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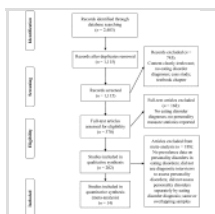
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Eating disorders and personality, 2004–2016: A systematic review and meta-analysis ☆

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Highlights

- Personality traits explain variance in ED symptomatic expression and prognosis.
- We provide a meta-analysis of personality disorder prevalence in EDs.
- Certain traits are frequent among all ED diagnoses, and more so than in controls.
- Avoidant and obsessive–compulsive PDs are the most common PDs in AN-R and BED.
- Borderline and paranoid PDs are also common in AN-BP, BN, and EDNOS.

Abstract

Research and theory suggest that meaningful variance in the onset, clinical course, symptomatic profile, and maintenance of eating disorders (EDs) can be explained by

personality traits. In this article, we provide a systematic review of literature on the link between self-reported personality and EDs, focusing on literature from the past decade and including only articles examining diagnosed EDs. A meta-analysis of the prevalence of interview-based personality disorders (PDs) in EDs is also presented. All ED diagnoses tend to be characterized by elevated perfectionism, neuroticism, and avoidance motivation; heightened sensitivity to social rewards; and lower extraversion and self-directedness than controls. Differences in personality between ED diagnoses also emerged, such as greater impulsiveness among those with bulimia nervosa (BN) than those with anorexia nervosa (AN); however, limited distinctions can be made. Meta-analytic findings revealed that avoidant and obsessive–compulsive PDs are among the most frequently diagnosed PDs in restricting AN and binge-eating disorder, whereas borderline and paranoid PDs are commonly diagnosed in binge-eating/purging AN, BN, and ED not otherwise specified. We conclude that considering personality traits in the treatment of EDs may not only help us better understand their etiology and maintenance, but also develop more effective ways of matching treatment to clients.

Keywords

Personality; Personality disorders; Eating disorders; Anorexia nervosa; Bulimia nervosa; Binge-eating disorder

1. Introduction

Personality is the set of psychological qualities that contribute to an individual's enduring patterns of feeling, thinking, and behavior ([Cervone & Pervin, 2009](#)). Research linking personality and eating disorders (EDs) has compared personality traits and profiles of those with EDs to controls, as well as those distinct to specific ED diagnoses, including anorexia nervosa, restricting type (AN-R); anorexia nervosa, binge-eating/purging type (AN-BP); bulimia nervosa (BN); binge-eating disorder (BED); and eating disorder not otherwise specified (EDNOS). In addition, rates of personality disorders (PDs) are also elevated among those with EDs compared to controls. Note that almost all relevant studies published in the past decade used DSM-IV diagnoses.

A previous review described associations between EDs and personality and posited theoretical linkages between personality traits in the etiology, symptomatic expression, and maintenance of EDs ([Cassin & von Ranson, 2005](#)). Several other reviews have also addressed the topic of personality and EDs (e.g. [Atiye, Miettunen, & Raevuori-Helkamaa, 2015](#); [Bardone-Cone et al., 2007](#); [Culbert, Racine, & Klump, 2015](#); [Sansone, Levitt, &](#)

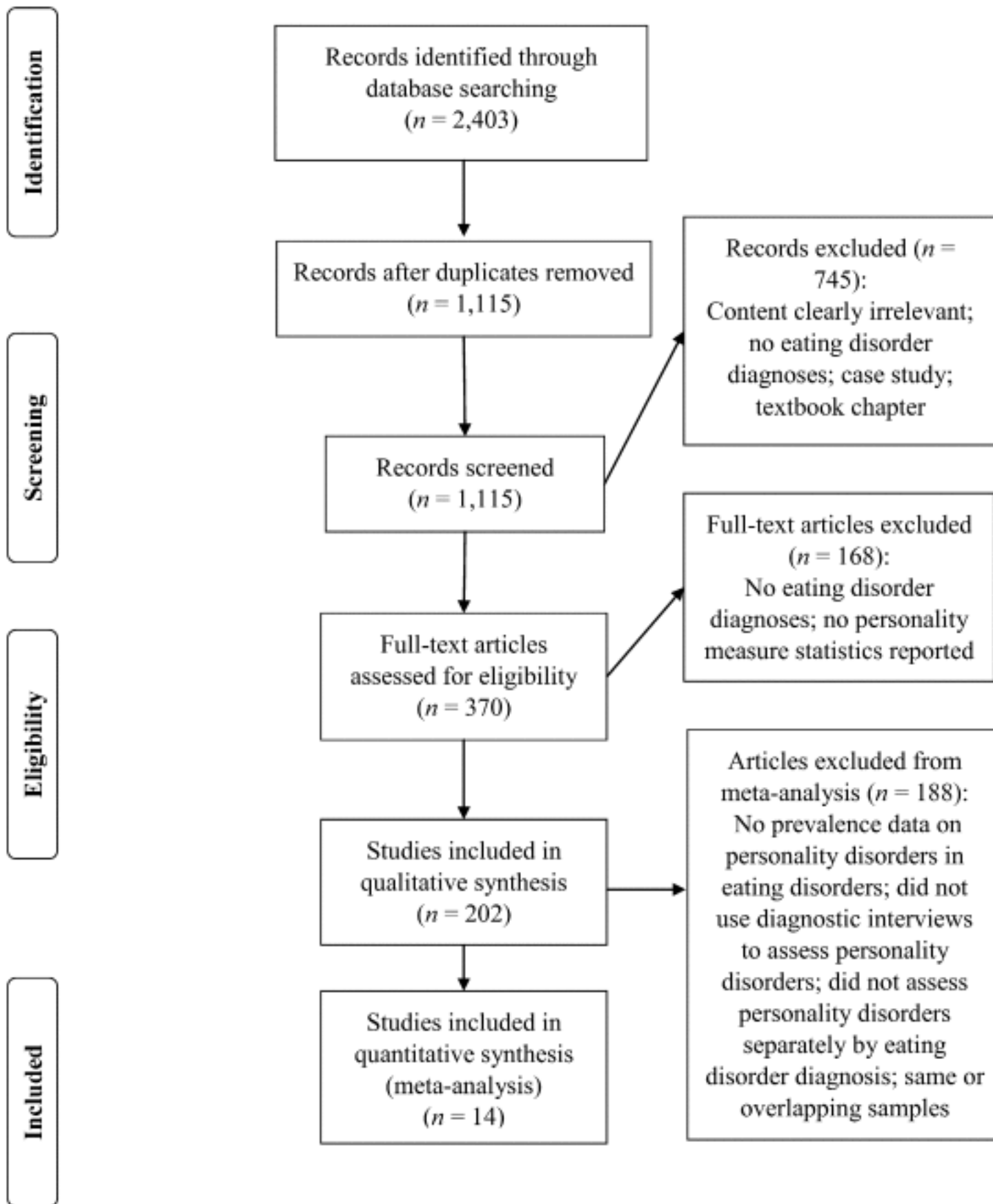
[Sansone, 2005](#); [Vitousek & Manke, 1994](#)). Although it may be commonly assumed that stable personality traits logically precede and contribute to ED symptoms, it is important to note that personality and EDs may interact in a variety of ways. Several conceptual models exist to describe potential causal or correlational relationships between personality and EDs, including that personality traits may serve as predisposing factors, risk factors, or complications of an ED; the possibility that personality and EDs may share common etiological factors; and that personality traits may influence ED course and treatment outcome ([Lilenfeld, Wonderlich, Riso, Crosby, & Mitchell, 2006](#)). Furthermore, acute starvation influences personality and behavior ([Keys, Brozek, Henschel, Michelsen, & Taylor, 1950](#)), including ED-like behaviors, and it is not clear how long and to what degree such personality changes persist after ED behaviors cease. Semistarvation complicates further the discrimination of trait and state characteristics ([Vitousek & Stumpf, 2004](#)). Additionally, response distortion and denial can impact the accuracy of self-reported personality among those with EDs, suggesting inferences should be made cautiously ([Vitousek & Stumpf, 2004](#)). Finally, the dimensional versus categorical structure of personality and EDs continues to be debated ([Lilenfeld et al., 2006](#); [Wildes & Marcus, 2013](#)).

It is in this context that we present this review. We have sought to build on previous reviews by focusing where possible on broad personality constructs rather than specific personality measures in this synthesis of current knowledge on links between personality traits and EDs across diverse assessment measures. The current review had three purposes. First, we aimed to provide a comprehensive, critical, systematic review of the literature linking personality and EDs, with an emphasis on publications since 2004. Although research on BED was notably lacking when [Cassin and von Ranson \(2005\)](#) conducted their review, it has since expanded. We evaluated whether and how understandings of associations between diagnosed EDs and personality have changed over the past decade. Second, we aimed to conduct a meta-analysis of PD prevalence rates among individuals with specific ED diagnoses, including previously little-studied AN-BP and BED. Third, we aimed to synthesize the literature to highlight the extent of current knowledge on personality and EDs, existing gaps in understanding, and future research directions.

