

**ARE MALADAPTIVE SCHEMA DOMAINS AND PERFECTIONISM RELATED TO BODY IMAGE
CONCERNS IN EATING DISORDER PATIENTS?**

Liesbet Boone ¹

Caroline Braet ¹

Walter Vandereycken ²

Laurence Claes ²

¹ Ghent University, Belgium

² Catholic University of Leuven, Belgium

Correspondence can be addressed to Liesbet Boone, Faculty of Psychology, Department of Developmental, Social, and Personality Psychology, Henri Dunantlaan 2, B-9000 Ghent, Belgium. E-mail: Liesbet.Boone@UGent.be,

Tel: +3292646486. Fax: +32926464 99.

Note: The first author is research assistant at the Fund for Scientific Research—Flanders (FWO).

**RUNNING HEAD: MALADAPTIVE SCHEMA DOMAINS AND PERFECTIONISM IN EATING
DISORDERS**

Abstract

Both maladaptive schemas (MS) and perfectionism have been associated with eating pathology. However, previous research has not examined these variables simultaneously and has not studied possible mediating relationships between MS and multidimensional perfectionism for body image concerns in eating disorder (ED) patients. Eighty-eight female ED patients completed the Young Schema Questionnaire (YSQ), the Multidimensional Perfectionism Scale Frost (F-MPS), and the Body Attitude Test (BAT). Body image concerns were found to be positively related to Personal Standards (PS) and Evaluative Concerns (EC) perfectionism and all five schema domains. PS Perfectionism was positively associated with Disconnection, Other-directedness, and Overvigilance. EC Perfectionism was positively related to Disconnection, Impaired Autonomy, Other-directedness, and Overvigilance. Moreover, EC perfectionism was found to be a significant mediator in the relationship between the schema domains Impaired Autonomy and Overvigilance and body image concerns. These findings denote the importance to address both core beliefs and perfectionism in ED treatment.

Key Words: Maladaptive Schema Domains; Perfectionism; Eating Disorders; Body Image Concerns

Background

Anorexia nervosa (AN) and bulimia nervosa (BN) are multiply determined disorders influenced by a complex interaction between genetic factors, family dynamics, stressful life events, and features of personality functioning (Polivy & Herman, 2002). Although our understanding of eating disorders (EDs) has increased during the last decades, there is still a lack of integration between cognitive theories of EDs and risk factor research (Cooper, 2005). Two prominent research lines in the literature on personality features involved in EDs deal with the role of (a) cognitive schemas (Jones, Leung, & Harris, 2007) and (b) perfectionism (Bardone-Cone et al., 2007). There are conceptual reasons to assume associations between cognitive schemas and perfectionism, but so far both sets of constructs have been examined separately. The present study aimed to integrate both research lines by examining the interplay between cognitive schemas and perfectionism in relation to body image concerns, a core feature in EDs (Fairburn, Cooper, & Shafran, 2003).

Maladaptive Schemas and Perfectionism

Young (1990) defined dysfunctional schemas as unconditional, self-defeating emotional and cognitive patterns that result from negative experiences and interactions with significant others during childhood or adolescence. These maladaptive schemas (MS) refer to stable, enduring and unconditional themes regarding oneself, others and the world, and are supposed to act as an organizing system for later experiences, thoughts, behaviors, and feelings during adolescence and adulthood (Young, 1999). Hence, maladaptive unconditional schemas act as a self-perpetuating, dysfunctional cognitive belief system and can cause and maintain psychopathology. Research evidence suggests a relationship between MS and ED pathology (Jones, et al., 2007). A large amount of case control studies

showed that anorectic and bulimic patients hold significantly more MS than do healthy controls (Dingemans, Spinhoven, & van Furth, 2006; Leung, Waller, & Thomas, 1999) or recovered patients (Jones, Harris, & Leung, 2005). According to some research, diagnostic subgroups differ on certain maladaptive core beliefs (Unoka, Tolgyes, & Czobor, 2007), whereas other studies found only small differences between groups (Leung, et al., 1999). In sum, this research demonstrates that unconditional core beliefs are present in eating disorders and might act as a vulnerability factor for ED relapse. However, it remains to be examined which psychological processes underlie the relationship between MS and ED pathology. We suppose perfectionism might play an important mediating role here.

Perfectionism is defined as a personality trait in which a person strives to be flawless in performances, sets exceptionally high standards for oneself and is overly self-critical of his own actions (Flett & Hewitt, 2002). In the Frost Multidimensional Perfectionism Scale (F-MPS; Frost, Marten, Lahart, & Rosenblate, 1990), the subscale high Personal Standards (PS) represents the 'adaptive' perfectionism component, while the subscales Concerns over Mistakes and Doubt about Actions represent the 'maladaptive' component or Evaluative Concerns (EC) perfectionism (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). The validity of these two perfectionism components was supported in prior studies (Cox, Enns, & Clara, 2002). PS perfectionism is more related to positive aspects, such as positive affect and self-esteem, and uncorrelated with negative affect; whereas EC perfectionism is more related to negative aspects, like negative affect, depressive symptoms, and distress (Stoeber & Otto, 2006).

