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

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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.

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

3 It has been noted by a number of sport psychologists that perfectionism
4 may be instrumental in helping athletes achieve performance excellence (e.g.,
5 Gould, Dieffenbach, & Moffatt, 2002; Hardy, Jones & Gould, 1996; Henschen,
6 2000). Conversely, others have argued that while perfectionism may be a potent
7 energising force, it may also bring with it considerable psychological costs (e.g.,
8 Flett & Hewitt, 2005; Hall, 2006). This seemingly paradoxical situation can, in
9 part, be explained by the general ambiguity that surrounds the perfectionism
10 construct. In particular, although perfectionism can be broadly defined as a
11 commitment to exceptionally high standards and a preoccupation with negative
12 self-evaluation (Hewitt & Flett, 1991; Frost et al., 1990), there is little agreement
13 on its precise definition. In addition, differences between measures of
14 perfectionism and measures of other adaptive achievement related constructs is
15 not always clear (see Flett & Hewitt, 2006). The present study seeks to address
16 this ambiguity by examining the construct validity of an instrument designed to
17 measure positive perfectionism in athletes by comparing it with a measure of
18 conscientious achievement striving.

19 The origins of perfectionism lie in clinical and counselling research. Based
20 upon their observations, early theorists considered perfectionism to be a largely
21 undesirable and debilitating quality that underpinned numerous psychological
22 difficulties (Burns, 1980; Hollander, 1965; Pacht, 1985). This was because
23 perfectionism was believed to be the product of irrational beliefs and
24 encompassed a cognitive style that included a preoccupation with self-critical

1 appraisal. Burns (1980), for example, defined perfectionism as unremitting
2 striving towards impossible goals and the tendency to measure self-worth based
3 upon accomplishment. Similarly, Pacht (1985) regarded perfectionism as the
4 setting of impossible standards in an effort to gain acceptance from significant
5 others. Consequently, perfectionism was considered unidimensional and measured
6 in a manner that primarily emphasised only its negative facets (e.g., Burns, 1980;
7 Garner, Olmstead, & Polivy, 1983).

8 Concerned by the possibility that this conceptualisation could obscure any
9 positive consequences of perfectionism, researchers have developed models that
10 assess perfectionism from a multidimensional perspective (e.g., Slaney, Rice,
11 Mobley, Tippi, & Ashby, 2001). A number of multidimensional models of
12 perfectionism currently exist that include a wide array of personal and
13 interpersonal dimensions. These models capture both the high levels of striving
14 and dysfunctional features that are believed to encapsulate this broad personality
15 characteristic (e.g., Frost et al., 1990; Hill et al., 2004; Slaney, et al., 2001; Terry-
16 Short, Owens, Slade, & Dewey, 1995). Utilising the corresponding measures,
17 researchers have been able to examine and compare the consequences of discrete
18 dimensions of perfectionism. In sport, this research has attested to the potential for
19 dimensions of perfectionism to have divergent consequences (see Stoeber & Otto,
20 2006, and Hall, 2006, for reviews). The findings of Stoeber and colleagues
21 (Stoeber & Becker, 2008; Stoeber, & Kersting, 2007; Stoeber, Otto, Pescheck,
22 Becker, & Stoll, 2007; Stoeber, Stoll, Pescheck, & Otto, 2008), for example, have
23 illustrated that perfectionistic striving and negative reactions to imperfection

1 encourage disparate cognitive (e.g., attributions), affective (e.g., anxiety, guilt,
2 shame) and behavioural (e.g., performance) outcomes in athletes.