2. Methods

We conducted a comprehensive literature search of English language articles in the PsycINFO and Medline databases published between September 2004 and February 12, 2016. As our initial search identified a very large number of articles (> 400), we limited our search to studies examining self-reported personality traits and interview-based PDs among adolescents and adults with ED diagnoses, and excluded studies that described disordered eating symptoms only. See [Fig. 1](#) for a PRISMA diagram ([Moher, Liberati, Tetzlaff, Altman, &](#)

The PRISMA group, 2009) depicting the selection of articles for the review. ED keywords searched included: eating disorder, anorexia, anorexia nervosa, bulimia, bulimia nervosa, binge eating, binge eating disorder, EDNOS, and eating disorder not otherwise specified. Personality keywords included: personality, temperament, personality disorder, axis II, NEO Personality Inventory, NEO-PI, Eysenck Personality Questionnaire, EPQ, Multidimensional Personality Questionnaire, MPQ, Minnesota Multiphasic Personality Inventory, MMPI, Tridimensional Personality Questionnaire, TPQ, Temperament and Character Inventory, and TCI. These search terms were the same as those used by Cassin and von Ranson (2005), except that we included three additional terms: binge eating disorder, EDNOS, and eating disorder not otherwise specified.



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Fig. 1. PRISMA diagram illustrating the selection of articles for the review.

The review is organized to present traits that have traditionally been the most commonly studied in the EDs first, followed by assessments of normative personality, personality pathology, diagnosable PDs, and finally personality subtype classifications. As indicated above, wherever possible, we focused on identifying associations between EDs and broad personality constructs rather than measure-specific scales. Decisions about which scales to

include within each personality construct were based on the following meta-analyses and factor analytic studies examining links among different measures of personality (Caseras, Àvila, & Torrubia, 2003; Fischer, Smith, & Cyders, 2008; Smillie, Jackson, & Dalgleish, 2006; Whiteside & Lynam, 2001; Zelenski & Larsen, 1999). See Appendix A for a list of measures used to assess each personality construct.

3. Eating disorders and personality traits

3.1. Perfectionism

Perfectionism is a trait characterized by setting unrealistically high standards for oneself despite adverse consequences (Cassin & von Ranson, 2005). Most measures take a unidimensional approach to studying perfectionism; however, two measures, both named the Multidimensional Perfectionism Scale, take a multidimensional approach. The Frost Multidimensional Perfectionism Scale (Frost MPS; Frost, Marten, Lahart, & Rosenblate, 1990) assesses five components, including Concern over Mistakes, Parental Criticism, Personal Standards, Doubts over Actions, and Organization. The other scale (MPS; Hewitt & Flett, 1990), which assesses Self-Oriented, Other-Oriented, and Socially Prescribed perfectionism, was not used over the past decade among individuals with diagnosed EDs, so it is not discussed further.

Individuals with AN, BN, BED, and EDNOS tend to score higher than non-ED controls on unidimensional measures of perfectionism (e.g. Fassino, Amianto, & Abbate-Daga, 2009; Hilbert et al., 2014; Nunez-Navarro et al., 2012). When assessed using the Frost MPS, both those with AN and BN endorsed excessive concern about mistakes and doubts about the quality of their actions (Boisseau, Thompson-Brenner, Pratt, Farchione, & Barlow, 2013; Wade et al., 2008). Disorder-specific predictors were also identified: those with AN endorsed high personal standards (Wade et al., 2008), whereas those with BN perceived high levels of parental criticism (Boisseau et al., 2013). When comparing individuals with AN to those with BN and EDNOS, most studies suggest similar scores on perfectionism (e.g. Dellava, Thornton, Lichtenstein, Pedersen, & Bulik, 2011; Fassino et al., 2009; Southgate, Tchanturia, Collier, & Treasure, 2008; Tasca et al., 2012).

Although limited, studies in BED have consistently found that women with BED report similar levels of perfectionism to those with BN (Hilbert et al., 2014; Nunez-Navarro et al., 2011; Villarejo et al., 2014). However, when compared to controls, findings have been inconsistent: one study found that obese women with BED did not differ from obese or normal-weight controls (Villarejo et al., 2014) whereas another found that women with BED reported higher levels of perfectionism than controls (Hilbert et al., 2014). The findings may be inconsistent because actual differences between BED and controls in perfectionism are small and the

study by [Hilbert et al. \(2014\)](#) had greater power to detect these differences.

Perfectionism is generally positively associated with ED psychopathology in ED samples. When using the Frost MPS in clinical samples, the use of compensatory behaviors was associated with excessive concern about mistakes, doubts about the quality of one's actions, and high levels of perceived parental criticism ([Reba et al., 2005](#); [Shroff et al., 2006](#); [Tozzi et al., 2006](#)). Although some studies have shown that scores on perfectionism can improve with treatment and possibly return to normal levels at discharge (e.g. [Bachner-Melman, Zohar, & Ebstein, 2006](#); [Ro, Martinsen, Hoffart, Sexton, & Rosenvinge, 2005](#)), the bulk of existing research over the past two decades suggests that perfectionism does not improve with treatment among women with AN or BN (e.g. [Aguera et al., 2012](#); [Cassin & von Ranson, 2005](#); [Segura-Garcia, Chiodo, Sinopoli, & De Fazio, 2013](#)).

3.1.1. Summary

Consistent with the findings of previous reviews ([Bardone-Cone et al., 2007](#); [Cassin & von Ranson, 2005](#); [Vitousek & Manke, 1994](#)), research over the past decade suggests that those with AN and BN report greater perfectionism than controls, individuals with different ED diagnoses score similarly to each other on measures of perfectionism, and levels of perfectionism do not tend to improve after treatment in AN or BN. More research is needed to clarify inconsistencies related to the relationship between perfectionism and BED.

3.2. Impulsiveness

Impulsiveness is understood to be a multifaceted construct composed of at least five different facets: negative urgency (i.e., tendency to engage in impulsive behavior when experiencing strong negative emotions), positive urgency (i.e., tendency to engage in impulsive behavior when experiencing strong positive emotions), lack of planning (i.e., inability to consider the consequences of one's behavior), sensation seeking (i.e., the desire for thrills and excitement), and difficulty persisting on tasks (i.e., inability to persist on tasks when bored and/or fatigued) ([Cyders et al., 2007](#); [Whiteside & Lynam, 2001](#)).

Negative urgency tends to be greater among those with, than those without, EDs (e.g. [Boisseau et al., 2012](#); [Fischer, Settles, Collins, Gunn, & Smith, 2011](#); [Fischer et al., 2008](#); [Rosval et al., 2006](#)). However, in a sample of individuals seeking weight loss treatment, those with and without BED scored similarly on negative urgency, suggesting that negative urgency may also be elevated in obese, non-binge-eating populations ([Nasser, Gluck, & Geliebter, 2004](#)). Negative urgency is consistently associated with increased binge eating and purging as well as loss of control eating (e.g. [Brownstone, Bardone-Cone, et al., 2013](#); [Forney, Haedt-Matt, & Keel, 2014](#); [Hoffman et al., 2012](#)). When comparing different EDs, those with AN and EDNOS tend to score similarly on negative urgency, those with BN tend

to score higher than those with AN, and those with AN-BP tend to score higher than those with AN-R (Claes, Vandereycken, & Vertommen, 2005; Le Grange et al., 2013). To date, only one study has examined positive urgency among individuals with diagnosed EDs. In a large study of women, positive urgency was elevated in AN-BP, BN, and EDNOS relative to AN-R and healthy controls (Claes et al., 2015).

Among the numerous measures of lack of planning, results obtained have varied depending upon the measure used. Across most measures, those with BN scored higher than those with AN on lack of planning (e.g. Claes et al., 2005; Rosval et al., 2006; Vervaet, van Heeringen, & Audenaert, 2004). When using the Barratt Impulsiveness Scale (BIS) — Motor subscale to assess lack of planning, those with EDs scored higher than controls and those with AN-BP scored higher than those with AN-R (Nasser et al., 2004; Rosval et al., 2006). However, when using any other measure to assess lack of planning (e.g., UPPS-R Premeditation scale; Multidimensional Personality Questionnaire — Control), no significant differences emerged (e.g. Fischer et al., 2011; Peterson et al., 2010; Rosval et al., 2006). One possible reason for these discrepant findings is that the BIS Motor scale is focused on behaviors whereas the other measures focus on cognitive aspects of planning.

Levels of sensation seeking tend to vary by ED diagnosis. Relative to controls, those with AN scored lower whereas those with BN and EDNOS scored higher on sensation seeking (e.g. Atiye et al., 2015; Klump et al., 2004; Miettunen & Raevuori, 2012). Those with BED do not tend to differ from controls on sensation seeking (Davis, Levitan, Carter, et al., 2008; Villarejo et al., 2014). When comparing across ED diagnoses, those with BN scored higher than those with AN (e.g. Fassino et al., 2009; Vervaet et al., 2004) yet scored similarly to those with BED on sensation seeking (e.g. Nunez-Navarro et al., 2011; Villarejo et al., 2014). Most studies have found no differences in sensation seeking between those with EDNOS and other EDs (e.g. Klump et al., 2004; Rodriguez-Cano, Beato-Fernandez, Moreno, & Vaz Leal, 2012); however, two studies found that those with EDNOS scored higher than those with AN on sensation seeking (Abbate-Daga, Gramaglia, Amianto, Marzola, & Fassino, 2010; Santonastaso et al., 2009). In a large sample of outpatients, Santonastaso et al. (2009) found that those with a type of EDNOS characterized by symptoms of AN without amenorrhea reported greater sensation seeking than those with AN and other types of EDNOS, such as those with AN symptoms but no drive for thinness or severe underweight status. These results suggest that the specific symptoms that a person with EDNOS exhibits may be more related to scores on sensation seeking than the EDNOS diagnostic category itself. The association of sensation seeking with ED behaviors such as binge eating and compensatory behaviors has been inconsistent, but two studies found that sensation seeking was negatively associated with compulsive exercise (Dalle Grave, Calugi, &

Marchesini, 2008; Shroff et al., 2006). In addition, a meta-analysis concluded that sensation seeking had a small but significant association to symptoms of BN (Fischer et al., 2008).