According to clinical and empirical studies, perfectionism appears to be involved in ED pathology (Bardone-Cone, et al., 2007). Case-control studies showed higher overall levels of perfectionism among patients with AN (Bastiani, Rao, Weltzin, & Kaye, 1995), BN

(Lilenfeld et al., 2000) and binge eating disorder (BED) (Striegel-Moore et al., 2005) compared to psychiatric or healthy controls. Using a retrospective case-control design, Pike et al. (2008) found that women with AN reported greater severity and higher rates of perfectionism than women with another psychiatric disorder.

Several studies applying the multidimensionality of perfectionism indicated that the level of PS as well as EC perfectionism in ED patients is higher compared to healthy controls or other psychiatric groups (Bastiani, et al., 1995; Lilenfeld, et al., 2000). Although several studies found both components important, Bulik et al. (2003) reported only EC perfectionism to be associated with elevated odds ratios for the development of EDs, compared to other psychiatric illnesses. In line with this, Soenens et al. (2008) found that ED patients had elevated scores on both perfectionism components compared to normal controls, but the significant association between PS perfectionism and ED disappeared when the shared variance with EC perfectionism was controlled for. This finding provides preliminary evidence that the distinction between PS and EC perfectionism is relevant in the area of ED. Other studies indicated that individuals recovered from AN and BN still show elevated scores on both PS and EC perfectionism compared to healthy controls (Bastiani, et al., 1995; Lilenfeld, et al., 2000). In the study of Soenens, Nevelsteen and Vandereycken (2007), at the end of treatment, the level of PS and EC perfectionism in former ED patients was significantly decreased compared to scores at the beginning of treatment. However, post-treatment levels were still higher compared to those of healthy controls. This, again, points to perfectionism as a risk and maintenance factor for EDs.

Aims of the Present Study

Current research on perfectionism lack a strong theoretical grounding in a broader etiologic model. In this study, we aim to integrate risk factor research on perfectionism and

EDs with cognitive theory. In his schema theory, Young (1999) proposed 16 schemas, grouped in five schema domains. Each of these domains refer to the frustration of different core emotional needs in childhood. The domains are 'disconnection/rejection' (i.e. expectation that one's need for security, acceptance, and stability will not be met in a predictable manner), 'impaired autonomy and performance' (i.e. the expectation about oneself and the environment that interfere with one's perceived ability to separate, survive, or perform successfully), 'impaired limits' (i.e. deficiency in internal limits, responsibility to others, or long-term goal-orientation), 'other-directedness' (i.e. an excessive focus on the desires, feelings, and responses of others, at the expense of one's own needs in order to gain love and approval), and 'overvigilance and inhibition' (i.e. excessive emphasis on suppressing one's spontaneous feelings and impulses or on meeting rigid, internalized rules and expectations about performance)". Using these schema domains, we aimed to examine specific associations between maladaptive schema domains and PS and EC perfectionism in ED patients, more specifically to their body image concerns since the latter appears to be associated with perfectionism (Hanstock & O'Mahony, 2002; Hewitt, Flett, & Ediger, 1995). A recent study by Boone, Soenens and Braet (2011) also showed that PS and EC perfectionism were indirectly related to body dissatisfaction. The present study will add to this research by evaluating specific association with schema domains. Since most of the existing studies used non-clinical samples, we wanted to demonstrate this particular association also in a clinical sample. Moreover, we aim to further expand assumptions of the cognitive schema theory and, by examining whether perfectionism would mediate the relation between MS and body image concerns (Young, 1999). Perfectionistic thinking and behavior are hypothesized to be coping mechanisms which deal with negative thoughts, feelings, and self-beliefs through processes such as schema avoidance, compensation or assimilation. In this

conceptualization, the schema remains the filter through which information is processed, whereas perfectionistic behaviors are a way to cope with distressing feelings associated with these maladaptive core beliefs.

Method

Participants

A total number of 88 women participated in this study, who had a mean age of 21.96 years ($SD = 6.11$, range 14.55 - 44.95). All participants were treated in a specialized inpatient unit for ED and were classified in diagnostic subgroups according the criteria of DSM-IV (American Psychiatric Association, 1994) on the basis of a standard interview by an experienced psychiatrist: 40% AN restrictive type ($n=35$), 14.5 % AN bingeing-purging type ($n=13$), 19 % BN purging type ($n=17$), 2.5 % BN non-purging type ($n= 2$), and 24% as eating disorder not otherwise specified (EDNOS; $n=21$). All patients admitted at the inpatient unit during the research period were invited to participate; there were no formal exclusion criteria. Mean duration of ED illness before first assessment was 5.74 year ($SD = 4.87$, range: 0.5-20 year), mean age of onset of the ED was 16.39 ($SD = 4.80$; range: 8-41 year). Concerning educational level, 32% were still in high school, 37% had finished secondary school but had no further education; 31% were higher education graduates (about half college graduates). Diagnostic groups (AN-restrictive, AN-purging, BN, and EDNOS) did not differ significantly from each other in terms of age ($F(3,83) = 1.17, p = .327$) and educational level ($\chi^2(6) = 5.14, p = .525$). After informed consent (for minors also approved by parents), patients who agreed to participate filled out the questionnaires in the first week of their admission. The study was approved by the ethical committees of Ghent University and the Alexian Brothers Psychiatric Hospital.

