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## DEPARTMENT OF PSYCHOLOGY

Multidimensional Perfectionism and Depressive Symptoms on  
Disordered Eating Behaviours among University Students

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### Abstract

In the present study, the relationship of multidimensional perfectionism (self-oriented, other-oriented, and socially prescribed perfectionism) and depressive symptoms related to disordered eating behaviours were investigated in a university context. Results from 112 participants showed that both perfectionism and depressive symptoms have a positive relationship with disordered eating behaviours, indicating that individuals with higher levels of perfectionism and depressive symptoms do indeed engage in more disordered eating behaviours. When assessed in sub-groups based on EDI-3 scores, significant differences between perfectionism and depressive symptoms scores were found across all sub-groups except for the comparison between the disordered eating behaviour group and the normal group (for perfectionism scores). More specifically and contrary to what was hypothesized, the findings revealed that students who engaged in disordered eating behaviours demonstrated group differences not on self-oriented perfectionism but rather, socially prescribed perfectionism. When assessed in sub-groups based on BDI-II scores, socially prescribed perfectionism was statistically significant only for the comparison between 'minimal' and 'moderate' groups. From these results, limitations of the study are discussed and specific ways that future research can resolve these shortcomings are addressed so as to improve the validity and reliability of the conclusions drawn.

*Keywords:* Disordered eating behaviours, perfectionism, depressive symptoms.

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The prevalence of eating disorders has increased dramatically in Western countries over the last few decades (Bulik et al., 2006; Miller & Pumariega, 2001), with approximately between 2 and 10 million people suffering from the eating disorders set out in the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Miller-Day & Marks, 2006). According to Stiegel-Moore and Bulik (2007), it is one of the most dangerous mental disorders that contribute to high mortality as compared to other psychiatric disorders.

Eating disorders (such as bulimia nervosa and anorexia nervosa) are characterized by clinical disturbances in body image and eating behaviours (*DSM-IV-TR*; APA, 2000). Without proper treatment, eating disorders can become chronic and, on occasion, be life-threatening. Steinhausen (2002) established that an estimate of 5 to 10% of individuals suffering from eating disorders could conceivably die from its related causes and consequences. If suicide was taken into consideration, this mortality estimation would increase to 20% (Hesse-Biber, Leavy, Quinn, & Zoino, 2006). Demographically, especially in Western cultures, eating disorders are largely confined to young, middle- to upper-class women who are obsessed with the idealization of thin body type that is biologically inappropriate and culturally mandated through society (e.g., by mass media). In addition to these socio-cultural pressures, other possible pathogenic factors include biological and genetic vulnerabilities (e.g., the disorders tend to run in families), psychological factors (e.g., low self-esteem; Fairburn, Cooper, & Shafran, 2003), social anxiety (e.g., fears of rejection), and distorted body image (McKenzie, Williamson, & Cubic, 1993).

Individuals with eating disorders tend to feel a relentless, all-encompassing drive to be thin, and it is common for individuals who engaged in disordered eating behaviours to exhibit

other forms of diagnoses, such as medical comorbidities, suicide attempts, affective disorders, substance abuse disorders, anxiety disorders, and personality disorders (Milos, Spindler, & Schnyder, 2004). One form of personality disposition that has been found to be associated with eating disorders is perfectionism. Perfectionism is characterized by a tendency to set and possess exceedingly unrealistic and compulsive standards for performance (e.g., all-or-nothing thoughts on success and failure), accompanied by neurotic critical self-evaluations of one's behaviour, such as the intolerance for mistakes, even minor ones (Garner, 2004; Stoeber & Janssen, 2011). Another comorbidity that commonly co-occurs with eating disorders is the manifestation of depressive symptoms. Depression is a severe medical illness that leads to one having negative affects (e.g., sadness) of his/her thoughts and behaviours (*DSM-IV-TR*; APA, 2000). Depression has many diverse symptoms which include feelings of worthlessness, changes in appetite that may result in unintentional weight losses or gains, insomnia, etc. Although depression is the most common comorbid diagnosis in adult individuals (Braun, Sunday, & Halmi, 1994; Polivy & Herman, 2002), studies have also shown that high levels of comorbidity exist between depression and eating disordered symptoms for adolescents (Santos, Richards, & Bleckley, 2007). In addition, race and ethnicity do not seem to have any form of impact on the predominance of depression. This is demonstrated by a study of Asians with anorexia nervosa in Singapore, which found that depression was the most common comorbid condition affecting 25.4% of that sample (Lee, Lee, Pathy, & Chan, 2005). Depression has also been found to identify with perfectionism (Hewitt & Flett, 1991; Huprich, Porcerelli, Keaschuk, Binienda, & Engle, 2008). Studies conducted by Hewitt and Flett (1991) found that individuals who were depressed have higher levels of perfectionism as compared to normal control participants. Furthermore, in recent research, one of the central issues that have rising interest amongst

researchers in the perfectionism and depression domains is that perfectionism has been found to interfere with the treatment of eating disorders and clinical depression (Blatt, Quinlan, Pilkonis, & Shea, 1995; Blatt, Zuroff, Bondi, Sanislow, & Pilkonis, 1998). Taken together, there has been substantial evidence for a relationship between depression and perfectionism in relation to eating disorders, although research outcomes and its relationship specificity remained mixed (Bardone-Cone et al., 2007).

### **Eating Disorders and Disordered Eating Behaviors**

There are three main categories in the DSM-IV-TR (APA, 2000) delineated for eating disorders: anorexia nervosa (AN), bulimia nervosa (BN), and eating disorder not otherwise specified (EDNOS). An individual who is diagnosed with AN does not maintain a minimal healthy body weight, expresses intense fear for gaining weight, and possesses a twisted perception of their body image (i.e. "*weight loss is viewed as an impressive achievement and a sign of extraordinary self-discipline, whereas weight gain is perceived as an unacceptable failure of self-control*", APA, 2000, p. 584). There are two subtypes for AN: a binge eating/purging type and a restricting type. An individual who suffers from BN has abnormal eating patterns (e.g., fasting) and engages in periods of binge eating and inappropriate compensatory behaviors (e.g., excessive exercising, purging) regularly. Like AN, it has two subtypes: a non-purging type and a purging type. Individuals who neither meet the criteria for AN nor BN subsume under the EDNOS category. EDNOS is the most prevalent eating disorder, although it has been deduced that period prevalence varies widely (5–15%; Levine & Smolak, 2010).

While extensive research for eating disorders has been widely conducted throughout the decades, not much has been determined in relation to individuals who possess the eating disorder

symptoms but fail to meet the DSM criteria for AN, BN, or EDNOS. These individuals have some form of eating dysfunction, customarily known as disordered eating behaviours (Mutterperl & Sanderson, 2002; Trattner & Thompson, 2001). These behaviours are damaging in the long run and are definitive of concern as longitudinal studies have suggested that 14-46% of individuals with partial eating disorders evolve to full-blown eating disorders within 1-2 years (Shisslak, Crago, & Estes, 1995). Westerberg, Edlund, and Ghaderi (2008) noted that individuals who display early signs of disordered eating behaviours may predict more detrimental eating behaviours in their adolescent and teenage years. In a study of 33 treatment-seeking women with only a partial syndrome eating disorder, it was found that 15 of these women went on to develop a full syndrome eating disorder within 24 to 52 months whilst only 6 women recovered (Herzog, Hopkins, & Bums, 1993). This indicated that a high proportion of patients with subclinical eating pathology either continue to exhibit subclinical pathology or go on to develop the full syndrome. These studies, among many others, depict the seriousness of eating disorders and its comorbidities, if left untreated.