The relationship between lack of persistence and EDs also tends to vary depending upon the ED diagnosis: those with AN score lower than controls, that is, reporting greater persistence (e.g. Atiye et al., 2015; Miettunen & Raevuori, 2012), and those with BN and EDNOS score similarly to controls (e.g. Abbate-Daga, Piero, Gramaglia, & Fassino, 2005; Amianto et al., 2012; Klump et al., 2004). In addition, those with BN tend to score higher than those with AN, whereas those with EDNOS cannot be distinguished from other EDs (e.g. Klump et al., 2004; Miettunen & Raevuori, 2012; Rodriguez-Cano et al., 2012). Few studies have examined this impulsiveness facet in BED. Two studies found that those with BED were indistinguishable from those with BN (Nunez-Navarro et al., 2011; Villarejo et al., 2014), and one study found that obese women with BED reported greater lack of persistence than normal weight and obese controls (Villarejo et al., 2014). More research is needed to determine whether lack of persistence is elevated among women with increased weight, or BED, relative to controls. In a meta-analysis, lack of persistence showed a small, positive relationship with BN symptoms (Fischer et al., 2008).

3.2.1. Summary

Consistent with previous reviews (Cassin & von Ranson, 2005; Culbert et al., 2015), the most consistent findings are that negative urgency is elevated across all EDs, and that those with BN score higher than those with AN on each facet of impulsiveness. Findings on EDNOS vary depending on the type of impulsiveness but generally have found that EDNOS cannot be distinguished from other EDs; however, findings may depend upon the specific symptom profile. The limited research on BED suggests that individuals with BED score similarly to those with BN on both sensation seeking and lack of persistence. This review builds on previous reviews by considering a multidimensional assessment of impulsiveness, indicating that those with AN are more impulsive than controls on only one facet of impulsiveness: negative urgency. Therefore, negative urgency may represent a common vulnerability factor for all EDs.

3.3. Associations of impulsiveness and compulsiveness

Despite generally higher levels of impulsiveness among those with BN compared to AN (Claes et al., 2005), the tendency to conceptualize BN primarily as a disorder of impulsivity may be inappropriate (Engel et al., 2005; Espelage, Mazzeo, Sherman, & Thompson, 2002; Westen & Harnden-Fischer, 2001). In fact, impulsivity and compulsivity—the latter a tendency towards overcontrolled behavior—have been found to be positively correlated (Engel et al., 2005). Analyses tend to show that among individuals with BN, four impulsivity-

compulsivity groups tend to emerge: low-low, low-high, high-low, and high-high; and these groupings tend to vary in personality pathology (Engel et al., 2005). Generally speaking, the low-low group exhibits the least personality pathology, eating pathology, and depression, whereas the high-high group demonstrates the most personality pathology, eating pathology, and depression (Engel et al., 2005). This finding serves as an important reminder that although it is fruitful to consider specific personality traits alone, one must not lose sight of the possible interaction of personality traits in understanding psychopathology.

3.4. Approach and avoidance motivation

Approach and avoidance motivation are theorized to underlie personality. Approach motivation refers to the tendency to move towards—or approach—rewarding situations, whereas avoidance motivation refers to the tendency to move away from—or avoid—situations associated with punishment (Elliot, 2006). The relationship between approach motivation and EDs is inconsistent and varies depending upon the measure that is used. Those with AN, BN, and BED scored higher than controls on the Sensitivity to Reward scale of the Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ; e.g., Davis, Levitan, Carter, et al., 2008; Frank et al., 2012; Frank, Reynolds, Shott, & O'Reilly, 2011; Torrubia, Ávila, Moltó, & Caseras, 2001) but not the Behavioral Activation System (BAS) Drive and Reward Responsiveness scales (e.g. Carver & White, 1994; Davis, Levitan, Kaplan, et al., 2008, Monteleone, Scognamiglio, Monteleone, Perillo, & Maj, 2014). These discrepant results may be due to differences between the two measures: the Sensitivity to Reward scale has items that refer to social situations and social rewards (e.g., praise, social standing, affection) whereas the items on the BAS scales refer to generic situations. Those with EDs appear to have elevated responsiveness to rewards specifically in social situations.

Avoidance motivation is consistently elevated among individuals with AN, BN, and EDNOS relative to controls (e.g. Atiye et al., 2015; Klump et al., 2004; Monteleone et al., 2014; Taborelli et al., 2013). Individuals with BED also have elevated avoidance motivation relative to normal-weight controls (Davis, Levitan, Carter, et al., 2008; Peterson et al., 2010); however, the results are inconsistent regarding how they compare to obese controls (Davis, Levitan, Carter, et al., 2008; Villarejo et al., 2014). When comparing across EDs, those with AN, BN, and EDNOS tend to score similarly on avoidance motivation (e.g. Bueno et al., 2014; Klump et al., 2004); however, two studies found that purging disorder, a variant of EDNOS in DSM-IV, was associated with lower avoidance motivation compared to BN (Brown, Haedt-Matt, & Keel, 2011; Keel, Haedt, & Edler, 2005). Research on BED is limited and findings have been inconsistent. One study found that women with BN and BED scored similarly on avoidance motivation (Nunez-Navarro et al., 2011) and another found that obese women with BN scored higher on avoidance motivation than obese women with BED

(Villarejo et al., 2014). More research on BED is needed to clarify these inconsistencies.

Avoidance motivation has been positively associated with objective binge episodes, laxative abuse, diet pill use, dietary restriction, and emotional eating (Banos et al., 2014; Brown et al., 2011; Reba-Harrelson et al., 2008; Tozzi et al., 2006). Multiple studies have shown that scores on avoidance motivation decrease with treatment (e.g. Calugi, Dalle Grave, & Marchesini, 2013; Segura-Garcia et al., 2013); however, individuals with AN are more likely to return to normal levels of avoidance motivation than those with BN (Klump et al., 2004).

3.4.1. Summary

Consistent with a previous meta-analysis (Harrison, O'Brien, Lopez, & Treasure, 2010), our review suggests that individuals with EDs consistently avoid situations associated with punishment more than normal-weight controls. Our review also suggests that those with EDs tend to approach socially-rewarding situations. The distinction between general reward responsiveness and social reward responsiveness was not made by Harrison et al. (2010), possibly because they did not include the SPSRQ in their review. Therefore, further research is needed to clarify the relationship among different types of approach motivation and EDs using a variety of measures.

4. Eating disorders and broadband measures of personality

4.1. Omnibus measures of normal personality

Broadband or omnibus personality measures aim to characterize normal personality dimensions. Given that the NEO Personality Inventory Revised (NEO-PI-R; Costa & McCrae, 1992) and Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1991) overlap in their assessment of neuroticism and extraversion, two of the traits most robustly associated with EDs, we discuss these two measures together. The Multidimensional Personality Questionnaire (MPQ; Tellegen, 1990), Freiburg Personality Inventory (FPI; Fahrenberg, Hampel, & Selg, 2004), and the Temperament and Character Inventory (TCI; Cloninger, 1994) are discussed subsequently.

4.1.1. NEO Personality Inventory and Eysenck Personality Questionnaire

The five factor model of personality (FFM) tapped by the NEO-PI-R postulates that personality is comprised of five broad domains: Neuroticism (i.e., anxiety, depression, impulsiveness, and stress vulnerability), Extraversion (i.e., gregariousness, assertiveness, and excitement seeking), Openness to Experience (i.e., adventurousness and imaginativeness), Agreeableness (i.e., compliance, cooperativeness, and modesty), and Conscientiousness (i.e., orderliness, deliberateness, and self-discipline) (Costa & McCrae, 1992).

Individuals with AN-R, AN-BP, and BN consistently report higher levels of Neuroticism and lower levels of Extraversion than non-ED controls, which corresponds with common emotion regulation difficulties and interpersonal problems among ED populations (Tasca et al., 2009). Although less studied, individuals with BED also appear to exhibit significantly higher levels of Neuroticism when compared to normal-weight controls (Izidorczyk, 2012). Research on the remaining FFM traits among those with EDs is less consistent. Thus far, minimal research has investigated Openness to Experience in individuals with EDs, and results have been mixed (Bollen & Wojciechowski, 2004; Podar, Jaanisk, Allik, & Harro, 2007). Research from the past decade suggests the association between Agreeableness and EDs is mixed but may depend on the particular ED diagnosis. In a study of a community-based sample, those with AN-R reported similar levels of Agreeableness as controls, whereas AN-BP and BN reported less Agreeableness (Tasca et al., 2009). In another study which used hospitalized inpatients, specific ED diagnoses did not vary on Agreeableness (De Bolle et al., 2011). Thus, Agreeableness may be related to symptom severity. When considered altogether, individuals with EDs generally report lower scores on Conscientiousness than controls (Podar et al., 2007), consistent with previous conclusions; however, one study reported that those with AN-R scored similarly to controls and higher on Conscientiousness than those with BN and AN-BP (Tasca et al., 2009).

