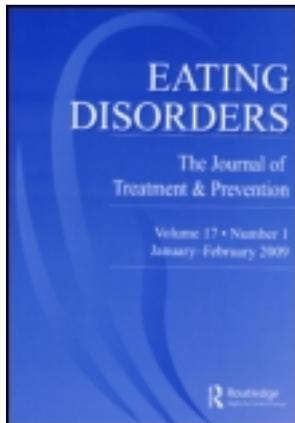


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### Depressive Mood, Eating Disorder Symptoms, and Perfectionism in Female College Students: A Mediation Analysis

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## **Depressive Mood, Eating Disorder Symptoms, and Perfectionism in Female College Students: A Mediation Analysis**

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*Although perfectionism has long been established as an important risk factor for depressive mood and eating disorders, the mechanisms through which this temperamental predisposition mediates the relationship between depressive mood and eating disorder symptoms are still relatively unclear. In this study we hypothesized that both perfectionism dimensions, self-oriented perfectionism and socially prescribed perfectionism, would mediate the relationship between current symptoms of depression and eating disorders in a non-clinical sample of Spanish undergraduate females. Two hundred sixteen female undergraduate students of the University Complutense of Madrid (Spain) completed the Spanish versions of the Eating Attitudes Test (EAT-40), the Multidimensional Perfectionism Scale (MPS), OBQ-44, and BDI-II and BAI. Results demonstrated the importance of socially prescribed perfectionism in mediation of the relationship between depressive mood and symptoms of eating disorders. Socially prescribed perfectionism mediates the relationship between depressive mood and eating disorder symptoms for female college students.*

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The incidence of eating disturbances continues to grow among college students (Kurth, Krahn, Nairn, & Drownowski, 1995; Mulholland & Mintz, 2001) and eating disorders are a pervasive social problem on college campuses, especially among women (Freizinger, Franko, Dacey, Okun, & Domar, 2010). As a consequence of college females being a high-risk group for developing eating disorders, both primary and secondary prevention of eating disorders are needed on campuses.

The use of an information-giving strategy is the main component of prevention programs for younger girls. Crisp (1988) argued that simply by providing students with information, the programs can both prevent new cases from arising and encourage students who already have problems to seek help. People who have eating disorders can experience a spectrum of disabling conditions that share a similar network of inter-related psychopathological processes that contribute to maintenance of the pathology (e.g., perfectionism, depressive mood, low self-esteem, and poor social relationships). This transdiagnostic perspective is relevant in this context because prevention and treatment is not effective unless this disabling network is addressed (Cooper et al., 2010; Egan, Wade, & Shafran, 2011; Fairburn, Cooper, & Shafran, 2003; Goldschmidt et al., 2010; Hilbert et al., 2011; Murphy, Cooper, Hollon, & Fairburn, 2009; Murphy, Straebl, Cooper, & Fairburn, 2010). Consistent with the transdiagnostic paradigm, the objective of this research was to analyze if the perfectionist attitude mediates the relationship between depressive moods and disordered eating behaviors. Results of this analysis will be helpful in developing prevention and treatment programs.

Multiple studies indicate that depressive disorder is the most common co-morbid diagnosis in people with eating disorders (Mischoulon et al., 2011). The role of depression in eating disorders is poorly understood. It is possible that the experience of depression renders an individual more vulnerable to developing an eating disorder. Alternatively, those with eating disorders may be more vulnerable to depression due to negative psychosocial consequences engendered by such disorders (Perez, Joiner, & Lewinsohn, 2004; Santos, Richards, & Bleckely, 2007).

Researchers and clinicians have long hypothesized a relation between eating disorders and obsessive-compulsive traits, including doubting, checking, and need for symmetry and exactness (Shafran, 2002; Wu, 2008). These obsessive traits are persistent and they continue after recovery both from anorexia (Srinivasagam et al., 1995) and bulimia (von Ranson, Kaye, Weltzin, Rao, & Matsunaga, 1999).

Perfectionism has emerged as an important construct with respect to the etiology and maintenance of various types of psychopathology including eating disorders, and it has been a topic of increased interest in recent years (Flett & Hewitt, 2002; Shafran & Mansell, 2001).

The possible relationship between perfectionism and eating disorders has a long history. Over 30 years ago Hilde Bruch, a pioneer researcher

in the field of eating disorders, concluded that individuals with anorexia nervosa were attempting to satisfy “every parent’s and teacher’s idea of perfection” (Bruch, 1978, p. 59).

