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The relationship between multidimensional perfectionism and psychological need thwarting in junior sports participants

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Abstract

Objectives: Perfectionism is thought to energise high quantities of motivation; however, its wider influence on the quality of the motivation exhibited by athletes is less clear. The purpose of this study was to examine the multivariate and univariate relationship between multidimensional perfectionism (perfectionistic concerns and perfectionistic striving) and perceived psychological need thwarting. Perfectionistic concerns was assessed via sub-dimensions of socially prescribed perfectionism, concern over mistakes, doubts about actions, parental pressure and coach pressure. Perfectionistic striving was assessed via sub-dimensions of self-oriented perfectionism, other-oriented perfectionism, personal standards and a need for organisation.

Design: A cross-sectional, survey-based design was employed.

Method: One hundred and ninety-nine junior sports participants were recruited from after-school sports clubs and completed measures of multidimensional perfectionism and psychological need thwarting.

Results: Canonical correlation analyses revealed that higher levels of perfectionistic concerns were associated with higher levels of perceived psychological need thwarting. Analogously, lower levels of perfectionistic striving were associated with lower levels of perceived psychological need thwarting. Regression analyses revealed that the relative importance of individual sub-dimensions of perfectionism differed depending on the facet of psychological need thwarting being assessed. Perceptions of parental pressure, coach pressure and concern over mistakes emerged as especially important.

Conclusion: Overall, the findings indicate that while perfectionism may contribute to high levels of behavioural investment, it may also impoverish the necessary support required for the fulfilment of psychological needs.

Keywords: Motivation; Achievement; Self-determination theory

The relationship between multidimensional perfectionism and psychological need thwarting in junior sports participants

The (mal)adaptive nature of perfectionism is currently the source of fervent debate (Flett & Hewitt, 2006; Owens & Slade, 2008). While there is general agreement that perfectionism can energise large quantities of motivation (i.e., behavioural investment), what is less clear is whether energising participation via perfectionism is associated with any psychological costs for athletes. In order for the consequences of perfectionism to be fully understood, its wider influence on the quality of motivation exhibited by athletes must be examined. Broadly, quality motivation can be inferred by the psychological well-being, moral functioning, social relations and long-term consequences that accompany behavioural investment (see Duda, 2005). The present study sought to address this issue by examining the degree to which fundamental psychological needs are perceived to be thwarted by multidimensional perfectionism in junior sports participants.

Perfectionism is broadly considered to be a multidimensional construct that entails features reflective of a commitment to exceedingly high standards and a preoccupation with harsh self-critical evaluation (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). Contemporary multidimensional approaches are exemplified by the models developed by Frost et al. (1990) and Hewitt and Flett (1991). Within Frost and colleagues' (1990) model, perfectionism is characterised by the pursuit of excessively high performance standards and an intolerance of imperfection. The model consists of six dimensions derived from the descriptions of perfectionism offered by early theorists (e.g., Burns, 1980; Pacht, 1984). Four of these dimensions relate to the features of the achievement striving energised by perfectionism (high personal standards, concern over mistakes, doubts about actions and a need for organisation). The two remaining dimensions reflect the presumed origins of perfectionism in the form of parental practices (parental criticism and parental expectations).

In sport, these two subscales have recently been supplanted by measures of coach pressure and parental pressure, which are considered more salient to the domain (Dunn, Causgrove Dunn, & Syrotuik, 2002; Gotwals & Dunn, 2009).

Hewitt and Flett's (1991) model adopts a different approach. They define perfectionism as the perceived need, or actual requirement, for perfection. Their model emphasises differences amongst dimensions of perfectionism in terms of the individual to whom perfectionism is directed. The first of these dimensions is self-oriented perfectionism and entails exceedingly high personal standards and the tendency to engage in self-criticism. The second dimension is socially prescribed perfectionism and entails the belief that others hold an excessively high standard for one's self and withhold approval based upon the attainment of those standards. The final dimension is other-oriented perfectionism and entails the tendency to impose unrealistically high standards on others.

