An empirical typology of perfectionism in early-to-mid adolescents and its relation with

eating disorder symptoms

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Abstract

Although the association between perfectionism and eating disorder (ED) symptoms is well-established, debate remains about the relative contribution of two central dimensions of perfectionism, that is, Personal Standards (PS) perfectionism and Evaluative Concerns (EC) perfectionism, in the prediction of ED symptoms. This study used cluster analysis to establish naturally occurring combinations of PS and EC perfectionism in early-to-mid adolescents (N = 656; M age = 13.9 years). Evidence was obtained for four perfectionism profiles: (1) maladaptive perfectionism (high PS and high EC), (2) pure evaluative concerns perfectionism (high EC only), (3) adaptive perfectionism (high PS, low EC) , and (4) non-perfectionism (low on both PS and EC). A comparison of participants in these four clusters in terms of ED symptoms suggests that a combination of high personal standards and evaluative concerns (rather than the presence of one of these two dimensions alone) is most strongly related to ED symptoms.

Key Words: Perfectionism; Eating Disorder; Adolescence; Cluster Analysis

Research addressing risk factors for the development of eating disorders identified perfectionism as an important vulnerability factor that possibly interacts with other risk factors such as self-esteem and body dissatisfaction to predict eating disorder (ED) symptoms (e.g., Bastiani, Rao, Weltzin, & Kaye, 1995; Fairburn, Cooper, & Shafran, 2003; Stice, 2002). Much research on the association between perfectionism and ED symptoms, however, has failed to adopt a multidimensional approach to perfectionism. The importance of adopting such an approach is underscored by recent research supporting a distinction between two central dimensions of perfectionism, that is, 'Personal Standards' (PS) perfectionism and 'Evaluative Concerns' (EC) perfectionism (e.g., Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). Whereas PS perfectionism entails the setting of high standards per se, EC perfectionism is characteristic of individuals engaging in negative self-evaluation, including concerns over mistakes and doubts about actions. Research has shown that both perfectionism components are related differentially to adjustment, with only EC perfectionism showing consistent and unique associations with maladaptive outcomes (e.g. depression and anxiety) (Stoeber & Otto, 2006).

However, studies examining the differential role of PS perfectionism and EC perfectionism in the development of ED symptoms remain scarce (Bardone-Cone et al., 2007). An important question that has arisen in this recent research is about the relative contribution of PS and EC perfectionism in the prediction of ED symptoms. Do both PS and EC perfectionism show independent associations with ED symptoms? Or is only EC perfectionism uniquely related to ED symptoms?

Depending on the statistical procedures used, studies have yielded different findings. In some studies, the variance shared between both perfectionism components was not taken into account. These studies typically revealed that both PS and EC perfectionism scores are related to ED symptoms or diagnosis (e.g. Bastiani et al., 1995). Other studies did control for the variance shared by both components, for instance by entering them simultaneously in a regression analysis or path analysis. These studies typically obtained support for a unique association of EC perfectionism (but not PS perfectionism) with ED symptoms (Dunkley, Blankstein, Masheb, & Grilo, 2006; Soenens et al., 2008, but see Bardone-Cone, 2007 for an exception).

One problem with the statistical approach of controlling for the variance shared between EC and PS perfectionism is that PS and EC perfectionism tend to be highly correlated, with correlations typically ranging between .40 and .60. The simple removal of this shared variance may result in a loss of important and substantive information. To deal with this problem, the aim of this study is to use cluster analysis to derive perfectionism profiles. Instead of pitting the effects of PS perfectionism and EC perfectionism against each other (thereby putting aside their shared variance), cluster analysis allows one to identify naturally occurring combinations of PS and EC and, next, to examine how these perfectionism profiles relate to ED symptoms.

A number of studies have used cluster analysis to identify individual profiles of perfectionism. Parker (1997) identified three clusters in a sample of academically talented sixth graders, labeled healthy (adaptive) perfectionists, (dysfunctional) maladaptive perfectionists, and non-perfectionists. The non-perfectionist students had low scores on all dimensions of perfectionism. The adaptive cluster was characterized

by moderately high scores on PS perfectionism and low scores on EC perfectionism. The dysfunctional cluster had the highest scores on both PS and EC perfectionism.

