¹ and replicates findings from a child and adolescent sample on loss of control eating.³ This represents the first explicit examination of the interpersonal model of binge eating in an adult sample and supports the relevance of the IPT model to eating disorder psychopathology more broadly.

In addition, we sought to examine the role of specific types (affiliation and dominance) of interpersonal problems and the mediating role of negative affect in these associations. Contrary to predictions, dominance was not associated with negative affect, binge eating, or eating disorder psychopathology in this sample. However, affiliation did show significant direct and indirect associations with eating disorder psychopathology. Binge eating and eating disorder psychopathology in individuals with less affiliation, or greater coldness, was mediated by negative affect. However, binge eating and specific forms of eating disorder psychopathology were also greater in individuals with more affiliation problems independent of negative affect. Direct effects of affiliation were significant for some features of eating disorder psychopathology (OBE, LOC, EDE-Q eating concern, and weight concern subscales) but not others (EDE-Q restraint and shape concern subscales). This supports our assertions that specific types of interpersonal problems, particularly those having to do with affiliation, represent a previously unarticulated component of the interpersonal model of binge eating. Negative affect statistically mediated the associations between unaffiliative interpersonal problems (problems with distancing oneself) and binge eating and loss of control over eating. Affiliative interpersonal problems (overly nurturant or problems with boundaries) were associated with binge eating and loss of control independent of negative affect. In addition, the suppression effects seen for the affiliation dimension highlight the importance of controlling for negative affect when examining specific types of interpersonal problems. These results suggest that depressive affect may not be the only pathway by which interpersonal problems can affect the occurrence and frequency of binge eating and

associated features of eating disorder psychopathology in women. This finding will need to be examined in future studies in which a broader negative affect construct is assessed, perhaps via low self-esteem or emotion dysregulation indices.

These findings have particular relevance for the IPT model for binge eating and eating disorder psychopathology. Models of the interpersonal effects on binge eating should consider alternatives to negative affect by which specific types of interpersonal problems may be influencing eating disorder psychopathology. Understanding these pathways could offer additional targets for psychotherapy intervention. Targeting interpersonal problems that result in negative affect may not comprehensively address the social behaviors associated with binge eating. In addition, these findings may inform treatment assignment. Research on interpersonal problems and treatment outcome for other psychological disorders have identified differences in treatment course and outcome depending on types of specific interpersonal problems.^{40–43} Further research is needed to determine whether types of interpersonal problems moderate treatment outcomes for BED and other eating disorders. For example, individuals who are less affiliative may benefit from existing interpersonal psychotherapy approaches due to the focus on negative affect while more affiliative individuals may not show similar reductions in binge eating.

Strengths of this study include the use of a community sample and the method of anonymous data collection which may have increased participants' candor, especially as it pertains to disordered eating.⁴⁴ Limitations include reliance on self-report. Although research has generally found that the EDE-Q converges adequately with the EDE interview, the degree of the convergence for OBEs across patient groups and settings can vary.²⁸ Future studies should test this model using the EDE interview to more rigorously assess eating disorder psychopathology. Studies should test this model in diverse study groups, including men, and specifically in clinical samples of patients with disordered eating. An additional limitation of the current analysis is the cross-sectional nature of the data. Although the dataset provided a unique opportunity to examine a diverse community sample in individuals who are not necessarily seeking treatment, it did not allow an examination of causal processes. In addition, it is possible that the relationship between interpersonal problems, negative affect, and binge eating involves reciprocal processes such that eating disorder psychopathology may increase negative affect and/or interpersonal problems. More definitive tests of the IPT model will require experimental manipulations and longitudinal designs in order to build upon our cross-sectional findings. Future studies should also expand upon the assessment of the negative affect construct and include self-esteem and emotion dysregulation. It may be that the direct effects observed for affiliation are better understood within a broader model of negative affect.

Acknowledgments

Supported by K24 DK070052, K23 DK071646 from the National Institutes of Health.

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FIGURE 1.
The interpersonal model of binge eating and loss of control.

