
Downloaded from: http://ray.yorksj.ac.uk/id/eprint/672/

The version presented here may differ from the published version or version of record. If you intend to cite from the work you are advised to consult the publisher's version: http://www.sciencedirect.com/science/article/pii/S1469029211001245

Research at York St John (RaY) is an institutional repository. It supports the principles of open access by making the research outputs of the University available in digital form. Copyright of the items stored in RaY reside with the authors and/or other copyright owners. Users may access full text items free of charge, and may download a copy for private study or non-commercial research. For further reuse terms, see licence terms governing individual outputs. Institutional Repository Policy Statement

RaY
Research at the University of York St John
For more information please contact RaY at ray@yorksj.ac.uk

An assessment of the similarities between a measure of positive perfectionism and a measure of conscientious achievement striving

Andrew P. Hill and Howard K. Hall
York St John University, UK

Paul R. Appleton
University of Birmingham, UK

Author note
Andrew P. Hill, Faculty of Health and Life Sciences, York St. John University;
Howard K. Hall, Faculty of Health and Life Sciences, York St. John University;
Paul R. Appleton, School of Sport and Exercise Sciences, University of Birmingham.

Correspondence concerning this article should be addressed to Andrew P. Hill, Faculty of Health and Life Sciences, York St. John University, Lord Mayor’s Walk, York, YO31 7EX, UK.
E-mail: a.hill1@yorksj.ac.uk
Abstract

Objectives: The purpose of the study was to examine the similarities between the constructs measured by the positive perfectionism subscale from the Positive and Negative Perfectionism Scale and the achievement striving subscale from the Revised NEO Personality Inventory.

Design: A non-experimental design was adopted.

Method: One-hundred and seventy-nine junior basketball players (age $M = 16.50$, $s = 1.12$) completed measures of positive perfectionism, conscientious achievement striving and other external measures.

Findings: Analyses revealed that the two scales were highly positively correlated and demonstrated a similar pattern of relationships with the external measures. However, a single latent factor model provided a comparatively poorer fit than a two latent factor model.

Conclusions: There is some evidence that the positive perfectionism and achievement striving constructs measured by the scales in this study are distinguishable as two distinct factors in a confirmatory factor analysis; however, more empirical evidence is needed to establish their substantive differences.
An assessment of the similarities between a measure of positive perfectionism and a measure of conscientious achievement striving

It has been noted by a number of sport psychologists that perfectionism may be instrumental in helping athletes achieve performance excellence (e.g., Gould, Dieffenbach, & Moffatt, 2002; Hardy, Jones & Gould, 1996; Henschen, 2000). Conversely, others have argued that while perfectionism may be a potent energising force, it may also bring with it considerable psychological costs (e.g., Flett & Hewitt, 2005; Hall, 2006). This seemingly paradoxical situation can, in part, be explained by the general ambiguity that surrounds the perfectionism construct. In particular, although perfectionism can be broadly defined as a commitment to exceptionally high standards and a preoccupation with negative self-evaluation (Hewitt & Flett, 1991; Frost et al., 1990), there is little agreement on its precise definition. In addition, differences between measures of perfectionism and measures of other adaptive achievement related constructs is not always clear (see Flett & Hewitt, 2006). The present study seeks to address this ambiguity by examining the construct validity of an instrument designed to measure positive perfectionism in athletes by comparing it with a measure of conscientious achievement striving.

The origins of perfectionism lie in clinical and counselling research. Based upon their observations, early theorists considered perfectionism to be a largely undesirable and debilitating quality that underpinned numerous psychological difficulties (Burns, 1980; Hollander, 1965; Pacht, 1985). This was because perfectionism was believed to be the product of irrational beliefs and encompassed a cognitive style that included a preoccupation with self-critical
appraisal. Burns (1980), for example, defined perfectionism as unremitting striving towards impossible goals and the tendency to measure self-worth based upon accomplishment. Similarly, Pacht (1985) regarded perfectionism as the setting of impossible standards in an effort to gain acceptance from significant others. Consequently, perfectionism was considered unidimensional and measured in a manner that primarily emphasised only its negative facets (e.g., Burns, 1980; Garner, Olmstead, & Polivy, 1983).

