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Psychometric properties of the Multidimensional Perfectionism Scale of Hewitt
in a Dutch speaking sample: Associations with the Big Five personality traits

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Abstract

We administered the Dutch Multidimensional Perfectionism Scale of Hewitt and Flett (1991, 2004) in a large student sample (N=959) and performed a confirmatory factor analysis to test the factorial structure proposed by the original authors. The existence of a method factor referring to the negative keyed items in the questionnaire was investigated by including it in the tested models. Next, we investigated how the three perfectionism dimensions are associated with the Five-Factor Model (FFM) of personality. The three-factor structure originally observed by the authors was confirmed, at least when a method factor that refers to the negatively keyed items was included in the model. Self-oriented and socially prescribed perfectionism were both distinguished by low extraversion and low emotional stability. Self-oriented perfectionism's positive relationship with both Conscientiousness and Openness to Experience differentiated the two perfectionism dimensions from each other. Other-oriented perfectionism was not well-characterized by the Big Five personality traits.

Keywords: SOP, SPP, OOP, confirmatory factor analysis, Five Factor Model

Introduction

Since the early 1990s, perfectionism has been conceived in the literature as a multidimensional concept (e.g. Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; Slaney, Rice, Mobley, Trippi, & Ashby, 2001). Hewitt and Flett's multidimensional conceptualization of *trait perfectionism* (Hewitt & Flett, 1991, 2004) is one of the most widely investigated models of perfectionism. The authors define perfectionism as “the perceived or real requirement for perfection for the self or for others” (Hewitt & Flett, 2004, p. 7). The model contains three trait dimensions of perfectionism: self-oriented perfectionism, socially prescribed perfectionism and other-oriented perfectionism. Self-oriented perfectionism (SOP) comprises the setting of very high standards for oneself and the critical evaluation of one's own behavior in order to avoid failures. Socially prescribed perfectionism (SPP) includes the need to satisfy high standards, which are perceived to be prescribed by significant others. This need originates from the conviction that acceptance by others depends on the fulfilment of their standards. Finally, other-oriented perfectionism (OOP) refers to the expectation that significant others constantly achieve unrealistic outcomes and is accompanied by the permanent evaluation of their performance.

To assess individual differences in these three dimensions of trait perfectionism, Hewitt and Flett (1991, 2004) designed the Multidimensional Perfectionism Scale (MPS-H). The MPS-H consists of 45 items, 15 items to measure each dimension. The three subscales contain several negatively keyed items, in order to control for response biases. The authors validated the questionnaire in two samples: a large sample of 1106 university students and a heterogeneous sample of 263 psychiatric patients (Hewitt & Flett, 1991, Study 2). Good internal consistency of the subscales has been demonstrated (SOP: $\alpha = .89$; SPP: $\alpha = .86$; OOP: $\alpha = .79$). In both samples, a principal-components analysis (PCA) revealed a three-factor structure. However, in other samples and cultures, conflicting results were found with respect

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to the factor structure of the MPS-H. Cox and colleagues (Cox, Enns, & Clara, 2002) tested the three-factor model proposed by Hewitt and Flett (1991), using confirmatory factor analysis, in a sample of college students (n=288) and in a sample of adult outpatients (n=412). Across samples, none of the fit indices fulfilled the evaluation criteria for good fit for this three-factor model. The three-factor structure that Labrecque and colleagues (Labrecque, Stephenson, Boivin, & Marchand, 1998) retained based on PCA, using the *French* MPS-H, showed substantial problems with respect to the OOP-subscale. Six out of the fifteen items of the OOP-subscale loaded higher on one of the other two factors. A possible cause of these conflicting findings on the factor structure is the inclusion of several negatively keyed items in the questionnaire: 4 for the SOP-scale, 5 for the SPP-scale, and 9 for the OOP-scale. Most conflicting results are obtained for the OOP-scale, which comprises the largest number of negatively keyed items. Several studies found that negatively keyed items may produce an artificial response factor that consists exclusively of negatively worded items (e.g., Podsakoff, MacKensie, Lee, & Podsakoff, 2003). This method aspect has never been directly investigated for the MPS-H. Because of the presence of a substantial amount of negatively keyed items in this questionnaire, it might explain the conflicting results concerning the factor structure of the MPS-H.

The construct validity of the MPS-H was demonstrated by correlating the subscales of the questionnaire with two other multidimensional perfectionism scales, which are widely used in the perfectionism literature. The substantial associations with the Multidimensional Perfectionism Scale of Frost (MPS-F; Frost et al., 1990) were shown both in student samples and in psychiatric samples (e.g., Hewitt & Flett, 2004). Importantly, the OOP subscale tended to have lower correlations with the MPS-F, which is in line with the fact that the MPS-F does not measure aspects of other-oriented perfectionism. The significant relation between the

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MPS-H and the Almost Perfect Scale-Revised (Slaney et al., 2001) was only established in student samples until now (e.g., Hewitt & Flett, 2004; Rice, Ashby, & Slaney, 2007).