Recently numerous studies have identified a relationship between eating disorders and perfectionism (c.f., Bardone-Cone et al., 2010, Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Stice, 2002). Several researchers have concluded that perfectionism may be a risk factor for eating disorders in community studies (Fairburn, Cooper, Doll, & Welch, 1999) and clinical samples (Halmi, Goldberg, Eckert, Casper, & Davis, 1979), modifies the course of illness, and remains elevated after recovery (Bardone-Cone, 2007; Jacobi & Fittig, 2010). Perfectionism has consistently been demonstrated to be higher in individuals with eating disorders compared to controls (Egan, Wade, & Shafran, 2011).

Little research has focused on the relationship between multidimensional perfectionism and disordered eating in non-clinical samples. This type of research is undoubtedly important, especially in non-clinical samples composed of undergraduate females for whom disordered eating is prevalent (Cohen & Petrie, 2005). Of the research that has been conducted (Franco-Paredes, Mancilla-Díaz, Vázquez-Arévalo, López-Aguilar, & Alvarez-Rayón, 2005) it has been determined that self-oriented and socially prescribed dimensions of perfectionism are correlated with dietary restraint in female college students (McLaren, Gauvin, & White, 2001) and are associated with anorexic attitudes and behaviors (Sherry, Hewitt, Besser, McGee, & Flett, 2004). In addition, Hewitt, Flett, and Ediger (1995) found that both self-oriented and socially prescribed dimensions were associated with anorexic attitudes and behaviors but that only socially prescribed dimensions was associated with bulimic symptoms. In a sample of young adolescents, McVey, Pepler, Davis, Flett, and Abdolell (2002) found that self-oriented perfectionism but not socially prescribed perfectionism (from the children’s version of the MPS) was associated with higher levels of dietary restraint and weight/food preoccupation.

### The Present Study

This limited literature presents some evidence in non-clinical samples for both self-oriented and socially prescribed dimensions of perfectionism being associated with eating disorders. Given the likely risk that perfectionism might be a mediator in developing disordered eating behaviors and depressive mood among young girls, the purpose of this study was to investigate the mediational influence of perfectionism in depressive mood and eating behavior relationships in a non-clinical Spanish female sample. More specifically, the current study examined the relationships among eating disorder symptoms and depressive mood mediated by perfectionism. Anxious affect and obsessive beliefs were entered as covariates.

We hypothesized that both self-oriented perfectionism (the tendency to hold oneself to high standards) and socially prescribed perfectionism (the predisposition to believe others expect perfection from oneself) would mediate the potential relationship between depressive mood and symptoms of eating disorders.

## METHOD

### Participants

Participants were 216 female undergraduate students enrolled in the General Psychopathology course at Complutense University in Madrid (Spain). They participated either individually or in small groups (no more than 10). No inclusion/exclusion criteria were adopted. Ages of participants ranged from 19 to 30 with a mean age of 21.41 (SD 2.54). Most students (93.3%) were in their second year of Faculty, and most (92.6%) were single and never married. Males were not included in this study.

### Instruments

#### EATING ATTITUDES TEST-40

Eating Attitudes Test 40 (EAT-40) was developed by Garner and Garfinkel (1979). Although EAT-40 was originally designed to screen and assess symptoms of anorexia, now it is used as a general screening measure for disordered eating attitudes in nonclinical samples (Mintz & O'Holloran, 2000). EAT-40 consists of 40 items using a 6 point Likert scale ranging from 6 (*never*) to 1 (*always*). Although there are six response options, items are scored as follows: each extreme response in the pathological eating direction (*never* in questions 1, 18, 19, 23, 27, 39 and *always* in the remaining questions) is assigned 3 points, while the adjacent alternatives are weighted as 2 points and 1 point, respectively. The total score for abnormal eating attitudes and behaviors is the sum of values assigned to response categories in each item. According to Garner and Garfinkel, a score of 30 is commonly used as a cut-off point to identify individuals with anorexia or bulimia. The degree of internal consistency was found to be high for anorexic samples (Alpha = .79) and controls (Alpha = .94) (Garner & Garfinkel). The Spanish version of the EAT-40 has achieved good internal consistency (.93) and concurrent validity (.63) among the Spanish population (Castro, Toro, Salamero & Guimera, 1991).