For this reason, it is important to examine disordered eating behaviours so as to uncover early predictors, indicators, and variables that could possibly influence subsequent eating disorders. Furthermore, as mentioned in the previous section, high levels of comorbidity exist between depression and eating disordered symptoms (Santos, Richards, & Bleckley, 2007). For example, participants diagnosed with an eating disorder displayed clinical levels of depression, whereas participants with disordered eating behaviours displayed mild levels of depressive symptoms, and those with no eating disorder or disordered eating habits displayed the lowest levels of depression (Gutzwiller, Oliver, & Katz, 2003). In addition, another study found that depression was a predictor of restricting behaviours regarding food (Morris, Parra, & Stender,

2011). In Preti et al.'s (2009) study, which drew on findings from interviews of 4,139 adults in six European countries, it was reported that eating disorder comorbidity with a range of other mental health disorders were highly common, though treatment was rarely sought after. Taken together, if left untreated, there could be a high plausible likelihood that disordered eating behaviours could perpetuate a chronic condition of not only eating disorders, but other mental illnesses.

Disordered eating behaviours may be especially prevalent in the university contexts due to a variation of contributory factors such as increased stress, freedom, control, and an expansion of one's social circle that may endorse thin idealization. A particular study by Mintz and Betz (1988) found that 61% of college women engage in some form of disordered eating behaviour. Similarly, it was found that university students were more likely to increase than decrease their disordered eating behaviours (i.e., participants went on diets and/or binge eat) from the beginning and end of the first year of their studies (Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). Many studies have also revealed that certain subgroups (e.g., ballet dancers, sorority members, and elite athletes) in universities would display higher prevalence for disordered eating behaviours due to the importance and influence of one's body measurements for their pursuits and future endeavours (Allison & Park, 2004; Garner, Garfinkel, Rockert, & Olmsted, 1987).

Although eating disorders are consistently found to be more prevalent in females than males, both within clinical and non-clinical populations (Jacobi et al., 2004), and college women are generally a high-risk group of engaging in disordered eating behaviours (as mentioned earlier, and further supported by Becker, Smith, & Ciao, 2005), the proposed study will recruit male participants as well. The motivation of this participant-type choice is due to the fact that

eating disorders and disordered eating behaviours do not only manifest in females, but also in males. Woodside et al. (2002) claimed that in terms of symptoms and comorbidity, both males and females experience this mental disorder similarly. This was supported by Hoyt and Ross (2003), where it was found that college students (both males and females) are significantly vulnerable to disordered eating behaviours. Recent research have also determined that males are at risk for disordered eating behaviours (Ackard, Fulkerson, & Neumark-Sztainer, 2007; Ålgars, Santtila, & Sandnabba, 2010; Hudson, Hiripi, Pope, & Kessler, 2007; McFarland & Petrie, 2012; Tantleff-Dunn, Barnes, & Larose, 2011). Furthermore, studies involving males and disordered eating are minimal, and there are likely more complex explanations regarding their disordered eating behaviours. Petrie (1996) have also emphasized that even though the diagnostic criteria for AN, BN, and EDNOS are set out clearly in the DSM IV-TR, it should be pointed out that eating behaviours exist along a continuum, and not categorically. Taking these reasons into consideration, the current study assesses disordered eating behaviours as a continuous variable, representing all types of eating behaviours, and not exclusively to restricting, binge-eating, and purging.

### **Perfectionism**

Perfectionism is the possession of unusually and often irrationally high expectations for performance and taking upon an excessive critical stance towards imperfection, often resulting in negative consequences on interpersonal and intrapersonal functioning (Flett, Greene, & Hewitt, 2004). There exist many other forms of perfectionism explanations (e.g., unidimensional perfectionism), but the proposed study takes upon Hewitt and Flett's (1991) work of multidimensional perfectionism comprising intrapersonal and interpersonal components across three dimensions: self-oriented perfectionism, other-oriented perfectionism, and socially



prescribed perfectionism. Unlike other models that characterize perfectionism as behavioural, attitudes, and cognitions features, Hewitt and Flett's model assesses the *direction* of the perfectionistic demands and behaviours. *Self-oriented perfectionism* reflects one's perfectionistic need or desire in their personal life and can be demonstrated by their behaviours, irrational thoughts, and excessively high standards on oneself. Findings have shown that certain sub-groups in universities such as medical students tend to score higher on self-oriented perfectionism (Enns, Cox, Sareen, & Freeman, 2001; Henning, Ey, & Shaw, 1998). In general, individuals who score high on self-oriented perfectionism are more conscientious and have greater work productivity. *Other-oriented perfectionism* is an interpersonal concept in which the individual holds exceptionally high standards for their significant other(s) and requires that their expectations to be met. If unsuccessful, it could result in frustration, hostility, cynicism, and criticism. *Socially prescribed perfectionism* reflects an individual's faulty perceptions of significant others' unrealistic and excessive expectations on oneself. An individual who score high on socially prescribed perfectionism have a greater risk of anxiety, depression, and even suicide if he/she experiences a major setback and is unable to put the challenge and criticism in perspective.

Most research have indicated that self-oriented perfectionism is a facet of adaptive perfectionism while socially prescribed perfectionism is a facet of maladaptive perfectionism (Bieling, Israeli, & Antony, 2004; Cox, Enns, & Clara, 2002; Klibert, Langhinrichsen-Rohling, & Saito, 2005). It is less clear for other-oriented perfectionism which does not appear to be significantly related to negative or positive affect (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). Although the distinction of maladaptive and adaptive perfectionism is accepted by some researchers (e.g., Cox, Enns, & Clara, 2002), others support Hewitt and Flett's (1991)

conceptualization that perfectionism is multidimensional which has an intrapersonal dimension (i.e., self-oriented perfectionism) and an interpersonal dimension (e.g., socially prescribed perfectionism) and consider perfectionism to comprise of predominantly maladaptive components (Hewitt & Flett, 1991). This is further substantiated by the fact that perfectionism has been identified as one of the salient factor in psychological profiles of individuals who suffer from eating disorders (e.g., Boone, Soenens, & Braet, 2011) and individuals with eating disorders also tend to possess higher perfectionism levels as compared with individuals with mood or anxiety disorders (Bardone-Cone et al. 2007).

As iterated earlier, perfectionism is one of the personality features initially identified with AN (Bastiani, Rao, Wetzin, & Kaye, 1995; Polivy & Herman, 2002; Striegel-Moore & Bulik, 2007). It may predate, alter, and persist even after recovery of eating disorders (Fairburn, Cooper, Doll, & Welch, 1999; Halmi et al., 2000; Kaye et al., 1998; Sutandar-Pinnock, Woodside, Carter, Olmsted, & Kaplan, 2003). In one of the earlier studies, it was shown that individuals with eating disorders hold on to the belief that everything in their lives have to be perfect; they possess an overwhelming desire to be perfect and any imperfection (of themselves or in their lives) is forbidden (Hewitt, Flett, & Ediger, 1995). Furthermore, this distorted belief could contribute to their eating preoccupations. This was also supported by Halmi et al. (2000) where it was found that greater severity of eating disorders symptoms was associated with higher levels of perfectionism.