The predictive validity of the MPS-H has been demonstrated extensively throughout the years. Of the three trait dimensions, SPP is assumed to be the most maladaptive in nature. This dimension relates to several types of psychopathological symptoms in clinical and in non-clinical samples (e.g., De Cuyper, Pieters, Claes, & Hermans, 2011; Hewitt & Flett, 2004), and predicts suicidal ideation and suicide attempts (Hewitt, Flett, Sherry, & Caelian, 2006; O'Connor, 2007). SPP also is partially correlated (after controlling for the other two dimensions) with several personality disorders (PD) (Ayearst, Flett, & Hewitt, 2012). In addition, SOP is significantly associated - but less strongly so than the SPP dimension - with several types of psychopathological symptoms, but not with personality pathology (Sherry, Hewitt, Flett, Lee-Baggley, & Hall, 2007). However, beside this maladaptive character of SOP, this dimension is also *positively* related to *desirable* outcome variables, like intrinsic work motivation (Stoeber, Davis, & Townley, 2013), active coping (Flett, Russo, & Hewitt, 1994) and less health risk behavior (Molnar, Sadava, Flett, & Colautti, 2012). The third factor, OOP, is not often associated with psychopathological symptoms, both in students and in psychiatric patients (e.g. Sherry, Hewitt, Flett, & Harvey, 2003; Short & Mazmanian, 2013). Nevertheless, it is shown to be positively associated with Narcissistic PD criteria (Ayearst et al., 2012), and Antisocial and Histrionic PD patterns (Hewitt & Flett, 1991; Stoeber, 2014). These three PD patterns are characterized by the tendency to make use of other persons for one's own purposes (e.g. the tendency to expect to be recognized by others as superior, to violate the rights of others in order to achieve own goals, to want full attention from others). The positive association between OOP and the inclination to make use of others for own purposes suggests that such persons expect high outcomes from others in light of their own personal goals.

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Furthermore, to investigate how the three trait perfectionism dimensions are associated with broader personality features, several studies investigated the associations between the MPS-H and the Five Factor Model (FFM) personality dimensions (Costa & McCrae, 1992) or the Big Five dimensions as measured by the Big Five Inventory (John & Srivastava, 1999). These studies found, without exception, a significantly positive correlation between SOP and Conscientiousness (Dunkley & Kyparessis, 2008; Enns & Cox, 2002; Hewitt & Flett, 2004; Hill, McIntire, & Bacharach, 1997; Rice et al., 2007; Nathanson, Paulhus, & Williams, 2006; Sherry et al., 2007; Stoeber, Otto, & Dalbert, 2009). Important to note here is that Costa and McCrae (1992) defined Achievement Striving (i.e., striving for excellence) as one of the facets of the lower-order structure of Conscientiousness. In a factor analysis on the facet scales of the NEO-PI-R in a sample of 1539 employees (Costa, McCrae & Dye, 1991), the Achievement Striving facet had a factor loading of .72 on the factor Conscientiousness. Therefore, the significant positive correlation across studies between SOP and Conscientiousness is not surprising. Additionally, a significant negative correlation between SPP and Emotional Stability was observed in all these studies (Dunkley & Kyparessis, 2008; Enns & Cox, 2002; Hewitt & Flett, 2004; Hill, et al., 1997; Nathanson et al., 2006; Rice et al., 2007; Sherry et al., 2007; Stoeber et al., 2009). Furthermore, the five studies that examined the association between OOP and a version of the NEO (NEO-PI-R or NEO-FFI; Costa & McCrae, 1992) showed a significant negative correlation with Agreeableness (Enns, & Cox, 2002; Hewitt & Flett, 2004; Hill et al., 1997; Rice et al., 2007; Sherry et al., 2007). In a study of Nathanson et al., (2006) in which OOP was correlated with the Big Five Inventory, no significant relation was observed. Finally, it has also been demonstrated that the MPS-H perfectionism dimensions demonstrate incremental validity above and beyond Neuroticism and Extraversion (assessed by the NEO-FFI) in the prediction of psychopathology, such as the severity of depressive symptoms (Enns & Cox, 1999), anxiety, and social dysfunction in

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students (Miquelon, Vallerand, Grouzet, & Cardinal, 2005). Consequently, the measurement of trait perfectionism dimensions is necessary in the light of the prediction of positive and negative outcome variables.

The aims of the present study are four-fold. First, we investigated the factor structure of the Dutch MPS-H in a large sample of Dutch speaking students (N=959). The study of the factor structure proposed by the original authors was mostly performed in medium-size samples until now (Cox et al., 2002; Hewitt & Flett, 1991). Additionally, due to the large number of negatively keyed items in the MPS-H, the existence of a method factor referring to the negative item format was investigated by including it in the tested models. Second, we examined the internal consistency reliability of the MPS-H subscales. Third, the convergent validity of the MPS-H was investigated by correlating the three MPS-H subscales with the total and the subscales scores of the Multidimensional Perfectionism Scale of Frost (MPS-F; Frost et al., 1990). Since the MPS-F does not measure other-oriented perfectionism, we expected the OOP subscale to have significantly lower correlations with the MPS-F total score, compared to the SOP and SPP subscales. Additionally, since both the SOP subscale of the MPS-H and the Personal Standards subscale of the MPS-F measure mainly the setting of high standards for the self, we expected the SOP subscale to correlate significantly more with the Personal Standards subscale, compared to the SPP and OOP subscales. Since the SPP subscale measures an interpersonal aspect of perfectionism, we expected this subscale to have a significantly higher correlation with the Parental Concerns and Parental Expectations subscales, compared to the SOP and OOP subscales. Finally, to investigate which personality traits typically characterize each of the three trait perfectionism dimensions, we simultaneously entered the Big Five scales into a regression equation to predict variance in each of the MPS-H subscales. As stated earlier, most often bivariate correlations are observed between the three perfectionism subscales and the FFM. And, consistently, significant