Concerned by the possibility that this conceptualisation could obscure any positive consequences of perfectionism, researchers have developed models that assess perfectionism from a multidimensional perspective (e.g., Slaney, Rice, Mobley, Tippi, & Ashby, 2001). A number of multidimensional models of perfectionism currently exist that include a wide array of personal and interpersonal dimensions. These models capture both the high levels of striving and dysfunctional features that are believed to encapsulate this broad personality characteristic (e.g., Frost et al., 1990; Hill et al., 2004; Slaney, et al., 2001; Terry-Short, Owens, Slade, & Dewey, 1995). Utilising the corresponding measures, researchers have been able to examine and compare the consequences of discrete dimensions of perfectionism. In sport, this research has attested to the potential for dimensions of perfectionism to have divergent consequences (see Stoeber & Otto, 2006, and Hall, 2006, for reviews). The findings of Stoeber and colleagues (Stoeber & Becker, 2008; Stoeber, & Kersting, 2007; Stoeber, Otto, Pescheck, Becker, & Stoll, 2007; Stoeber, Stoll, Pescheck, & Otto, 2008), for example, have illustrated that perfectionistic striving and negative reactions to imperfection
encourage disparate cognitive (e.g., attributions), affective (e.g., anxiety, guilt, shame) and behavioural (e.g., performance) outcomes in athletes.

Researchers have recently adopted a behavioural model that distinguishes between positive and negative perfectionism to examine the influence of perfectionism in athletes (Haase & Prapavessis, 2004; Haase, Prapavessis, & Owens, 1999, 2002). Originally developed by Slade, Owens and colleagues (Terry-Short et al., 1995; Slade & Owens, 1998; Owens & Slade, 2008), this model is based on the contentions of Hamachek (1978) who argued that perfectionism can exist in both ‘normal’ and ‘neurotic’ forms. Within Slade and Owens’s model negative perfectionism refers to cognitions and behaviours directed toward high levels of achievement by the avoidance of negative consequences (e.g., fear of failure), whereas positive perfectionism refers to cognitions and behaviours directed towards high levels of achievement by approach tendencies (e.g., desire for success). Positive and negative perfectionism are purported to reflect different types of goals (approach versus avoidance), self-concept involvement (ideal self versus feared self), emotional correlates (satisfaction versus dissatisfaction) and environmental reinforcement (positive versus negative). In support of this distinction, empirical research outside of sport has found that positive and negative perfectionism have divergent relationships with a wide range of psychological factors that includes cognitive styles (Burns & Fedewa, 2005), coping strategies (Burns, Dittmann, Nguyen, & Mitchelson, 2000), shame, guilt, pride (Fedewa, Burns, & Gomez, 2005), emotional regulation and life-satisfaction (Bergman, Nyland, & Burns, 2007; Mitchelson & Burns, 1998). Initial research in sport has found similar findings in that positive
perfectionism appears unrelated to the aversive outcomes associated with negative perfectionism in athletes (disturbed eating attitudes and social physique anxiety) (Haase, Prapavessis, & Owens, 1999, 2002).

Slade, Owens and colleagues’ (Terry-Short et al., 1995; Slade & Owens, 1998; Owens & Slade, 2008) model may, however, pose a conceptual dilemma that brings into question the construct validity of positive perfectionism (Flett & Hewitt, 2006; Greenspon, 2000, 2008; Hall, 2006). A number of researchers have argued that, when perfectionism is conceptualised as an adaptive form of achievement striving, it does not capture the central characteristics of perfectionism. Greenspon (2000), for example, has argued that the essence of perfectionism is not striving for excellence, but feelings of conditional self-acceptance which is absent from positive perfectionism. Moreover, there is also no clear distinction between measures of positive perfectionism and a healthy commitment to exceedingly high standards when this approach is taken (Flett and Hewitt, 2006; Shafran & Mansell, 2001). Consequently, adopting this approach may lead to unnecessary confusion at both conceptual and measurement levels which hinders the ability of researchers to establish the consequences of perfectionism.

On this issue, Flett and Hewitt (2006; Hewitt & Flett, 2007) have argued that measures of positive perfectionism appear extremely similar to measures of conscientiousness. Conscientiousness is a broad personality factor characterised by the purposeful and determined pursuit of personal goals (Costa & McCrae, 1992). Like positive perfectionism, conscientiousness includes striving that entails high aspirations, a desire for success, and a need for organisation. In short, both
are indicative of a healthy commitment to high personal standards. A number of studies have examined the relationship between various measures of perfectionism and conscientiousness (e.g., Rice, Ashby, & Slaney, 2007; Sherry, Hewitt, Sherry, Flett, & Graham, 2010; Stoeber & Kersting, 2007). This research has typically found that conscientiousness and dimensions of perfectionism indicative of striving (e.g., self-oriented perfectionism and perfectionistic striving) are moderately-to-highly positively correlated. Some of this research alludes to key differences between them (e.g., Sherry et al., 2010), whereas others suggest substantial similarities (e.g., Stoeber, Otto, & Dalbert, 2009). However, research has yet to examine the similarity between positive perfectionism and conscientiousness and, in doing so, establish the construct validity of the positive perfectionism scale.