4.1.2. Multidimensional Personality Questionnaire

The MPQ (Tellegen, 1990) is a self-report measure that assesses normal-range personality characteristics on 3 higher-order factors and 11 primary scales. Compared to normal-weight controls, individuals with BN reported significantly higher Negative Emotionality and lower Positive Emotionality, whereas those with BED scored significantly lower on Positive Emotionality alone (Peterson et al., 2010). These results are consistent with those of a previous review done by Vitousek and Manke (1994). However, when self-reported depression symptoms, measured by the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), were introduced as a covariate, group differences disappeared. Thus, the presence of a mood disturbance may complicate assessments of higher-order personality dimensions such as Positive and Negative Emotionality, as it may be difficult to differentiate whether the apparent negative affect is state-dependent or indicative of a more enduring trait. Nonetheless, those with BN scored significantly higher than those with BED, normal-weight controls, and obese controls on Stress Reaction (Peterson et al., 2010), which is consistent with the typical profile of elevated neuroticism in BN (Peterson et al., 2010). Comparisons across treatment-seeking and non-treatment-seeking women with AN have revealed that those who do not seek treatment report lower scores on Stress Reaction and Alienation, and lower Negative Emotionality overall, which suggests that higher levels of negative emotions may help motivate women with AN to seek

treatment (Perkins, Klump, Iacono, & McGue, 2005).

4.1.3. Summary of NEO-PI-R, EPQ, and MPQ

Taken together, and consistent with previous reviews (Cassin & von Ranson, 2005; Culbert et al., 2015; Vitousek & Manke, 1994), results using these measures suggest that those with EDs are more prone to experiencing elevated levels of negative emotions compared to controls; however, this association may disappear after taking into account levels of depressive symptoms. Additionally, those with AN-BP and BN tend to report greater negative emotionality than those with AN-R and BED.

Individuals with EDs tend to score lower on Extraversion, and those with BN and BED score lower on Positive Emotionality, than controls. Findings regarding Positive Emotionality and Extraversion are consistent with a review conducted by Vitousek and Manke (1994) but inconsistent with those of Cassin and von Ranson (2005), the latter of whom reported weak to nonexistent associations between Extraversion and ED symptomatology in both clinical and nonclinical samples. The inconsistent findings can be attributed to Cassin and von Ranson (2005) having cited Gual et al. (2002) as the most persuasive study in their review because of its large, community sample; however, their conclusion was based on a lack of association between Extraversion and scores on the Eating Attitudes Test (EAT-40; Garner & Garfinkel, 1979), which assesses disordered eating symptoms rather than ED diagnoses. Results from the past decade have been inconsistent regarding Openness to Experience and Agreeableness; more research is needed to determine how individuals with EDs compare to controls on these traits and whether there is consistent variation across ED diagnoses.

4.1.4. Freiburg Personality Inventory

A large, multi-center European study using the Freiburg Personality Inventory-Revised (FPI-R; Fahrenberg et al., 2004) reported that young women with EDs reported lower levels of Life Satisfaction and Health Concern and higher levels of Social Orientation, Inhibition, Irritability, Strain, Somatic Complaints, and Emotionality when compared to controls (Massoubre et al., 2005). Women with AN-R, AN-BP, and BN-Nonpurging type (BN-NP) scored lower on Extraversion than controls. Those with AN scored lower on Frankness and Extraversion than those with BN, but scored higher on Inhibition and Health Concern. In addition, those with AN-R scored lower on Aggressiveness than those with BN and lower on Emotionality than those with AN-BP or BN.

4.1.5. Temperament and Character Inventory

Although certain TCI personality dimensions map onto the personality constructs of impulsiveness (i.e., Persistence, Novelty Seeking) and avoidance motivation (Harm

Avoidance) discussed above, we now discuss the three character dimensions Self-Directedness, Cooperativeness, and Self-Transcendence, as well as the temperamental trait Reward Dependence. The Self-Directedness scale assesses an individual's level of responsibility, reliability, resourcefulness, and self-confidence (Cloninger, 1994); research over the past decade has consistently found that those with EDs score lower than controls on this trait (e.g. Alvarez-Moya et al., 2007; Klump et al., 2004; Villarejo et al., 2014). Binge eating, purging, and emotional eating tend to be negatively associated with scores on Self-Directedness (Banos et al., 2014; Dalle Grave, Calugi, & Marchesini, 2012; Reba et al., 2005; Rotella et al., 2015; Tozzi et al., 2006), and those with EDs that involve binge eating and/or purging (e.g., AN-BP, BN) tend to score lower than those with AN-R (e.g. Abbate-Daga et al., 2010; Vervaet et al., 2004). Findings also suggest that those with EDNOS score similarly to those with AN on Self-Directedness; however, findings comparing those with EDNOS to those with BN on Self-Directedness are mixed (Abbate-Daga et al., 2010; Rodriguez-Cano et al., 2012). Scores on Self-Directedness appear to improve with treatment (e.g. Aguera et al., 2012; Calugi et al., 2013). Although findings over the past decade have been mixed, most studies have found that scores on Cooperativeness (e.g., the extent to which an individual feels like a part of the larger society), Self-Transcendence (e.g., the extent to which an individual feels like a part of the universe), and Reward Dependence (e.g., individual's responsiveness to social cues and social rewards) are unassociated with EDs (e.g. Atiye et al., 2015; Fassino et al., 2009; Klump et al., 2004).

4.1.6. Summary

Individuals with EDs score lower than controls, and those with AN-BP and BN score lower than AN-R, on Self-Directedness. Cooperativeness, Self-Transcendence, and Reward Dependence appear to be unassociated with EDs. The findings of this review are consistent those of Cassin and von Ranson (2005) with one exception: although earlier findings suggested that low levels of Cooperativeness were common to all EDs, research using the TCI in ED samples over the past decade now suggests that Cooperativeness is not associated with EDs.

4.2. Omnibus measures of personality pathology

As the prevalence of personality disorders (PDs) among individuals with EDs has been reported to be high (Cassin & von Ranson, 2005), omnibus self-report measures assessing personality psychopathology are frequently used. Among these measures are the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ; Livesley & Jackson, 2009), the Karolinska Scales of Personality (KSP; Af Klinteberg, Schalling, & Magnusson, 1986), and the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher et al., 2001).

4.2.1. DAPP-BQ and KSP

The DAPP-BQ ([Livesley & Jackson, 2009](#)) consists of 18 lower-order subscales which delineate four higher-order personality dimensions (Emotional Dysregulation, Dissocial Behavior, Inhibition, and Compulsivity). The KSP ([af Klinteberg et al., 1986](#)) has 15 scales designed to assess vulnerability for psychopathology from a neuropsychological perspective.

Evidence has consistently linked the DAPP-BQ lower-order constructs of Affective Lability and Anxiousness to EDs ([Lavender, De Young, et al., 2013](#)). Affective Lability refers to the tendency to experience frequent fluctuations in the intensity, valence, or type of emotion ([Livesley & Jackson, 2009](#)), and has been proposed to increase one's vulnerability to regulate negative emotional states using maladaptive behaviors ([Lavender, De Young, et al., 2013](#)). Affective Lability is an important correlate of both binge eating and BN ([Brownstone, Fitzsimmons-Craft, et al., 2013](#)), as women with BN who are more affectively labile have reported greater ED symptom severity and binge eating frequency ([Anestis et al., 2009](#)). Accordingly, those with AN-BP tend to report greater Affective Lability than those with AN-R ([Lavender, De Young, et al., 2013](#)).

Anxiety has also been widely associated with EDs ([Lavender, De Young, et al., 2013](#)). Scales on the KSP and DAPP-BQ provide a measure of anxiety proneness, indicating an underlying propensity towards feelings of anxiety. When assessed using the KSP, individuals with EDs report significantly higher scores than controls on Somatic Anxiety (i.e., autonomic symptoms, concentration difficulties, vague distress), Muscular Tension (i.e., tenseness in the muscles, trembling, feeling stiff, gnashing jaws), and Psychic Anxiety (i.e., worry, insecurity, anticipatory anxiety, social anxiety) scales ([Ahren-Moonga, Holmgren, von Knorring, & af Klinteberg, 2008](#)). Similarly, in individuals with subthreshold and clinical AN, DAPP-BQ scores on Anxiousness significantly predicted global scores on the EDE ([Lavender, De Young, et al., 2013](#)). In a study using the KSP, individuals with AN reported significantly lower levels of Somatic Anxiety and Psychic Anxiety than those with BN ([Ahren-Moonga et al., 2008](#)).