#### MULTIDIMENSIONAL PERFECTIONISM SCALE—MPS

The 45-item Multidimensional Perfectionism Scale (Hewitt & Flett, 1991) assesses three dimensions of perfectionism: a) Self-Oriented Perfectionism

(SOP)—intrapersonal component that involves exacting standards for oneself and stringently evaluating one's own behavior, b) Social Prescribed Perfectionism (SPP)—interpersonal component involving the perception that significant others hold excessively high standards and expectations of perfection for oneself, and c) Other-Oriented Perfectionism (OOP)—interpersonal component that involves perfectionist standards and demands derived from the self but imposed on others. Participants rate their agreement on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Each subscale has 15 items and the scores can range from 15 to 105. Higher scores reflect greater endorsement of that dimension of perfectionism. Hewitt and Flett reported Cronbach's alphas of .86 and .87, respectively, for self-oriented and socially prescribed perfectionism with a sample of male and female undergraduates and 3-month test-retest reliability coefficients for the self-oriented ( $r = .88$ ) and socially prescribed ( $r = .75$ ) subscales.

#### OBQ-44

The OBQ-44 (Obsessive Compulsive Cognitions Working Group [OCCWG], 2005) is a 44 item scale used to assess a range of belief domains that have been proposed as important in the etiology of OCD. The OCCWG analyzed the originally developed longer version, the OBQ-87, and found three factors with 44 high loading items: perfectionism/certainty, importance/control of thoughts, and responsibility/overestimation of threat. The OBQ-44 demonstrated good internal consistency and criterion-related validity in clinical and non-clinical samples. The internal consistency coefficients (Cronbach  $\alpha$ ) for OBQ total score was .95 (OCCWG, 2005) and Tolin, Worhunsky, and Maltby (2006) reported good internal consistency with Cronbach alphas of .93, .93 and .90 for the three factors.

#### BECK DEPRESSION INVENTORY-II

The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) assesses severity of depressive symptoms within the past 2 weeks and includes 21 items rated on a 4-point Likert scale (range = 0–63). Higher scores suggest increased depression severity. The instrument has excellent reliability and validity with depressed younger and older adults (Nezu, Ronan, Meadows, & McClure, 2000). Internal consistency with reported coefficient alphas of .91 is high (Beck et al.) and test-retest reliability (Sprinkle et al., 2002) of the BDI-II are acceptable (test-retest correlation of .93).

#### BECK ANXIETY INVENTORY

The Beck Anxiety Inventory (BAI; Beck & Steer, 1993) is comprised of 21 items measuring intensity of cognitive, affective, and somatic anxious

symptoms. Respondents are asked to rate how much each symptom has bothered them in the past week. The BAI has excellent internal validity,  $\text{Alpha} = .92$ , satisfactory test retest reliability,  $r = .75$ , and good known-groups, concurrent, and discriminant validity (Beck & Steer).

## Procedures

The questionnaires were administered either individually or in small groups of 2 to 8 participants, as part of a larger project. Consent was obtained from all participants. They read a consent form, which explained that they would receive a course credit for participation, and they were told they could withdraw from the study at any time without penalty. Participants were then given packets with the measures and a short demographic questionnaire. To control for sequence effects, the measures were arranged in four counterbalanced orders and each participant was randomly assigned to receive one of those four orders.