Perfectionism has also been associated with being the salient characteristic present in individuals who engage in disordered eating behaviours (Striegel-Moore & Bulik, 2007) and the relationship between perfectionism and disordered eating behaviours has been determined in recent studies (e.g., Forbush, Heatherton, & Keel, 2007). In particular, higher levels of self-

oriented perfectionism and socially prescribed perfectionism have been found not only in individuals with AN and BN, but also in individuals who display disordered eating symptoms as compared to normal control participants in the studies (Bastiani et al., 1995; Hewitt, Flett, & Ediger, 1995; McLaren, Gauvin, & White, 2001). In comparison, however, one particular study illustrated only a significant relation for self-oriented perfectionism (but not socially prescribed perfectionism) with individuals who displayed anorexic symptoms (McVey, Pepler, Davis, Flett, & Abdolell, 2002). Conversely, another study found a significant relation for socially prescribed perfectionism (but not self-oriented perfectionism) with individuals who displayed bulimic symptoms (Hewitt, Flett, & Ediger, 1995).

Perfectionism with disordered eating behaviour research comparing gender differences have found mixed results. Bardone-Cone et al. (2007) noted that there is still an existence of many disparities. For example, there have been many inconsistencies in regard to males' and females' experiences (Kashubeck-West, Mintz, & Weigold, 2005; Forbush, Heatherton, & Keel, 2007; Woodside, Carter, & Blackmore, 2004; Elgin & Pritchard, 2006). One study found that men displayed perfectionism more when associating it with a lifetime history of fasting while women tended to display perfectionism more when associating it with purging; however, the overall levels of perfectionism were similar between both sexes (Forbush, Heatherton, & Keel, 2007). In contrast, Woodside, Carter, and Blackmore (2004) compared the personalities of both sexes with various types of eating disorders and found that men displayed less perfectionistic personality traits than women. These results were consistent across types of eating disorders and states of physical health. Conversely, Elgin and Pritchard (2006) found that perfectionism was a significant predictor of disordered eating in men but not in women. Moreover, perfectionism was the strongest predictor of disordered eating in men. The results of these studies do not seem to

strongly favour perfectionism components in males or females, so it is unclear as to which gender the trait is more predominantly found. Furthermore, these studies also varied greatly in the populations which were examined. An essential point to note is that none of the studies administered the Eating Disorder Inventory–3 (EDI–3). Overall, the findings have provided considerable evidence for an association between perfectionism and disordered eating behaviours, specifically self-oriented perfectionism and socially prescribed perfectionism.

As indicated previously, although research has demonstrated that individuals with eating disorders possess higher perfectionism as compared to individuals with either mood or anxiety disorders, there exist a pertinent relationship between perfectionism and depression (Bardone-Cone et al. 2007). One straightforward explanation for this relation is that individuals who constantly desire and strive for perfection in their lives but whose efforts are unsuccessful in their attempts, would feel like a failure, dwell on their mistakes and flaws, and persistently question their self-worth and existence. This results in intense feelings of guilt and shame that could impair one's self-esteem and predispose self-deprecating thoughts and depressed mood (Ashby, Rice, & Martin, 2006). More specifically, in terms of the three dimensions of perfectionism, an earlier study conducted by Hewitt and Flett (1991) found that individuals who were depressed had higher levels of socially prescribed perfectionism and in some cases, self-oriented perfectionism. Subsequent research also established that self-oriented perfectionism and socially prescribed perfectionism “are part of clinical depression and of depression in college students and are related to indications of severe psychopathology in psychiatric patients” (Blatt, Quinlan, Pilkonis, & Shea, 1995, p.130). On the contrary, Flett and Hewitt's (2006) found that individuals with high self-oriented perfectionism scores tend to score low on self-satisfaction. Interestingly, however, the study also showed a negative association between self-oriented

perfectionism and performance satisfaction, illustrating that self-oriented perfectionism is not always an adaptive or positive behaviour like what previous studies have shown (Bieling et al., 2004; Cox, Enns, & Clara, 2002; Klibert, Langhinrichsen-Rohling, & Saito, 2005).

Apart from studies which examined the relationship between (1) disordered eating and depression, (2) perfectionism and disordered eating and (3) depression and perfectionism alone, few research examined the combined association of perfectionism, depression, and disordered eating. In a study which sought to investigate perfectionism (as a mediator) in the relationship between depressive mood and eating disorder symptoms in a non-clinical sample of Spanish undergraduate females, it was found that socially prescribed perfectionism (but not self-oriented perfectionism) mediates the relationship between depressive mood and eating disorder symptoms (García-Villamizar, Dattilo, & del Pozo, 2012). Likewise, in the study conducted by Graziano and Sikorski (2014), the levels of disordered eating across depression, perfectionism, and body dissatisfaction were examined. The results indicated that women with eating disorders showed similar levels of depressive symptoms, perfectionistic tendencies, and body dissatisfaction as women with disordered eating behaviours. Although no perfectionistic tendencies differences were revealed amongst the groups, women with disordered eating behaviours showed significantly more depressive symptoms than women with normal eating attitudes and behaviours. Consequently, this suggests that a prediction model of perfectionism, depression, and disordered eating behaviours could be highly plausible.

Although the findings noted above are promising and generally support an association involving the combined relationship of perfectionism, depression, and disordered eating behaviours, some methodological flaws from the previous studies could undermine the conclusions drawn. First, the studies dealt only with female university students. As discussed

earlier, eating disorders and disordered eating behaviours manifest not only in females but males as well. Many research have also established that males are at risk of disordered eating behaviours. Additionally, despite being the most updated and improved version since a decade ago, none of the studies administered the Eating Disorder Inventory-3 (EDI-3). Further, with the recent validation of the EDI-3 in Sweden (Nyman-Carlsson, Engström, Norring, & Nevonen, 2015), the current study could contribute to the research lapse and add to the research literature that do not account for disordered eating behaviours previously. In view of this, the need to clarify the current negative state of research gaps and contribute to possible explanations is essential so as to yield practical and/or scientific benefits for individuals who might be susceptible to disordered eating behaviours. Taken together, three instruments will be used to examine the elements of perfectionism and depressive symptoms in relation to disordered eating behaviours. Psychological traits associated with eating disorders will be measured using the Eating Disorder Inventory-3 (EDI-3). The Beck Depression Inventory (BDI) will be used to test for depressive symptoms, and the Multidimensional Perfectionism Scale (MPS) will measure the dimensions reflecting the personal and social components of perfectionism.

In summary, both perfectionism and depressive symptoms have been linked to disordered eating behaviours. The present study is galvanized by the evident increasing number of eating disorder research globally, indicating that it is widespread and serious. Furthermore, eating disorders and disordered eating behaviours usually co-exist with other forms of associated psychological disorders, particularly anxiety and mood disorders (i.e., depression). Also, causes of eating disorders stem from many different aspects of one's life – biologically, socially, and psychologically. If left untreated, disordered eating behaviours could potentially perpetuate a chronic condition of not only eating disorders, but other mental illnesses. Thus, the current study

hopes to gain a better understanding of the relationship of perfectionism and depressive symptoms on individuals with disordered eating behaviours. By doing so, this could lead to a greater understanding of: (1) specific characteristics that contribute and influence the development of disordered eating behaviours or; (2) whether the development of disordered eating behaviours may have a formative effect on an individual's personality or; (3) whether both could (or would) arise simultaneously.