Subsequent studies yielded further evidence for the existence of these three perfectionism profiles (e.g., see Rice & Ashby, 2007 for an overview), although at least some studies found evidence for more than three clusters (e.g., Lundh, Saboonchi, & Wangby, 2008). Further, these studies showed that the clusters had distinct profiles in terms of different outcome variables, such as depression, self-esteem, anxiety, and positive affect (Rice & Ashby, 2007). People in the maladaptive perfectionism group tend to display higher scores on negative outcomes compared to both the adaptive or the non-perfectionist cluster (Rice & Ashby, 2007). People in the adaptive perfectionism cluster tend to have the highest scores on positive adjustment, with non-perfectionists either scoring in between the maladaptive and adaptive perfectionists or in ways comparable with the adaptive perfectionists.

To date, this person-centered approach has not been applied to the relationship between perfectionism and ED symptoms. Herein, we argue that cluster analysis yields an interesting approach to clarify the inconsistent findings concerning the unique relationship between PS and EC perfectionism in relation to ED symptoms. Specifically, cluster analysis allows us to explore how within-person combinations of PS perfectionism and EC perfectionism relate to ED symptoms.

The present study

In the present study, using cluster analysis we aim to evaluate the relevance of identifying subtypes of perfectionism for ED symptoms in a non-clinical sample of early-to-mid adolescents. Until now most studies on perfectionism have focused on

college students, at the expense of research on early-to-mid adolescents. This is unfortunate because early-to-mid adolescence is considered a crucial period for the development of both perfectionism (Flett, Hewitt, Oliver, & MacDonald, 2002) and ED-related psychopathology (Stice, 2002).

Prior to the cluster analysis we aim to examine the relative contribution of PS perfectionism and EC perfectionism in the prediction of ED symptoms using regression analysis. This was deemed important (a) because previous findings with this approach did not yield unequivocal results and (b) because this allows us to examine whether cluster analysis results in different conclusions regarding the relative contribution of both perfectionism dimensions. First, using cluster analysis we aim to identify different perfectionism subtypes. On the basis of previous research, we expect to identify at least three subtypes, that is, maladaptive perfectionists, adaptive perfectionists, and non-perfectionists. Second, we aim to examine whether the clusters obtained differ in terms of ED symptoms. Given the consistent evidence for a unique association between EC perfectionism and ED symptoms, we expect that adolescents in the maladaptive perfectionism group (i.e., the cluster characterized by high EC perfectionism scores) will have significantly higher scores on eating disorder symptoms compared with the adaptive or the non-perfectionism group. Between-cluster comparisons in terms of ED symptoms may also shed light on the unique role of PS perfectionism. Specifically, it is interesting to compare the 'adaptive' cluster (which is expected to be uniquely characterized by high PS perfectionism) to the non-perfectionist cluster (where PS perfectionism is absent). Because past research has yielded inconsistent evidence for the unique role of PS perfectionism in eating

disorders, we did not formulate an a priori hypothesis about the comparison between the 'adaptive' perfectionism group and the two other groups. Instead, we explore two alternative hypotheses: If PS perfectionism has a unique association with ED symptoms, adolescents in the adaptive perfectionism group would score higher on eating disorder symptoms compared to the non-perfectionists. In contrast, if PS perfectionism does not play a unique role in ED symptoms, the adaptive and non-perfectionistic groups would not differ in ED symptoms. In examining these hypotheses, we controlled for a number of relevant background variables, including body mass index, gender, and age.

Method

Participants and Procedure

Participants were 711 high-school students from Belgium ranging in age between 12 and 15 years. After exclusion of subjects with missing data on critical measures ($n = 38$) and after removal of uni- and multivariate outliers ($n = 16$), the final sample consisted of 656 adolescents with an average age of 13.9 years ($SD = 0.91$). The sample was 58.5 % female. All participants were Caucasian, followed the academic track (meaning that students are prepared to follow post-secondary education, such as university studies), and came from middle-class backgrounds. Of the participants, 80.8 % came from intact, two-parent families.

We obtained passive informed consent from parents and active informed consent from the children themselves. Parents received a letter that explained the purpose and method of the study two weeks prior to the data collection and they were asked to fill out a form if they did not want their child to participate in the study. Less

than 2 % of the parents did not allow their child to participate and all remaining

adolescents agreed to participate. The adolescent questionnaires were administered

during a class period. Students had approximately 45 minutes to complete the survey.