Instruments

Young Schema Questionnaire (YSQ-L 2nd ed.; Young, 1999). The YSQ is a 205-item self-report questionnaire, measuring maladaptive core beliefs (unconditional, broad cognitions about oneself, others, and the world) on a 6-points Likert scale. The YSQ contains 16 scales, representing the 16 schemas outlined by Young (1999). Questionnaire items are grouped by theme. A score of 5 or 6 on an item represents a high score on that item, a high total score refers to more maladaptive functioning. The Dutch translation (Sterk & Rijkeboer, 1997) has shown good levels of validity and reliability (Rijkeboer, van den Bergh, & van den Bout, 2005). Studies generally provided support for the existence of the core beliefs as proposed by Young (1999). As it is generally accepted, we did not use the scale 'social undesirability' since this scale appears not psychometrically valid (Lee, Taylor, & Dunn, 1999). As a recent study of Van Vlierberghe and colleagues (2010), found that theoretically the use of the five domains is theoretically most appealing, we decided to use the second order structure (5 schema domains) instead of the first order structure (15 schemas) of the YSQ. In our study, all five domains showed excellent internal consistencies (alpha's ranging from .91 to .97).

The Multidimensional Perfectionism Scale (F-MPS; Frost, et al., 1990) is a 35-item self-report questionnaire using a Likert type 5-points response format ranging from "strongly disagree" to "strongly agree" on six subscales. Because it was our aim to examine intra-individual features of perfectionism, rather than focusing on parental criticism and concerns, we only used the three intra-personal subscales of the F-MPS. These three subscales are Personal Standards (PS), Concern over Mistakes (CM), and Doubts about Actions (DA), which represent the strongest and most clear-cut indicators of PS and EC perfectionism

respectively (see also Boone, Soenens, Braet, & Goossens, 2010). The psychometric properties are good, the scale appears to be a reliable and valid measure of perfectionism (Frost, et al., 1993; Frost, et al., 1990). In our study, the subscales had a good internal consistency ($\alpha = .80; .86; .71$ for PS, CM, and DA respectively). CM and DA were grouped together to represent EC perfectionism ($\alpha = .90$) (see Table1).

The Body Attitude Test (BAT; Probst, Van Coppenolle, & Vandereycken, 1995) is a 20-item self-report questionnaire scored on a 6-point scale, developed for female ED patients. The scale measures the subjective body experience and the attitude toward one's body, with a higher score indicating more abnormality. The scale yields a stable factor structure with four subscales: negative appreciation of body size, lack of familiarity with one's own body, general body dissatisfaction, and a rest factor. The total score is used here as a measure of body image concerns. The BAT has good convergent validity with existing body experience related questionnaires, general psychopathological phenomena and complaints (Probst, Vandereycken, Van Coppenolle, & Vanderlinden, 1997). Cronbach's alpha for the total scale was .88.

Analytic Plan

Data analyses were performed in three steps. First, differences in schema domains, perfectionism, and body image concerns were examined between diagnostic groups (AN-restrictive, AN-purging, BN, EDNOS), using two MANOVA's and a single ANOVA respectively. Second, correlations between schema domains, perfectionism and body image concerns were computed. Fishers' z-tests were used to examine significant differences in the strength of associations. Third, following the procedures of Baron and Kenny (1986), mediation analyses were performed to examine the role of perfectionism as mediating variable

between schema domains and body image problems. According to the four step procedure of Baron and Kenny (1986), conditions in all paths should be met to show mediation. Step 1 requires a significant path from the independent variable (schema) to the dependent variable (body image concern). Step 2 involves a significant path from the independent variable to the mediating variable (EC perfectionism). Step 3 requires finding a significant path from the mediating to the dependent variable, controlling for the independent variable. Finally, step 4, mediation is shown when the initial significant effect of the independent variable on the dependent variable is reduced to non-significance after controlling for the mediator. Partial mediation is shown when this path is only reduced in significance.

Results

Descriptive Statistics

Mean level differences between diagnostic categories. Although the multivariate test showed a significant difference between diagnostic groups for schema domains [*Wilk's* $\lambda = .71, p < .05; F(15,218) = 1.90, \eta^2 = .11$], at the univariate level no significant differences between diagnostic groups could be detected. No differences between diagnostic groups were found for PS and EC perfectionism [*Wilk's* $\lambda = .87, p > .05; F(6,164) = 2.01, \eta^2 = .07$], and body image concerns ($F(3,82) = .78, p > .05$). To examine associations between the study variables (schema domains, PS and EC perfectionism, body image concerns) and age and Body Mass Index (BMI), we carried out additional MANOVAs: the effect of age [*Wilk's* $\lambda = .90, p > .05, F(9,71) = .86, \eta^2 = .10$] and BMI [*Wilk's* $\lambda = .85, p > .05, F(9,71) = 1.41, \eta^2 = .15$] were not significant. Given these similarities, further analyses were not controlled for diagnosis, age or BMI.