### **Research Aims and Hypotheses**

The present study sought to examine the relationship of perfectionistic tendencies and depressive symptoms pertaining to disordered eating behaviours. This relationship was explored using a sample of university students. For the reasons that past research do not include individuals who engaged in disordered eating behaviours (but do not satisfy the diagnostic criteria for any particular eating disorder), and that the male population has been vastly underrepresented in the research of disordered eating, it is hoped that the following aims and objectives stipulated below will be achieved.

Specifically, do university students who engage in disordered eating behaviours have higher perfectionism scores and display higher levels of depressive symptoms? Also, how do perfectionism and depressive symptoms predict disordered eating behaviours? Do individuals (and potential sub-groups) differ in terms of the three dimensions of perfectionism, and in relation to depressive symptoms? Taking a step further, how do the above tie in with gender differences? In accordance with the reviewed literature and the aims stated above, it was hypothesized that:

***Hypothesis 1:*** Perfectionism as measured by the MPS and depressive symptoms as measured by the BDI-II will account for a significant proportion of variance in the EDI-3.

**Hypothesis 2a:** Sub-groups will display significant differences with regards to perfectionism and depressive symptoms.

**Hypothesis 2b:** Students who meet the criteria for engaging in disordered eating behaviour (but do not satisfy the diagnostic criteria for eating disorder) will display higher levels of perfectionism and depressive symptoms as compared to students who have normal eating behaviours.

**Hypothesis 3:** Students who engaged in disordered eating behaviours (but do not satisfy the diagnostic criteria for eating disorder) will demonstrate significant differences across sub-groups on the *Self-Oriented Perfectionism (SOP)* scale as measured by the MPS as compared to *Socially-Prescribed Perfectionism (SPP)* and *Other-Oriented Perfectionism (OOP)* scales.

**Hypothesis 4:** Students who display higher levels of depressive symptoms will demonstrate significant differences across sub-groups on the *Socially-Prescribed Perfectionism (SPP)* scale as measured by the MPS as compared to *Self-Oriented Perfectionism* scale (*SOP*) and *Other-Oriented Perfectionism (OOP)* scales.

Although there is no conclusive basis about gender differences, as an extension to the study, it will be explored for both hypotheses 3 and 4.

## Methodology

### Participants

One hundred and eighteen individuals participated in the study. Five participants were dropped, as evidenced by the failure to complete any one of the 3 instruments administered.

After removal of these participants, the complete dataset consisted of 113 participants ( $M_{age} =$



24.88 years,  $SD_{age} = 4.04$ , age range: 19 – 40 years old; 54.9% female, 45.1% male). All individuals were students from a southern Swedish university and had received some form of education (Exchange Studies: 6.2%, Bachelor's: 40.7%, Master's: 48.7%, PhD: 4.4%) from different faculties within the university (Medicine: 3.5%, Law: 8.0%, Social Sciences; 40.7%, Humanities and Theology: 8%, Science: 29.2%, Engineering: 5.3%, Economics and Management: 3.5%, Others: 1.8%). Participants were of diverse ethnicities and nationalities – 74.3% from within Europe ( $n = 84$ ), 13.3% from Asia ( $n = 15$ ), 4.4% from Africa ( $n = 5$ ), 1.8 % from Eurasia ( $n = 2$ ), 3.5% from America ( $n = 4$ ), 1.8% from Australia ( $n = 2$ ), and 1 (0.9%) did not specify.

Participants were recruited via two ways. First, through snowball sampling using social media, a link to the electronic version of the compiled questionnaire containing the 3 instruments was shared on Facebook. Participants were instructed to read the informed consent before deciding to participate in the study. Second, the researcher had contacted professors from the different faculties and sought permission to administer the compiled questionnaire through the direct administration of the pen-and-paper method.

### **Materials and Instruments**

**The Eating Disorder Inventory-3 (EDI-3).** The Eating Disorder Inventory-3 (EDI-3; Garner, 2004) is a self-report measure of psychological traits associated with eating disorders. Previous versions of the EDI have been widely used in both clinical and research contexts (Anderson & Paulosky, 2004b) and it had demonstrated good reliability and consistency. Validation of the EDI-3 in Sweden has also been established (Nyman-Carlsson, Engström, Norring, & Nevonon, 2015) across patients with eating disorders, psychiatric outpatients, and a normal control sample. Currently, it is accepted that the EDI-3 is the best version of the

instrument (Cumella, 2006). The EDI-3 consists of twelve scales: three pertaining to eating disorders (Drive for Thinness, Bulimia, and Body Dissatisfaction) and nine psychological scales (Low Self-esteem, Personal Alienation, Interpersonal Insecurity, Interoceptive Deficits, Emotional Dysregulation, Perfectionism, Asceticism, and Maturity Fears) which assess psychopathology commonly found in individuals with eating disorders. It also comprises of six composites (Eating Disorder Risk, Ineffectiveness, Interpersonal Problems, Affective Problems, Overcontrol, and General Psychological Maladjustment), which takes into account the different groupings of the scales mentioned above. The 91 items (e.g., *'I feel guilty after overeating.'*, *'I eat moderately in front of others and stuff myself when they are gone.'*, *'If I gain a pound, I worry that I will keep gaining.'*) are rated responses on a six-item Likert scale that ranged from "always" to "never" (Garner, 2004). For the current study, the EDI-3 showed a high internal consistency of Cronbach's alpha .953.

**The Beck Depression Inventory-II (BDI-II).** The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a self-report questionnaire used to assess depressive symptoms. The items on the BDI were originally drawn from depressed patients in treatment, standardized on psychiatric patients, and validated against psychiatric standards to measure the severity of depression. It has established strong reliability and validity in both clinical and non-clinical populations (Yin & Fan, 2000). The BDI-II comprised of 21 groups of statements measuring affective and somatic symptoms of depression on a 4-point scale ranging from 0 to 3. Two groups (i.e., 16 and 18) that measure the increase or decrease of appetite and sleep contain seven choices, while the remaining groups have four statements to choose from. Scores obtained can range from 0 to 63 with the following cut-off scores: 0–13 (*minimal*), 14–19 (*mild*), 20–28 (*moderate*) and 29–63 (*severe*). Higher scores indicate an increased level of

depressive symptoms. For the current study, the BDI-II showed a high internal consistency of Cronbach's alpha .911.

**Multidimensional Perfectionism Scale (MPS).** The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1990) is composed of 45 items on 3 dimensions reflecting the personal and social components of perfectionism:

- (1) *Self-Oriented Perfectionism (SOP)* – An intrapersonal component, reflecting one's personal setting and behaviour of high standards deriving from and directed to the self (e.g., *'When I am working on something, I cannot relax until it is perfect.'*),
- (2) *Socially Prescribed Perfectionism (SPP)* – An interpersonal component, reflecting perceived high expectations from others of oneself (e.g., *'I find it difficult to meet others' expectations of me.'*),
- (3) *Other-Oriented Perfectionism (OOP)* – An interpersonal component, reflecting one's excessive high demands and expectations imposed on others (e.g., *'I am not likely to criticize someone for giving up too easily'*).