One way of assessing construct validity of psychological instruments is to compare the responses of different scales that are purported to measure the same or similar constructs (Marsh, 1994). Marsh (1994; Marsh et al., 2000) argues that two scales can be considered to reflect similar underlying constructs when: (i) they are highly correlated, (ii) can be collapsed into a single factor, (iii) and have a similar pattern of relations to external criteria. Moreover, Marsh (1994; Marsh, Craven, Hinkley, & Debus, 2000), and others (Block, 1995), have described two types of fallacies that are common among psychological measures. The first is termed a jingle-fallacy. This entails the erroneous assumption that scales with the same label reflect the same construct. The second is termed a jangle-fallacy. This entails the erroneous assumption that scales with different labels measure different constructs. In this instance, it is possible that scales measuring positive
perfectionism and conscientious achievement striving reflect the same underlying construct. In which case, positive perfectionism and conscientious achievement striving are an example of a jangle-fallacy. Alternatively, there may be sufficient differences between the two instruments to suggest they measure different constructs and therefore warrant different labels.

The purpose of the current study was to examine the similarity of the constructs measured by positive perfectionism and conscientious achievement. Based on the suggestions of Flett and Hewitt (2006; Hewitt & Flett, 2007), it was hypothesised that the findings would fulfil the conditions required for two scales to be considered to reflect similar underlying construct (Marsh 1994; Marsh et al., 2000). Firstly, the relationship between positive perfectionism and conscientious achievement striving latent factors would be substantial. Secondly, confirmatory factor analysis would suggest that the responses to the positive perfectionism and conscientious achievement striving scales could be adequately represented as a single latent factor. Thirdly, the positive perfectionism and conscientious achievement striving scales would display a similar pattern of relations with a series of external measures (fear of failure, self-criticism, mental preservation, and overgeneralization of failure). These variables were selected with the aim of assessing the divergent validity of the two scales and have previously been found to be associated with various dimensions of perfectionism (e.g., Hewitt & Flett, 1991; Hill et al., 2010; Sagar & Stoeber, 2009). Moreover, a number of researchers have suggested that these elements may reflect perfectionism but not conscientiousness (Flett & Hewitt, 2006, 2007).

Method
Participants

Participants were 198 junior basketball players (age $M = 16.52$, $s = 1.09$, range 12-19, 169 males, 23 females, 6 non-respondents) recruited from U18 and U16 youth teams of basketball clubs in the UK. The sample included 66 players who were currently representing their national sides. On average, the athletes reported participating in basketball for 5.78 years ($s = 2.68$) and spent 8.11 hours ($s = 4.44$) training and competing per week. Participants also reported that in comparison to other activities they engaged in, their participation in basketball was very important ($M = 8.14$, $s = 0.93$) on a nine-point Likert scale ($1 = \text{not at all important}$ to $9 = \text{extremely important}$). Participants complete a multi-sectional questionnaire that contained measures of positive perfectionism, conscientious achievement striving, fear of failure, self-criticism, mental preservation, and overgeneralization of failure. Approval was gained from the University Research Ethics Committee for the protocol. Informed consent and parental/guardian consent was gained from each participant prior to completion of the questionnaire.

Instruments

Positive perfectionism. Positive and negative perfectionism was measured using the adapted Positive and Negative Perfectionism Scale (Terry-Short, Owens, Slade, & Dewey, 1995) developed by Haase and Prapevassis (2004). The instrument includes two subscales that measure positive perfectionism (“When I am competing against others, I am motivated by wanting to be the best.” “I like the challenge of setting very high standards for myself.”) and negative perfectionism (“Other people expect noting less that perfection from me.” “I feel guilty or ashamed if I do less than perfectly.”). Negative
perfectionism was included to provide contrast in the assessment of divergent
validity of the positive perfectionism scale and the conscientiousness achievement
striving scale with external measures. The positive perfectionism subscale
contains 7-items and the negative perfectionism contains 12-items. Both subscales
are scored on a seven-point Likert scale (1 = strongly disagree to 7 = strongly
agree). Haase and Prapevassis (2004) have provided evidence to support the
psychometric properties of measurement associated with the scale in athletes. This
includes adequate internal reliability (Cronbach’s alpha) (positive perfectionism $\alpha = .75$ and negative perfectionism $\alpha = .79$) and factor structure.