Associations between Schema Domains, Perfectionism, and Body Image Concerns

The schema domains Disconnection, Impaired Autonomy, Impaired Limits, Other-directedness and Overvigilance were significantly positively related to body image concerns (r ranging from .23 to .48, $p < .01$), the smallest association was found with Impaired Limits ($r = .23$, $p < .05$). The latter was not significantly related to PS or EC perfectionism ($r = .10$ and $r = .18$, $p < .05$ respectively). PS perfectionism did only show a marginally significant association with Impaired Autonomy, but was significantly related to Disconnection, Other-directedness and Overvigilance. EC perfectionism was strongly associated with all four schema domains (see Table 1). The strongest association with PS and EC perfectionism was found for Overvigilance ($r = .56$ and $.60$ respectively, $p < .001$). Overall, the correlation between EC perfectionism and the schema domains ($r = .46$ to $r = .59$, $p < .001$) was stronger compared to the correlation between PS perfectionism and the schema domains ($r = .23$ to $r = .56$), which might suggest that EC perfectionism, compared to PS perfectionism, is more strongly associated with schema domains. However, Fisher's z -tests indicated that only the schema domain Impaired Autonomy was significantly more strongly correlated with EC perfectionism than with PS perfectionism ($z = -2.19$, $p < .05$). Body image concerns were related with both PS ($r = .34$, $p < .01$) and EC perfectionism ($r = .50$, $p < .001$). Overall, four domains of maladaptive schemas (except Impaired Limits) showed significant associations with PS and especially EC perfectionism and body image concerns. These four domains will be further examined.

Insert Table 1 about here

Perfectionism as Mediator Between Schema Domains and Body Image Concerns

First, the relative contribution of PS and EC perfectionism to body image concerns was determined to select valuable mediators. Regression analysis revealed only EC perfectionism

as a significant predictor for body image concerns ($\beta = .55, p < .001$). Therefore, mediation analyses were only performed using EC perfectionism as mediator. Because schema domains were found to correlate highly among each other, separate analyses per schema domain were performed.

As can be seen in table 2, all path coefficients in the first three steps were significant. When entering EC perfectionism at step 4, the path coefficient of the schema domains Impaired Autonomy and Overvigilance was reduced to non-significance ($\beta = .21, \beta = .20$, respectively). This finding supports the mediating role of EC perfectionism. The path coefficient for the other two schema domains (Disconnection and Other-directedness) decreased, but remained significant after entering EC perfectionism to the equation ($\beta = .32, p < .01; \beta = .26, p < .05$, respectively). This means that EC perfectionism partially mediates between these schema domains and body image concerns. Closer inspection showed that the regression coefficients have been reduced almost to half its original size. Additionally, all Sobel tests were significant, revealing that the indirect effects of these particular schema domains to body image concerns are significant.

Insert Table 2 about here

Supplementary Analysis

Although we did not hypothesize MS domains to function as mediator in the relation between EC perfectionism and body image concerns, we tested the possibility that schema domains could function as mediators. As can be seen in table 3, mediation could not be shown for the schema domains Overvigilance and Impaired Autonomy, because the path from the schema domains to body image concerns, controlling for EC perfectionism was not significant ($\beta = .20, p = .09; \beta = .21, p = .06$, respectively). For the schema domains

Disconnection and Other-directedness, regression coefficients in step 4 were slightly reduced, but stayed significant. These results tend to show that schema domains do not function consistently and conclusive as mediators in the relation between EC perfectionism and body image concerns.

Insert Table 3 about here

Discussion

Currently, a multidimensional conceptualization and operationalization of perfectionism is widely accepted. However, one critical issue with the most frequently used multidimensional assessment instruments of perfectionism, is that they are developed from a bottom-up perspective. As a result, the majority of current research on multidimensional perfectionism lacks a strong theoretical grounding in an articulated etiologic model [one notable exception is the work of Slade and Owens (1998), which is based on Skinnerian reinforcement theory]. In our study, we aimed to reframe perfectionism as a risk factor for EDs within the context of schema theory. To the best of our knowledge this study is the first to explicitly examine the relation between MS and multidimensional perfectionism and body image concerns in ED patients. Based on cognitive theory, we forwarded and tested a mediation model in which perfectionism operates as a mediator in the relation between MS domains and body image concerns. Based on cognitive theory (Young, 1999), we propose that the adoption of a perfectionist self-critical orientation could serve the function of primary avoidance of emotion or could represent a cognitive-behavioral strategy as an attempt to cope with the distressing thoughts, feelings, and behaviors associated with MS (Waller, Kennerley, & Ohanian, 2007). The schema domains Impaired Autonomy and Overvigilance appeared to be fully mediated by EC perfectionism in its relation with body

image concerns. How such a perfectionist orientation, developed as a coping strategy with current MS, increases the experience of body image concerns (Boone, et al., 2011) could be hypothesized as follows. When people are confronted with negative self-beliefs associated with these schema domains, evaluative concerns perfectionism might arise as an attempt to cope with these feelings. When the uncertainties and self-criticism become applied to the domain of weight and shape, body dissatisfaction is likely to occur (Boone, et al., 2011). Because current western society portrays a perfect thin body as a highly desirable goal, indicating success and persistence (Striegel-Moore, Silberstein, & Rodin, 1986), the body seems to be one route through which EC perfectionism might be expressed.

First, as expected, both PS and EC perfectionism were significantly associated with body image concerns. However, a regression analysis revealed only EC perfectionism to hold a unique association with body image concerns, a relationship also reported in patients with acne (Hanstock & O'Mahony, 2002) and healthy adolescents (Boone, et al., 2010).

Second, we found that all schema domains (Disconnection, Impaired Autonomy, Impaired Limits, Other-Directedness, and Overvigilance) were strongly positively associated with body image concerns in ED patients. Only for Impaired Limits, this association was less strong. This finding confirms earlier studies establishing an important role for MS in ED pathology (e.g., Dingemans, et al., 2006; Jones, et al., 2005).