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positive correlations are observed between SOP and Conscientiousness, while significant negative correlations are perceived between SPP and Emotional Stability, and OOP and Agreeableness. We chose to conduct three uni-variate regression analyses, with the aim to examine whether the unique relations with the Big Five dimensions would reflect the predictive validity patterns of the three subscales. Based on the predictive value of the three subscales regarding positive and negative criterion variables shown in longitudinal studies, the three subscales can be characterized as follows. SPP is demonstrated to be exclusively maladaptive in nature, SOP combines functional and dysfunctional characteristics and OOP is only related to personality patterns that are characterized by the tendency to make use of other persons for one's own purposes. Based on these findings, it is hypothesized (1) that SPP and SOP will overlap in their dysfunctional relation with the Big Five, (2) that SOP will also show a positively coloured relation with the Big Five, and (3) that OOP will show a largely different relation with the Big Five compared to SOP and SPP, in which the negative relation with Agreeableness will be most significant.

Method

Participants

The sample consisted of 971 first year undergraduate students, majors in psychology who participated in the study for course credits. Twelve participants did not fully complete the questionnaires. Therefore, they were excluded from the analyses, which were computed on the remaining 959 participants. The majority of the sample was female (812 females, 147 males), which is consistent with the gender distribution of the first year undergraduate students at this university. Their mean age was 18.45 years ($SD = 1.75$; range 15-37 years). All participants provided informed consent. The study was approved by the Ethics Committee of the University of Leuven, Belgium.

Procedure

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Participants completed Hewitt and Flett's (1991) Multidimensional Perfectionism Scale during a one-hour session. Six hundred eighty seven of the 959 participants, also completed the Multidimensional Perfectionism Scale of Frost (MPS-F) during that session (Frost et al., 1990). Four hundred twenty two of these 687 students, also received and completed a shortened version of Goldberg's Big Five questionnaire during that same session (Gerris et al., 1998; Goldberg, 1992). Participants were tested in subgroups of 80 to 100 persons.

Instruments

Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991). The MPS-H consists of 45 items and measures self-oriented perfectionism (SOP; 15 items), socially prescribed perfectionism (SPP; 15 items), and other-oriented perfectionism (OOP; 15 items). Each item is rated on a 7-point Likert scale, ranging from 1 (*disagree*) to 7 (*agree*). Reliability (SOP: $\alpha = .89$; SPP: $\alpha = .86$; OOP: $\alpha = .79$) and validity have been demonstrated extensively throughout the years (Hewitt & Flett, 2004). For the use of the MPS-H in the Dutch speaking population, we constructed the Dutch MPS-H. For this aim, the English MPS-H was independently translated by three Dutch-speaking psychologists with a good knowledge of English. After consulting each other, they agreed on one Dutch translation of the questionnaires. Subsequently, a back-translation was made by an academically educated scholar in Dutch and English. To improve the quality of our Dutch inventory, inconsistencies between the original questionnaire and the back-translation were discussed with two Dutch-speaking persons with a profound knowledge of English. The final retranslation was accepted by the publishing company Multi-Health Systems.

Multidimensional Perfectionism Scale (MPS-F; Frost et al., 1990). The MPS-F is a 35-item questionnaire that measures different aspects of perfectionism. The scale consists of 6 subscales: Personal Standards (PS; 6 items), Concern over Mistakes (CM; 9 items), Doubts

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about Actions (DA; 4 items), Organization (O; 6 items), Parental Criticism (PC; 4 items) and Parental Expectations (PE; 5 items). Each item is rated on a 5-point rating scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). All the subscales have shown satisfactory to very high internal consistency with α coefficients ranging from .77 to .90 (Frost et al., 1990). Five of the six subscales strongly correlate with each other, except for the Organization subscale. Therefore, as stated by the original authors, the total score of perfectionism does not include the score on the Organization subscale (Frost, Lahart, & Rosenblate, 1991). The internal consistency for the total score is .90 (Frost et al., 1990). Moderate to excellent convergent and discriminant validity have been demonstrated (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Frost et al., 1990). In the present study, the validated Dutch MPS-F (Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005) was used. The reliability and validity were demonstrated to be highly similar to the psychometric properties of the original inventory (Soenens et al., 2005; Soenens et al., 2008).

Shortened version of Goldberg's Big Five questionnaire (Gerris et al., 1998; Goldberg, 1992). Big Five personality dimensions were assessed using a shortened 30-item Dutch version of Goldberg's Big Five questionnaire. This instrument measures five personality dimensions: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience. Each dimension is measured with 6 items. Each item is rated on a 7-point Likert scale, ranging from 1 (*completely untrue*) to 7 (*completely true*). Reliability (Cronbach's α) has been demonstrated to be satisfactory to very high for middle to late adolescents: Extraversion (.86-.91), Agreeableness (.81-.88), Conscientiousness (.87-.92), Emotional Stability (.79-.85), and Openness to Experience (.74-.79). Several studies supported the validity of this shortened version of Goldberg's Big Five questionnaire for adolescents (Klimstra, Hale III, Raaijmakers, Branje, & Meeus, 2009).