Conscientious achievement striving. The Achievement Striving subscale
(C-AS) of Costa and McCrae’s (1992) Revised NEO Personality Inventory (NEO-
PI-R) was used to measure conscientious achievement striving. This subscale
reflects high aspirations, diligence and a desire for success (e.g., “I strive to
achieve all I can.” “I strive for excellence in everything I do.”). The subscale
contains 8-items and is scored on a five-point Likert scale (1 = strongly disagree
to 5 = strongly agree). Previous research has found support for the validity and
reliability of measurement associated with the scale in general samples (see Costa
& McCrae, 1992). This includes adequate internal consistency ($\alpha = .67$) and factor
structure (Costa & McCrae, 1992; Costa, McCrae, & Dye, 1991). Recent research
has also found that the subscale has adequate internal reliability in athlete samples
(Hill, Hall, & Appleton, 2010).

Fear of failure. Fear of failure was measured using Conroy, Willow, and
Metzler's (2002) short version of the Performance Failure Appraisal Inventory.
The scale is a measure of cognitive appraisals associated with the fear of failure
(“When I am failing I am afraid that I might not have enough talent.”). The scale includes 5-items and is scored on a 5-point Likert scale (1 = do not believe at all to 5 = believe 100% of the time). Conroy et al. (2002) have provided support for the psychometric properties of the scale. This includes adequate internal reliability (α = .72) and factor structure (Conroy et al., 2002). The short-form of the scale is also highly correlated with the long-form supporting the concurrent validity of the scale (r =.92; Conroy et al., 2002).

**Self-criticism, overgeneralization and mental perseveration.** Self-criticism, overgeneralization of failure and mental perseveration were assessed using scales developed by Carver and colleagues (Carver, La Voie, Kuhl, & Ganellen, 1988). Responses to the self-criticism scale reflect intolerance of a discrepancy between attainment and desired standards and the tendency to engage in self-criticism in response (3-items) (“I get unhappy with anything less than what I expected of myself.” “I get angry with myself if my efforts don't lead to the results I wanted.”). Responses to the overgeneralization subscale reflects the tendency to overgeneralise negative judgements of oneself (4-items) (“Noticing one fault of mine makes me think more and more about other faults.” “How I feel about myself overall is easily influence by a single mistake.”). Finally, responses to the mental perseveration subscale assess the tendency to ruminate about previous failures (5-items) (“If I fail, I think about that particular failure for a long time afterward.” “A bad performance will often preoccupy me for a long time afterward.”). All three subscales are scored on a five-point Likert scale (1= strongly disagree to 5 = strongly agree). Carver and colleagues (Carver, et al., 1988) have provided support for the psychometric properties of these subscales.
This includes adequate internal reliability (self-criticism $\alpha = .65$, overgeneralization $\alpha = .74$, and mental perseveration $\alpha = .85$) and factor structure.

**Results**

**Preliminary analysis**

Prior to the main analyses, missing value analysis was conducted on the measured items. Due to large amounts of missing data from individual respondents (> 5%), 7 participants were removed from the sample. Once these values were removed, there were 172 complete cases and 19 cases with incomplete data. For those with incomplete data, the average number of items not complete was 1.11 ($s = 0.31$, range = 1 to 2, median = 1). There were 3 unique patterns of missing data (participants with the same single item not complete) that accounted for the missing data of 6 participants. The other 13 participants had missing data in a pattern not shared with other participants. The ratio of patterns of missing data to the number of participants with missing data was = .84 suggesting that the data was missing in a non-systematic manner. The low number of missing data and apparent lack of any meaningful patterns of missing data suggests that any missing data imputation method is likely to be satisfactory (Hair, Black, Babin, & Anderson, 2009). To preserve the characteristics of the overall data set and minimise the impact of missing data imputation, missing data was replaced with the mean of the available items for the relevant subscale for each participant (Graham, Cumsille, & Elek-Fisk, 2003).

Items from the positive perfectionism and conscientious achievement striving scales were assessed for normality. First they were screened for univariate and multivariate outliers (see Tabachnick & Fidell, 2007). Standardised $z$-scores
larger than 3.29 ($p < .001$, two-tailed) were used as criteria for univariate outliers. This procedure led to the removal of 10 participants. A Mahalanobis distance greater than $\chi^2 (14) = 36.12$ was used as criterion for multivariate outliers. This procedure led to the removal of a further 2 participants. All subsequent analyses was conducted on the revised sample ($n = 179$, age $M = 16.50$, $s = 1.12$, range 12-19, years of participation $M = 5.69$, $s = 2.67$, hours spent practising and competing $M = 8.36$, $s = 4.53$, importance of participation $M = 8.11$, $s = 0.93$, 152 males, 23 females, 4 non-respondents).