Third, all schema domains were related to PS or EC perfectionism, only the schema domain Impaired Limits was not. Core beliefs related to Impaired Limits are characterized by lack of responsibility and self-control on the one hand and feelings of grandiosity on the other hand. These former beliefs are indeed contradictory to beliefs held by perfectionists, who are typically characterized by high levels of self-control, feelings of responsibility, and doubts about performances (Frost, et al., 1990). Subsequently, one might have expected an

inverse relation between perfectionism and Impaired Limits. The absence of any relation could possibly be explained by the fact that feelings of grandiosity and superiority, which also belong to this schema domain, might yet be associated with perfectionistic tendencies. Indeed, research has found perfectionism to be associated with feelings of grandiosity (Ward & Ashby, 2008). For the other domains, we found varying relationships with perfectionism.

The domain Disconnection was found to be related to both PS and EC perfectionism. Based on theory of MS, we hypothesize that living with constant fear of being abandoned, abused, unloved by others, is associated with the setting of high standards (Young, 1999). Possibly, the pursuit of high standards can be an attempt to gain approval from important others and to maintain self-esteem (Blatt, 1995). Accordingly, it is likely that such conditional approval is associated with doubts and uncertainty and feelings that one is never good enough (Burns, 1980; Hamachek, 1978).

The domain Other-directedness is related to PS and especially EC perfectionism. It seems that people with a strong focus on desires, and feelings of others at the expense of the own feelings are more likely to perceive the need to attain to standards and expectations hold by others, possibly with the intention to gain or maintain their love and approval by doing this (Bachar, Gur, Canetti, Berry, & Stein, 2010; Young, 1999). This type of functioning is closely related to a contingent self-esteem and clinical perfectionism, in which self-evaluation is dependent on the pursuit and attainment of demanding standards (Burns, 1980; Shafran, Lee, & Fairburn, 2004).

Impaired Autonomy was only related to higher levels of self-critical perfectionism, and not to the setting of high standards. Mediation analyses showed that EC perfectionism was as a full mediator in the relation between Impaired Autonomy and body image concerns. It has been suggested that one of the seeding grounds for this schema domain are

enmeshed, controlling and perfectionistic families, which have indeed previously been linked to perfectionism and eating disorders (Flett, Hewitt, Oliver, & MacDonald, 2002; Soenens, et al., 2008). These results suggest that a person who has difficulties to develop an independent, clear sense of self is more vulnerable to experience self-criticism and constant doubts about one's abilities in different domains of life (Blatt, 1995; Young, 1999). When these fears and doubt are being applied to the domain of the body, body image concerns are likely to result.

Overvigilance is the schema domain that held the strongest association with PS and EC perfectionism. People with a strong emphasis on suppressing one's spontaneous feelings and actions or on meeting rigid rules and expectations about performance appear to be characterized by a rigid adherence of internalized rules (PS perfectionism), constantly feel that one should do better, and are preoccupied with worries and concerns whether they act upon expectations and norms (EC perfectionism) (Hamachek, 1978; Young, 1999). The finding that EC perfectionism can fully explain the relation between the schema domain 'overvigilance and inhibition' and body image concerns, is especially interesting. The hypothesis that perfectionistic cognitions and behaviors develop from Overvigilance as a coping response, through the schema process of surrendering (Young, Klosko, & Weishaar, 2003) was confirmed by the full mediation finding. Surrendering means that a person yields to his own schema by acting in ways that confirm the schema, which involves in this context an excessive emphasis on suppressing one's spontaneous feelings and impulses or on meeting rigid, internalized rules in which the self is highly criticized (Young, 1999). Overvigilance is supposed to develop in a grim, punitive, and demanding family in which mistakes are unacceptable and emotions are hidden. As such, it is also likely that through the process of modeling, people who are raised in such a harsh, highly critical family

environment will internalize the critical attitude of the parents and become perfectionist themselves (Flett, et al., 2002; Hamachek, 1978; Soenens, et al., 2008). This self-criticism is the working mechanism why concerns appear. When these rigid rules are applied to the domain of weight and shape in order to attain the perfect body, self-criticism will arise and body image concerns are likely to result when these standards cannot be met.

Limitations and directions for future research

Our study has several strengths, such as the use of a clinical sample of ED patients, and an integration of two fields of research, i.e. perfectionism and cognitive schemas. However, this study contends also with some limitations. A major limitation of this study is the cross-sectional design, which constrains the interpretation of some findings. Although we performed regression analyses, in which direction of effects are suggested, conclusions about the direction of effects could not be made. It would be most interesting to longitudinally examine the association between MS in childhood and the development of perfectionism and ED symptoms later in life. Additionally, it seems prudent that future research on the relation between MS and perfectionism should focus more on the developmental pathways that can explain how MS lead to perfectionism. The noxious rearing environments that are supposed to underlie MS (Young, et al., 2003) bear a strong resemblance with descriptions of the development of perfectionism (Flett, et al., 2002; Hamachek, 1978; Shafran & Mansell, 2001). Other limitations are the heterogeneity of the ED sample, which might blur specific relations, and the reliance on a single informant, which may have artificially increased some of the obtained relationships. Another limitation, is the small sample size ($n = 88$) of the study. Given that our sample consisted of patients in all diagnostic categories, it would have been interesting to examine the obtained relations for each diagnostic group separately, even when we could not find differences among diagnosis

on perfectionism and MS domains. Future research might want to use a larger heterogeneous ED sample and examine differences among diagnostic groups. However, given our small sample size the obtained results can be interpreted as strong effects. Moreover, in this study, we were careful with interpreting marginally significant effects as real established effects, which again strengthens the reliability of our findings.