Analyses

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To test the factorial structure of the MPS-H, confirmatory factor analyses (CFAs) were performed with LISREL 8.8 (Jöreskog & Sörbom, 2012). Model parameters were estimated with a diagonal weighted least squares (DWLS) approach, since the responses on the questionnaire items are categorical variables (each item is rated on a 7-point Likert scale). First, we tested a one-factor model, with all items loading on one general perfectionism factor. Second, a three-factor model as proposed by Hewitt and Flett (1991), with the factors SOP, SPP and OOP, was tested. The fit of the two models was compared, in order to test whether the power of the three-factor model was strong enough to reject a more parsimonious one-factor alternative (Bentler, 2007). In a third step, a method factor that refers to the negatively keyed items was included in both models. This method factor models additional variance which can be caused by the reverse wording format (Podsakoff, MacKensie, Lee, & Podsakoff, 2003). Items that were negatively worded were allowed to cross-load on both their original factor and the methods factor. To evaluate model fit, multiple criteria were used (Schweizer, 2010): the Satorra-Bentler scaled chi-square value, the comparative fit index (CFI) for fit relative to a null model, with values above .95 referring to good model fit and between .90 and .95 to acceptable fit (Hu & Bentler, 1999), the root mean squared error of approximation (RMSEA) for which values below .05 have been found to indicate a good model fit and values below .08 an acceptable model fit, and the standardized root mean square residual (SRMR) as the standardized difference between the observed and the predicted correlation, for which values below .10 refer to acceptable model fit (Kline, 2005).

To investigate the reliability of the MPS-H subscales, the Cronbach's α - coefficient of internal consistency was calculated for the three subscales. The construct validity of the three MPS-H subscales was examined by calculating the Pearson correlation coefficients with the MPS-F total score and its subscale scores.

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Finally, three uni-variate regression analyses were performed to examine the unique contribution of each of the Big Five dimensions to the three perfectionism dimensions.

Results

Factor structure of the MPS-H

First, the skewness, kurtosis, and distribution of the items were inspected. Skewness and kurtosis of all items were limited, ranging from -.77 to 1.06, and from -.85 to 1.66 respectively. According to the Shapiro Wilk's test, the responses on the items are not normally distributed (Shapiro Wilk's tests of the items ranging from .84 to .95; all p 's < .001). This was expected since the responses on the items are categorical variables (each item is rated on a 7-point Likert scale). In case of categorical data, the diagonal weighted least squares algorithm is best suited to estimate the parameters of the CFA models (Flora & Curran, 2004; Lei, 2009). The skewness of the items did not transgress the limit of 1.5 set by Forero and colleagues (Forero, Maydeu-Olivares, & Gallardo-Pujol, 2009) to apply this algorithm. Table 1 summarizes the results of the different CFAs. Perfectionism is better represented by a three-factor solution than by a one-factor solution. In addition, the models in which a method factor was included obtained a better fit. This result suggests that the negatively keyed items account for an additional source of variance. For the model with three perfectionism factors and one method factor, three fit indices indicate an acceptable to good model fit. Only the normed χ^2 (χ^2/df) is too high. Consequently, the model with the three perfectionism factors and one method factor was retained as the factor structure of the Dutch MPS-H.

For the best fitting model, the factor loadings of the questionnaire items are shown in Table 2. Tucker's congruence coefficient ϕ (Tucker, 1951) was computed to compare the factor loadings of the original three-factor model and the best fitting model in which the method factor was comprised. As expected, based on the amount of negatively keyed items

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being part of each subscale (four for SOP, five for SPP, and nine for OOP), φ was highest for the SOP-factor ($\varphi = .99$) and lowest for OOP-factor ($\varphi = .91$; for the SPP-factor: $\varphi = .93$). The SOP-factors in both models can be compared equal ($\varphi > .95$). The OOP- and SPP-factors in both models display fair similarity ($.85 < \varphi < .94$; Lorenzo-Seva & ten Berge, 2006).

Reliability and correlations between the three MPS-H subscales

As presented in Table 3, the three MPS-H subscales demonstrated moderate to strong internal consistency. The correlations between the MPS-H scales were moderate, which is consistent with the confirmed three-factor structure of the questionnaire.

Construct validity of the MPS-H

To investigate the convergent validity of the Dutch MPS-H, we correlated the MPS-H with the MPS-F. As presented in Table 4, the three MPS-H subscales correlated significantly with the total score of the MPS-F and with all its subscales. As hypothesized, the OOP subscale was less strongly correlated with the total score compared to the SOP and SPP subscales. Also in line with the hypotheses, the SOP subscale was significantly and more highly correlated with the PS subscale, compared to the SPP and OOP subscales, and the SPP subscale was more strongly and significantly correlated with the PC and PE subscales, compared to the SOP and OOP subscales. All these differences were significant ($p < .001$; all $|z| > 7.48$; Steiger, 1980; Lee & Preacher, 2013). Additionally, all correlations that were hypothesized to be higher in comparison to other correlations had large effect sizes, in contrast with the other correlations (see Table 4; Cohen, 1988).