The MPS is not a clinical measure so there is no clinical cutoff scores but it has been stipulated that the higher the score of each scale, the more likely an individual would demonstrate negative forms of perfectionistic tendencies and behaviors (Hewitt, Flett, & Ediger, 1995). Scores may range from 1 to 315 (subscales from 15 to 105) and rating of each item falls on a 7-point Likert scale ranging from *strongly disagree* (score 1), to *strongly agree* (score 7). The MPS subscales have shown adequate degrees of reliability and validity in past studies and the MPS factor structure is consistent across clinical and student samples (Hewitt & Flett, 1991). For the current study, the MPS showed a high internal consistency of Cronbach's alpha .936.

Subscales' internal consistencies were: SOP (15 items) = 0.912; SPP (15 items) = 0.886; OOP (15 items) = 0.847.

**Personal Questionnaire (Appendix B).** Participants will complete a demographics form that will record ethnicity, age, gender, education level, and other variables. Only key variables will be used in addressing the research questions of the study.

### **Procedure and Ethical Issues**

Before the compiled questionnaire was administered, participants were informed that the study will be about how they feel about themselves, and their attitudes and behaviours towards food, with no specific mention of eating behaviours or disorders. Prior to commencement, participants were briefed and assured that there is no obligation if they choose to cease participation from the study at any point in time. Further, it was reiterated that participation will be voluntary and confidentiality will be maintained. Each participant is to provide informed consent (Appendix A) and no form of monetary compensation will be offered for participation. This holds true for the electronic version as well. There was no stipulated time limitation for completing the questionnaire. The researcher was available if the participants had any queries at any point in time while completing the questionnaire. After completion, participants were thanked and asked if they had any questions or feedback about the study. No potential negative consequences for participants were foreseen. Before the research was conducted, ethical considerations and institutional approval were cleared and approved by the Department of Psychology, Lund University.

### **Research Design, Statistical Power, and Effect Size**

A quantitative survey research design was used to carry out the study. The software G\*POWER (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007)

was used to determine the number of participants necessary to have sufficient power for the study. Tabachnick and Fidell (2007) recommended that  $N$  should ideally be  $50 + 8(k)$ ,  $k$  as in the number of predictors, for testing a full regression model, or  $104 + k$  when testing individual predictors. Accordingly, the researcher reasoned that calculations will be done both ways, and then aimed for the largest, thereby increasing the power. Thus, minimum  $N$  for the current study was 106.

Based on the power analysis, a total sample size of 48 participants were needed, assuming a large effect size, with  $F(2, 45) = 3.204$  and Lambda ( $\lambda$ ) = 16.8 ( $f^2 = .35$ , Power = .95,  $p < .05$ ). Assuming a medium effect size, 107 participants were needed,  $F(2, 104) = 3.084$  and Lambda ( $\lambda$ ) = 16.05 ( $f^2 = .15$ , Power = .95,  $p < .05$ ). Hence, issues associated with achieving an acceptable sample size and adequate power for this study were accounted for. Reliability coefficients for all instruments used were all above .80, as discussed previously.

### Results

The following section explains the analyses completed to test the hypotheses from the previous chapter of this paper. SPSS Statistics for Windows version 20.0 software was used to analyse the data. Statistical significance was set for a p-value  $< 0.05$ . Before conducting the main analyses, screening of the data using missing values analysis (MVA) was performed. Five cases were removed in its entirety as the participants failed to complete either any one of the three instruments in the compiled questionnaire that was administered. The data were examined to ensure that all of its underlying assumptions were met and there was no violation for normality, linearity, multicollinearity, and homoscedasticity. These results led to square root data transformations being performed to reduce skewness and improve the normality of the data. The rationale behind this transformation is due to the data being positively skewed and having extremely small values. These reasons for data transformations were also supported by

Tabachnick and Fidell (2007). With the use of a  $p < .001$  criterion for Mahalanobis distance, one outlier was revealed and this case was subsequently removed from the analyses. Thus,  $N = 112$ .

Table 1 presents the means and standard deviations for variables relevant to the current study.

All other variables were set aside.

Table 1

*Means and Standard Deviations for the Variables across Gender*

Variables	Gender	Mean (SD)
EDI	Male	8.16 (1.95)
	Female	9.09 (2.34)
BDI	Male	2.83 (1.21)
	Female	3.07 (1.36)
MPS	Male	12.86 (1.40)
	Female	12.99 (1.31)
SOP	Male	65.66 (16.56)
	Female	66.21 (15.48)
OOP	Male	52.26 (12.46)
	Female	52.19 (12.89)
SPP	Male	49.28 (13.78)
	Female	52.06 (13.58)

Correlational analyses (Table 2) were completed to explore relationships among the relevant variables.

Table 2

*Relationship of the Variables*

Variable	EDI	BDI	MPS	SOP	OOP	SPP
EDI	-					
BDI	.679**	-				
MPS	.370**	.349**	-			
SOP	.232*	.186	.875**	-		
OOP	.138	.177	.816**	.628**	-	
SPP	.557**	.502**	.762**	.476**	.425**	-

*Note.* \* $p < .05$ . \*\* $p < .01$ .

All except other-oriented perfectionism were significantly correlated with disordered eating behaviours (i.e. EDI-3 scores). There was no significant relationship between BDI scores and self-oriented perfectionism, and the significant relationship between self-oriented perfectionism and disordered eating behaviours was a weak one.

Prior to the main analyses, group differences based on demographic variables were explored in relation to the EDI-3 scores and no significant between-group differences were found. A Pearson correlation was used to test whether the continuous variable of age was associated with variability on EDI-3 scores, and it was not significantly correlated,  $r(112) = -.077$ ,  $p = .418$ . Therefore, it was determined that including any demographic control variables was not necessary. For the upcoming main analyses, specifically for hypotheses 2 and 3, participants were first grouped based on their EDI-3 scores. Any participant who obtained a total score of 90 or higher was classified as meeting the criteria for having an eating disorder (i.e. 'ED' group). This cut-off score was the EDI-3 national norms established using sensitivity and specificity analysis from Nyman-Carlsson, Engström, Norring, and Nevenon (2015). Because the

present study also aimed to examine individuals who engaged in disordered eating behaviours, participants with a total score of 38 through 89 were classified as engaging in disordered eating behaviours (i.e., ‘DEB’ group). These numbers were chosen because the cut-off score for the risk of developing an eating disorder is 38 and it is below the cut-off score of 90 used in prior research to classify individuals as having an eating disorder. Participants scoring below 38 would be in the ‘NORM’ group. Once participants were grouped accordingly, these sub-groups were compared to the levels of depressive symptoms and perfectionistic tendencies. For hypothesis 4, participants were grouped based on their level of depressive symptoms, into one of these sub-groups according to their BDI-II scores: *minimal* (score of 0–13), *mild* (score of 14–19), *moderate* (score of 20–28), and *severe* (score of 29–63).