Although these models offer alternative conceptualisations of perfectionism, research suggests that there is a large amount of conceptual overlap between the two approaches. In particular, a number of factor-analytical studies have found that the dimensions captured by these two measures can be considered to be indicative of two higher-order dimensions of perfectionism (e.g., Bieling, Israeli, & Antony, 2004; Cox, Enns, & Clara, 2002; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). The two broad dimensions identified in these studies are perfectionistic striving and perfectionistic concerns (Stoeber & Otto, 2006) [1]. Perfectionistic striving primarily involves the setting of exacting and high standards for one's self (Dunkley & Blankstein, 2000). This dimension is typically measured by a combination of personal standards, a need for organisation, self-oriented and other-oriented sub-dimensions of perfectionism. Perfectionistic concerns, on the other hand, involve concerns about others' unrealistic expectations and criticism, overly critical self-evaluation and the inability to derive satisfaction from success (Dunkley & Blankstein, 2000). In contrast to perfectionistic

striving, perfectionistic concerns is typically measured by a combination of concern over mistakes, doubts about actions, parental criticism, parental expectations and socially prescribed sub-dimensions of perfectionism.

The divergent outcomes associated with perfectionistic striving and perfectionistic concerns are evident in clinical, social and educational research (see Stoeber & Otto, 2006). Specifically, while perfectionistic concerns appear to be a significant source of psychological difficulties, perfectionistic striving is more equivocal in that it is largely unrelated to negative consequences and, in some instances, is associated with positive consequences. Research by Dunkley and his colleagues, for example, have found that these broad dimensions of perfectionism have divergent relationships with psychological adjustment. Notably, differences between them are evident in their relationships with coping tendencies (Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000), self-esteem (Blankstein, Dunkley, & Wilson, 2008), general positive and negative affect (Gaudreau & Thompson, 2010), anxiety (Bieling, et al., 2004), and depression (Enns, Cox, & Clara, 2002).

To date, two studies have utilised similar broad conceptualisations of perfectionism in sport (Gaudreau & Antl, 2008; Kaye, Conroy, & Fifer, 2008). Their findings support those outside of sport and suggest that broad dimensions indicative of perfectionistic striving and concerns are associated with different forms of motivational regulation, coping strategies and achievement goals in athletes. Research that has focused on examining sub-dimensions of perfectionism also suggests that perfectionistic concerns encapsulate features that are responsible for the negative cognitive and affective experiences of athletes (e.g., higher levels of competitive anxiety, anger, and exhaustion; Frost & Henderson, 1991; Hill, Hall, Appleton, & Kozub, 2008; Vallance, Dunn, & Causgrove Dunn, 2006). In contrast, as found outside of sport, research suggests that perfectionistic striving largely contains the energising features of perfectionism (e.g., higher personal standards and higher performance; Stoeber,

Uphill, & Hotham, 2009). However, it is noteworthy that the salutogenic effects of perfectionistic striving have yet to be established (Stoeber & Otto, 2006).

Self-determination theory and basic psychological needs theory

Self-determination theory (Deci & Ryan, 1985, Ryan & Deci, 2002) is a meta-theory offering a lens through which the relationship between multidimensional perfectionism and quality of athlete motivation can be examined. Over the past decade, self-determination theory has become a popular model through which to explore motivational, performance, interpersonal and well-being related outcomes in sport and exercise (see Ryan & Deci, 2007, for a review). The foundation of self-determination theory concerns the interaction between individuals' natural organismic tendencies toward growth, integration, vitality and healthy functioning and the social-contextual environment that either nurtures or inhibits these tendencies (Ryan & Deci, 2002). Moreover, the fulfilment of basic psychological needs is thought to be central to the dialectical interplay between organism and environment. The three fundamental needs within self-determination theory are autonomy (feelings of volition, choice and self-directedness), competence (perceptions of being effective) and relatedness (feelings of belonging or connectedness to others) (Deci & Ryan, 2000; Ryan & Deci, 2002).

According to basic psychological needs theory, a micro-theory of self-determination theory (Deci & Ryan, 2000), the optimal conditions in which organismic tendencies are enacted are defined by the satisfaction of the three innate psychological needs. The fulfilment of these needs, in turn, are purported to lead to positive psychological consequences, such as better quality, more autonomous, motivation and well-being (Deci & Ryan, 2000). This is because when psychological needs are satisfied the organismic activities of the individual are given full opportunity to flourish (Ryan, 1995). Research in a variety of life domains (e.g., work, health and exercise) has provided support for the assertions of basic needs theory (Deci & Ryan, 2000). Similar findings are evident in sport where researchers have found support

for the beneficial effects of psychological need satisfaction. For example, higher levels of psychological need satisfaction has been found to predict higher levels of subjective vitality, autonomous motivation and positive affect in athletes (e.g., Adie, Duda, & Ntoumanis, 2008; Hollembeak & Amorose, 2005; Reinboth & Duda, 2006).