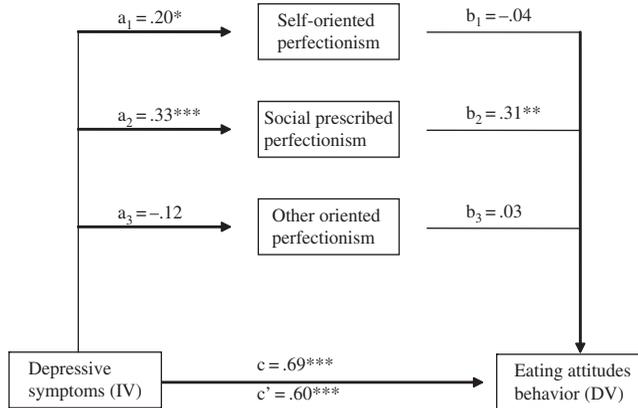
## Statistical Analyses

All statistical analyses were performed with SPSS, version 17.0, for Windows (Copyright, SPSS Inc., 1989–2008). Correlation was computed for EAT-40, MPS dimensions scores, emotional and affective symptoms (The BAI and BDI-II) and Obsessive-Compulsive symptoms (OBQ-44). Then the testing of the multiple mediation hypotheses was conducted with SPSS macros for bootstrapping as provided by Preacher and Hayes (2008). Total score on EAT-40 was used as the dependent variable (DV) and the depressive mood (BDI) as the independent variable (IV); Self-Oriented Perfectionism (SOP), Social Prescribed Perfectionism (SPP) and Other-Oriented Perfectionism (OOP) were tested as mediators (see Figure 1). Obsessive-compulsive behavior (OBQ-44) and the anxious mood (BAI) were entered as covariates. Following recommendations by Preacher and Hayes (2008) we present the bootstrapping sampling procedure (5,000 bootstrap samples) via the Bias Corrected and accelerated (BCa) estimates and 95% confidence intervals to present the indirect effects' significance. An indirect effect (total or specific) was considered to be significant if its 95% bootstrap CIs from 5,000 samples did not include zero at  $\alpha = .05$ .

## RESULTS

### Correlational Analysis

To establish basic relationships between variables we first computed first-order correlations between IV, DV, mediators, and covariates. The means,



**FIGURE 1** Model of multiple mediation among Depressive symptoms (ID), Eating attitudes behaviour (DV) and Dimensions of perfectionism (Mediator variables)  $a_1$ ,  $a_2$ ,  $a_3$  = Direct effects of IV on mediators (a paths);  $b_1$ ,  $b_2$ ,  $b_3$  = Direct effects of mediators on DV (b paths)  $c$  = Total effect of IV on DV (c path);  $c'$  = Direct effect of IV on DV (c prime path); Anxious and Obsessive-compulsive were entered as covariates; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

standard deviations, and intercorrelations of the depressive mood, dimensions of perfectionism, eating disorder symptoms, and clinical measures (anxiety and obsessive symptoms) are presented in Table 1. With respect to trait aspects of perfectionism, SOP and SPP were significantly correlated with EAT-40 total scores; however, OOP was not correlated with eating disorder symptoms. In addition, EAT-40 correlated with depressive mood and other clinical measures (BAI and OBQ-44). Furthermore, the highest significant correlation observed was between eating disorder symptoms and depressive mood and socially prescribed perfectionism.

**TABLE 1** The Pearson Product-Moment Correlation Coefficients Among Quantitative Predictor Variables and the Criterion Variable

	2	3	4	5	6	7	Mean	SD
1 EAT-40	.415**	.218**	.208**	.365**	.120	.252**	19.54	11.28
2 BDI-II		.506**	.214**	.326**	.048	.405**	9.47	7.98
3 BAI			.145	.249**	.121	.214**	29.61	7.66
4 SOP				.481**	.376**	.382**	59.90	8.78
5 SPP					.277**	.303**	60.24	8.49
6 OOP						.202**	58.76	7.56
7 OBQ-44							140.96	33.44

\*\*Correlation is significant at the .01 level 2-tailed.

EAT-40 = Eating Attitudes Test-40; BDI-II = Beck Depression Inventory II; BAI = Beck Anxiety Inventory; SOP = Self-oriented perfectionism; OOP = Other-oriented perfectionism; SSP = Social-prescribed perfectionism; OBQ-44 = Obsessive Compulsive Questionnaire-44.

**TABLE 2** Summary of Multiple Mediator Model Analysis of Depressive Mood on Eating Disorder Symptoms Through Perfectionism Dimensions (Anxious and Obsessive Symptoms Entered as Covariates)

	Effects of IV on M	Effects of M on DV	Direct effects	Point estimate	Indirect effects (ab paths) BCa 95% CI <sup>1</sup>		Total effect
	(a path)	(b path)	c'path		Lower	Upper	c path
Total			.60***	.09	.01	.22	.69***
SOP	.20*	-.04		-.01	-.07	.03	
SPP	.33***	.31**		.10	.03	.24	
OOP	-.12	.03		-.01	-.05	.01	

<sup>1</sup>BCa, bias corrected and accelerated confidence intervals; 5,000 bootstrap samples.