### Main Analyses

**Hypothesis 1.** Standard multiple regression was employed to determine if perfectionism and depressive symptoms will account for a significant proportion of variance in the EDI-3 scores. Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each variable in the regression model are reported in Table 3.

Table 3

*Unstandardised ( $B$ ) and Standardised ( $\beta$ ) Regression Coefficients, and Squared Semi-Partial Correlations ( $sr^2$ ) for Each Variable in a Regression Model Predicting EDI*

Variable	$B$ [95% CI]	$\beta$	$sr^2$
BDI	1.070 [.821, 1.320]	.626**	.345
MPS	.248 [.009, .488]	.151*	.020

*Note.* CI = Confidence Interval. \* $p < .05$ . \*\* $p < .01$ .



In combination, 48.1% of the variance in EDI can be explained by the predictors,  $R = .694$ ,  $R^2 = .481$ , adjusted  $R^2 = .472$ ,  $F(2, 109) = 50.58$ ,  $p < .001$ . Durbin-Watson statistic of 2.073 implied that the assumption of independent errors being tenable has been met. The result suggests that BDI and MPS contribute highly to account for a significant proportion of unique variance in EDI. In this case, BDI can account for the higher significant proportion of unique variance at  $t(109) = 8.51$ ,  $p < .001$  as compared to the MPS,  $t(109) = 2.06$ ,  $p = .042$ . Hence, hypothesis 1 ( $H^1$ ) was supported.

**Hypothesis 2a and 2b.** Using one-way analyses of variance (ANOVA), it was tested whether sub-groups would display significant differences with regards to perfectionism and depressive symptoms. Table 4 presents the means and standard deviations for the sub-groups.

Table 4  
*Means and Standard Deviations for the Sub-groups*

Variable / Group	ED ( $N = 35$ )	DEB ( $N = 68$ )	NORM ( $N = 9$ )
BDI	3.98 ( $SD = 1.19$ )	2.64 ( $SD = 0.96$ )	1.45 ( $SD = 1.18$ )
MPS	13.51 ( $SD = 1.33$ )	12.72 ( $SD = 1.23$ )	12.23 ( $SD = 1.63$ )

The ANOVA was statistically significant,  $F(2, 109) = 28.89$ ,  $p < .001$ ,  $\eta^2 = .346$  and  $F(2, 109) = 5.77$ ,  $p = .004$ ,  $\eta^2 = .096$ , across sub-groups for depressive symptoms and perfectionism respectively. Post-hoc analyses with Tukey's HSD are presented in Table 5.

Table 5

*Multiple Comparisons of Each Variable across Sub-groups*

	Sub-groups	Mean Differences [CI]
BDI	ED x DEB	1.35** [.824, 1.868]
	ED x NORM	2.54** [1.601, 3.476]
	DEB x NORM	1.19** [.302, 2.082]
MPS	ED x DEB	0.79* [.152, 1.431]
	ED x NORM	1.29* [.138, 2.435]
	DEB x NORM	0.49 [.529, 1.585]

*Note.* CI = Confidence Interval. \* $p < .05$ . \*\* $p < .01$ .

The results revealed significant differences between the perfectionism and depressive symptoms scores across all sub-groups except for the comparison between ‘DEB’ and ‘NORM’ groups for perfectionism scores. Hence, hypothesis 2a was mostly supported. Subsequently, an independent sample t-test was used to test hypothesis 2b. As confirmed, it yield significant results between the ‘DEB’ and ‘NORM’ groups for depressive symptoms,  $t(75) = 3.41$ ,  $p = .001$ , but not for perfectionism,  $t(75) = 1.09$ ,  $p = .278$ . Hence, hypothesis 2b was partially supported.

**Hypothesis 3.** Multivariate analysis of variance (MANOVA) was employed to determine if EDI-3 sub-groups would display significant differences with regards to self-oriented perfectionism as compared to socially-prescribed perfectionism and other-oriented perfectionism. Gender differences were also examined. Findings showed that there was a significant effect of the sub-groups on the combined dependent variables,  $F(6, 208) = 6.29$ ,  $p = .001$ ,  $\eta^2 = .154$ . Individual analysis of the dependent variables, however, showed no effects for self-oriented perfectionism. Socially-prescribed perfectionism was the only dependent variable

that was statistically significant at  $F(2, 106) = 19.69, p = .001, \eta^2 = .271$ . Planned contrasts revealed that socially-prescribed perfectionism was statistically significant for 'ED x NORM' and 'ED x DEB' groups, but not in the 'DEB x NORM' group. There was also no significant gender differences found for hypothesis 3. Hence, no support has been found for hypothesis 3.

**Hypothesis 4.** Multivariate analysis of variance (MANOVA) was employed to determine if BDI-II sub-groups would display significant differences with regards to socially-prescribed perfectionism as compared to self-oriented perfectionism and other-oriented perfectionism. Gender differences were also examined. Findings showed that there was a significant effect of the sub-groups on the combined dependent variables,  $F(9, 248) = 2.61, p = .007, \eta^2 = .071$ . Individual analysis of the dependent variables showed that socially-prescribed perfectionism was the only dependent variable that was statistically significant at  $F(3, 104) = 6.06, p = .001, \eta^2 = .149$ . Planned contrasts revealed that socially-prescribed perfectionism was statistically significant only for 'Minimal x Moderate' group. There was also no significant gender differences found for hypothesis 4. Therefore, hypothesis 4 was partially supported.

### Discussion

The aim of the present study was to investigate and gain a better understanding of the relationship between perfectionism and depressive symptoms in relation to individuals with disordered eating behaviors. By doing so, it is hoped that the current study could contribute to the growing body of literature on the specific characteristics of these predictors so as to aid practitioners in identification of possible risk factors and for the assessment, treatment, and prevention of disordered eating behaviors.

### **Major Findings and Theoretical Contributions**

In relation to the hypotheses, the results of the present study shed light to the relationship of disordered eating behaviors in association with perfectionism and depressive symptoms. As predicted, both perfectionism and depressive symptoms have a positive relationship with disordered eating behaviors, indicating that individuals with higher levels of perfectionism and depressive symptoms do indeed display more disordered eating behaviors. This finding substantiated previous research (e.g., Bardone-Cone et al., 2007; Gutzwiller, Oliver, & Katz, 2003; Preti et al., 2009) and further demonstrated that the EDI-3 was a reliable and valid measurement for the intended purpose of the current study. In particular, from the magnitude of the t-statistics, depressive symptoms had a significantly stronger impact and predictive power than perfectionism in explaining disordered eating behaviors.

When grouped according to EDI-3 scores, results revealed significant differences between the perfectionism and depressive symptoms scores across all but one comparison (i.e. between 'DEB' and 'NORM' groups in relation to perfectionism). Interestingly, this could suggest that students who engaged in disordered eating behaviour demonstrated similar levels of perfectionistic tendencies as compared to students who have normal eating behaviours. This was partially consistent with earlier research where greater severity of disordered eating symptoms should be associated with higher levels of perfectionism (e.g., Halmi et al., 2000).