In this study, EC perfectionism could not fully explain how certain schema domains are related to body image concerns in EDs. Therefore, future research may want to explore other explanatory mechanisms for these associations, such as other unhealthy coping strategies (Camara & Calvete, 2010), emotion regulation (Fox & Power, 2009), or contingent self-esteem (Crocker, 2002).

Implications for treatment

The finding that both schema domains *Overvigilance and Impaired Autonomy* and perfectionism are highly prevalent and of importance in ED patients points to the need to focus on both MS and perfectionism in the treatment of EDs (Jones, et al., 2007; Shafran, et al., 2004). Moreover, this study seems to provide some preliminary evidence for perfectionism as coping mechanism to avoid or to deal with distressing feelings associated with particular schema domains. This finding supports the view of Hewitt, Flett, Besser, Sherry, and McGee (2003, p. 1232) and Waller and colleagues (2007) that treatment aimed at long-lasting changes of perfectionism in EDs, should include a schema-focused phase, in which enduring, depth-level schemas based on interpersonal patterns, developmental origins and traumatic experiences are addressed, as well as the way patients cope with these schemas. Indeed, although cognitive behavior therapy has been promoted as the treatment of choice for EDs (Fairburn, 2008) and cognitive behavioral interventions for clinical perfectionism seem promising (Glover, Brown, Fairburn, & Shafran, 2007), a large group of

patients are not adequately helped with this approach. Although our findings need replication using a longitudinal design, they might suggest that many ED patients may get stuck because of core psychological themes originating from childhood or adolescence and, as a consequence, suffer at a broader and deeper cognitive level than just dysfunctional cognitions about weight, shape and eating (Young, et al., 2003).

References

- Association, A. P. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: APA.
- Bachar, E., Gur, E., Canetti, L., Berry, E., & Stein, D. (2010). Selflessness and perfectionism as predictors of pathological eating attitudes and disorders: A longitudinal study. *European Eating Disorders Review*, *18*(6), 496-506. doi: 10.1002/erv.984
- Bardone-Cone, A. M., Wonderlich, S. A., Frost, R. O., Bulik, C. M., Mitchell, J. E., Uppala, S., & Simonich, H. (2007). Perfectionism and eating disorders: Current status and future directions. *Clinical Psychology Review*, *27*, 384-405. doi: 10.1016/j.cpr.2006.12.005
- Baron, R. M., & Kenny, D. A. (1986). The moderator mediator variable distinction in social psychological-research - conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.
- Bastiani, A. M., Rao, R., Weltzin, T., & Kaye, W. H. (1995). Perfectionism in anorexia-nervosa. *International Journal of Eating Disorders*, *17*, 147-152. doi: DOI: 10.1002/1098-108X(199503)17:2<147::AID-EAT2260170207>3.0.CO;2-X
- Blatt, S. J. (1995). The destructiveness of perfectionism - Implications for the treatment of depression. *American Psychologist*, *50*, 1003-1020. doi: doi; 10.1037/0003-066X.50.12.1003
- Boone, L., Soenens, B., & Braet, C. (2011). Perfectionism, body dissatisfaction, and bulimic symptoms: The intervening role of perceived pressure to be thin and thin ideal internalization. *Journal of Social and Clinical Psychology*, *30*(10), 1043-1068. doi: 10.1521/jscp.2011.30.10.1043
- Boone, L., Soenens, B., Braet, C., & Goossens, L. (2010). An empirical typology of perfectionism in early-to-mid adolescents and its relation with eating disorder symptoms. *Behaviour Research and Therapy*, *48*, 686-691. doi: 10.1016/j.brat.2010.03.022
- Bulik, C. M., Tozzi, F., Anderson, C., Mazzeo, S. E., Aggen, S., & Sullivan, P. F. (2003). The relation between eating disorders and components of perfectionism. *American Journal of Psychiatry*, *160*, 366-368.
- Burns, D. D. (1980). The perfectionists script for self-defeat. *Psychology Today*, *14*, 34-52.
- Camara, M., & Calvete, E. (2010). The role of early maladaptive schemas and coping in the development of anxiety and depression symptoms. *Behavioral Psychology-Psicologia Conductual*, *18*(3), 491-509.
- Cooper, M. J. (2005). Cognitive theory in anorexia nervosa and bulimia nervosa: Progress, development and future directions. *Clinical Psychology Review*, *25*, 511-531. doi: 10.1016/j.cpr.2005.01.003
- Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychological Assessment*, *14*(3), 365-373. doi: 10.1037//1040-3590.14.3.365
- Crocker, J. (2002). The costs of seeking self-esteem. *Journal of Social Issues*, *58*(3), 597-615. doi: 10.1111/1540-4560.00279
- Dingemans, A., Spinhoven, P., & van Furth, E. (2006). Maladaptive core beliefs and eating disorder symptoms. *Eating Behaviours*, *7*, 258-265.
- Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. New York: Guildford Press.
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: a "transdiagnostic" theory and treatment. *Behaviour Research and Therapy*, *41*, 509-528. doi: 10.1016/s0005-7967(02)00088-8
- Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issues. In P. L. H. G. L. Flett (Ed.), *Perfectionism: Theory, research, and treatment* (pp. 5-13). Washington, DC: American Psychological Association.
- Flett, G. L., Hewitt, P. L., Oliver, J. M., & MacDonald, S. (2002). Perfectionism in children and their parents: A developmental analysis. In G. L. F. P. L. Hewitt (Ed.), *Perfectionism: Theory, research, and treatment* (pp. 89-132). Washington, DC American Psychological Association.