Researchers in sport have recently turned their attention to examining need thwarting. The frustration, or thwarting, of psychological needs is thought to lead to negative psychological consequences, such as lesser quality, more controlled, motivation and ill-being (Deci & Ryan, 2000). This is because when needs are thwarted, the natural organismic activities of the individual are inhibited (Ryan, 1995). As recently described by Bartholomew, Ntoumanis, Ryan and Thøgersen-Ntoumani (2011), need thwarting entails more than perceptions of lower levels of need satisfaction. Instead, it is characterised by perceptions that psychological needs are obstructed and *actively* undermined. In accord, the three needs are likely to be thwarted when an individual's sense of choice and self-control is quashed (autonomy); they feel ineffective or that the context is demeaning (competence); and the social environment is perceived as being cold and neglectful (relatedness) (Vansteenkiste, Niemiec, & Soenens, 2010). Initial research in the area of sport has found support for the negative impact of need thwarting, with higher levels of psychological need thwarting being found to be associated with lower levels of vitality and higher levels of exhaustion in athletes (e.g., Bartholomew et al., 2011). Need thwarting may be especially important in the context of understanding any costs associated with perfectionism for athletes because psychological need thwarting is purported to be more relevant to the development of ill-being than the absence of need satisfaction (Bartholomew et al., 2011).

Multidimensional perfectionism and psychological need thwarting

Perfectionistic concerns are likely to lead to higher perceptions of need thwarting. This is because sub-dimensions of perfectionistic concerns (e.g., socially prescribed

perfectionism, parental pressure and coach pressure) entail a number of beliefs and perceptions that include standards over which individuals have limited perceived control, negative self-evaluative tendencies, perceptions of external pressure and sensitivity to social rejection. This possibility is evident in empirical research inside and outside of sport. For example, socially prescribed perfectionism and concern over mistakes are associated with lower levels of perceived control and autonomy (e.g., Flett, Hewitt, Blankstein, & Mosher, 1995; Mor, Day, Flett, & Hewitt, 1995), poorer appraisals of task performance (e.g., Frost & Marten, 1990; Frost et al., 1995), and lower levels of athletic confidence (Frost & Henderson, 1991; Gotwals, Dunn, & Wayment, 2003). Socially prescribed perfectionism is especially problematic in terms of interpersonal-adjustment. Previous research suggests that it is associated with perceptions of poorer close relationships (Flett, Hewitt, Shapiro, & Rayman, 2001-2002; Haring, Hewitt, & Flett, 2003), a higher frequency of negative social interactions (Flett, Hewitt, Garshowitz, & Martin, 1997), and lower perceived social skills (Flett, Hewitt, & De Rosa, 1996). In sport, Ommundsen, Roberts, Lemyre, and Miller (2005) also found that a collection of sub-components of perfectionistic concerns were associated with perceptions of lower quality peer-relationships in junior soccer players.

Perfectionistic striving, on the other hand, is likely to lead to lower perceptions of need thwarting. This is because sub-dimensions of perfectionistic striving involve higher levels of personal control and efficacy (e.g., personal standards and self-oriented perfectionism), and are relatively undisruptive in terms of interpersonal-adjustment. In support of this possibility, self-oriented perfectionism has been found to be associated with higher levels of self-efficacy in an educational context and the competence facet of conscientiousness (a sense that one is capable, sensible, prudent and effective) (Dunkley & Kyparissis, 2008; Mills & Blankstein, 2000). Self-oriented perfectionism has also been found to have either a positive influence (e.g., Hill, Zrull, & Turlington, 1997), or no influence

(Blankstein, Lumley, & Crawford, 2007; Sherry, Hewitt, Flett, & Harvey, 2003), on interpersonal adjustment. Similar findings are evident in sport where personal standards are related to higher perceptions of ability and confidence leading up to athletic competition (Hall, Kerr, & Matthews, 1998) and unrelated to perceptions of peer-relationships in junior soccer players (Ommundsen et al., 2005).