More specifically, the correlations analyses weighed that both self-oriented perfectionism and socially prescribed perfectionism (but not other-oriented perfectionism) were associated with disordered eating behaviours. However, contrary to what was hypothesized, students who engaged in disordered eating behaviours did not have higher levels of self-oriented perfectionism as compared to the other two dimensions. Instead, it was socially prescribed perfectionism that

was statistically significant. The ED group had significantly higher levels of socially prescribed perfectionism ( $M = 62.60$ ) as compared to DEB ( $M = 47.31$ ) and NORM ( $M = 38.33$ ) groups. Also, the results indicated that students who engaged in disordered eating behaviours demonstrated similar levels of socially prescribed perfectionism as compared to students who have normal eating behaviours. In this manner, it was not fully consistent with previous research findings which stipulated that besides socially prescribed perfectionism, individuals with disordered eating behaviours should display higher levels of self-oriented perfectionism as well (Bastiani et al., 1995; Hewitt, Flett, & Ediger, 1995; McLaren, Gauvin, & White, 2001). Taking this into consideration, it could be possible that the current study's sample consisted of students who displayed bulimic symptoms rather than anorexic symptoms (Hewitt, Flett, & Ediger, 1995; McVey, Pepler, Davis, Flett, & Abdolell, 2002). This may also indicate that the current sample could possibly possess faulty perceptions of others' unrealistic and excessive expectations on themselves, hence their susceptibility to disordered eating behaviours.

When grouped according to BDI-II scores, it was revealed that socially prescribed perfectionism was only statistically significant when comparing the 'Minimal' group with the 'Moderate' group. Moreover, there was no significant relationship between participants' depressive symptoms scores and self-oriented perfectionism. This was partially consistent with previous findings of Blatt, Quinlan, Pilkonis, and Shea (1995) and Hewitt and Flett (1991). Additionally, it also suggests that socially prescribed perfectionism do in fact belong to a facet of maladaptive perfectionism (Bieling, Israeli, & Antony, 2004; Cox, Enns, & Clara, 2002; Klibert, Langhinrichsen-Rohling, & Saito, 2005).

No gender disparities were found in the current study and this substantiated recent research that illustrated both males and females are at risk for disordered eating behaviours and

share similar experience in terms of symptoms and comorbidity (Ackard, Fulkerson, & Neumark-Sztainer, 2007; Ålgars, Santtila, & Sandnabba, 2010; Hoyt & Ross, 2003; Hudson et al., 2007; McFarland & Petrie, 2012; Tantleff-Dunn, Barnes, & Larose, 2011; Woodside et al., 2002). Furthermore, there were no differences in both males' and females' perfectionism across sub-groups. This was congruent with previous theoretical accounts discussed in the literature review. For instance, although men displayed perfectionism more when associated it with a lifetime history of fasting while women tended to display perfectionism more when associating with purging, Forbush, Heatherton, and Keel (2007) found that the overall levels of perfectionism were similar between both sexes. However, considering the diversity of the participants' ethnicity and nationality, one could also speculate that gender disparities would likely emerge and be attributed to other complex reasons stemming from socioeconomic and cultural factors (Miller & Pumariega, 2001). In Miller and Pumariega (2001), a cross-cultural review of factors contributing to the development of eating disorders was conducted and it was stated that different cultural beliefs and attitudes, apart from ethnicity and nationalities, also contribute to the development of eating disorders. Furthermore, as cultures evolve, these factors also change and could possibly increase one's vulnerability to disordered eating behaviours. These reasons are out of the scope for the current study; moreover, there exists different school of thoughts about whether socio-cultural factors are indirect contributors or they do play a role in causality [for example, Polivy and Herman (2002) in contrast with Becker, Burwell, Herzog, Hamburg, and Gilman (2002)].

Overall, in terms of the combined association of perfectionism, depressive symptoms, and disordered eating, the present study supports previous research by Graziano and Sikorski (2014). The findings were comparable to the current study as it depicted that women with eating

disorders showed similar levels of depressive symptoms, perfectionistic tendencies, and body dissatisfaction as women with disordered eating behaviours. Although no perfectionistic tendencies differences were revealed amongst the groups, women with disordered eating behaviours showed significantly more depressive symptoms than women with normal eating attitudes and behaviours (Graziano & Sikorski, 2014).

### **Limitations of the Current Study**

The findings of the present study should be interpreted carefully taking into consideration the potential limitations stated in this section. First, the sample population is heavily unbalanced across nationality and ethnicity, and it is not large enough to be representative of the overarching disordered eating population in neither country nor ethnicity, hence one should approach generalization of the results cautiously. Furthermore, using a sample of university students meant that it is uncertain if the results could be generalized to clinical and/or community samples. Also, utilizing the snowball sampling method meant that representativeness is not guaranteed. Nevertheless, the results of the current study still provide valuable insight regarding the relationship of perfectionism and depressive symptoms on disordered eating behaviors cross-culturally since diverse nationalities and ethnicities were assessed. Second, it is not representative of the overall eating disorder population in terms of the diagnostic types (AN, BN, and EDNOS) as outlined in the DSM-IV-TR and this could limit conclusions drawn about the predictors of the current study to specific diagnoses, especially in clinical settings. However, as mentioned at the beginning chapters of this paper, the hypotheses of the current study were not designed to make distinctions by diagnosis. Rather, it sees eating behaviours existing on a spectrum, along a continuum, representing all types of eating behaviours, and not exclusively to restricting, binge-eating, and purging.

Another shortcoming of the study is that the EDI-3, although effective in assessing to some degree of eating pathology an individual experiences, it is nonetheless a self-report measure that provides normative information. Because of the nature of self-report measures, it is possible that some of the results are not truly reflective of eating disorder or disordered eating symptomatology. Hence, the findings from self-report measures (such as in this study) must always be interpreted with a degree of caution as this could potentially result in substantial error and bias, which affect both reliability and validity (Korotitsch & Nelson-Gray, 1999). Due to the sensitive and subjective nature of eating disorders, it is also probable that individuals could intentionally complete the measures deceitfully (either in denial and/or for concealment) or they do not have the capacity for accurate self-evaluation (Túry, Güleç, & Kohls, 2010). This phenomenon presumably occurs because eating-related pathology such as binge eating and purging are deemed to be shameful and embarrassing (Havaki, Friedman, & Brownell, 2002) and it is therefore easier to deny and/or conceal these behaviours. As a result, relying merely on subjective self-report measures could have an impact on the study's validity.

Another limitation of the current study involved the use of different data collection methods – direct pen-and-paper administration and online questionnaires. While it is desirable to use the same method, the response and attrition rates and the logistics involved made it challenging to administer the questionnaire directly across all the faculties in the university. Issues pertaining to construct validity also arose as the EDR composite scale (Eating Disorder Risk; containing subscales Drive for Thinness, Bulimia, and Body Dissatisfaction) could have been used instead, for a more specific evaluation of eating behaviours symptomatology. However, the scale violated the assumption of normality, even after data transformations. Hence, the researcher reasoned that it would be ideal to use the EDI-3 scores in its place as it also took



into account individuals' psychological adjustments. Additionally, it was not possible to control for bio-developmental factors such as puberty and body mass index (BMI) – which are potential contributors to the expression of disordered eating behaviors (Striegel-Moore, Silberstein, Frensch, & Rodin, 1989).