- Fox, J. R. E., & Power, M. J. (2009). Eating Disorders and Multi-Level Models of Emotion: An Integrated Model. *Clinical Psychology & Psychotherapy*, *16*(4), 240-267. doi: 10.1002/cpp.626
- Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of 2 measures of perfectionism. *Personality and Individual Differences*, *14*, 119-126.
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, *14*, 449-468.
- Glover, D. S., Brown, G. P., Fairburn, C. G., & Shafran, R. (2007). A preliminary evaluation of cognitive-behaviour therapy for clinical perfectionism: A case series. *British Journal of Clinical Psychology*, *46*, 85-94. doi: 10.1348/014466506x117388
- Hamachek, D. E. (1978). Psychodynamics of normal and neurotic perfectionism *Psychology*, *15*, 27-33.
- Hanstock, T. L., & O'Mahony, J. F. (2002). Perfectionism, acne and appearance concerns. *Personality and Individual Differences*, *32*(8), 1317-1325.
- Hewitt, P. L., Flett, G. L., Besser, A., Sherry, S. B., & McGee, B. (2003). Perfectionism is multidimensional: A reply to Shafran, Cooper and Fairburn (2002). *Behaviour Research and Therapy*, *41*(10), 1221-1236. doi: 10.1016/s0005-9767(03)00021-4
- Hewitt, P. L., Flett, G. L., & Ediger, E. (1995). Perfectionism traits and perfectionistic self-presentation in eating disorder attitudes, characteristics, and symptoms. *International Journal of Eating Disorders*, *18*(4), 317-326. doi: 10.1002/1098-108X(199512)18:4<317::AID-EAT2260180404>3.0.CO;2-2
- Jones, C., Harris, G., & Leung, N. (2005). Core beliefs and eating disorder recovery. *European Eating Disorders Review*, *13*(4), 237-244. doi: 10.1002/erv.642
- Jones, C., Leung, N., & Harris, G. (2007). Dysfunctional core beliefs in eating disorders: A review. *Journal of Cognitive Psychotherapy: An International Quarterly*, *21*, 156-171.
- Lee, C. W., Taylor, G., & Dunn, J. (1999). Factor structure of the Schema Questionnaire in a large clinical sample. *Cognitive Therapy and Research*, *23*(4), 441-451.
- Leung, N., Waller, G., & Thomas, G. (1999). Core beliefs in anorexic and bulimic women. *Journal of Nervous and Mental Disease*, *187*(12), 736-741.
- Lilenfeld, L. R. R., Stein, D., Bulik, C. M., Strober, M., Plotnicov, K., Pollice, C., . . . Kaye, W. H. (2000). Personality traits among currently eating disordered, recovered and never ill first-degree female relatives of bulimic and control women. *Psychological Medicine*, *30*, 1399-1410.
- Pike, K. M., Hilbert, A., Wilfley, D. E., Fairburn, C. G., Dohms, F. A., Walsh, B. T., & Striegel-Moore, R. (2008). Toward an understanding of risk factors for anorexia nervosa: a case-control study. *Psychological Medicine*, *38*(10), 1443-1453. doi: 10.1017/s0033291707002310
- Polivy, J., & Herman, C. P. (2002). Causes of eating disorders. *Annual Review of Psychology*, *53*, 187-213.
- Probst, M., Van Coppenolle, H., & Vandereycken, W. (1995). The body attitude test for patients with an eating disorder: Psychometric characteristics of a new questionnaire. *Eating Disorder: Journal of Treatment and Prevention*, *3*, 133-145.
- Probst, M., Vandereycken, W., Van Coppenolle, H., & Vanderlinden, J. (1997). Further experience with the Body Attitude Test. *Eating and Weight Disorders*, *2*, 100-104.
- Rijkeboer, M. M., van den Bergh, H., & van den Bout, J. (2005). Stability and discriminative power of the Young Schema-Questionnaire in a Dutch clinical versus non-clinical population. *Journal of Behavior Therapy and Experimental Psychiatry*, *36*(2), 129-144. doi: 10.1016/j.btep.2004.08.005
- Shafran, R., Lee, M., & Fairburn, C. G. (2004). Clinical perfectionism: A case report. *Behavioural and Cognitive Psychotherapy*, *32*(3), 353-357. doi: 10.1017/s1352465804001420
- Shafran, R., & Mansell, W. (2001). Perfectionism and psychopathology: A review of research and treatment. *Clinical Psychology Review*, *21*(6), 879-906. doi: doi:10.1016/S0272-7358(00)00072-6
- Slade, P. D., & Owens, R. G. (1998). A dual process model of perfectionism based on reinforcement theory. *Behavior Modification*, *22*(3), 372-390. doi: 10.1177/01454455980223010