3 Researchers have recently adopted a behavioural model that distinguishes
4 between positive and negative perfectionism to examine the influence of
5 perfectionism in athletes (Haase & Prapavessis, 2004; Haase, Prapavessis, &
6 Owens, 1999, 2002). Originally developed by Slade, Owens and colleagues
7 (Terry-Short et al., 1995; Slade & Owens, 1998; Owens & Slade, 2008), this
8 model is based on the contentions of Hamachek (1978) who argued that
9 perfectionism can exist in both ‘normal’ and ‘neurotic’ forms. Within Slade and
10 Owens’s model negative perfectionism refers to cognitions and behaviours
11 directed toward high levels of achievement by the avoidance of negative
12 consequences (e.g., fear of failure), whereas positive perfectionism refers to
13 cognitions and behaviours directed towards high levels of achievement by
14 approach tendencies (e.g., desire for success). Positive and negative perfectionism
15 are purported to reflect different types of goals (approach versus avoidance), self-
16 concept involvement (ideal self versus feared self), emotional correlates
17 (satisfaction versus dissatisfaction) and environmental reinforcement (positive
18 versus negative). In support of this distinction, empirical research outside of sport
19 has found that positive and negative perfectionism have divergent relationships
20 with a wide range of psychological factors that includes cognitive styles (Burns &
21 Fedewa, 2005), coping strategies (Burns, Dittmann, Nguyen, & Mitchelson,
22 2000), shame, guilt, pride (Fedewa, Burns, & Gomez, 2005), emotional regulation
23 and life-satisfaction (Bergman, Nyland, & Burns, 2007; Mitchelson & Burns,
24 1998). Initial research in sport has found similar findings in that positive

1 perfectionism appears unrelated to the aversive outcomes associated with negative
2 perfectionism in athletes (disturbed eating attitudes and social physique anxiety)
3 (Haase, Prapavessis, & Owens, 1999, 2002).

4 Slade, Owens and colleagues' (Terry-Short et al., 1995; Slade & Owens,
5 1998; Owens & Slade, 2008) model may, however, pose a conceptual dilemma
6 that brings into question the construct validity of positive perfectionism (Flett &
7 Hewitt, 2006; Greenspon, 2000, 2008; Hall, 2006). A number of researchers have
8 argued that, when perfectionism is conceptualised as an adaptive form of
9 achievement striving, it does not capture the central characteristics of
10 perfectionism. Greenspon (2000), for example, has argued that the essence of
11 perfectionism is not striving for excellence, but feelings of conditional self-
12 acceptance which is absent from positive perfectionism. Moreover, there is also
13 no clear distinction between measures of positive perfectionism and a healthy
14 commitment to exceedingly high standards when this approach is taken (Flett and
15 Hewitt, 2006; Shafran & Mansell, 2001). Consequently, adopting this approach
16 may lead to unnecessary confusion at both conceptual and measurement levels
17 which hinders the ability of researchers to establish the consequences of
18 perfectionism.

19 On this issue, Flett and Hewitt (2006; Hewitt & Flett, 2007) have argued
20 that measures of positive perfectionism appear extremely similar to measures of
21 conscientiousness. Conscientiousness is a broad personality factor characterised
22 by the purposeful and determined pursuit of personal goals (Costa & McCrae,
23 1992). Like positive perfectionism, conscientiousness includes striving that entails
24 high aspirations, a desire for success, and a need for organisation. In short, both

1 are indicative of a healthy commitment to high personal standards. A number of
2 studies have examined the relationship between various measures of
3 perfectionism and conscientiousness (e.g., Rice, Ashby, & Slaney, 2007; Sherry,
4 Hewitt, Sherry, Flett, & Graham, 2010; Stoeber & Kersting, 2007). This research
5 has typically found that conscientiousness and dimensions of perfectionism
6 indicative of striving (e.g., self-oriented perfectionism and perfectionistic striving)
7 are moderately-to-highly positively correlated. Some of this research alludes to
8 key differences between them (e.g., Sherry et al., 2010), whereas others suggest
9 substantial similarities (e.g., Stoeber, Otto, & Dalbert, 2009). However, research
10 has yet to examine the similarity between positive perfectionism and
11 conscientiousness and, in doing so, establish the construct validity of the positive
12 perfectionism scale.

13 One way of assessing construct validity of psychological instruments is to
14 compare the responses of different scales that are purported to measure the same
15 or similar constructs (Marsh, 1994). Marsh (1994; Marsh et al., 2000) argues that
16 two scales can be considered to reflect similar underlying constructs when: (i)
17 they are highly correlated, (ii) can be collapsed in to a single factor, (iii) and have
18 a similar pattern of relations to external criteria. Moreover, Marsh (1994; Marsh,
19 Craven, Hinkley, & Debus, 2000), and others (Block, 1995), have described two
20 types of fallacies that are common among psychological measures. The first is
21 termed a jingle-fallacy. This entails the erroneous assumption that scales with the
22 same label reflect the same construct. The second is termed a jangle-fallacy. This
23 entails the erroneous assumption that scales with different labels measure different
24 constructs. In this instance, it is possible that scales measuring positive

1 perfectionism and conscientious achievement striving reflect the same underlying
2 construct. In which case, positive perfectionism and conscientious achievement
3 striving are an example of a jangle-fallacy. Alternatively, there may be sufficient
4 differences between the two instruments to suggest they measure different
5 constructs and therefore warrant different labels.