The current study had two purposes. The first purpose was to examine the multivariate relationship between broad dimensions of perfectionism (perfectionistic concerns and perfectionistic striving) and psychological need thwarting. The second purpose was to examine the predictive ability of sub-dimensions of perfectionism in relation to each facet of psychological need thwarting. Based on the preceding theoretical argument and previous empirical research, it was hypothesised that perfectionistic concerns would be positively associated with psychological need thwarting whereas perfectionistic striving would be negatively associated with psychological need thwarting. It was also hypothesised that the sub-dimensions of perfectionistic concerns would have the greatest predictive ability in terms of psychological need thwarting. This is because these dimensions are likely to play a more subversive role in the need fulfilment process. The importance of specific sub-dimensions of perfectionistic concerns was also expected to vary depending on the facet of psychological need thwarting being predicted. Consistent with research findings in sport that suggest perceptions of social-contextual support (e.g., parent and coach autonomy support; Adie et al., 2008; Gagné, Ryan, & Bargmann, 2003; Reinboth, Duda, & Ntoumanis, 2004) may be more central to perceptions of autonomy and relatedness satisfaction than competence satisfaction, inter-personal sub-dimensions of perfectionistic concerns (socially prescribed perfectionism, parental pressure and coach pressure) were expected to be the largest predictor of perceptions of autonomy and relatedness thwarting. In contrast, intra-personal sub-

dimensions of perfectionistic concerns (concern over mistakes and doubts about actions) were expected to be the largest predictor of perceptions of competence thwarting.

Method

Participants

Two-hundred and five junior sports participants (88 males, 117 females, *M age* = 15.30 years, *s* = 1.36 years, range = 14-18 years) were recruited from a range of after-school sport clubs. Participants were involved at recreational (n = 47), club (n = 113), county (n = 26), regional (n = 13) and national level (n = 5). There was one non-respondent in terms of competitive level. On average, the sample had participated in their sport for 6.45 years (*s* = 3.37), trained and played for an average of 4.53 hours per week (*s* = 3.73) and reported on a nine-point Likert scale that their participation in sport was considered very important (*M* = 7.04, *s* = 1.68*)* in comparison to other activities (1 = *not at all important* to 9 = *extremely important*). Participants completed a multi-sectional questionnaire during a session of an after-school sport club.

Instruments

Multidimensional perfectionism. Perfectionistic concerns and perfectionistic striving were measured using a combination of the sub-dimensions contained on a brief version of Hewitt and Flett's (1991) Multidimensional Perfectionism Scale developed by Cox et al. (2002) and Dunn and colleagues Sport-Multidimensional Perfectionism Scale (Dunn et al., 2006; Gotwals & Dunn, 2009). Perfectionistic concerns was assessed using socially prescribed perfectionism, concern over mistakes, doubts about actions, parental pressure and coach pressure sub-dimensions. Perfectionistic striving was assessed using self-oriented perfectionism, other-oriented perfectionism, personal standards and a need for organisation sub-dimensions.

The brief version of Hewitt and Flett's (1991) Multidimensional Perfectionism Scale contains three, 5-item, subscales that assess self-oriented (SOP: e.g., "I set very high standards for myself"), socially prescribed (SPP: e.g., "My family expects me to be perfect") and other-oriented perfectionism (OOP: e.g., "I do not expect a lot from my friends" [reversed]). Items are measured on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). The stem of the instrument was adapted to ensure that participants were focused on sport specific cognitions and beliefs ("The following items ask you to think about when you are practicing or playing your sport"). Cox et al. (2002) have provided evidence of the validity and reliability of this instrument. This includes adequate factor structure, acceptable internal reliability (SOP $\alpha = .84$, SPP $\alpha = .85$, and OOP $\alpha = .66$), and a strong correlation between the shortened subscales and the original subscales (SOP $r = .95$, SPP $r = .94$, and OOP $r = .77$).