Despite the removal of univariate and multivariate outliers, a number of items from both scales remained significantly skewed or kurtotic. These items were subsequently transformed using the guidelines provided by Tabachnick and Fidell (2007). Following transformation (SQRT[X], -SQRT[K – X], or -LG10[K – X]), all items were considered to be approximately normally distributed (absolute skewness $M = 0.14$, $s = 0.11$, $SE = 0.18$, absolute kurtosis $M = 0.59$, $s = 0.34$, $SE = 0.35$, Mardia’s normalised coefficient = 3.21). The transformed items were also almost perfectly correlated with the original items ($r = .97$ to $.99$). The transformed items were used in the confirmatory factor analysis.

As the primary analyses also included comparison of bivariate correlations amongst the measured variables, internal reliability analysis (Cronbach’s alpha) was performed on each scale. This analysis included the untransformed items for positive perfectionism and conscientious achievement striving. All scales demonstrated adequate internal consistency (positive perfectionism $\alpha = .78$, conscientious achievement striving $\alpha = .70$, negative perfectionism $\alpha = .83$, fear of failure $\alpha = .83$, self-criticism $\alpha = .81$, mental perseveration $\alpha = .86$, and
overgeneralization of failure $\alpha = .64$). Whether these variables were normally
distributed was also assessed. Only positive perfectionism ($z\text{skew} = 2.84$) and
self-criticism ($z\text{skew} = 2.92$) significantly deviated from a normal distribution.
These variables were transformed ($-\text{SQRT}[K - X]$) and, as a consequence, no
longer significantly deviated from a normal distribution (positive perfectionism
$z\text{skew} = 0.04$ and self-criticism $z\text{skew} = 0.13$). The transformed variables were
also almost perfectly correlated with the original variables (positive perfectionism
$r = 1.00$ and self-criticism $r = .99$). All the variables were subsequently considered
to be approximately normally distributed (absolute skewness $M = 0.10$, $s = 0.05$,
$SE = 0.18$, absolute kurtosis $M = 0.23$, $s = 0.11$, $SE = 0.36$). The transformed
variables were used in the comparison of the bivariate correlations.

**Primary analyses**

**The relationship and factor structure of positive perfectionism and**

**conscientious achievement striving.** In order to examine the relationship
between the two scales, and test whether the constructs they measure can
adequately be represented as a single latent factor, responses to the positive
perfectionism scale and conscientious achievement striving scale were subjected
to confirmatory factor analysis. In doing so, a comparison of two potential
confirmatory factor analysis models was made, as well as an estimate of the error-
free relationship between the two constructs. The first model represented the
responses to the scales as separate but related latent factors with items from each
scale loading on each factor independently (model 1). The second model
represented the responses to the scales as indicative of a single latent factor
(adaptive achievement striving) with items from both scales loading on this single
factor (model 2). If the confirmatory factor analysis model with two latent factors (positive perfectionism and conscientious achievement striving) provided better fit in comparison to the confirmatory factor analysis model with a single latent factor (adaptive achievement striving), support would be provided for the notion that the two scales measure sufficiently distinct constructs. Alternatively, if the confirmatory factor analysis model with a single latent factor (adaptive achievement striving) provided better fit in comparison to the confirmatory factor analysis model with the two scales represented as two latent factors (positive perfectionism and conscientious achievement striving), this would provide support for the notion that the two scales measure the same constructs.