- Soenens, B., Nevelsteen, W., & Vandereycken, W. (2007). De betekenis van perfectionisme bij eetstoornissen: Een vergelijkend onderzoek. *Tijdschrift voor psychiatrie*, *49*, 709-718.
- Soenens, B., Vansteenkiste, M., Vandereycken, W., Luyten, P., Sierens, E., & Goossens, L. (2008). Perceived parental psychological control and eating-disordered symptoms - Maladaptive perfectionism as a possible intervening variable. *Journal of Nervous and Mental Disease*, *196*, 144-152. doi: 10.1097/NMD.0b013e318162aabf
- Sterk, F., & Rijkeboer, M. M. (1997). *Schema-Vragenlijst [Schema-Questionnaire]*. Utrecht: Ambulatorium Utrecht University.
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, *10*, 295-319. doi: 10.1016/S0272-7358(00)00072-6
- Striegel-Moore, R. H., Fairburn, C. G., Wilfley, D. E., Pike, K. M., Dohm, F. A., & Kraemer, H. C. (2005). Toward an understanding of risk factors for binge-eating disorder in black and white women: a community-based case-control study. *Psychological Medicine*, *35*(6), 907-917. doi: 10.1017/s0033291704003435
- Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist*, *41*, 246-263.
- Unoka, Z., Tolgyes, T., & Czobor, P. (2007). Early maladaptive schemas and body mass index in subgroups of eating disorders: a differential association. *Comprehensive Psychiatry*, *48*(2), 199-204. doi: 10.1016/j.comppsy.2006.09.002
- Van Vlierberghe, L., Braet, C., Bosmans, G., Rosseel, Y., & Bogels, S. (2010). Maladaptive schemas and psychopathology in adolescence: On the utility of young's schema theory in youth. *Cognitive Therapy and Research*, *34*(4), 316-332. doi: 10.1007/s10608-009-9283-5
- Waller, G., Kennerley, H., & Ohanian, V. (2007). Schema-focused cognitive-behavioral therapy for eating disorders. In L. P. Riso, P. L. Du Toit, D. J. Stein & J. E. Young (Eds.), *Cognitive schemas and core beliefs in psychological problems: A scientist-practitioner guide*. Washington, DC: American Psychological Association.
- Ward, A. M., & Ashby, J. S. (2008). Multidimensional perfectionism and the self. *Journal of College Student Psychotherapy*, *22*. doi: 10.1080/87568220801952222
- Young, J. E. (1999). *Cognitive therapy for personality disorders: a schema focused approach* (3th ed.). Sarasota, Florida: Professional Resource Press.
- Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema therapy: A practitioner's guide*. New York: Guilford Press.

Table 1
Reliability, Means, Standard Deviations, and Correlations of the Study Variables

	α	1	2	3	4	5	6	7	8
PS perfectionism	.80								
EC perfectionism	.90	.75***							
Body image concern	.88	.34**	.50***						
Disconnection	.97	.27*	.49***	.48**					
Impaired autonomy	.96	.21+	.50***	.40***	.66***				
Impaired limits	.91	.10	.18+	.23*	.38***	.40***			
Other-directedness	.93	.31**	.52***	.45***	.67***	.71***	.15		
Overvigilance	.94	.57***	.60***	.43***	.58***	.67***	.50***	.63***	
Mean		3.57	3.49	3.04	2.88	2.80	2.67	3.47	3.62
SD		0.88	0.86	0.78	0.94	0.89	0.81	0.97	0.98

N = 88. PS = Personal Standards; EC = Evaluative Concerns.

* $p < .05$, ** $p < .01$ *** $p < .001$, + $p > .10$.

Table 2. Mediation analyses: EC perfectionism as mediator in the relation between schema domains and body image concerns.

	Step 1	Step 2	Step 3	Step 4	Sobel	R- Square
Disconnection	.48***	.49***	.34**	.32**	2.76***	.32***
Impaired autonomy	.40***	.49***	.40**	.21	3.00***	.28***
Other-directedness	.45***	.52***	.36**	.26*	2.86***	.30***
Overvigilance	.43**	.60***	.38**	.20	2.92***	.27***

Note. Step 1= path from independent (YSQdomain-score) to dependent variable (total BAT score). Step 2 = path from independent to mediating variable (EC perfectionism). Step 3 = path from mediating variable to dependent variable (controlling for the independent variable). Step 4 = path from independent to dependent variable (controlling for the mediator). * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3. Supplementary mediation analyses: schema domains as mediators in the relation between EC perfectionism and body image concerns.

Mediator	Step 1	Step 2	Step 3	Step 4	Sobel	R- Square
Disconnection	.50***	.50***	.32**	.34**	2.77***	.32***
Impaired autonomy	.50***	.50***	.21	.40***	1.80+	.28***
Other-directedness	.50***	.52***	.26*	.36**	2.23*	.30***
Overvigilance	.50***	.60***	.20	.38**	1.65	.27***

Note. Step 1= path from independent (EC Perfectionism-score) to dependent variable (total BAT score). Step 2 = path from independent to mediating variable (YSQ-domain score). Step 3 = path from mediating variable to dependent variable (controlling for the independent variable). Step 4 = path from independent to dependent variable (controlling for the mediator). * $p < .05$, ** $p < .01$, *** $p < .001$.