TABLE 1

Means, standard deviations, and correlations among interpersonal, depression/negative affect, and eating disorder psychopathology variables ($N = 350$)

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. IIP-SC Total	69.6	23.9	—									
2. Affiliation	-.04	.62	-.08	—								
3. Dominance	.13	.61	-.14	-.17	—							
4. BDI	14.8	10.9	.59	-.12	-.04	—						
5. OBE frequency	2.7	5.2	.36	.06	-.05	.47	—					
6. LOC frequency	5.5	9.1	.38	.01	-.02	.50	.80	—				
7. EDE-Q total	2.8	1.4	.38	.01	-.03	.61	.47	.53	—			
8. EDE-Q restraint	2.2	1.7	.20	-.06	.02	.33	.24	.34	.76	—		
9. EDE-Q eating concern	2.0	1.6	.41	.02	-.03	.62	.57	.62	.89	.58	—	
10. EDE-Q shape concern	3.9	1.6	.36	.01	-.05	.60	.40	.44	.92	.56	.76	—
11. EDE-Q weight concern	3.3	1.5	.36	.06	-.04	.57	.42	.44	.91	.52	.77	.91

SD = standard deviation; IIP-SC = inventory of interpersonal problems-short circumplex version; OBE = objective bulimic episodes; LOC = loss of control (includes objective bulimic episodes and/or subjective bulimic episodes); EDE-Q = eating disorder examination-questionnaire; BDI = Beck depression inventory.

TABLE 2
Regression analyses of interpersonal variables and BDI on categorical binge eating and loss of control over eating variables ($N = 350$)

χ^2 for Model	Effect of IV on BDI (a)	OR for BDI on DV (b)	95% CI for OR	Total Effect OR (c)	95% CI for OR	Direct Effect OR (c')	95% CI for OR	Point Estimate for Indirect Effect (a $\times$ b)	95 % CI for Point Estimate
HIP-SC total									
OBE 80.23 ***	.59 **	1.11 ***	1.07–1.14	1.03 ***	1.02–1.04	1.003	.99–1.02	.03	.02–.04
LOC 73.40 ***	.59 **	1.11 ***	1.07–1.15	1.03 ***	1.02–1.04	1.002	.99–1.02	.03	.02–.04
Affiliation									
OBE 87.95 ***	–2.02 *	1.12 ***	1.09–1.15	1.30	.92–1.84	1.73 **	1.18–2.56	–.22	–.46–(–.02)
LOC 79.60 ***	–2.02 *	1.12 ***	1.09–1.15	1.26	.89–1.77	1.67 **	1.12–2.5	–.22	–.46–(–.02)

* $p < .05$;
 ** $p < .01$;
 *** $p < .001$.

HIP-SC = inventory of interpersonal problems-short circumplex version; OBE = presence of objective bulimic episodes; LOC = presence of loss of control (includes objective bulimic episodes and/or subjective bulimic episodes); BDI = Beck depression inventory.

TABLE 3
Regression analyses of interpersonal variables and BDI on dimensional eating disorder psychopathology variables ($N = 350$)

	R² for model	Effect of IV on BDI (a)	Effect of BDI on DV (b)	Total Effect (c)	Direct Effect (c')	Indirect Effect (a × b)	95% CI for Indirect Effect
IIP-SC total with BDI on							
OBE frequency	.27***	.27***	.06***	.02***	.005	.02	.01–.02
LOC frequency	.30***	.27***	.08***	.03***	.006	.02	.02–.03
EDE-Q total	.37***	.27***	.08***	.02***	.002	.02	.02–.03
EDE-Q restraint	.11***	.27***	.05***	.01***	.001	.01	.01–.02
EDE-Q eating concern	.39***	.27***	.09***	.03***	.005	.02	.02–.03
EDE-Q shape concern	.36***	.27***	.09***	.03***	.000	.02	.02–.03
EDE-Q weight concern	.33***	.27***	.08***	.02***	.002	.02	.02–.03
Affiliation with BDI on							
OBE frequency	.28***	–2.02*	.06***	.16	.29**	–.13	–.27–(–.02)
LOC frequency	.30***	–2.02*	.09***	.09	.26*	–.18	–.35–(–.02)
EDE-Q total	.38***	–2.02*	.08***	.01	.17	–.16	–.30–(–.01)
EDE-Q restraint	.11***	–2.02*	.05***	–.17	–.06	–.10	–.21–.01
EDE-Q eating concern	.39***	–2.02*	.10***	.05	.24*	–.19	–.37–(–.02)
EDE-Q shape concern	.37***	–2.02*	.09***	.02	.21	–.19	–.35–(–.01)
EDE-Q weight concern	.34***	–2.02*	.08***	.14	.31**	–.17	–.32–(–.02)

* $p < .05$;

** $p < .01$;

*** $p < .001$. Coefficients in table are unstandardized.

IIP-SC = inventory of interpersonal problems-short circumplex version; OBE = objective bulimic episodes; LOC = loss of control (includes objective bulimic episodes and/or subjective bulimic episodes); EDE-Q = eating disorder examination-questionnaire; BDI = Beck depression inventory.