The SOP subscale was significantly correlated with the PS and O subscales, and these correlations were of higher magnitude than the SPP and OOP subscales were with the PS and O subscales ($ps < .001$; all $|z| > 6.75$). Nevertheless, the correlation between SOP and PS was substantially higher compared to the correlation between SOP and O ($z = 11.81$, $p < .001$). Additionally, and also unexpectedly, the OOP subscale correlation with the CM and

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DA subscales was significantly lower than were the same subscales' correlations with the SOP and SPP subscales (all $|z| > 6.88$, $p < .001$; Steiger, 1980; Lee & Preacher, 2013).

Relation between the Big Five personality traits and the MPS-H

Descriptive statistics and internal consistencies for the Big Five personality subscales are displayed in Table 5. Three uni-variate regression analyses were performed to examine the unique associations between each of the Big Five personality traits and the three perfectionism traits of Hewitt (1991), while simultaneously controlling for the shared variance between the five personality dimensions. In each of the three regression analyses, the five personality traits were simultaneously entered as independent variables. According to the Kolmogorov-Smirnov test (KS; Smirnov, 1948), the studentized residuals in the three regression analyses were normally distributed (SOP: KS $d = .03$, $p > .20$; SPP: KS $d = .03$, $p > .20$; OOP: KS $d = .05$, $p > .20$). As presented in Table 6, the variance of the trait perfectionism subscales explained by the Big Five personality traits (compared to the total variance) had a medium effect size for SOP and a small effect size for SPP and OOP (Cohen, 1988). Emotional Stability and Extraversion were both significantly negatively associated with SOP and SPP, but not with OOP. Both Conscientiousness and Openness to Experience were significantly positively correlated with SOP, but not with SPP. Conscientiousness was also significantly associated with OOP, while Agreeableness was only significantly associated with OOP in the negative direction.

Discussion

In the present study, we investigated the psychometric properties of the Dutch MPS-H in a large sample of 959 Flemish first year undergraduate students, majors in psychology. The three MPS-H subscales demonstrated moderate to strong internal consistency. Confirmatory factor analyses (CFA) confirmed that perfectionism - as measured by the MPS-H - is better represented by a three-factor solution than a one-factor solution. As such, our results confirm

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the three-factor structure originally described by the authors of the MPS (Hewitt & Flett, 1991, Study 2). In addition, inclusion of a method factor that refers to the negatively keyed items led to a better fit. To our knowledge, it was the first time that a method factor was included when the factor structure of the MPS-H was examined. Podsakoff and colleagues (Podsakoff et al., 2003) stated in their overview of method biases that “Unfortunately, research has shown that reverse-coded items may produce artifactual response factors consisting exclusively of negatively worded items” (p. 884). Our results suggest that, in the Dutch MPS-H, the negative item format of 15 items caused an additional source of variance. We propose that this method factor should be taken into account - especially when it concerns translations of the questionnaire - when the investigation of the construct validity of the MPS-H leads to inconsistent results regarding the original three-factor structure. In studies by Masson and colleagues (Masson, Cadot, & Anseau, 2003) and Labrecque and colleagues (Labrecque, Stephenson, Boivin, & Marchand, 1998), items of the French MPS-H OOP subscale did not load well onto the factor that should reflect OOP. It is not surprising that, in both studies, it was the OOP subscale that demonstrated substantial problems, since this subscale consists of the largest amount of negatively keyed items, compared to the SOP and SPP subscale.

It is probably not without reason that the OOP subscale consists of more negatively keyed items compared to positively worded items. The original authors included items with a negative format into the questionnaire in order to control for response biases (Hewitt & Flett, 1991, 2004). This inclusion is most needed in the OOP subscale due to the fact that it assesses a personality trait that is less socially accepted, compared to the SOP and SPP subscales. We assume that most people prefer to admit that they put high standards on themselves versus acknowledging that they expect high achievements from others. Nevertheless, it might also be the case that by including these items, the clarity of the constructs measured by the MPS-H

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was unintentionally blurred, at least in the Dutch version of the MPS-H. We hypothesize that the negatively worded items of the MPS-H assess “acceptance of the self and of others”, which cannot be understood as exactly the opposite of the construct perfectionism. To test this hypothesis, a similar regression analysis was performed in which the Big Five traits were simultaneously regressed upon the sum of negatively keyed items of the MPS-H (without inversion of the itemscores to make the interpretation of the results more straightforward). Based on our hypothesis, it was expected that the negatively worded items would be positively related to Emotional Stability and to Agreeableness. It was indeed observed that only the relations with Emotional Stability and Agreeableness were significant and in the positive direction (respectively $\beta = .15$, $t(416) = 3.04$, $p < .01$ and $\beta = .19$, $t(416) = 3.61$, $p < .001$). Our results suggest that our factor structure analysis might have revealed that at least the Dutch version of the MPS-H also measures a fourth factor, which can be called acceptance of the self and of others. A factor which this meaning is traditionally not seen as (the inverse of) an aspect of perfectionism and is characterized by a personality pattern that is different of the other three factors assessed by the MPS-H. Of course, based on these results, no conclusions can be made regarding the meaning of the fourth factor observed in the Dutch MPS-H. Future studies are needed to examine whether, also in other samples and using other language versions of the questionnaire, the original three-factor structure leads to a poorer fit of the data compared to the three-factor structure completed with a method factor referring to the negatively worded items of the questionnaire.