This procedure was approved by the ethics committee of the researchers' university.

Measures

Body Mass Index. Each participant self-reported the current weight (kg) and

height (m). The body mass index was calculated as weight (in kg) / height (in m)². This

study used the adjusted BMI [(actual BM / percentile 50 of BMI for age and gender) x

100] to allow for comparisons with children of the same age and gender. The 50th

percentiles of the BMI for age and gender are based on normative data in a Dutch

sample (Fredriks, van Buuren, Wit, & Verloove-Vanhorick, 2000). An adjusted BMI ≤

85% is considered as underweight. An adjusted BMI ≥ 120% is considered as

overweight. In the current sample, 57 adolescents (9%) were underweight, 508

adolescents (84%) had normal weight, 42 adolescents (7%) were overweight, and 49

adolescents did not report their height or weight.

Perfectionism. The Frost Multidimensional Perfectionism Questionnaire (F-MPS;

Frost, Marten, Lahart, & Rosenblate, 1990) is a 35-item self-report questionnaire using

a Likert scale ranging between 1 (*strongly disagree*) and 5 (*strongly agree*). For the

purpose of this study, we only used three scales from the F-MPS, as these represent

the strongest and most clear-cut indicators of PS perfectionism and EC perfectionism

(e.g., Dunkley et al., 2006): Concern over mistakes (CM), Doubts about actions (DA),

and Personal standards (PS). The F-MPS has a good internal consistency, with alphas

ranging from .77 to .93 (Frost et al., 1990). In this study, a factor analysis on the 20

items of these three scales revealed evidence for 2 factors, which could be clearly interpreted in terms of the distinction between PS perfectionism (i.e., the PS items) and EC perfectionism (i.e., the CM and DA items). Two items intended to measure PS perfectionism, however, did not load as expected and were removed in order to obtain a pure PS perfectionism score. An EC perfectionism score was computed by taking the mean of the items assessing Concern over Mistakes and Doubts about Actions.

Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994). The EDE-Q is a 28 items self-report measure derived from the Eating Disorder Examination interview (EDE). In the current study, the child version of the Dutch EDE-Q was used (Decaluwé & Braet, 1999). The EDE-Q focuses on the past 28 days and assesses four core attitudinal and behavioral features of eating disorders: Dietary Restraint (5 items), Weight Concern (5 items), Shape Concern (8 items), and Eating Concern (5 items). Items are rated on a 7-point rating scale, ranging between 1 (*no days*) and 7 (*every day*). The EDE-Q has been shown to have adequate internal consistency, with Cronbach's alphas ranging from 0.78 to 0.93 (Luce & Crowther, 1999).

<div align="center">Results</div>

Descriptive Statistics and Correlations

To examine differences in the study variables by gender, adjusted BMI, and age, a multivariate analysis of variance (MANCOVA) was conducted with gender as an independent variable and with adjusted BMI and age as covariates. All study variables (i.e. perfectionism components and eating disorder symptoms) were entered as dependent variables. A significant overall effect was obtained for each of the three variables: gender, Wilk's $\lambda = .77$, $F(6, 590) = 28.93$, $p < 0.001$, $\eta^2 = .23$; adjusted BMI,

Wilk's λ = .84, F (6, 590) = 18.26, $p < 0.001$, η^2 = .16; age, Wilk's λ = .98, F (6, 590) = 2.26, $p < 0.05$, η^2 = .02. Univariate ANOVA's indicated that gender was significantly related to PS and EC perfectionism, and each of the EDE-Q measures, except for eating concerns. Male participants reported higher levels of PS perfectionism and EC perfectionism compared to female participants. Girls indicated higher levels of ED symptoms compared to boys. Adjusted BMI was significantly related to higher scores on EC perfectionism, and all EDE-Q measures (rs ranging between .16 and .31). Age was significantly related to higher scores on EC perfectionism, and shape concerns (r = .11, $p < .01$). In all main analyses we controlled for the effects of gender, adjusted BMI, and age.

Means and standard deviations of the study variables, along with correlations between all study variables are displayed in Table 1. PS perfectionism and EC perfectionism were positively correlated. Both perfectionism components were positively related to the eating disorder symptoms, with the correlations of EC perfectionism ranging from .33 to .44 and with the correlations of PS Perfectionism ranging from .15 to .25.