The Sport Multidimensional Perfectionism Scale (Sport-MPS; Dunn et al., 2006; Gotwals & Dunn, 2009) is based on Frost et al.'s (1990) measure of perfectionism. It contains six subscales that assess personal standards (PS; 7-items, e.g., "I have extremely high goals for myself in my sport"), concern over mistakes (COM; 8-items, e.g., "If I fail in competition, I feel like a failure in person"), doubts about actions (DAA; 6-items, e.g., "Prior to competition, I rarely feel satisfied with my training"), perceived parental pressure (PPP; 9-items, e.g., "My parents expect excellence from me in my sport"), perceived coach pressure (PCP; 6-items, e.g., "My coach sets very high standards for me in competition"); and a need for organisation (ORG; 6-items, e.g., "I have and follow a pre-competitive routine"). Items are measured on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Dunn and colleagues have provided evidence of the validity and reliability of the instrument. This includes factorial structure and adequate internal consistency for the six subscales (all α's $\geq$ .74).

Psychological need thwarting. Psychological need thwarting was measured using the Psychological Need Thwarting Scale (PNTS; Bartholomew et al., 2011). This includes three, 4-item, subscales that assess autonomy thwarting (e.g., "I feel pushed to behave in certain ways in my sport"); competence thwarting (e.g., "Situations occur in my sport in which I am made to feel incapable"); and relatedness thwarting (e.g., "I feel other people involved in my sport dislike me"). Items are measured on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). In the recent development of the instrument, Bartholomew et al. (2011) have provided evidence of the validity and reliability of the instrument. This includes factorial structure and internal reliability (RHO's ≥ .77).

Results

Preliminary analysis

In order to prepare the data for the primary analysis, the data was subjected to a series of preliminary analyses (missing value analysis, assessment of normality and internal reliability analysis). Missing value analysis indicated that there were 171 complete cases and 34 incomplete cases. In accordance with the recommendations of Tabachnick and Fidell (2007), participants with missing data (item non-response) that exceeded 5% were removed (n = 4). None of the remaining participants had missing data for more than 3 items (M = 1.37, s = 0.56, *range* = 1-3 items). Examination of the pattern of missing data suggested that the data was missing in a non-systematic manner. Specifically, there were 27 unique patterns of missing data for the 30 participants with missing data (ratio = .90). Given the low number of missing values, the high ratio of missing data patterns to the number of participants with missing data, and the previous satisfactory internal consistency of the scales adopted (e.g., Bartholomew et al., 2011; Cox et al., 2002; Dunn et al., 2006), missing values were replaced using the mean of the non-missing items from the subscale in each individual case (see Graham, Cumsille & Elek-Fisk, 2003). Using the available information for each individual,

helps to both preserve the characteristics of the data set and maximises the available data for the main statistical data-analysis (Graham et al., 2003).

Scales were then computed and screened for univariate and multivariate outliers using the protocol outlined by Tabachnick and Fidell (2007). Standardised z-scores larger than 3.29 (p <.001, two-tailed) were used as criteria for univariate outliers and a Mahalanobis distance greater than $\chi^2_{(12)} = 32.91$ was used as criteria for multivariate outliers. This led to the removal of 2 further participants. Examination of the skewness and kurtosis values for each variable indicated that self-oriented perfectionism (zskew = 3.37), socially prescribed perfectionism (zskew = 3.00) and perceived parental pressure (zskew = 3.52) were significantly skewed. These variables were subsequently transformed (SOP = -SQRT[8-SOP], SPP = SQRT[SPP], and PPP = SQRT[PPP]) and, as a consequence, were no longer significantly skewed (zskew = 0.76, zskew = 0.21, and zskew =0.15). The transformed variables were almost perfectly correlated with the corresponding original variables (r = .99). The remaining data (n = 199, *M age* = 15.31 years, s = 1.34 years, range 14-18 years) was considered to be approximately univariate and multivariate normal (absolute skewness M = .09, s = .06, SE = .17; absolute kurtosis M = .34, s = .21, SE = .34; Mahalanobis distance M = 11.62, s = 5.87). Finally, an assessment of the internal reliability of each scale was conducted. The results of this analysis are displayed in Table 1. All scales demonstrated sufficient internal consistency. Specifically, all Cronbach's alphas exceeded .70 (Nunnally, 1978).