6 The purpose of the current study was to examine the similarity of the
7 constructs measured by positive perfectionism and conscientious achievement.
8 Based on the suggestions of Flett and Hewitt (2006; Hewitt & Flett, 2007), it was
9 hypothesised that the findings would fulfil the conditions required for two scales
10 to be considered to reflect similar underlying construct (Marsh 1994; Marsh et al.,
11 2000). Firstly, the relationship between positive perfectionism and conscientious
12 achievement striving latent factors would be substantial. Secondly, confirmatory
13 factor analysis would suggest that the responses to the positive perfectionism and
14 conscientious achievement striving scales could be adequately represented as a
15 single latent factor. Thirdly, the positive perfectionism and conscientious
16 achievement striving scales would display a similar pattern of relations with a
17 series of external measures (fear of failure, self-criticism, mental preservation, and
18 overgeneralization of failure). These variables were selected with the aim of
19 assessing the divergent validity of the two scales and have previously been found
20 to be associated with various dimensions of perfectionism (e.g., Hewitt & Flett,
21 1991; Hill et al., 2010; Sagar & Stoeber, 2009). Moreover, a number of
22 researchers have suggested that these elements may reflect perfectionism but not
23 conscientiousness (Flett & Hewitt, 2006, 2007).

24

Method

1 **Participants**

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

16 **Instruments**

17 **Positive perfectionism.** Positive and negative perfectionism was
18 measured using the adapted Positive and Negative Perfectionism Scale (Terry-
19 Short, Owens, Slade, & Dewey, 1995) developed by Haase and Prapevassis
20 (2004). The instrument includes two subscales that measure positive
21 perfectionism (“When I am competing against others, I am motivated by wanting
22 to be the best.” “I like the challenge of setting very high standards for myself.”)
23 and negative perfectionism (“Other people expect nothing less than perfection from
24 me.” “I feel guilty or ashamed if I do less than perfectly.”). Negative

1 perfectionism was included to provide contrast in the assessment of divergent
2 validity of the positive perfectionism scale and the conscientiousness achievement
3 striving scale with external measures. The positive perfectionism subscale
4 contains 7-items and the negative perfectionism contains 12-items. Both subscales
5 are scored on a seven-point Likert scale (1 = *strongly disagree* to 7 = *strongly*
6 *agree*). Haase and Prapevassis (2004) have provided evidence to support the
7 psychometric properties of measurement associated with the scale in athletes. This
8 includes adequate internal reliability (Cronbach's alpha) (positive perfectionism α
9 = .75 and negative perfectionism α = .79) and factor structure.

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

22 **Fear of failure.** Fear of failure was measured using Conroy, Willow, and
23 Metzler's (2002) short version of the Performance Failure Appraisal Inventory.
24 The scale is a measure of cognitive appraisals associated with the fear of failure

1 (“When I am failing I am afraid that I might not have enough talent.”). The scale
2 includes 5-items and is scored on a 5-point Likert scale (1 = *do not believe at all*
3 to 5 = *believe 100% of the time*). Conroy et al. (2002) have provided support for
4 the psychometric properties of the scale. This includes adequate internal reliability
5 ($\alpha = .72$) and factor structure (Conroy et al., 2002). The short-form of the scale is
6 also highly correlated with the long-form supporting the concurrent validity of the
7 scale ($r = .92$; Conroy et al., 2002).