Regression Analysis

To assess the relative contribution of PS and EC perfectionism in the prediction of ED symptoms, a set of multiple regression analyses was performed. Each of the EC scales was regressed on PS and EC perfectionism as simultaneous independent variables. PS and EC perfectionism added significantly to the prediction of all ED scales (see Table 2). As shown in Table 2, whereas EC perfectionism was a significant and

positive predictor of each outcome variable, PS perfectionism was no longer uniquely

related to the outcomes.

Cluster Analysis

Based on recommendations by Gore (2000), cluster analysis was performed in

two steps. In the first step, the standardized PS and EC perfectionism scores were

entered in a hierarchical cluster analysis. Second, a nonhierarchical, k-means cluster

analysis was performed to optimize the hierarchical solution, using the initial seed

points of the best cluster solution as derived from the hierarchical cluster solution in

Step 1 (Gore, 2000).

In Step 1, we estimated cluster solutions with two to five clusters and we

inspected the percentage of variance explained in each solution. One commonly used

criterion is that the cluster solution should explain at least 50% of the variance in each

of the defining variables. This was not the case for a two-cluster solution, which was

not further considered. Further, although we observed a substantial increase in the

explained variance when moving from three clusters to four clusters, this was not the

case when moving from four clusters to five clusters. Thus, we further considered the

three-cluster and four-cluster solution.

Step 2 (i.e., non-hierarchical *k*-means clustering) was applied to the three- and

the four-cluster solutions. To examine the stability of both solutions we used the

double-split cross-validation procedure outlined by Breckenridge (2000). The sample

was randomly divided into two subsamples (subsample A and subsample B). The full

two-step procedure (Ward, followed by k-means) was applied to each half and these

two solutions were then compared for agreement by means of a Cohen's kappa (κ)

(see Breckenridge, 2000 for more details). An agreement of at least .60 is considered acceptable (Breckenridge, 2000). Both the three-cluster solution and the four-cluster solution had good agreement ($\kappa = .95$ and $\kappa = .90$, respectively), suggesting that both solutions are highly stable.

Next, we examined the interpretability of the three- and four-cluster solutions by inspecting the z-scores of the clustering variables within each of the clusters. Although the three-cluster solution contained two clusters that could be interpreted as 'maladaptive perfectionism' and 'non-perfectionism', respectively, it also contained a cluster that could not be clearly interpreted as representing 'adaptive perfectionism' because it had a rather undifferentiated profile.

The four-cluster solution did yield four clearly distinct and interpretable clusters. Cluster 1 consisted of individuals scoring high on both PS and EC perfectionism ($n = 103$, $z = 1.28$ and $z = 1.51$, respectively). This cluster will be referred to as 'maladaptive perfectionism'. Cluster 2 consisted of individuals scoring average on PS perfectionism and high on EC perfectionism ($n = 155$, $z = -.13$ and $z = .53$, respectively). Because individuals had elevated scores on the negative self-evaluative component of perfectionism but not on the setting of high standards, we will refer to this group as 'pure evaluative concerns'. Cluster 3 consisted of individuals scoring high on PS perfectionism and average on EC perfectionism ($n = 137$, $z = .62$ and $z = -.31$, respectively). This cluster will be referred to as 'adaptive perfectionism'. Cluster 4 consisted of individuals scoring low on both PS and EC perfectionism ($n = 261$, $z = -.89$ and $z = -.83$, respectively) and will be referred to as 'non-perfectionism'.

We preferred the four-cluster solution over the three-cluster solution on the basis of two criteria, that is, (a) the higher percentage of explained variance in the four-cluster solution and (b) its better interpretability. In the final four-cluster solution (see Figure 1), 103 participants (15.7%) were classified in the maladaptive perfectionism cluster, 155 participants (23.6%) were classified in the pure evaluative concerns cluster, 137 participants (20.9%) were classified in the adaptive perfectionism cluster, and 261 participants (39.8%) were classified in the non-perfectionism cluster. Significant gender differences were found in the distribution across clusters, $\chi^2(3) = 13.71$, p < .01. More girls (46%) than boys (32%) were classified in the maladaptive perfectionism cluster, whereas boys were relatively more represented in all other clusters. Differences in adjusted BMI were also found, $F(3,603) = 3.72$, $p < .05$, with participants in the maladaptive cluster scoring highest, followed by those in the pure evaluative concerns cluster, the adaptive and non-perfectionistic cluster. No differences were found in terms of age, $F(3,641) = 2.37$, $p > .05$.