Confirmatory factor analysis was performed using AMOS (AMOS 18.0.0; Arbuckle, 2009) and maximum likelihood estimation. The two models (two latent factors and single latent factor) were compared using a range of absolute and comparative fit indices. Based on recommendations of Bentler (2007), this included the Comparative Fit Index (CFI), Non-normed Fit Index (NNFI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). Conventional criteria were used to evaluate and compare the fit of both of the confirmatory factor models (CFI and NNFI >.90, RMSEA and SRMR <.10, $\chi^2$/df < 3; Hu & Bentler, 1995; Joreskog & Sorbom, 1993; Marsh, 2007). Akaike’s Information criterion (AIC) and Brown-Cudeck criterion (BCC) were also provided to aid non-nested model comparison. Smaller values represent greater parsimony and better fit (Hu and Bentler, 1995). Fit indices for the two models are displayed in Table 1 and standardised factor loadings for each model are displayed in Table 2.
The confirmatory factor analysis of the two latent factor model (model 1) suggested that this model provided acceptable fit. In addition, with the exception of one factor loading from the conscientious achievement striving scale (CAS-1), all factor loadings were statistically significant. In contrast, the confirmatory factor analysis of the single latent factor model (model 2) suggested this model provided less than acceptable fit. As with model 1, all factor loadings were statistically significant with the exception of a single item from the conscientious achievement striving scale (CAS-1). A comparison of the fit of the two models indicated that the two latent factor model provided better fit for the data than the single latent factor model. The correlation between the two latent factors was extremely high (=.70). These analyses provided mixed support for the possibility that the scales measuring positive perfectionism and conscientious achievement striving reflect the same underlying construct. This is because they are highly correlated however a comparison of two alternative models provided support for the distinctiveness of positive perfectionism and conscientious achievement striving.

Pattern of relations with external measures. To examine whether the two scales have a similar pattern of relations to external measures, the direction and magnitude of their bivariate correlations with a series of variables were compared (see Table 3). In addition, whether these bivariate correlations were significantly different from each other was examined using the procedure described by Meng, Rosenthal, and Robin (1992). The correlations between the negative perfectionism subscale and external measures are also provided for contrast and included as a final external variable. A comparison of the direction and magnitude of the bivariate correlations revealed that they were very similar.
Specifically, the correlation between positive perfectionism and conscientious achievement striving with fear of failure, mental preservation, and overgeneralization of failure were all negative and small, or small-to-moderate, in size (Cohen, 1992). The relationship between positive perfectionism with self-criticism was positive and small, whereas there was no discernable relationship between conscientious achievement striving and self-criticism. There was no statistically significant difference between any of these bivariate correlations. It is noteworthy, however, that there was a difference in the relationship between positive perfectionism and conscientious achievement striving with negative perfectionism (PP-NP \( r = .14, p > .05 \); CAS-NP \( r = -.07, p > .05 \); \( z(\text{diff}) = 2.79, p < .01 \)). In summary, a comparison of the pattern of relations with external measures provides partial support for the contention that the positive perfectionism and conscientious achievement striving scales may reflect the same underlying construct, distinguishable only in terms of their association with negative perfectionism.

**Discussion**

The purpose of the current study was to examine the similarity of the constructs measured by positive perfectionism and conscientious achievement. Marsh (1994; Marsh et al., 2000) argues that two scales can be considered to reflect the same underlying construct when they are highly correlated, can be collapsed in to a single factor, and have a similar pattern of relations to external measures. Therefore, consistent with the arguments of Flett and Hewitt (2006; Hewitt & Flett, 2007), it was hypothesised that the relationship between positive perfectionism and conscientious achievement striving latent factors would be
substantial. It was hypothesised that confirmatory factor analysis would suggest that the responses to the positive perfectionism and conscientious achievement striving scales could be adequately represented as a single latent factor. Finally, it was hypothesised that the positive perfectionism and conscientious achievement striving scales would display a similar pattern of relations with a series of external measures.

The results provided partial support for these hypotheses. In support of the hypotheses, the positive perfectionism and conscientious achievement striving scales were highly positively correlated. In addition, the positive perfectionism and conscientious achievement striving scales demonstrated a similar pattern of relationships with external measures (i.e., direction and magnitude). They were, however, distinguishable in terms of their association with negative perfectionism. Finally, contrary to the hypotheses, the confirmatory factor analysis revealed that a single latent factor model provided a poorer fit to the data in comparison to a two latent factor model. Therefore, only one of the three necessary conditions outlined by Marsh (1994) was fully met.

A number of researchers have argued that because positive perfectionism is conceptualised as an adaptive form of achievement striving, the ways in which measures of positive perfectionism are distinct from measures of other achievement related concepts such as conscientious achievement striving is unclear (e.g., Flett & Hewitt, 2006; Greenspon, 2000; Hall, 2006). In response, Owens and Slade (2008) have argued that there is a somewhat shared understanding of the potential positive effects that can arise as a consequence of striving for perfection. Therefore, until it is demonstrated that the term positive
perfectionism is a clear misnomer, use of the term, and by extension instruments that measure it, remain useful. The findings suggest that while there is considerable overlap between the two constructs captured by the two instruments in the current study, they may be best considered distinct. Consequently, this measure of positive perfectionism should not be conflated with conscientious achievement striving.