8 **Self-criticism, overgeneralization and mental perseveration.** Self-
9 criticism, overgeneralization of failure and mental perseveration were assessed
10 using scales developed by Carver and colleagues (Carver, La Voie, Kuhl, &
11 Ganellen, 1988). Responses to the self-criticism scale reflect intolerance of a
12 discrepancy between attainment and desired standards and the tendency to engage
13 in self-criticism in response (3-items) (“I get unhappy with anything less than
14 what I expected of myself.” “I get angry with myself if my efforts don't lead to the
15 results I wanted.”). Responses to the overgeneralization subscale reflects the
16 tendency to overgeneralise negative judgements of oneself (4-items) (“Noticing
17 one fault of mine makes me think more and more about other faults.” “How I feel
18 about myself overall is easily influence by a single mistake.”). Finally, responses
19 to the mental perseveration subscale assess the tendency to ruminate about
20 previous failures (5-items) (“If I fail, I think about that particular failure for a long
21 time afterward.” “A bad performance will often preoccupy me for a long time
22 afterward.”). All three subscales are scored on a five-point Likert scale (1=
23 *strongly disagree* to 5 = *strongly agree*). Carver and colleagues (Carver, et al.,
24 1988) have provided support for the psychometric properties of these subscales.

1 This includes adequate internal reliability (self-criticism $\alpha = .65$,
2 overgeneralization $\alpha = .74$, and mental perseveration $\alpha = .85$) and factor structure.

3 **Results**

4 **Preliminary analysis**

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

22 Items from the positive perfectionism and conscientious achievement
23 striving scales were assessed for normality. First they were screened for univariate
24 and multivariate outliers (see Tabachnick & Fidell, 2007). Standardised z-scores

1 larger than 3.29 ($p < .001$, two-tailed) were used as criteria for univariate outliers.
2 This procedure led to the removal of 10 participants. A Mahalanobis distance
3 greater than $\chi^2(14) = 36.12$ was used as criterion for multivariate outliers. This
4 procedure led to the removal of a further 2 participants. All subsequent analyses
5 was conducted on the revised sample ($n = 179$, age $M = 16.50$, $s = 1.12$, range 12-
6 19, years of participation $M = 5.69$, $s = 2.67$, hours spent practising and competing
7 $M = 8.36$, $s = 4.53$, importance of participation $M = 8.11$, $s = 0.93$, 152 males, 23
8 females, 4 non-respondents).

9 Despite the removal of univariate and multivariate outliers, a number of
10 items from both scales remained significantly skewed or kurtotic. These items
11 were subsequently transformed using the guidelines provided by Tabachnick and
12 Fidell (2007). Following transformation (SQRT[X], -SQRT[K - X], or -LG10[K
13 - X]), all items were considered to be approximately normally distributed
14 (absolute skewness $M = 0.14$, $s = 0.11$, $SE = 0.18$, absolute kurtosis $M = 0.59$, $s =$
15 0.34 , $SE = 0.35$, Mardia's normalised coefficient = 3.21). The transformed items
16 were also almost perfectly correlated with the original items ($r = .97$ to $.99$). The
17 transformed items were used in the confirmatory factor analysis.

18 As the primary analyses also included comparison of bivariate correlations
19 amongst the measured variables, internal reliability analysis (Cronbach's alpha)
20 was performed on each scale. This analysis included the untransformed items for
21 positive perfectionism and conscientious achievement striving. All scales
22 demonstrated adequate internal consistency (positive perfectionism $\alpha = .78$,
23 conscientious achievement striving $\alpha = .70$, negative perfectionism $\alpha = .83$, fear of
24 failure $\alpha = .83$, self-criticism $\alpha = .81$, mental perseveration $\alpha = .86$, and

1 overgeneralization of failure $\alpha = .64$). Whether these variables were normally
2 distributed was also assessed. Only positive perfectionism (zskew = 2.84) and
3 self-criticism (zskew = 2.92) significantly deviated from a normal distribution.
4 These variables were transformed ($-\text{SQRT}[K - X]$) and, as a consequence, no
5 longer significantly deviated from a normal distribution (positive perfectionism
6 zskew = 0.04 and self-criticism zskew = 0.13). The transformed variables were
7 also almost perfectly correlated with the original variables (positive perfectionism
8 $r = 1.00$ and self-criticism $r = .99$). All the variables were subsequently considered
9 to be approximately normally distributed (absolute skewness $M = 0.10$, $s = 0.05$,
10 $SE = 0.18$, absolute kurtosis $M = 0.23$, $s = 0.11$, $SE = 0.36$). The transformed
11 variables were used in the comparison of the bivariate correlations.