Although the aims of the study were achieved, another methodological weakness exists in that it is not possible to determine directional causality of the predictors and as to which variable occurred first. Also, there could be systematic differences over conditions in participants' characteristics that could cause the observed effects found in this study, hence future studies should strongly utilise the same methods throughout data collection. Given these limitations around generalization, methodology, and design of the current study, the next section will discuss the practical implications and future directions aimed at resolving these issues.

### **Practical Implications and Future Directions**

The purpose of this study was to gain a better understanding of the relationship of perfectionism and depressive symptoms on individuals with disordered eating behaviours. By doing so, it could lead to a deeper understanding of how these predictors could contribute and influence disordered eating behaviours. This would provide an insight to practitioners who deal with eating disorders, depression, and improve the progressing research that have examined these predictors in relation to psychological risk factors and eating pathology. As consistently emphasized in previous studies, understanding the risk factors is pertinent to eating pathology for early identification, assessing, and treatment purposes (White, 2000). More importantly, the researcher reflected that the study could bring about an increased awareness to the development and maintenance of eating disorders and hopefully establish a form of '*protective-prevention*' approach for eating pathology and mood disorders in both clinical and community settings.

The following paragraphs will address specific ways that future research can resolve the shortcomings addressed in the previous section and improve the validity and reliability of conclusions drawn regarding the relationship between perfectionism and depressive symptoms in association to disordered eating behaviors.

One obvious necessary component for future research, in addition to the self-report instruments used, is to include the use of an objective measurement so as to improve the study's reliability and validity. Although this could give rise to respondent fatigue, researchers have been encouraged to use multiple measures. This would not only provide less biased response from the participants, but also take into account individuals' own specific psychological experiences and symptoms. In most fields where eating pathology is involved, an objective clinical interview is mandatory and it has been demonstrated that interviews are considered to be much more reliable and holistic (Decaluwé & Braet, 2004). This would also prevent under- and over-endorsement of eating symptomatology. In this study, for ethical reasons and in order to maximize honest responses, participants in this study were informed that their responses were confidential and anonymous, and that there is no obligation if they choose to cease participation from the study. Perhaps to prevent response bias and check for dishonest responses, including a social desirability measure would have been beneficial. Moreover, the administering of measurements could have been counterbalanced to control for order effects. Future studies should also implement same stringent data collection method to improve validity. Having said that, one prominent points of the current study is its practicality in relation to generalizability (i.e. external validity) and this is supported by Shadish, Cook, and Campbell (2001). Take for instance, based on previous studies, the current study took into consideration that gender could influence or moderate the effects of the variables examined, and so both females and males were deliberately

included. By doing so, if there exists a relationship between gender and the variables studied, then there is prima facie evidence of limited external validity (Shadish, Cook, & Campbell, 2001). Furthermore, there is no reasonable doubt that the constructs used and examined in this study are based on previous knowledge and there are well-developed theories (as reviewed earlier) that describe how these constructs and instances relate to each other. Hence, in this manner, the current study ensured that there is both diversity and specificity which can be applied in real-world settings.

In light of the findings and limitations of the current study demonstrating the relationships of the variables (and in particular, the magnitude of the t-statistics depicting that depressive symptoms had a significantly stronger impact and predictive power than perfectionism in explaining disordered eating behaviors), future research could take upon this study and utilize statistical path analysis methods to assess the indirect and/or spurious associations to establish a plausible recursive/non-recursive model in explaining disordered eating behaviors. This could shed light to elucidate whether each dimension of perfectionism and depressive symptoms is/are specific predisposing variable(s) or whether disordered eating behaviors have a formative effect on one's personality since this has not been established. Likewise, in the same direction as García-Villamizar, Dattilo, and del Pozo (2012), perfectionism should also be investigated as a mediator in the relationship between depressive symptoms and disordered eating behaviours. Longitudinal designs should also be warranted to understand the extent of these relationships and draw more definitive interpretations.

An area which could be an interesting extension to this study and show possible indication of gender disparities would be to consider socio-cultural contributors, such as one's perception of thinness and internalized sexism. Further, individuals' and groups' perceptions of

the different dimensions of perfectionism will be worthy to delve into as these dimensions bring about contrasting meanings to one's life. While it may be an adaptive/positive characteristic for a particular individual, it may also spawn negative processes and consequences for another. In the same vein, as discussed in the earlier sections, certain sub-groups (e.g., ballet dancers, sorority members, and elite athletes) would display higher prevalence for disordered eating behaviours and perfectionism; hence elevations in these dimensions of perfectionism may not necessarily mean it would be a maladaptive characteristic to them since they could perceive perfectionism as a useful feature to aid their endeavours towards success.

These suggestions for future directions will help to enhance the validity and reliability of the findings by addressing the shortcomings of the study. Improving generalization efforts, methodology flaws, issues related to the design of the study, and continued exploration of other predictors of eating disorders and disordered eating behaviours are essential for advancements in this field. These recommendations will hopefully facilitate the degree to which more distinctive and accurate conclusions can be made regarding the relationships between predictors of eating disorders and disordered eating behaviours.

In conclusion, this study is the first in Sweden to utilize the EDI-3 to investigate disordered eating behaviours in relation to perfectionism and depressive symptoms in a university context. The findings of this study have added to previous knowledge about how engaging in disordered eating behaviors and suffering from depressive symptoms can be extremely debilitating for any individual, both physically and mentally. It is also certain that perfectionism should not be seen as a trivial feature as it has conceptual, emotional, and psychopathological implications. Though exploratory, this study also offered some insight to disordered eating behaviours associated with gender differences. With further research, in-depth

relationships across individuals and groups for different dimensions of perfectionism and depressive symptoms could conceivably be established as reliable indicators of disordered eating behaviors. To this end, identifying predictors and variables that could possibly influence subsequent eating disorders may have lasting impact to prevent the perpetuation of a chronic condition of not only disordered eating behaviours but also other mental illnesses.

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## Appendices

**Appendix A - Consent Form****LUND UNIVERSITY**

Faculty of Social Sciences

**Please read the following carefully before you decide to participate in this study.**

Dear Student,

You are being asked to participate in a research study.

There is no time allocation for this study. Your responses will be used anonymously and will remain strictly confidential. Any information collected **will not** directly identify you. Your responses will be coded so that there will be no direct link to your identity.

Participation is completely voluntary and may be discontinued at any time without having to state a reason or with any negative consequences.

There are no anticipated risks or direct incentives for participation. However, your participation will provide valuable information that will advance knowledge and understanding of your fellow students.

If you are willing to participate in this study, please sign on the line below.

**Consent –**

**I have read the above carefully and have had the opportunity to ask questions and received them answered, received information about the study's content and purpose. I hereby agree to participate in the study:**

Signature: .....

Date: .....

Name: .....

If you have any further queries, please email them to **alison.toh.950@student.lu.se**.  
Thank you for your time.

**Appendix B - Personal Questionnaire****Personal Questionnaire**

Age: \_\_\_\_\_

Gender:

- Male
- Female
- Others

Nationality: \_\_\_\_\_

Ethnicity: \_\_\_\_\_

Current University Level:

- Exchange Studies
- Bachelor's
- Master's
- PhD
- Others (please specify): \_\_\_\_\_

Which faculty are you from?

- Medicine
- Law
- Social Sciences
- Humanities & Theology
- Science
- Engineering
- Economics & Management
- Fine & Performing Arts
- Others (please specify): \_\_\_\_\_