The current study is only the second in sport to directly examine the similarities and differences between measures of perfectionism and other achievement related constructs (see Hill et al., 2010). This line of research has important implications for understanding perfectionism in sport. If clear differences are not established, it brings in to question whether measures of positive perfectionism are simply creating unnecessary confusion in the manner described by Marsh (1994, Marsh et al., 2000). Discriminating between measures of adaptive achievement striving and positive, functional or healthy perfectionism (e.g., positive perfectionism, high personal standards, perfectionistic striving), is essential if the construct validity of measures of these dimensions of perfectionism are to be established. Prior to resolving this issue, researchers must be cognizant of the potential for confusion and avoid labelling measures of perfectionism in a manner that presume their consequences (e.g., positive striving, conscientious perfectionism; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Hill et al., 2004).

Echoing calls made by Marsh et al. (2000) in the area of motivation, this area of research requires more careful attention to measurement, more precise and agreed definitions, and operational definitions that have received especially close
scrutiny. Currently, this area of research is characterised by a great deal of conceptual confusion. Notable areas of disagreement include the subtle, but important, difference between striving for perfection and striving for excellence (see Flett & Hewitt, 2006; Greenspon, 2000). There is also disagreement over whether some dimensions of perfectionism (e.g., need for organisation, other-oriented perfectionism) are central or tangential to the construct (Hewitt, Flett, Besser, & McGee, 2003; Stoeber & Otto, 2006; Shafran, Cooper, & Fairburn, 2002). Finally, whether exceptional levels of achievement striving is independently sufficient to warrant the label perfectionism continues to be a source of fervent debate (see Greenspon, 2000). Some of these issues can be examined through greater scrutiny of the content of scales currently used in this area. At the moment, for example, some instruments designed to measure the striving associated with perfectionism do not include items that make reference to perfection (e.g., personal standards; Frost et al., 1990) and are ambiguous in terms of whether they represent perfectionism or conscientious achievement striving (e.g., "My successes spur me on to greater achievements" PP-6) (Flett & Hewitt, 2006; Sherry et al., 2010). Other issues require a greater focus on the construct validity of current measures of perfectionism, as undertaken in the current study. These are important empirical questions that must be examined if the current debate regarding the consequences of perfectionism for athletes is to be resolved. The potential dangers associated with misconstruing these constructs are illustrated by the stark contrast between the correlates of negative perfectionism and those of positive perfectionism in the current study. Negative perfectionism appears to encapsulate a number of debilitating features that are likely to render
adolescent sport participants to psychological difficulties. The potential for other features of perfectionism to do so is also evident in research in this area (Hall, 2006). Consequently, the current findings also serve to highlight the potential of some dimensions of perfectionism to undermine the potential for sport to be a rewarding experience for junior athletes. Identifying the psychological costs associated with energising sport participation through perfectionism therefore remains an important area for future research.

Limitations and future directions

While the current study provides an important initial step to addressing the overlap between positive perfectionism and conscientious achievement striving, the study has a number of limitations that must be taken in to account when considering the findings. Firstly, the study employed a sample of junior basketball players. Future research should examine the degree to which the findings generalise to other samples and sports. Secondly, in terms of examining the pattern of relations between positive perfectionism and conscientious achievement striving, a limited number of variables were used. Future research should compare these relations across a wider range of variables, particularly indicators of the presence of health. Thirdly, the substantial relationship between positive perfectionism and conscientious achievement striving alludes to the need to examine their similarities and differences further. In particular, identifying factors that account for variance they do not share would provide valuable insight in to their differences (i.e., factors indicative of their distinctive features). The current study suggests negative perfectionism may be a good starting point in this regard. Finally, further scrutiny of positive and negative perfectionism is required in
terms of other measures of perfectionism (e.g., FMPS, S-MPS-2, and HMPS). The manner in which positive perfectionism is related to the current network of sub-dimensions of perfectionism will help further ascertain its validity as a measure of perfectionism.

Conclusion

The current examined the similarity of the constructs measured by positive perfectionism and conscientious achievement. The findings suggest that there is considerable overlap between the constructs measured by the positive perfectionism and conscientious achievement striving scales in the current study. However, evaluation of the two scales indicated that only two of the necessary conditions were met in terms of establishing that they measured the same underlying construct. Therefore, they should be best considered distinct.