Between-Clusters Differences in Eating Disorder Symptoms

To examine differences between the four clusters in terms of eating disorder symptoms, a MANCOVA was conducted. We controlled for the effects of age and adjusted BMI by entering them as covariates. Gender was added as an independent variable next to cluster solution. Results of this MANCOVA are reported in Table 3.

The MANCOVA (with the EDE-Q scales as dependent variables) revealed an overall significant effect of cluster membership, Willks's $\lambda = .83$, $F(12, 1550) = 9.54$, $p < .001$, $\eta^2 = .06$, and gender, Willks's $\lambda = .80$, $F(4, 586) = 38.1$, $p < .001$, $\eta^2 = .21$. The interaction between cluster membership and gender was not significant, indicating

that associations between cluster membership and ED symptoms were similar for boys and girls. Each of the univariate ANOVAs was statistically significant and the effect sizes (η^2) of cluster membership ranged from .10 to .15. Between-cluster differences in each of the eating disorder outcomes were further examined using Tukey HSD tests (see Table 3).

Participants in the maladaptive perfectionism cluster showed the highest scores on the eating disorder scales, followed by those in the pure evaluative concerns cluster, those in the adaptive perfectionism group, and those in the non-perfectionist group. Participants in the maladaptive perfectionism cluster scored significantly higher on all scales compared to participants in each of the other clusters. The pure evaluative concerns group in turn showed significantly higher scores on the outcomes than the adaptive perfectionism group and the non-perfectionistic group. Notably, the adaptive perfectionism group and the non-perfectionistic group did not differ significantly from each other, indicating that the presence of PS alone is not related to ED symptoms.

<p style="text-align:center">Discussion</p>

The purpose of this study was to empirically derive a typology of perfectionism and to determine its relationship with ED symptoms. An innovative feature of this study is that we compared two statistical approaches to examine the relative contribution of PS perfectionism and EC perfectionism in predicting ED symptoms. In this study and in line with previous research (Dunkley et al., 2006; Soenens et al., 2008), an examination of the relative contribution of PS and EC perfectionism using regression analysis revealed that only EC uniquely predicted ED symptoms. This finding

seems consistent with the notion that only EC, and not PS perfectionism is important in the prediction of ED symptoms.

Largely similar results were obtained when deriving naturally occurring patterns of PS and EC perfectionism in early-to-mid adolescents using cluster analysis. We discerned four interpretable clusters of perfectionists on the basis of scores for PS and EC perfectionism. Three clusters were similar to those found in earlier research, that is, maladaptive perfectionism, adaptive perfectionism, and non-perfectionism (Rice & Ashby, 2007). Unexpectedly, after careful evaluation of both statistical (e.g., percentage of variance explained) and substantive (e.g., interpretability) criteria a fourth cluster emerged which we referred to as a 'pure evaluative concerns' cluster. Participants in this cluster seem to be characterized by a tendency to engage in negative self-evaluations (e.g., concerns over making mistakes and doubts about actions), even though they do not set high standards for themselves. Possibly, these adolescents had a developmental history where parents were very critical and conveying doubt about the child's performance but did not emphasize or push for high standards. Alternatively, it could be hypothesized that adolescents in the pure evaluative concerns group once had high standards but abandoned their ambitions or striving attitudes because of recurrent experiences with failure. Future research is needed (a) to replicate the existence of the pure evaluative concerns cluster, and (b) to examine the dynamics involved in this cluster.

Similar to the findings obtained with the regression analyses, at least some results from the cluster analysis indicate a unique role for EC perfectionism (but not PS perfectionism) in ED symptoms. For instance, participants in the adaptive

perfectionism cluster, which is characterized uniquely by high levels on PS

perfectionism, reported lower levels of ED symptoms compared to those in the pure

evaluative concerns cluster. Thus, being high on EC perfectionism seems to be more

strongly related to ED symptoms than being high on PS perfectionism. Moreover, no

significant differences in terms of ED symptoms were found between the adaptive

perfectionism cluster and the non-perfectionism cluster. Given that PS perfectionism is

the only feature differentiating between these two clusters, PS perfectionism again

seems to be harmless with respect to ED vulnerability.