Furthermore, we demonstrated the construct validity of the Dutch MPS-H by correlating its subscales with Frost’s Multidimensional Perfectionism Scale (Frost et al., 1990). The conceptualisations of perfectionism, as proposed separately by Frost and by Hewitt and Flett, show similarities, but also clear differences (Frost et al., 1993). Both the PS subscale of the MPS-F and the SOP subscale of the MPS-H are conceptually focused on

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personal standards. Likewise, the PC and PE subscales of the MPS-F and the SPP subscale of the MPS-H are conceptually similar. They relate to the perception of significant others' expectations and criticism with regard to one's own achievements. The OOP dimension however, is only part of Hewitt's and Flett's trait perfectionism model, but not of Frost's conceptualisation. Consequently, it is not assessed by items of the MPS-F. Both the similarities and differences between the two questionnaires were reflected in the correlations that were observed between the subscales of the two inventories in our study. The SOP subscale correlated significantly more with the PS subscale, compared to the SPP and OOP subscale, and the SPP subscale correlated significantly more with the PC and PE subscales, compared to the SOP and OOP subscale. The OOP subscale did correlate significantly with the Total score of the MPS-F, but significantly smaller compared to the large correlations of the SOP and SPP subscales with the Total score of the MPS-H. Additionally and unexpectedly, we observed that people who score high on OOP experienced significantly less concerns about their mistakes and had significantly fewer doubts about their actions, compared to people who score high on SOP and/or SPP. This observation is in line with the fact that OOP is – in contradiction to SOP and SPP – often not associated with psychopathological symptoms, neither in students, nor in psychiatric patients (e.g. Sherry, Hewitt, Flett, & Harvey, 2003; Short & Mazmanian, 2013).

To investigate whether the three trait perfectionism dimensions are differently related to broader personality features in line with the predictive validity patterns of the three subscales, we examined the relation to the Big Five personality traits (Goldberg, 1992). In line with the eight studies that investigated the correlations between the trait perfectionism dimensions and the Five Factor Model (Costa & McCrae, 1992) or the Big Five personality traits (John & Srivastava, 1999), we observed a significant positive association between SOP and Conscientiousness and a significant negative association between SPP and Emotional

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Stability (Dunkley & Kyparessis, 2008; Enns & Cox, 2002; Hewitt & Flett, 2004; Hill et al., 1997; Nathanson et al., 2006; Rice et al., 2007; Sherry et al., 2007; Stoeber et al., 2009). The pattern of unique associations between SPP and the Big Five personality traits – that consists of a significant negative association with Emotional Stability and with Extraversion – reflects the exclusively maladaptive nature of SPP. The same two significant associations appeared also in the pattern of unique associations between SOP and the Big Five personality traits. These results are in line with current findings in the literature which show that both SOP and SPP are associated with the internalizing dimension of psychopathological symptoms (Hewitt & Flett, 2004). Internalization, the tendency to experience distress about oneself, like in depressive and anxiety disorders (Krueger, McGue, & Iacono, 2001), is shown to be characterized by low Emotional Stability and low Extraversion (for a meta-analysis: Kotov, Gamez, Schmidt, & Watson, 2010). However, in our study, SOP was – in contrast to SPP – also uniquely correlated with higher degrees of Conscientiousness and of Openness to Experience. Several studies show that measures of Conscientiousness are associated with individual differences in effortful control (MacDonald, 2008; Nigg, 2006; Rothbart, Ahadi, & Evans, 2000). According to MacDonald (2008), effortful control is a self-regulation process that controls prepotent affectively charged responses, which enables the individual to decrease the risks that are related to affective reactivity (Bijttebier, Beck, Claes, & Vandereycken, 2009). It can be argued that this form of self-regulation makes it possible for individuals who score high on SOP to also achieve *desired* outcomes thanks to the high standards they put on themselves, despite their critical evaluation of their own behavior, in order to avoid failures. Consequently, we conclude that the pattern of unique associations between SOP and the Big Five personality traits reflects both the favourable and the unfavourable side of trait SOP.

Finally, OOP shows a different relation with the Big Five personality traits, compared to SOP and SPP. First, in our study, OOP correlated significantly negatively with

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Agreeableness, as was expected. However, and more importantly, only four percent of the variance of OOP was explained by the Big Five personality traits, illustrating that the five personality dimensions hardly constitute the personality dynamics that characterize OOP, in contrast to SOP and SPP. Additionally, and unexpectedly, OOP was also associated with a higher degree of Conscientiousness in our study. To our knowledge, only one other study observed this positive correlation with Conscientiousness (Sherry et al., 2007). Since the Big Five personality traits only explains four percent of the variance of OOP, it is not surprising that this significant association is only observed in one other study.

Summarizing, we conclude from our study that the Dutch MPS-H is a psychometrically sound inventory that assesses three trait perfectionism dimensions. Our study confirms the three-factor structure originally found by the authors of the MPS-H (Hewitt & Flett, 1991, Study 2), at least when a method factor that refers to the negatively keyed items was included in the three-factor model. Additionally, the observed relation between the three trait dimensions of perfectionism and the Big Five personality traits suggest that (1) SOP and SPP are both distinguished by low extraversion and low emotional stability, that (2) SOP's positive relationship with Conscientiousness and Openness to experiences differentiate SOP and SPP from each other, and (3) that OOP is not well-characterized by the personality traits of the Big Five personality traits. These differentiating associative patterns between the Big Five personality dimensions and especially SOP and SPP, are in line with a large body of studies investigating the relationship between the three perfectionism dimensions and desirable versus undesirable outcome behaviour.