12 **Primary analyses**

13 **The relationship and factor structure of positive perfectionism and**
14 **conscientious achievement striving.** In order to examine the relationship
15 between the two scales, and test whether the constructs they measure can
16 adequately be represented as a single latent factor, responses to the positive
17 perfectionism scale and conscientious achievement striving scale were subjected
18 to confirmatory factor analysis. In doing so, a comparison of two potential
19 confirmatory factor analysis models was made, as well as an estimate of the error-
20 free relationship between the two constructs. The first model represented the
21 responses to the scales as separate but related latent factors with items from each
22 scale loading on each factor independently (model 1). The second model
23 represented the responses to the scales as indicative of a single latent factor
24 (adaptive achievement striving) with items from both scales loading on this single

1 factor (model 2). If the confirmatory factor analysis model with two latent factors
2 (positive perfectionism and conscientious achievement striving) provided better fit
3 in comparison to the confirmatory factor analysis model with a single latent factor
4 (adaptive achievement striving), support would be provided for the notion that the
5 two scales measure sufficiently distinct constructs. Alternatively, if the
6 confirmatory factor analysis model with a single latent factor (adaptive
7 achievement striving) provided better fit in comparison to the confirmatory factor
8 analysis model with the two scales represented as two latent factors (positive
9 perfectionism and conscientious achievement striving), this would provide
10 support for the notion that the two scales measure the same constructs.

11 Confirmatory factor analysis was performed using AMOS (AMOS 18.0.0;
12 Arbuckle, 2009) and maximum likelihood estimation. The two models (two latent
13 factors and single latent factor) were compared using a range of absolute and
14 comparative fit indices. Based on recommendations of Bentler (2007), this
15 included the Comparative Fit Index (CFI), Non-normed Fit Index (NNFI),
16 Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error
17 of Approximation (RMSEA). Conventional criteria were used to evaluate and
18 compare the fit of both of the confirmatory factor models (CFI and NNFI >.90,
19 RMSEA and SRMR <.10, $\chi^2/df < 3$; Hu & Bentler, 1995; Joreskog & Sorbom,
20 1993; Marsh, 2007). Akaike's Information criterion (AIC) and Brown-Cudeck
21 criterion (BCC) were also provided to aid non-nested model comparison. Smaller
22 values represent greater parsimony and better fit (Hu and Bentler, 1995). Fit
23 indices for the two models are displayed in Table 1 and standardised factor
24 loadings for each model are displayed in Table 2.

1 The confirmatory factor analysis of the two latent factor model (model 1)
2 suggested that this model provided acceptable fit. In addition, with the exception
3 of one factor loading from the conscientious achievement striving scale (CAS-1),
4 all factor loading were statistically significant. In contrast, the confirmatory factor
5 analysis of the single latent factor model (model 2) suggested this model provided
6 less than acceptable fit. As with model 1, all factor loadings were statistically
7 significant with the exception of a single item from the conscientious achievement
8 striving scale (CAS-1). A comparison of the fit of the two models indicated that
9 the two latent factor model provided better fit for the data than the single latent
10 factor model. The correlation between the two latent factors was extremely high
11 ($=.70$). These analyses provided mixed support for the possibility that the scales
12 measuring positive perfectionism and conscientious achievement striving reflect
13 the same underlying construct. This is because they are highly correlated however
14 a comparison of two alternative models provided support for the distinctiveness of
15 positive perfectionism and conscientious achievement striving.

16 **Pattern of relations with external measures.** To examine whether the
17 two scales have a similar pattern of relations to external measures, the direction
18 and magnitude of their bivariate correlations with a series of variables were
19 compared (see Table 3). In addition, whether these bivariate correlations were
20 significantly different from each other was examined using the procedure
21 described by Meng, Rosenthal, and Robin (1992). The correlations between the
22 negative perfectionism subscale and external measures are also provided for
23 contrast and included as a final external variable. A comparison of the direction
24 and magnitude of the bivariate correlations revealed that they were very similar.