Comparisons of DAPP-BQ scores indicated higher levels of Anxiety, Narcissism, and Affective Lability among those with BN than their unaffected sisters ([Lehoux & Howe, 2007](#)). However, when depression and anxiety symptoms were controlled, affective instability no longer predicted BN status ([Lehoux & Howe, 2007](#)). Thus, heightened levels of Affective Lability among those with BN may reflect the acute ED episode, with anxiety playing a more salient role overall in the prediction of BN development. When compared to controls, individuals with BN reported more DAPP-BQ Antisocial Aggression, Anxiousness, Cognitive Distortion, Identity Problems, Narcissism, and Suspiciousness ([Bruce, Steiger, Koerner, Israel, & Young, 2004](#)), as well as higher scores on KSP Psychasthenia (i.e., a tendency to

feel easily fatigued), Inhibition of Aggression (i.e., an inability to speak up for oneself and a non-assertive demeanor), Detachment, Suspicion, and Guilt (Ahren-Moonga et al., 2008). Those with BN scored higher than those with AN on KSP Inhibition of Aggression (Ahren-Moonga et al., 2008).

4.2.2. Summary

Overall, research over the past decade suggests that affective instability is associated with EDs, particularly those that involve binge eating (i.e., AN-BP, BN), and that levels of anxiety are higher among individuals with EDs compared to controls. However, acute depression and anxiety symptoms may mediate or moderate the relationship between BN and affective instability. Additionally, those with BN tend to report higher scores on scales that measure personality traits consistent with Cluster B PDs such as affective instability, identity problems, and antisocial aggression when compared to their unaffected sisters and those with AN.

4.2.3. Minnesota Multiphasic Personality Inventory-2

The MMPI-2 (Butcher et al., 2001) has been widely used to assess personality and other pathology among individuals with EDs. In addition to validity scales, the MMPI-2 contains 10 clinical scales, 15 content scales, and 15 supplementary scales. MMPI-2 clinical profiles can be summarized in code types based upon an individual's scale elevations. In a clinical sample, those with AN-R, AN-P, BN-NP, and EDNOS—but not BN-P—most often demonstrated a 2–7 code type, which is characterized by a mixture of depressive and anxiety symptoms (Exterkate, Bakker-Brehm, & de Jong, 2007). In this study, all five ED subgroups exhibited clinically elevated scores on the same six scales: 2, 3, 4, 6, 7, and 8, indicating similar profiles of psychopathology and distress characterized by somatic concerns, a tendency to focus on physical symptoms to avoid coping with stressors, anger, paranoia, anxiety, and social alienation. Those with AN-BP, BN-P, and EDNOS also showed elevations on scale 1, indicating prominent somatic concerns among those with EDs who engage in binge eating and purging. Subgroup comparisons indicated that those with AN-BP reported greater depression than those with AN-R. The direction of these effects is unclear. Moreover, those with BN-P scored higher on scale 9 than those with AN-R, AN-P, and EDNOS, indicating a greater tendency to engage in impulsive behaviors. Overall, individuals with AN-R exhibited the least symptomatology in subgroup comparisons, indicating greater psychopathology among individuals with EDs who engage in binge eating and purging. Another study found that women with BED attending intensive day treatment reported similar scale elevations on the MMPI-2: scales 1, 2, 4, 6, 7, and 8, indicating a profile characterized by somatic concerns, anxiety, apathy, depression, paranoia, and social isolation (Aragona, Petta, & Balbi, 2015).

Little is known about personality among women with midlife-onset EDs. A recent study examined MMPI-2 profiles among inpatients with midlife-onset ED (64% restricting EDs, 36% binge-purge EDs) and found that altogether, women with midlife-onset EDs showed clinically elevated scores on scales 1, 2, 3, 7, and 8 on the MMPI-2 ([Cumella & Kally, 2008](#)). Although the MMPI-2 scale elevations observed were similar to those evident among younger ED inpatients, they more often yielded a 2–3 code type in contrast to the 2–7 code type often found among younger ED patients, indicating less severe anxiety but greater denial of their disorder among those with midlife-onset EDs. The 2–3 code type also suggests depression, helpless feelings, somatic denial, lack of insight, emotional overcontrol, and dependency issues.

4.2.4. Summary

Individuals with AN, BN-NP, and EDNOS—but not BN-P—tend to exhibit a 2–7 code type characterized by a mixture of depression and anxiety symptoms. Women with BED endorse a very similar clinical profile. Comparisons across ED diagnoses suggest that those with AN-BP exhibit higher levels of depression compared to AN-R, and those with BN-P are more impulsive than those with AN or EDNOS. Generally, findings are similar across women of different ages; however, women who develop an eating disorder in midlife may exhibit less anxiety and more denial of their disorder than their younger counterparts.

5. Eating disorders and personality disorders

As PD diagnoses determined using self-report often greatly overestimate PD prevalence ([Cassin & von Ranson, 2005](#)), only studies using diagnostic interviews for PD diagnosis were considered in the present meta-analysis. An initial literature search for articles since September 2004 identified 24 articles. Articles were excluded if they did not assess PDs separately by ED diagnosis or if they provided a dimensional rather than a categorical PD diagnosis. We included a total of 14 studies, 10 of which met criteria for inclusion in the meta-analysis of PD diagnosis by each distinct diagnosis and eight which met criteria to assess PD by cluster. The quality of each article was assessed using 14 criteria (i.e., sample size, methodology, etc.) outlined by [Kmet, Lee, and Cook \(2004\)](#). Each article was assigned an overall rating that ranged between 0 and 1, with higher values indicating higher quality. See [Appendix B](#) for details of the articles included in the meta-analysis and quality assessment ratings for each article. Previous studies (with scores ranging from 0 to 1) using the QualSyst quality assessment protocol have utilized a minimum threshold score of 0.55 for inclusion of studies (e.g., [Wassenaar, Schouten, & Schoonhoven, 2014](#)) and others have reported the inclusion of studies within a range of 0.74–0.91 with a median of 0.82 (e.g., [Stierlin et al., 2015](#)). Given that the lowest quality rating in the studies we identified was 0.83, with a median of 0.87, we deemed all appropriate for inclusion in analyses.

5.1. Statistical analysis

MetaXL 2.2 was used to calculate pooled prevalence and 95% confidence intervals (CIs) using the double arcsine transformation to best address variance instability (Barendregt, Vos, Lee, & Norman, 2015). To address heterogeneity in the pooled prevalence, a random effects model was used, which takes into account inherent variability between studies due to differences in study protocols and execution, and assumes that heterogeneity is driven by real differences in the distribution of prevalence rates (Doi, Barendregt, & Mozurkewich, 2011).

5.2. PD prevalence rates in EDs

Current PD prevalence rates in AN-R, AN-BP, BN, EDNOS, and BED are presented in Table 1. The PDs most commonly associated with AN-R were obsessive–compulsive, avoidant, and dependent. Although previous meta-analyses were unable to assess PD prevalence among those with AN-BP due to a paucity studies, the current meta-analysis indicated that obsessive–compulsive, avoidant, borderline, dependent, and paranoid PDs were most prevalent in both AN-BP and BN. EDNOS is most commonly associated with paranoid, borderline, obsessive–compulsive, and avoidant PDs and the two studies that assessed PD prevalence in BED found that avoidant, obsessive–compulsive, and paranoid PDs were most common.

Table 1. Prevalence rates (in percent) of personality disorders in individuals with eating disorders.

Study	Participants	Cluster A			Cluster B				Cluster C		
		PA	SZ	SC	AN	BO	HI	NA	DE	AV	OC
<i>Anorexia nervosa, restricting</i>											
De Bolle et al. (2011)	28 female inpt	7	0	0	0	0	4	4	7	7	21
Diaz-Marsa et al. (2011)	25 female outpt	nr	nr	nr	nr	12	nr	nr	nr	nr	nr
Jordan et al. (2008)^a	26 female outpt	8	4	0	0	0	0	0	12	19	12
Maranon, Echeburua, and Grijalvo (2004)	16 female outpt	0	0	0	0	0	0	0	0	13	13
Maranon, Echeburua, and Grijalvo (2007)	20 female outpt	0	0	0	0	0	0	0	5	15	15

Ramklint, Jeansson, Holmgren, and Ghaderi (2010)	20 female/male pt.	5	0	0	0	10	0	0	0	0	5	5
Pooled prevalence (95% CI)		5 (1, 10)	2 (0, 5)	0 (0, 4)	2 (0, 6)	2 (0, 7)	2 (0, 5)	2 (0, 5)	6 (2, 11)	13 (7, 20)	14 (8, 22)	

Anorexia nervosa, binge eating/purging

De Bolle et al. (2011)	36 female inpt	17	3	0	0	17	6	3	14	11	36	
Diaz-Marsa et al. (2011)	14 female outpt	nr	nr	nr	nr	29	nr	nr	nr	nr	nr	
Jordan et al. (2008)^a	23 female outpt	35	9	4	4	22	9	13	26	44	26	
Maranon et al. (2004)	10 female outpt	0	0	0	0	20	0	0	20	30	60	
Maranon et al. (2007)	11 female outpt	0	0	0	0	18	0	0	9	18	55	
Ramklint et al. (2010)	18 females/males	6	0	0	6	0	0	0	0	17	0	
Pooled prevalence (95% CI)		11 (0, 30)	4 (0, 16)	2 (0, 13)	3 (0, 15)	16 (1, 38)	4 (0, 17)	4 (0, 17)	12 (0, 33)	23 (5, 47)	30 (0, 56)	