Besides the strengths of our study, two limitations need to be addressed. First, our sample is limited to a student population of psychology students, who are predominantly female. Therefore, the three-factor structure of the MPS-H and our findings concerning the personality features of the trait perfectionism dimensions do not automatically generalise to a

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clinical sample and to both the male and female population. Second, this study had a cross-sectional design, which does not allow conclusions with respect to causal relations between the Big Five personality traits and the three trait perfectionism dimensions, as they might occur over time. Since the results of our study suggest that the dimensions of trait perfectionism are characterized by different personality traits, we support going beyond the descriptive level of personality models. We encourage the investigation of the differential relationship between the three aspects of trait perfectionism and models explaining the motivational basis of personality, such as Reinforcement Sensitivity Theory (RST; Gray, 1982; Gray & McNaughton, 2000). Such research has the potential to, for example, ultimately explain why people scoring high on SPP and on SOP both experience more psychopathological symptoms, while people scoring high on SOP, but low on SPP, also engage in psychologically desirable criterion variables. Randles and colleagues (2010) observed that people scoring high on SOP were both driven (i.e., high on the Behavioral Activation System, Drive subscale) and anxiety prone (i.e., high on the Behavioral Inhibition System). This makes them vulnerable to approach-avoidance conflicts, as Flett and Hewitt (2006) already earlier hypothesized. This might explain why people scoring high on SOP not only experience positive outcomes but also more psychopathological symptoms. However, studies investigating the relationship between the three trait perfectionism dimensions and behavioral activation and inhibition demonstrate mixed findings until now (for an overview: see Randles, Flett, Nash, McGregor & Hewitt, 2010; Rasmussen, Elliot, & O'Connor, 2012; Turner & Turner, 2011), which necessitates further research. Moreover, longitudinal studies are needed to investigate whether differences in the motivational basis of personality can predict differences in multidimensional perfectionism.

To conclude, our study demonstrates the Dutch MPS-H to be a psychometrically sound inventory, assessing one intrapersonal and two interpersonal dimensions of

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perfectionism. This questionnaire contributes to the assessment of the many guises of the personality trait perfectionism.

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Table 1

Fit indices of CFA-models, MPS-H (n = 959), estimated via DWLS

Model	DF	Satorra-Bentler scaled χ^2	CFI	RMSEA	SRMR
1 factor perfectionism	945	12873.44	.81	.12	.11
3 factors perfectionism	942	6437.74	.91	.08	.08
1 factor perfectionism, 1 method factor	927	9781.65	.86	.10	.09
3 factors perfectionism, 1 method factor	921	4053.82	.95	.06	.06

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Table 2

Factor loadings for the CFA of the model with the three original perfectionism factors and a method factor for the negative item-format, completely standardized solution (n = 959)

	Factor SOP	Factor SPP	Factor OOP	Factor Negative
Item 1 SOP	.608	-	-	-
Item 6 SOP	.823	-	-	-
Item 8 SOP*	.735	-	-	.511
Item 12 SOP*	.822	-	-	.378
Item 14 SOP	.817	-	-	-
Item 15 SOP	.904	-	-	-
Item 17 SOP	.837	-	-	-
Item 20 SOP	.836	-	-	-
Item 23 SOP	.585	-	-	-
Item 28 SOP	.749	-	-	-
Item 32 SOP	.409	-	-	-
Item 34 SOP*	.682	-	-	.105
Item 36 SOP*	.619	-	-	.449
Item 40 SOP	.730	-	-	-
Item 42 SOP	.671	-	-	-
Item 5 SPP	-	.406	-	-
Item 9 SPP*	-	1.147	-	.842
Item 11 SPP	-	.369	-	-
Item 13 SPP	-	.726	-	-
Item 18 SPP	-	.632	-	-

* = negatively keyed item

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	Factor SOP	Factor SPP	Factor OOP	Factor negative
Item 21 SPP*	-	1.167	-	.898
Item 25 SPP	-	.628	-	-
Item 30 SPP*	-	1.199	-	.952
Item 31 SPP	-	.627	-	-
Item 33 SPP	-	.612	-	-
Item 35 SPP	-	.621	-	-
Item 37 SPP*	-	.523	-	.353
Item 39 SPP	-	.773	-	-
Item 41 SPP	-	.626	-	-
Item 44 SPP*	-	.970	-	.788
Item 2 OOP*	-	-	.533	.505
Item 3 OOP*	-	-	.904	.744
Item 4 OOP*	-	-	.785	.634
Item 7 OOP	-	-	.762	-
Item 10 OOP*	-	-	.170	.193
Item 16 OOP	-	-	.538	-
Item 19 OOP*	-	-	.602	.575
Item 22 OOP	-	-	.476	-
Item 24 OOP*	-	-	.453	.536
Item 26 OOP	-	-	.587	-
Item 27 OOP	-	-	.554	-
Item 29 OOP	-	-	.518	-