Identifying how measures of positive perfectionism, and similar constructs (e.g., perfectionistic striving and high personal standards), are different from existing and established measures of adaptive achievement striving (e.g., conscientious achievement striving) is central to resolving the current discord regarding the consequences of perfectionism for athletes. It is hoped that this study will provide the impetus for further scrutiny of the conceptual and empirical similarities and differences between these related constructs.
References


Table 1 *Comparison of confirmatory factor analysis models*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\chi^2$/df</th>
<th>CFI</th>
<th>NNFI</th>
<th>SRMR</th>
<th>RMSEA (90% CI)</th>
<th>AIC</th>
<th>BCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Two latent factors</td>
<td>147.20**</td>
<td>89</td>
<td>1.65</td>
<td>.90</td>
<td>.89</td>
<td>.06</td>
<td>.06 (.04 to .08)</td>
<td>239.20</td>
<td>248.28</td>
</tr>
<tr>
<td>Model 2: Single latent factor</td>
<td>204.08**</td>
<td>90</td>
<td>2.27</td>
<td>.81</td>
<td>.78</td>
<td>.07</td>
<td>.08 (.07 to .10)</td>
<td>294.08</td>
<td>302.97</td>
</tr>
</tbody>
</table>

** $p < .01$  
* $p < .05$
Table 2 *Confirmatory factor analysis solutions for two latent factor and single latent factor models*

<table>
<thead>
<tr>
<th>Items</th>
<th>Positive perfectionism</th>
<th>Conscientious achievement striving</th>
<th>Adaptive achievement striving</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP-1</td>
<td>.43</td>
<td>0</td>
<td>.42</td>
</tr>
<tr>
<td>PP-4</td>
<td>.52</td>
<td>0</td>
<td>.44</td>
</tr>
<tr>
<td>PP-6</td>
<td>.66</td>
<td>0</td>
<td>.65</td>
</tr>
<tr>
<td>PP-9</td>
<td>.55</td>
<td>0</td>
<td>.51</td>
</tr>
<tr>
<td>PP-12</td>
<td>.58</td>
<td>0</td>
<td>.53</td>
</tr>
<tr>
<td>PP-15</td>
<td>.66</td>
<td>0</td>
<td>.61</td>
</tr>
<tr>
<td>PP-18</td>
<td>.66</td>
<td>0</td>
<td>.59</td>
</tr>
<tr>
<td>CAS-1</td>
<td>0</td>
<td>.07</td>
<td>.05</td>
</tr>
<tr>
<td>CAS-2</td>
<td>0</td>
<td>.35</td>
<td>.36</td>
</tr>
<tr>
<td>CAS-3</td>
<td>0</td>
<td>.32</td>
<td>.33</td>
</tr>
<tr>
<td>CAS-4</td>
<td>0</td>
<td>.63</td>
<td>.61</td>
</tr>
<tr>
<td>CAS-5</td>
<td>0</td>
<td>.47</td>
<td>.45</td>
</tr>
<tr>
<td>CAS-6</td>
<td>0</td>
<td>.71</td>
<td>.60</td>
</tr>
<tr>
<td>CAS-7</td>
<td>0</td>
<td>.78</td>
<td>.69</td>
</tr>
<tr>
<td>CAS-8</td>
<td>0</td>
<td>.50</td>
<td>.44</td>
</tr>
</tbody>
</table>

*Note. CAS = Conscientious achievement striving items. PP = positive perfectionism items. Item numbers are taken from Haase and Prapavessis (2004). Standardised factor loadings are presented. Factor loadings of 0 are fixed and not estimated.*
Table 3 Comparison of the bivariate correlations coefficients between negative perfectionism, positive perfectionism, conscientious achievement striving and criterion variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Negative perfectionism (NP)</th>
<th>Positive perfectionism (PP)</th>
<th>Conscientious achievement striving (CAS)</th>
<th>PP versus CAS z(diff) (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of failure</td>
<td>.58**</td>
<td>-.10</td>
<td>-.17*</td>
<td>0.94</td>
</tr>
<tr>
<td>Overgeneralization of failure</td>
<td>.54**</td>
<td>-.19*</td>
<td>-.24**</td>
<td>0.68</td>
</tr>
<tr>
<td>Self-criticism</td>
<td>.40**</td>
<td>.17*</td>
<td>.05</td>
<td>1.60</td>
</tr>
<tr>
<td>Mental preservation</td>
<td>.42**</td>
<td>-.10</td>
<td>-.09</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Note. z(diff) = z-value of the difference between the correlation coefficient of positive perfectionism and criterion variable and conscientious achievement striving and the criterion variable. Correlation coefficients for negative perfectionism are not included in this comparison.

** p < .01    * p < .05