Bulimia nervosa

Bruce et al. (2004)	36 female outpt	0	0	0	6	22	3	0	8	0	22	
De Bolle et al. (2011)	36 female inpt	14	0	3	0	31	0	0	19	11	22	
Diaz-Marsa et al. (2011)	30 female outpt	nr	nr	nr	nr	33	nr	nr	nr	nr	nr	
Jordan et al., 2008^a	132 female outpt	24	2	5	5	29	17	5	13	29	18	

Magallon-Neri et al. (2014)	17 female inpt/outpt	0	0	0	0	24	12	6	6	0	6
Maranon et al. (2004)	21 female outpt	0	0	0	0	24	0	0	0	19	14
Maranon et al. (2007)	29 female outpt	0	0	0	0	28	3	0	0	21	14
Ramklint et al. (2010)	44 female/male pt	2	2	0	5	18	0	0	0	14	11
Rowe et al. (2008)^a	134 females	24	1	4	5	28	16	4	13	28	18
Pooled prevalence (95% CI)		6 (0, 15)	1 (0, 6)	2 (0, 7)	3 (0, 9)	26 (15, 40)	5 (0, 14)	2 (0, 7)	6 (0, 15)	14 (5, 25)	16 (7, 28)

Eating disorder not otherwise specified

Maranon et al. (2004)	19 female outpt	5	0	0	0	11	5	5	0	11	11
Maranon et al. (2007)	24 female outpt	4	0	0	0	25	4	4	0	13	25
Magallon-Neri et al. (2014)	51 female inpt/outpt	0	0	0	0	12	2	2	0	8	0
Ramklint et al. (2010)	55 female/male pt	24	0	2	11	11	0	2	5	16	9
Pooled prevalence (95% CI)		14 (0, 21)	0 (0, .07)	1 (0, 9)	3 (0, 12)	13 (1, 33)	3 (0, 14)	4 (0, 16)	2 (0, 10)	9 (0, 23)	10 (0, 25)

Binge eating disorder

Becker, Masheb, White, and Grilo (2010)^a	259 female/88 male pt	7	2	1	2	6	1	3	2	23	19
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Ramklint et al. (2010)	15	0	0	0	0	0	0	0	0	7	7
	female/male										
	pt										
Pooled prevalence (95% CI)		10	2 (0, 1	2	5 (0, 1	3 (0, 2	(0, 8)	(0, 13)	(0, 10)	18	15
		(0, 14)	8)	(0, 8)	(0, 13)	(0, 10)	(0, 14)	(0, 13)	(0, 10)	(6, 33)	(4, 30)

Note: PA-paranoid; SZ-schizoid; SC-schizotypal; AN-antisocial; BO-borderline; HI-histrionic; NA-narcissistic; DE-dependent; AV-avoidant; OC: obsessive-compulsive; nr: prevalence rate not reported in original article; CI: confidence interval; inpt: inpatient; outpt: outpatient; comm: community; pt.: patient. Full citations found in [Appendix B](#).

a Included probable diagnoses (i.e., one trait shy of full PD diagnosis) with full PD diagnoses.

5.3. PD prevalence rates assessed by PD cluster

Only one study assessed PDs by cluster in BED, so it was not included in the meta-analysis. Studies assessing PD prevalence rates by cluster among the different ED diagnoses revealed that Cluster C PDs were most prevalent among those with AN-R, AN-BP, and BN (see [Table 2](#)). However, in EDNOS, Cluster B and Cluster C PDs were equally prevalent.

Table 2. Prevalence rates (in percent) of personality disorders by cluster in women with eating disorders.

Study	Participants	Cluster A	Cluster B	Cluster C
<i>Anorexia nervosa, restricting</i>				
Maranon et al. (2004)	16 outpt	0	0	19
Maranon et al. (2007)	20 outpt	0	0	25
Jordan et al. (2008)^a	26 outpt	12	0	27
Wagner et al. (2006)	21 recovered pt	5	5	42
Pooled prevalence (95% CI)	83	4 (0, 11)	2 (0, 7)	29 (19, 41)
<i>Anorexia nervosa, binge-eating/purging</i>				
Maranon et al. (2004)	10 outpt	0	20	80
Maranon et al. (2007)	11 outpt	0	18	64

Jordan et al. (2008)^a	23 outpt	39	26	48
Pooled prevalence (95% CI)	44	11 (0, 43)	24 (0, 62)	64 (22, 98)
<i>Bulimia nervosa</i>				
Magallon-Neri et al. (2014)	17 inpt & outpt	0	41	12
Maranon et al. (2004)	21 outpt	0	24	29
Maranon et al. (2007)	29 outpt	0	28	28
Keel et al. (2005)	39 comm	4	5	15
Rowe et al. (2010b)^a	134	28	34	42
Spindler and Milos (2004)	126 inpt, outpt & comm	8	30	48
Jordan et al. (2008)^a	132 outpt	28	34	42
Wagner et al. (2006)	19 recovered pt.	0	0	20
Pooled prevalence (95% CI)	517	7 (0, 16)	23 (12, 36)	30 (18, 44)
<i>Eating disorder not otherwise specified</i>				
Magallon-Neri et al. (2014)	51 inpt & outpt	0	16	8
Maranon et al. (2004)	19 outpt	5	16	16
Maranon et al. (2007)	24 outpt	4	29	25
<i>Purging Disorder</i>				
Keel et al. (2005)	37 comm	3	3	5
Pooled prevalence (95% C)	135	4 (0, 10)	14 (5, 27)	12 (4, 25)

Note: Cluster A includes paranoid, schizoid, and schizotypal PD; Cluster B includes antisocial, borderline, histrionic, and narcissistic PD; Cluster C includes dependent, avoidant, and obsessive–compulsive PD. nr: prevalence rate not reported in original article; CI: confidence interval; inpt: inpatient; outpt: outpatient; comm: community; pt.: patient.

a DSM-III-R eating disorder diagnosis.

5.4. Summary of meta-analysis findings

These findings support previous work ([Cassin & von Ranson, 2005](#); [Sansone et al., 2005](#)) showing that avoidant and obsessive–compulsive PDs were among the most frequently diagnosed PDs in AN-R and BED, suggesting a tendency towards heightened concern with acceptance and approval, fear of criticism and rejection, and perfectionism. Borderline PD and paranoid PD were more commonly diagnosed among those with AN-BP, BN, and EDNOS, suggesting that these EDs are associated with greater levels of emotion dysregulation, impulsivity, and suspiciousness of others. Consistent with previous reviews ([Cassin & von Ranson, 2005](#); [Sansone et al., 2005](#)), the lowest prevalence rates of all PD clusters were found among those with AN-R and BED, whereas the highest prevalence of PDs was among those with AN-BP and BN.

6. ED psychopathology associated with PDs

Across all ED types, high rates of binge eating and purging are often associated with Cluster B PDs (e.g., [Spindler & Milos, 2007](#)), whereas high rates of dieting, fasting, and excessive exercise are more common among those with Cluster C PDs, especially obsessive–compulsive PD (e.g. [Anderluh, Tchanturia, Rabe-Hesketh, Collier, & Treasure, 2009](#); [Spindler & Milos, 2007](#)). The effect of a comorbid PD on treatment outcome appears to vary depending upon the specific ED diagnosis. Those with AN and a comorbid PD were more likely to drop out of treatment (e.g., [Pham-Scottez et al., 2012](#)) and those with AN and avoidant PD were less likely to recover relative to those without a comorbid PD ([Zerwas et al., 2013](#)); however, research has consistently shown that the presence of a PD does not adversely affect treatment outcome in women with BN (e.g. [Grilo et al., 2012](#); [Rowe et al., 2010](#)). Research on how comorbid PDs relate to treatment outcome among those with BED is mixed: one study found that cluster C PDs were associated with more severe post-treatment psychopathology and negative affect ([Masheb & Grilo, 2008](#)), whereas another study found that those with avoidant PD responded just as well to dialectical behavior therapy for BED as those without avoidant PD ([Robinson & Safer, 2012](#)).

7. Personality subtype classification

Although the majority of existing research examining the link between personality and EDs has focused on identifying specific personality traits or PDs associated with EDs, another line of research has taken a transdiagnostic approach by separating individuals with EDs into distinct personality types. Conceptualizing and treating EDs based on personality subtypes may clarify the heterogeneity evident among individuals with the same ED diagnosis and, importantly, may also offer an advantage given the high prevalence of diagnostic crossover among ED diagnoses over time. Arguably the most widely replicated

subtyping approach are the three subtypes first identified by [Westen and Harnden-Fischer \(2001\)](#): underregulated (i.e., impulsive and emotionally/behaviorally dysregulated), overregulated (i.e., compulsive and inhibited), and normative (i.e., low levels of personality pathology). This three-class subtype has been replicated by numerous research teams ([Lavender, Wonderlich, et al., 2013](#); [Steiger et al., 2010](#); [Strober, 1983](#); [Turner et al., 2014](#); [Wildes et al., 2011](#); [Wonderlich et al., 2005](#)) using a variety of assessment measures, in AN, BN, and mixed ED populations. Although the researchers have often used different labels, the overall descriptions of the subtypes they identified were similar to those of Westen and Harden-Fischer.