SOP = Self-oriented perfectionism; OOP = Other-oriented perfectionism; SSP = Social-prescribed perfectionism

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

### Testing the Multiple Mediation Model

Results of the Multiple Mediation Model indicated that when taken as set PPT, OOP and SOP mediate effects of depressive mood on eating disorder symptoms. As can be seen in Table 2, the total (c path) and direct effects (c' path) of depressive mood on EAT-40 are .69 ( $p < .0001$ ) and .60 ( $p < .0001$ ), respectively. The partial effect of control variables (BAI and OBQ-44) on the dependent variable (EAT-40) were not significant [ $-.01$  ( $p = .65$ , n.s.) and  $.03$  ( $p = .73$ , n.s.) respectively].

The difference between the total and direct effects is the total indirect effects through the three mediators with a point estimate of .09 and a 95% BCa bootstrap CI of 0.01 to 0.22. That is, the difference between the total and the direct effect of *depressive mood* on *eat* is different from zero.

An analysis of the specific indirect effects indicates that only SPP is a mediator, since its 95% CI does not contain zero. Neither OOP nor SOP contributes to the indirect effect above and beyond SPP.

## DISCUSSION

The main purpose of this study was to investigate the mediation between several dimensions of perfectionism and depressive mood and measures of eating disorder symptoms of Spanish university students. This study supported and extended existing clinically based research by demonstrating the importance of socially prescribed perfectionism in mediating eating disorder symptoms and depressive mood for a sample of female college students.

The finding that socially prescribed perfectionism is a mediator of the relationship between depressive mood and eating disorder symptoms offers support for the hypothesis that eating disorder symptoms are motivated by

a strong need to conform to an ideal of perfection as demanded by self or others. The underpinning belief to this hypothesis is that one must be acceptable to others by meeting their perceived perfectionist requirements (Hewitt et al., 1995). These results support the conclusion that socially prescribed perfectionism is a significant mediator of eating pathology in females (see Bruch, 1981; Stice, 2002).

In addition, this study identified the presence of negative affect among females with eating disorder symptoms. Other researchers have demonstrated that negative affect is a significant predictor of the onset of eating disorder symptoms (Leon, Fulkerson, Perry, Keel, & Klump, 1999; Perez et al., 2004; Spady, Schopflocher, Svenson, & Thompson, 2005; Tykora, Waldron, Graber, & Brooks-Gunn, 2002). For example, Kitsantas, Gilligan, and Kamata (2003) reported that college students with eating disorders and students at risk for developing eating disorders demonstrated higher levels of negative affect than students who did not have eating disorders or associated at-risk behaviors.

Although eating disorder symptoms have been associated with obsessive-compulsive behavior and anxiety (Cassidy, Allsop, & Williams, 1999; Halmi et al., 2003; Kaye et al., 1992; Rothenberg, 1986), in this study obsessive compulsive behavior, as assessed by OBQ-44, and anxiety mood, assessed by BAI, did not covariate with the relationship between depressive mood and eating disorder symptoms.

### Limitations and Future Research

This study has several limitations. First, the sample was limited to only women who were 19–30 years old. Therefore, generalization of findings to all Spanish university students is limited. Future research efforts exploring perceptions of females at various stages of development including adolescence have merit. In addition, research examining perceptions of males would provide useful comparative data.

Another limitation is that due to the self-report nature of the study, results might not reflect participants' actual eating behaviors. It is well known that self-report assessment questionnaires tend to overestimate psychopathology (Beglin & Fairburn, 1992) and no diagnostic interviews were performed to evaluate eating disorder behaviors in this study. Although the EAT-40 is used as a screening instrument to measure eating disorder symptoms, the EAT-40 alone is insufficient when attempting to identify eating disorder behaviors (D'Souza, Forman, & Austin, 2005; Garfinkel & Newman, 2001). Future studies that use a variety of measures, including observations, will help to triangulate data collection and provide a more holistic perspective of eating disordered behavior.

Although results support the conclusion that socially prescribed perfectionism is a significant mediator of eating pathology and depressive mood in females, it would be helpful if future research examined whether

perfectionism dimensions and clinical variables predict change in disordered eating during the application of prevention programs. Studies that examine effects of interventions specifically designed to address issues associated with perfectionism and depression related to eating disordered behavior may provide important information for practitioners.

From a transdiagnostic perspective (Murphy et al., 2010), this research is relevant to epidemiological and treatment programs for eating disordered behaviors on the university campuses and for demonstrating the value of socially prescribed perfectionism in mediating eating disorder symptoms and depressive mood. The correction of this trait should reduce the impact of depression on eating disorders.

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