However, other results from the cluster analysis do suggest a possible role for

PS perfectionism in ED symptoms and as such attest to the unique contribution of a

cluster-analytic approach. Specifically, the cluster that was associated with the highest

level of ED symptoms was the maladaptive perfectionism cluster, which is

characterized by a highly self-evaluative attitude in combination with the setting of

high personal standards. Notably, ED symptom scores in this cluster were significantly

higher than those in the pure evaluative concerns cluster. This finding is consistent

with a number of previous findings in the literature, including Bardone-Cone's (2007)

finding that high levels of bulimic symptoms were related to a combination of PS

perfectionism and EC perfectionism. This finding is important because it indicates that

adding PS perfectionism to EC perfectionism is related to a higher display of ED

symptoms. If PS perfectionism plays a buffering role against the effects of EC

perfectionism, then individuals in the maladaptive perfectionism cluster (where EC

perfectionism is combined with PS perfectionism) should score lower on ED symptoms

than individuals in the pure evaluative concerns cluster. However, rather than

offsetting the risk for ED symptoms associated with EC perfectionism, PS perfectionism

seems to act like an aggravating factor for the effects of EC perfectionism on ED

symptoms, as the combination of PS and EC perfectionism is associated with a larger

risk for ED symptoms than the presence of EC perfectionism alone. Technically

speaking, this implies a moderator effect where high PS perfectionism is only related

to ED symptoms when combined with EC perfectionism. This interplay of PS and EC

perfectionism is consistent with the maintenance model of perfectionism outlined by

Shafran, Cooper, & Fairburn (2002). In this model it is assumed that PS perfectionism

and EC perfectionism would mutually reinforce one another in an escalating vicious

cycle, such that over time the combination of high PS and EC perfectionism is related

to the strongest vulnerability to eating disorders (Shafran et al., 2002).

Implications for Future Research, Prevention, and Therapy

There are several practical implications that can be drawn from the results of

this study. Results from this study indicate that EC perfectionism is strongly related to

a vulnerability for ED symptoms. As such, prevention as well as intervention programs

may primarily focus on adolescents displaying high EC perfectionism, thereby

attempting to reduce adolescents' tendency to engage in negative self-evaluations.

Targeting EC perfectionism is also important because of its strong relations to

depression and anxiety. However, our findings also point to the importance of

targeting high standards, particularly when standards are combined with EC

perfectionism. For those adolescents vulnerable to negative self-evaluations, it may be

important to simultaneously reduce negative self-evaluations and challenge unrealistic

and rigidly held personal standards.

Limitations and Directions for Future Research

A first limitation is the use of self-report measures in the study. The reliance on a single informant may have artificially increased some of the relationships obtained. Second, the cross-sectional design of the study limits interpretations of the direction of the effect. These results also ask for replication via a longitudinal research design. It would be interesting to examine whether individuals shift from one cluster to another over time and whether this affects changes in ED symptoms. Third, since our sample consisted of Caucasian early-to-middle adolescents from middle-class backgrounds, the homogeneity of the sample is another limitation. Further studies with a more diverse population are needed to replicate and extend the present findings. Also, it would also be interesting to examine whether the perfectionism profiles identified here could be replicated in a clinical sample, preferably a heterogeneous group of patients with Anorexia, Bulimia, and Eating Disorder Not Otherwise Specified (e.g. Binge Eating Disorder).

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Table 1

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

	α	1	2	3	4	5	6
1. PS Perfectionism	.74						
2. EC Perfectionism	.91	.63***					
3. EDEQ-Restraint	.86	.22***	.37***				
4. EDEQ-Eating concerns	.80	.25***	.44***	.75***			
5. EDEQ-Weight concerns	.86	.15***	.33***	.73***	.65***		
6. EDEQ-Shape concerns	.92	.16***	.34***	.75***	.66***	.93***	
Mean		2.46	1.93	0.63	0.55	1.18	1.20
SD		0.75	0.71	1.00	0.87	1.29	1.33

Note. N = 656. PS = Personal Standards; EC = Evaluative Concerns; EDEQ = Eating Disorder Examination Questionnaire.