In addition to the common three-subtype classification, researchers have also identified a five-class and six-class subtyping scheme. [Krug et al. \(2011\)](#) used the TCI to identify a six-class subtyping model in a large sample of women with various EDs. The six classes identified include impulsive (i.e., impulsive, low avoidance motivation, high approach motivation), inhibited (i.e., avoidance of punishment, low impulsiveness), average (average values on all scales), adaptive (i.e., responsible, reliable, self-confident, feels connected to society), self-focused (i.e., feels like part of the universe), and maladaptive (i.e., not confident, low approach motivation, irresponsible, unreliable, does not feel like part of society). [Thompson-Brenner et al. \(2008\)](#) used a structured interview for personality disorders to identify a five-class subtyping scheme among women with AN and BN. The five classes identified included behaviorally dysregulated (i.e., impulsive, self-damaging), emotionally dysregulated (i.e., extreme affective experiences), avoidant-insecure (i.e., low self-confidence, high social anxiety), obsessional-sensitive (i.e., perfectionistic, interpersonally sensitive), and high functioning (normal scores on all scales). Upon closer inspection, there seems to be much overlap in the classes identified in each of the subtyping methods. For example, the average, adaptive, and high functioning classes appear to map onto [Westen and Harnden-Fischer \(2001\)](#)'s normative group; the impulsive, maladaptive, behaviorally dysregulated, and emotionally dysregulated classes are similar to [Westen and Harnden-Fischer \(2001\)](#)'s underregulated group; and the inhibited, avoidant-insecure, and obsessional-sensitive are similar to [Westen and Harnden-Fischer \(2001\)](#)'s overregulated group.

Although there are minor discrepancies in the different subtyping systems which point to the necessity of further research, the personality subtypes have been shown to exhibit unique associations with clinical variables that may predict level of functioning and clinical course ([Wonderlich et al., 2005](#)), treatment outcomes ([Thompson-Brenner et al., 2008](#); [Wildes et al., 2011](#)), comorbidity with personality disorders ([Gazzillo et al., 2013](#)), and etiological variables and ED symptoms ([Westen & Harnden-Fischer, 2001](#)), above and beyond specific

ED diagnoses. Thus, personality subtypes appear to be a promising avenue worth exploring in our efforts to refine our understanding and treatment of EDs.

8. Discussion

In this paper we have aimed to provide a systematic review of the literature on personality and EDs, emphasizing the decade since the last comprehensive review ([Cassin & von Ranson, 2005](#)). Relative to controls, certain personality traits were common to AN-R, AN-BP, BN, and BED, including elevated perfectionism, neuroticism, negative urgency, avoidance motivation, sensitivity to social rewards, low extraversion, and high self-directedness. Consistent with findings from broadband, dimensional measures of personality, among those with EDs, avoidant and obsessive–compulsive PDs were the most prevalent. As perfectionism and obsessive–compulsive traits share a number of overlapping features, such as rigidity, a need for control, and orderliness, it is unsurprising that obsessive–compulsive PD often co-occurs with EDs. Moreover, avoidant PD is characterized by fear of criticism, rejection, and embarrassment, and feelings of inadequacy, which map onto the heightened sensitivity to social rewards and avoidance motivation also reported by those with EDs.

Additionally, borderline and paranoid PDs were commonly found among those with AN-BP, BN, and EDNOS. These findings are consistent with results using omnibus measures of personality pathology, which found that those with AN-BP and BN reported elevations associated with emotion dysregulation, anxiety, aggression, paranoia, and suspiciousness of others. Previous reviews have not found consistently elevated rates of paranoid PD in ED samples. However, methodological decisions may have played a role, as one review ([Sansone et al., 2005](#)) explicitly stated that they evaluated the presence of Cluster A PDs as a group rather than individually “because of anticipated infrequency” ([Sansone et al., 2005, p. 9](#)). It may be fruitful for researchers to examine the prevalence of paranoid PD in those with EDs as a possible means to understand the way some of the associated traits (i.e., lack trust in others, suspicious of others' motives) may affect the ability of therapists to build rapport with clients.

Differences in personality across ED diagnoses also emerged, such as greater impulsiveness among those with BN compared to AN. Despite a number of subtle differences in personality profiles of specific ED diagnoses, these distinctions may have limited utility. The preponderance of evidence suggests that personality traits may be more robustly associated with specific ED symptoms than ED diagnoses. For example, binge eating and purging behaviors, common to both AN-BP and BN, are generally associated with greater personality pathology.

As research into EDs and personality has progressed over the past decade, it has become increasingly clear that personality dimensions explain meaningful variance in several areas of functioning of clinical importance to assessment, symptomatic expression, and treatment of EDs. An approach to conceptualizing and treating EDs that includes personality dimensions as they relate to major ED symptoms—i.e., treatment matching—may be warranted to capitalize on knowledge about personality in the treatment of EDs ([Martinez & Craighead, 2015](#); [Tasca et al., 2009](#)). For example, if a person with an ED has elevated perfectionism and obsessive–compulsive personality traits, it may be helpful to approach treatment using the enhanced version of cognitive-behavioral therapy for eating disorders (i.e., CBT-E) because it includes a module that focuses specifically on clinical perfectionism. On the other hand, if a person with an ED presents with severe affective lability and impulsiveness, it may be more useful to approach treatment using dialectical behavior therapy or integrative cognitive-affective therapy (ICAT), both of which teach skills related to tolerating distress and regulating emotions. Support for treatment matching comes from a recent clinical trial which found that women with BN who reported elevated sensation seeking and/or affective lability had greater reductions in bulimic behaviors after receiving ICAT versus CBT-E ([Accurso et al., 2016](#)).

Investigating personality in EDs is important for at least two additional reasons. First, considering personality may help advance our understanding of EDs and related symptoms. For example, certain personality traits, such as affective lability, have been associated with a tendency to engage in more impulsive behaviors, such as self-injury and risky sexual behavior in those with BN ([Anestis et al., 2009](#)), and interact with high levels of compulsivity to predict more frequent hard exercise ([Brownstone, Fitzsimmons-Craft, et al., 2013](#)). Moreover, perfectionism has consistently been associated with more severe ED symptomatology ([Reba et al., 2005](#)) and the preponderance of evidence suggests that perfectionism persists after ED treatment ([Segura-Garcia et al., 2013](#)).

Second, omnibus measures of personality can also be used to advance our understanding of EDs. Measures such as the MMPI-2 indicate that elevations on particular scales can predict risk of suicide attempts ([Youssef et al., 2004](#)) and dropout from inpatient programs among those with AN ([Nozaki et al., 2007](#)). Moreover, measures assessing the Big Five factors of personality (e.g., NEO-PI-R) have shown utility in predicting treatment outcomes and symptom fluctuation. For example, among obese individuals with BED, those who reported higher levels of Extraversion experienced less improvement following a cognitive-behavioral therapy treatment program, whereas those who reported higher levels of Openness experienced more improvement ([Deumens, Noorthoorn, & Verbraak, 2012](#)). Furthermore, a retrospective study suggested that higher levels of Neuroticism may be

associated with crossover from AN to BN diagnoses ([Tozzi et al., 2005](#)). Further research is needed to ascertain whether tailoring interventions to various personality profiles provides more effective treatment and relapse prevention across a range of ED diagnoses.

8.1. Limitations and future directions

A previous review highlighted that the great majority of studies examining associations between personality and EDs have used correlational, cross-sectional research designs, noting that such designs prohibit conclusions regarding the etiological significance of personality ([Cassin & von Ranson, 2005](#)). In spite of a call for prospective studies, almost all research conducted over the past decade has continued to use cross-sectional designs. Our conclusions are limited by these methodological choices. Does a personality trait predispose an individual to an ED, increase the risk of developing an ED, impact ED symptom severity, or emerge as a consequence of the ED itself? Without prospective studies, it remains difficult to distinguish state and trait personality characteristics among those with EDs. Starvation and binge/purge cycles may impact personality profiles; however, data suggest that most personality traits considered persist beyond recovery (e.g., [Wagner et al., 2006](#)). It should also be noted that the majority of studies included in the present review examined associations between personality and EDs among Caucasian women. In addition, we limited our review to studies using self-report measures of personality rather than observer ratings or behavioral tasks. In future studies, including information from observer ratings or behavioral tasks might be useful to validate the accuracy of self-reported personality traits.

Furthermore, few studies to date have investigated personality among those with BED, with the majority of studies having focused on AN-R, AN-BP, and BN. BED was recognized as its own ED diagnosis in the DSM-5, distinguishing it from the phenomenon of overeating based on its severity and association with significant psychological and physical difficulties.

Research continues to be needed to investigate the stability and predictive value of personality among individuals with BED. Preliminary evidence has suggested that those diagnosed with AN via DSM-IV and DSM-5 criteria do not differ on measures of personality (e.g. [Dellava et al., 2011](#); [Le Grange et al., 2013](#)). As recent changes in diagnostic nomenclature which broadened diagnostic criteria for AN and BN are not expected to alter the personality profiles that have been outlined for each ED diagnosis, we believe that findings of this review remain relevant for DSM-5 ED diagnoses.