1 Specifically, the correlation between positive perfectionism and conscientious
2 achievement striving with fear of failure, mental preservation, and
3 overgeneralization of failure were all negative and small, or small-to-moderate, in
4 size (Cohen, 1992). The relationship between positive perfectionism with self-
5 criticism was positive and small, whereas there was no discernable relationship
6 between conscientious achievement striving and self-criticism. There was no
7 statistically significant difference between any of these bivariate correlations. It is
8 noteworthy, however, that there was a difference in the relationship between
9 positive perfectionism and conscientious achievement striving with negative
10 perfectionism (PP-NP $r = .14$, $p > .05$; CAS-NP $r = -.07$, $p > .05$; $z(\text{diff}) = 2.79$, p
11 $< .01$). In summary, a comparison of the pattern of relations with external
12 measures provides partial support for the contention that the positive
13 perfectionism and conscientious achievement striving scales may reflect the same
14 underlying construct, distinguishable only in terms of their association with
15 negative perfectionism.

16 Discussion

17 The purpose of the current study was to examine the similarity of the
18 constructs measured by positive perfectionism and conscientious achievement.
19 Marsh (1994; Marsh et al., 2000) argues that two scales can be considered to
20 reflect the same underlying construct when they are highly correlated, can be
21 collapsed in to a single factor, and have a similar pattern of relations to external
22 measures. Therefore, consistent with the arguments of Flett and Hewitt (2006;
23 Hewitt & Flett, 2007), it was hypothesised that the relationship between positive
24 perfectionism and conscientious achievement striving latent factors would be

1 substantial. It was hypothesised that confirmatory factor analysis would suggest
2 that the responses to the positive perfectionism and conscientious achievement
3 striving scales could be adequately represented as a single latent factor. Finally, it
4 was hypothesised that the positive perfectionism and conscientious achievement
5 striving scales would display a similar pattern of relations with a series of external
6 measures.

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

17 A number of researchers have argued that because positive perfectionism
18 is conceptualised as an adaptive form of achievement striving, the ways in which
19 measures of positive perfectionism are distinct from measures of other
20 achievement related concepts such as conscientious achievement striving is
21 unclear (e.g., Flett & Hewitt, 2006; Greenspon, 2000; Hall, 2006). In response,
22 Owens and Slade (2008) have argued that there is a somewhat shared
23 understanding of the potential positive effects that can arise as a consequence of
24 striving for perfection. Therefore, until it is demonstrated that the term positive

1 perfectionism is a clear misnomer, use of the term, and by extension instruments
2 that measure it, remain useful. The findings suggest that while there is
3 considerable overlap between the two constructs captured by the two instruments
4 in the current study, they may be best considered distinct. Consequently, this
5 measure of positive perfectionism should not be conflated with conscientious
6 achievement striving.

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

22 Echoing calls made by Marsh et al. (2000) in the area of motivation, this
23 area of research requires more careful attention to measurement, more precise and
24 agreed definitions, and operational definitions that have received especially close

1 scrutiny. Currently, this area of research is characterised by a great deal of
2 conceptual confusion. Notable areas of disagreement include the subtle, but
3 important, difference between striving for perfection and striving for excellence
4 (see Flett & Hewitt, 2006; Greenspon, 2000). There is also disagreement over
5 whether some dimensions of perfectionism (e.g., need for organisation, other-
6 oriented perfectionism) are central or tangential to the construct (Hewitt, Flett,
7 Besser, & McGee, 2003; Stoeber & Otto, 2006; Shafran, Cooper, & Fairburn,
8 2002). Finally, whether exceptional levels of achievement striving is
9 independently sufficient to warrant the label perfectionism continues to be a
10 source of fervent debate (see Greenspon, 2000). Some of these issues can be
11 examined through greater scrutiny of the content of scales currently used in this
12 area. At the moment, for example, some instruments designed to measure the
13 striving associated with perfectionism do not include items that make reference to
14 perfection (e.g., personal standards; Frost et al., 1990) and are ambiguous in terms
15 of whether they represent perfectionism or conscientious achievement striving
16 (e.g., "My successes spur me on to greater achievements" PP-6) (Flett & Hewitt,
17 2006; Sherry et al., 2010). Other issues require a greater focus on the construct
18 validity of current measures of perfectionism, as undertaken in the current study.
19 These are important empirical questions that must be examined if the current
20 debate regarding the consequences of perfectionism for athletes is to be resolved.