*** $p < .01$.

Table 2

Regression Analyses with PS and EC perfectionism Predicting Eating Disorder Symptoms (Controlled for the Effects of Gender, Age, and Adjusted BMI)

	Personal Standards Perfectionism		Evaluative Concerns Perfectionism			
Dependent variable	*B (SE)*	β	*B (SE)*	β	*F (5, 593)*	*R²*
EDEQ-Restraint	.01 (.06)	.01	.50 (.07)	.35***	32.59***	.22
EDEQ-Eating concerns	-.02 (.05)	-.02	.56 (.06)	.45***	33.20***	.22
EDEQ-Weight concerns	-.06 (.07)	-.04	.63 (.08)	.35***	55.57***	.32
EDEQ-Shape concerns	-.06 (.08)	-.04	.70 (.08)	.37***	57.69***	.33

Note. N = 656. PS = personal standards; EC = evaluative concerns; EDEQ = Eating Disorder Examination Questionnaire. *p <.05, ** p<.01, *** p < .001
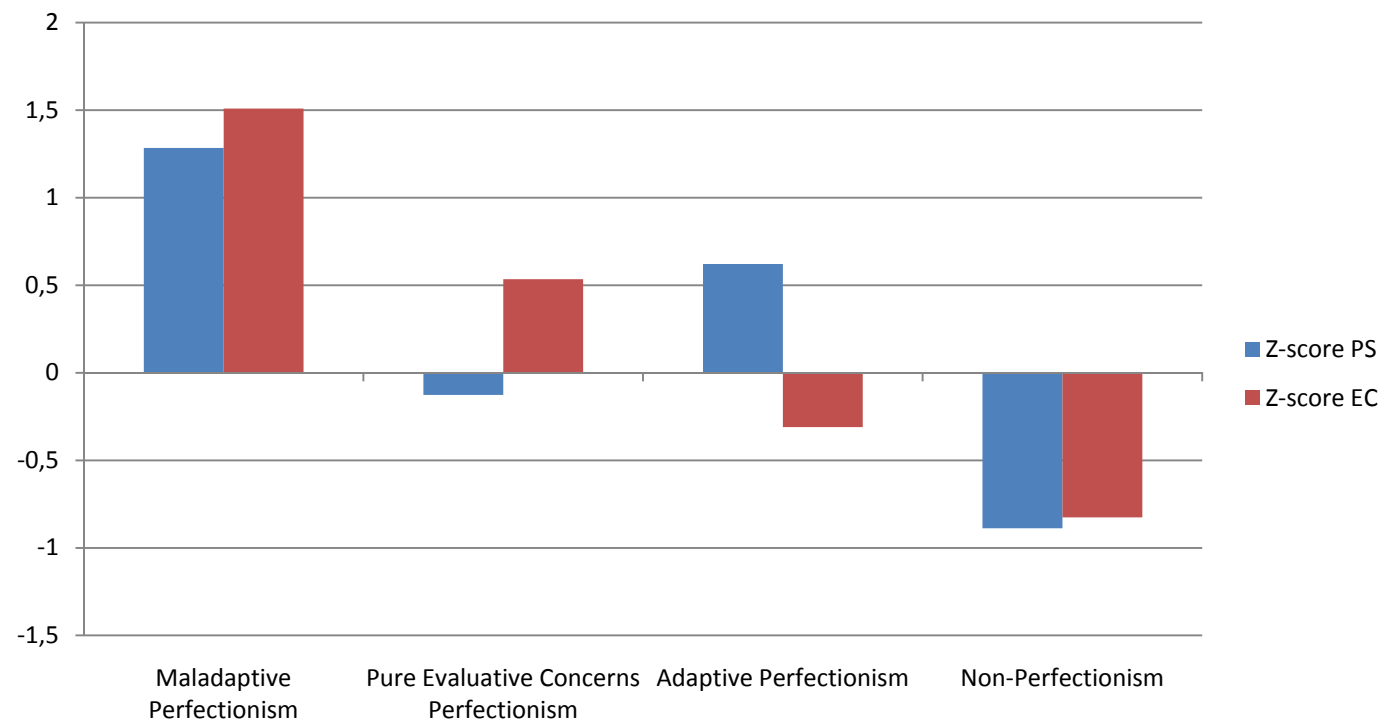
Figure 1. Z-scores for Personal Standards (PS) Perfectionism and Evaluative Concerns (EC) Perfectionism in the four-cluster solution.