Ultimately, examining personality traits within the boundaries of each ED subtype may be a limiting method of conceptualizing personality in the EDs. The classification of those with various ED diagnoses into underregulated, overregulated, and normative personality subtypes provides an alternative and potentially fruitful way to examine personality constellations among the EDs to guide predictions about level of functioning and clinical

course, and to tailor interventions. These replicated personality subtypes are consistent with the interpretation that various ED symptoms may serve differing functions, depending on the personality characteristics that accompany or perhaps lead to those behaviors. Given the reliability with which certain associations have been found among these subtypes, personality subtyping warrants continued investigation and holds potential as a promising means to improve ED treatment.

9. Conclusion

Continued research is needed to investigate the utility and feasibility of considering personality in ED nosology. With a few exceptions noted throughout the review, the literature that has emerged over the past decade largely confirms the conclusions made by previous reviews associating personality with EDs. Notwithstanding a greater emphasis on the inclusion of BED and EDNOS in recent publications, the picture that emerges consistently implicates many commonalities across all ED subtypes, with few differentiating factors across diagnoses. Despite the intuitive desire to map personality traits to specific ED subtypes, the minimal additional insight garnered from ten years' worth of research towards differentiating diagnoses arguably suggests that research would be better directed towards elucidating whether such personality traits are sequelae of experiencing an ED or precede as markers of risk, as well as investigating avenues for incorporating and targeting personality variables in treatment. Research has identified configurations of personality traits that show utility in predicting clinical course ([Wonderlich et al., 2005](#)) and treatment outcomes ([Wildes et al., 2011](#)) above and beyond the presence or absence of specific ED diagnoses, although the role of concurrent depression and anxiety symptoms are important to consider as well, as they may cloud the picture. The frequency of diagnostic crossover over the course of an ED ([Eddy et al., 2008](#)) in conjunction with the commonalities evident between specific ED diagnoses, such as AN-BP and BN, point to the need to consider personality traits as potentially stable variables that may help us to develop more effective avenues for ED treatment.

Appendix A. Scales used in the systematic view to measure various personality constructs

Personality construct	Citation
Perfectionism	
Childhood Retrospective Perfectionism Questionnaire	Southgate, Tchanturia, Collier, & Treasure (2008)

Eating Disorder Inventory — 2 Perfectionism scale	Garner (1991)
Frost Multidimensional Perfectionism Scale	Frost, Marten, Lahart, and Rosenblate (1990)
Negative urgency	
NEO-PI-R Impulsiveness	Costa and McCrae (1992)
Barratt Impulsivity Scale Attentional Impulsivity	Patton, Stanford, and Barratt (1995)
UPPS-R Urgency scale	Whiteside and Lynam (2001)
Sensation seeking	
NEO-PI-R Excitement Seeking	Costa and McCrae (1992)
I-7 Venturesomeness	Eysenck, Pearson, Easting, and Allsop (1984)
UPPS-R Sensation Seeking scale	Whiteside and Lynam (2001)
Dimensional Assessment of Personality Pathology stimulus seeking items	Livesley and Jackson (2009)
TCI novelty seeking scale	Cloninger (1994)
Zuckerman Sensation Seeking Scale	Zuckerman (1994)
BIS/BAS Behavioral Activation System Fun Seeking Scale	Carver and White (1994)
Lack of persistence	
NEO-PI-R Self Discipline	Costa and McCrae (1992)
TCI Persistence	Cloninger (1994)
UPPS-R Perseverance scale	Whiteside and Lynam (2001)
Lack of planning	
NEO-PI-R Deliberation	Costa and McCrae (1992)
NEO-IPIP Cautiousness	Goldberg (1999)
Multidimensional Personality Questionnaire — Control	Tellegen (1990)
I-7 Impulsivity	Eysenck et al. (1984)
TCI Impulsivity	Cloninger (1994)

Barratt Impulsivity Scale Nonplanning Impulsivity	Patton et al. (1995)
Barratt Impulsivity Scale Motor Impulsivity	Patton et al. (1995)
UPPS-R Premeditation	Whiteside and Lynam (2001)
Dimensional Assessment of Personality Pathology Impulsiveness Items	Livesley and Jackson (2009)
Approach motivation	
BIS/BAS Behavioral Activation System Reward Responsivity Scale	Carver and White (1994)
BIS/BAS Behavioral Activation System Drive Scale	Carver and White (1994)
SPSRQ Sensitivity to Reward scalereward responsiveness scale	Torrubia et al. (2001)
Avoidance motivation	
BIS/BAS Behavioral Inhibition Scale	Carver and White (1994)
SPSRQ Sensitivity to Punishment scale	Torrubia et al. (2001)
TCI Harm Avoidance	Cloninger (1994)
State–Trait Anxiety Inventory — Trait scale	Spielberger, Gorsuch, and Lushene (1970)

Note: NEO-PI-R = NEO-Personality Inventory-Revised; TCI = Temperament and Character Inventory; BIS = Behavioral Inhibition System; BAS = Behavioral Activation System; NEO-IPIP = NEO-International Personality Item Pool; SPSRQ = The Sensitivity to Punishment and Sensitivity to Reward Questionnaire.

Appendix B. Articles included in the meta-analysis of prevalence rates in personality disorders in individuals with eating disorders

Study	Participants	Prevalence by PD cluster?	Prevalence by PD diagnosis?	Prevalence of PD for BN separated by purging vs.	Prevalence of PD for AN separated by purging vs.	PD diagnostic measure	Quality assessment rating
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				nonpurging type	nonpurging type		
Becker et al. (2010)	347 treatment-seeking patients with BED (259 women, 88 men)	No	Yes; but reported if they had full diagnostic criteria or were 1 trait shy of full diagnosis	N/A	N/A	Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV)	0.85
Brucetal. (2004)	28 BN-P, 4 BN-NP, 4 subclinical BN, 23 controls (outpatient ED sample)	No	Yes, but separated by BN with avoidant PD and BN without avoidant PD	No	N/A	SCID-II	0.85
DeBollet al. (2011)	100 female inpatients (28 AN-R, 36 AN-BP, 36 BN)	No	Yes	No	Yes	SIDP-IV	0.95
Diaz-Marsa et al. (2011)	25 AN-R, 14 AN-BP, 3 AN-NOS, 29 BN-P, 1 BN-NP, 28 controls	No	Only BPD rate reported	No	Yes	SCID-II & Zanarini Rating Scale for BPD	0.85
Jordan et al. (2008)	288 female outpatients (26 AN-R, 23 AN-BP, 132 BN, 96 with major depression and no ED)	Yes	Yes	No	Yes	SCID-II for DSM-III-R	0.90
Keel	39 women from	Yes	No	No	N/A	SCID-II	0.85

et al. (2005)	the community with BN							
Magaillon-Neri et al. (2014)	100 female inpatients & outpatients (25 AN-R, 7 AN-BP, 15 BN-P, 2 BN-NP)	Yes	Yes	No	No	Spanish version of the International Personality Disorder Examination (IPDE)	0.90	
Marañon et al. (2004)	66 outpatient females (16 AN-R, 10 AN-BP, 21 BN-P, 19 EDNOS)	Yes	Yes	No (only BN-P assessed)	Yes	IPDE	0.83	
Marañon et al. (2007)	130 females (84 outpatient females with EDs, 23 females seeking treatment for another Axis I mental disorder, and 23 normative women)	Yes	Yes	Yes	No (only BN-P reported)	Spanish version of the IPDE	0.83	
Ramklint et al. (2010)	154 individuals seeking treatment from ED Unit at the Uppsala Department of Psychiatry (147 female, 7 male)	No	Yes	Yes	Yes	SCID-II & SCID-II-PQ	0.88	
Rowe et al. (2008)	134 women with DSM-III-R diagnosis of BN	No	Yes	No	N/A	SCID-II	0.91	

Rowe et al. (2010a)	134 women with DSM-III-R diagnosis of BN (same sample as used in other two Rowe studies)	Yes	No	No	N/A	SCID-II	0.91
Spindler and Milos (2004)	126 females with BN-P (inpatient, outpatient, & community)	Yes	No	No (only BN-P assessed)	N/A	German SCID-II	0.95
Wagner et al. (2006)	47 healthy control women, 21 RAN women, 8 recovered women with AN-BP, 12 women with AN and BN, 19 recovered women with BN	Yes	No	No (groups were separated into RAN, BAN, and recovered with BN)	No	SCID-II	0.85

Note: PD = personality disorder; ED = eating disorder; AN = anorexia nervosa; AN-R = anorexia nervosa-restricting subtype; AN-BP = anorexia nervosa-binge/purge subtype; BN = Bulimia nervosa; BED = binge eating disorder; RAN = recovered women with anorexia nervosa-restricting subtype; BAN = recovered women with anorexia nervosa-binge/purge subtype and those with both anorexia nervosa and bulimia nervosa; quality assessment ratings based on QualSyst tool ([Kmet, Lee, & Cook, 2004a](#)).

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