Primary analyses

Descriptive statistics and bivariate correlations between psychological need thwarting and dimensions of perfectionism

The descriptive statistics and bivariate relationships between dimensions of perfectionism and psychological need thwarting are reported in Table 1. Levels of

perfectionism and psychological need thwarting were consistent with findings in other samples of youth athletes (e.g., Bartholomew et al., 2011; Hill et al., 2008; Lemyre, Hall & Roberts, 2008). The three aspects of psychological need thwarting displayed a similar pattern of relations with dimensions of perfectionism. Autonomy thwarting had a significant positive relationship with all dimensions of perfectionism except other-oriented perfectionism. Competence and relatedness thwarting had a significant positive relationship with most dimensions of perfectionism. The only dimensions that these two aspects of need thwarting were not related to were self-oriented perfectionism and other-oriented perfectionism. Typically, the correlations between psychological need thwarting and perfectionism dimensions were moderate in size (Cohen, 1992).

The multivariate relationship between dimensions of perfectionism and psychological need thwarting

Canonical correlation analysis was used to examine the multivariate relationship between dimensions of perfectionism and psychological need thwarting. Each canonical correlation analysis included a set of predictor variables (perfectionistic concerns or striving sub-dimensions) and a set of criterion variables (facets of psychological need thwarting). Based on the recommendations of Tabachnick and Fidell (2007), canonical functions were considered meaningful if they were statistically significant ($p < .05$) and the squared canonical correlation exceeded 0.10. Factor loadings were used to identify the characteristics of the canonical variates. Variables were considered to contribute to the canonical variate if their canonical loading (i.e., canonical structure coefficient) exceeded |.30|. The results of these analyses are reported in Table 2 and 3.

The first canonical correlation analysis examined the relationship between sub-dimensions of perfectionistic concerns and facets of psychological need thwarting. Perfectionistic concerns was represented as a linear composite of socially prescribed

perfectionism, concern over mistakes, doubts about actions, perceived parental pressure, and perceived coach pressure. Psychological need thwarting was represented as a composite of autonomy, competence and relatedness thwarting. This analysis revealed a significant multivariate relationship: Wilks' $\lambda = 0.74$, $F(15, 569) = 3.97$, $p < 0.001$. One statistically significant canonical function emerged. The canonical correlation between the two variates was .46 ($R_c^2 = .21$).

Examination of canonical loadings indicated that all perfectionism sub-dimensions loaded highly on the first canonical variate (.69 to .89). Therefore, the canonical variate was considered to be reflective of perfectionistic concerns. Similarly, all of the psychological need thwarting facets loaded highly on the second canonical variate (.75 to .99). This canonical variate was therefore considered to be reflective of psychological need thwarting. The perfectionistic concerns variate explained an average of 68.03% of the variance in the perfectionism dimensions, while the psychological need thwarting variate explained an average of 72.81% of the variance in facets of need thwarting. Overall, the canonical correlation between the two variates suggests that higher levels of perfectionistic concerns are associated with higher levels of psychological need thwarting.

The second canonical correlation analysis examined the relationship between sub-dimensions of perfectionistic striving and facets of psychological need thwarting. Perfectionistic striving was represented as a linear composite of self-oriented perfectionism, other-oriented perfectionism, personal standards, and a need for organisation. Again, psychological need thwarting was represented as a composite of autonomy, competence and relatedness thwarting. This analysis revealed a significant multivariate relationship: Wilks' $\lambda = 0.83$, $F(12, 508) = 3.19$, $p < 0.001$. Two statistically significant canonical functions emerged ($p < .05$). The first canonical function had a canonical correlation of .33 ($R_c^2 = .11$). The second canonical function had a canonical correlation of .24 ($R_c^2 = .06$). However,

because the squared canonical correlation fell below the criteria to be considered meaningful (.10), it was not interpreted.

Examination of canonical loadings for the perfectionistic striving variate indicated that, with the exception of other-oriented perfectionism, dimensions of perfectionism typically loaded moderately-to-highly on the variate (-.39 to -.94). It was largely characterised by lower levels of high personal standards. This canonical variate was considered to be reflective of lower levels of perfectionistic striving. All facets of psychological need thwarting loaded highly (-.49 to -.88) on the psychological need thwarting variate. This canonical variate was therefore considered to be reflective of lower levels of psychological need thwarting. The perfectionistic striving variate explained an average of 34.09% of the variance in the perfectionism dimensions, while the psychological need thwarting variate explained an average of 49.69% of the variance in facets of need thwarting. Overall, the canonical correlation between the two variates and the canonical loadings suggest that lower levels of perfectionistic striving are associated with lower levels of psychological need thwarting.