* = negatively keyed item

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	Factor SOP	Factor SPP	Factor OOP	Factor negative
Item 38 OOP*	-	-	.800	.519
Item 43 OOP*	-	-	.839	.724
Item 45 OOP*	-	-	.831	.567

* = negatively keyed item

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Table 3

Internal consistency, means, standard deviations, and correlations between the three subscales of the Dutch MPS-H (n = 959)

MPS-H	α	M	SD	Correlations [95% Confidence Interval] Cohen's d of sign. correlations ^a		
				1	2	3
1. Self-Oriented Perfectionism	.91	59.49	16.10	-	.47* [.42, .52]	.41* [.36, .46]
2. Socially Prescribed Perfectionism	.85	49.00	12.10		-	.40* [.35, .45]
3. Other-Oriented Perfectionism	.76	49.44	10.30			-

Note. MPS-H = Multidimensional Perfectionism Scale of Hewitt and Flett. * $p < .001$

^a By Cohen's (1988) convention, d effect sizes of .10, .30, and .50 are interpreted as resp. small, medium and large.

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Table 4

Means, standard deviations, and correlations of the three subscales of the MPS-H with the MPS-F total score and its subscales (n = 687)

	α	M	SD	Correlations [95% Confidence Interval] Cohen's d of sign. correlations ^a		
				SOP	SPP	OOP
MPS-F total	.92	70.36	17.10	.68*** [.64, .72]	.67*** [.63, .71]	.39*** [.33, .45]
Personal Standards	.82	19.76	5.40	.76*** [.73, .79]	.39*** [.33, .45]	.37*** [.30, .43]
Concern over Mistakes	.89	20.59	6.89	.64*** [.59, .68]	.59*** [.54, .64]	.36*** [.29, .42]
Doubts about actions	.73	11.21	3.26	.46*** [.40, .52]	.45*** [.39, .51]	.15*** [.08, .22]
Organization	.93	20.25	5.54	.42*** [.36, .48]	.08* [.01, .15]	.16*** [.08, .24]
Parental Criticism	.79	7.60	3.08	.21*** [.14, .28]	.53*** [.47, .58]	.20*** [.13, .27]
Parental Expectations	.81	11.23	3.98	.25*** [.18, .32]	.55*** [.50, .60]	.29*** [.22, .36]

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Note. MPS-F = Multidimensional Perfectionism Scale of Frost. SOP = Self-Oriented Perfectionism subscale of the MPS-H. SPP = Socially Prescribed Perfectionism subscale of the MPS-H. OOP = Other-Oriented Perfectionism subscale of the MPS-H. * $p < .05$, *** $p < .001$

^a By Cohen's (1988) convention, d effect sizes of .10, .30, and .50 are interpreted as resp. small, medium and large.

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Table 5

Means, standard deviations, and correlations of the three subscales of the MPS-H with the Big Five personality dimensions (n = 422)

30-item Big Five questionnaire	<i>M</i>	<i>SD</i>	<i>α</i>
Extraversion	27.44	7.60	.92
Agreeableness	33.63	3.96	.83
Conscientiousness	25.15	7.93	.92
Emotional Stability	22.01	6.55	.83
Openness to Experience	28.08	5.59	.75

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Table 6

Three uni-variate regression analyses examining the unique associations between each of the Big Five personality traits and the three trait perfectionism dimensions of Hewitt (n = 422)

MPS-H subscales	Big Five personality traits	B (SE)	β	t	p	Total R ²	Overall F	Cohen's f ^{2 a}
Self-Oriented Perfectionism	Intercept	51.05 (6.86)		7.45	< .001			
	Extraversion	-.28 (.10)	-.13	-2.63	.009			
	Agreeableness	.08 (.20)	.02	.41	.682			
	Conscientiousness	.53 (.09)	.26	5.76	< .001			
	Emotional Stability	-.64 (.11)	-.26	-5.56	< .001			
	Openness to Experiences	.46 (.13)	.16	3.49	.001			
						.23***	24.73	.30
Socially Prescribed Perfectionism	Intercept	67.74 (67.74)		12.18	< .001			
	Extraversion	-.37 (.09)	-.23	-4.33	< .001			
	Agreeableness	-.13 (.16)	-.04	-.83	.408			
	Conscientiousness	-.12 (.07)	-.08	-1.55	.122			
	Emotional Stability	-.32 (.09)	-.17	-3.40	.001			
	Openness to Experiences	.16 (.11)	.07	1.49	.138			
						.11***	10.57	.12
Other-Oriented Perfectionism	Intercept	55.14 (4.41)		12.50	< .001			
	Extraversion	.09 (.07)	.07	1.34	.182			

VALIDATION OF THE MULTIDIMENSIONAL PERFECTIONISM SCALE

Agreeableness	-.41 (.13)	-.17	-3.19	.002			
Conscientiousness	.17 (.06)	.15	2.94	.004			
Emotional Stability	-.08 (.07)	-.06	-1.12	.264			
Openness to Experiences	.09 (.08)	-.06	1.12	.264			
					.04**	3.53	.04

Note. ** $p < .01$, *** $p < .001$.

^a By Cohen's (1988) convention, f^2 effect sizes of .02, .15, and .35 are interpreted as resp. small, medium and large.