21 The potential dangers associated with misconstruing these constructs are
22 illustrated by the stark contrast between the correlates of negative perfectionism
23 and those of positive perfectionism in the current study. Negative perfectionism
24 appears to encapsulate a number of debilitating features that are likely to render

1 adolescent sport participants to psychological difficulties. The potential for other
2 features of perfectionism to do so is also evident in research in this area (Hall,
3 2006). Consequently, the current findings also serve to highlight the potential of
4 some dimensions of perfectionism to undermine the potential for sport to be a
5 rewarding experience for junior athletes. Identifying the psychological costs
6 associated with energising sport participation through perfectionism therefore
7 remains an important area for future research.

8 **Limitations and future directions**

9 While the current study provides an important initial step to addressing the
10 overlap between positive perfectionism and conscientious achievement striving,
11 the study has a number of limitations that must be taken in to account when
12 considering the findings. Firstly, the study employed a sample of junior basketball
13 players. Future research should examine the degree to which the findings
14 generalise to other samples and sports. Secondly, in terms of examining the
15 pattern of relations between positive perfectionism and conscientious achievement
16 striving, a limited number of variables were used. Future research should compare
17 these relations across a wider range of variables, particularly indicators of the
18 presence of health. Thirdly, the substantial relationship between positive
19 perfectionism and conscientious achievement striving alludes to the need to
20 examine their similarities and differences further. In particular, identifying factors
21 that account for variance they do not share would provide valuable insight in to
22 their differences (i.e., factors indicative of their distinctive features). The current
23 study suggests negative perfectionism may be a good starting point in this regard.
24 Finally, further scrutiny of positive and negative perfectionism is required in

1 terms of other measures of perfectionism (e.g., FMPS, S-MPS-2, and HMPS). The
2 manner in which positive perfectionism is related to the current network of sub-
3 dimensions of perfectionism will help further ascertain its validity as a measure of
4 perfectionism.

5 **Conclusion**

6 The current examined the similarity of the constructs measured by positive
7 perfectionism and conscientious achievement. The findings suggest that there is
8 considerable overlap between the constructs measured by the positive
9 perfectionism and conscientious achievement striving scales in the current study.
10 However, evaluation of the two scales indicated that only two of the necessary
11 conditions were met in terms of establishing that they measured the same
12 underlying construct. Therefore, they should be best considered distinct.
13 Identifying how measures of positive perfectionism, and similar constructs (e.g.,
14 perfectionistic striving and high personal standards), are different from existing
15 and established measures of adaptive achievement striving (e.g., conscientious
16 achievement striving) is central to resolving the current discord regarding the
17 consequences of perfectionism for athletes. It is hoped that this study will provide
18 the impetus for further scrutiny of the conceptual and empirical similarities and
19 differences between these related constructs.

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1 Table 1 *Comparison of confirmatory factor analysis models*

	χ^2	df	χ^2/df	CFI	NNFI	SRMR	RMSEA (90% CI)	AIC	BCC
Model 1: Two latent factors	147.20**	89	1.65	.90	.89	.06	.06 (.04 to .08)	239.20	248.28
Model 2: Single latent factor	204.08**	90	2.27	.81	.78	.07	.08 (.07 to .10)	294.08	302.97

2 ** $p < .01$ * $p < .05$

- 1 Table 2 *Confirmatory factor analysis solutions for two latent factor and single latent*
 2 *factor models*

Items	Model 1		Model 2
	Two latent factors		Single latent factor
	Positive	Conscientious	Adaptive achievement
	perfectionism	achievement striving	striving
PP-1	.43	0	.42
PP-4	.52	0	.44
PP-6	.66	0	.65
PP-9	.55	0	.51
PP-12	.58	0	.53
PP-15	.66	0	.61
PP-18	.66	0	.59
CAS-1	0	.07	.05
CAS-2	0	.35	.36
CAS-3	0	.32	.33
CAS-4	0	.63	.61
CAS-5	0	.47	.45
CAS-6	0	.71	.60
CAS-7	0	.78	.69
CAS-8	0	.50	.44

- 3 *Note.* CAS = Conscientious achievement striving items. PP= positive perfectionism
 4 items. Item numbers are taken from Haase and Prapavessis (2004). Standardised
 5 factor loadings are presented. Factor loadings of 0 are fixed and not estimated.

1 Table 3 *Comparison of the bivariate correlations coefficients between negative perfectionism, positive perfectionism, conscientious achievement*
 2 *striving and criterion variables*

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

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

5 ** $p < .01$ * $p < .05$

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