The predictive ability of dimensions of perfectionism in relation to psychological need thwarting

Three regression analyses were used to examine the predictive ability of all dimensions of perfectionism in relation to psychological need thwarting. The results of these analyses are reported in Table 4. Preliminary analysis indicated that multicollinearity between variables was unproblematic in each analysis (tolerance: regression one [autonomy] = 0.33–0.94, regression two [competence] = 0.33–0.94, and regression three [relatedness] = 0.33–0.94). There was a lack of autocorrelation (regression one [autonomy] Durbin–Watson = 2.02, regression two [competence] Durbin–Watson = 2.14, and regression three [relatedness]

Durbin–Watson = 2.06). Finally, residuals were normally distributed and homoscedastic (based on standardised predicted values-standardised residuals plots).

The first hierarchical regression indicated dimensions of perfectionism accounted for 21% of variance in autonomy, $F = 5.61$, $p < .01$. Perceived coach pressure was the only significant individual predictor of autonomy thwarting (B = .33, β = .22, $p < .05$). The second hierarchical regression indicated dimensions of perfectionism accounted for 17% of variance in competence, $F = 4.31$, $p < .01$. Personal standards (B = -.48, β = -.30, $p < .05$) and concern over mistakes (B = .38, β = .25, $p < .05$) were the only significant individual predictors of competence thwarting. The third hierarchical regression indicated dimensions of perfectionism accounted for 17% of variance in relatedness, $F = 4.25$, $p < .01$. Perceived parental pressure was the only significant individual predictor of relatedness thwarting (B = .97, β = .22, $p < .05$).

Discussion

The purpose of the study was to: (i) examine the multivariate relationship between broad dimensions of perfectionism (perfectionistic concerns and perfectionistic striving) and psychological need thwarting and (ii) to examine the predictive ability of sub-dimensions of perfectionism in relation to each facet of psychological need thwarting. It was hypothesised that perfectionistic concerns would be positively associated with psychological need thwarting, whereas perfectionistic striving would be negatively associated with psychological need thwarting. It was also hypothesised that the sub-dimensions of perfectionistic concerns would have the greatest predictive ability in terms of psychological need thwarting. Inter-personal sub-dimensions (socially prescribed perfectionism, parental pressure and coach pressure) were expected to be the largest predictor of autonomy and relatedness thwarting. In contrast, intra-personal sub-dimensions (concern over mistakes and doubts about actions) were expected to be the largest predictor of competence thwarting.

The findings provided partial support for the hypotheses. In support of the hypotheses, canonical correlation analyses revealed that higher levels of perfectionistic concerns were associated with higher perceptions of psychological need thwarting. However, contrary to expectations, lower levels of perfectionistic striving were associated with lower perceptions of psychological need thwarting, suggesting a positive association. In terms of the assessment of the predictive ability of sub-dimensions of perfectionism, the findings were largely consistent with the hypotheses. Perceived coach pressure emerged as the only significant predictor of perceived autonomy thwarting. Perceived parental pressure emerged as the only significant predictor of perceived relatedness thwarting. Both concern over mistakes and personal standards emerged as significant predictors of perceived competence thwarting.

Perfectionistic concerns and psychological need thwarting

Current understanding of perfectionistic concerns is that it embodies the most problematic features of perfectionism and is an antecedent of negative cognitive and affective experiences in sport (Frost & Henderson, 1991; Hall et al., 1998; Hill et al., 2008). The findings extend this research by indicating that a further concomitant of perfectionistic concerns is higher levels of psychological need thwarting. This broad dimension of perfectionism appears to engender perceptions of helplessness and excessive external pressures that subvert the self-agency, effectance and positive inter-personal relations required to fulfil psychological needs (Deci & Ryan, 2000). In doing so, this dimension of perfectionism may render athletes vulnerable to an array of negative consequences via need thwarting. For example, pro-social and anti-social behaviour (Ntoumanis & Standage, 2009), drop-out (Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002), burnout (Perreault, Gaudreau, Lapointe, & Lacroix, 2007), and well-being (Quested & Duda, 2010) are all associated with need satisfaction, in varying degrees. In short, perfectionistic concerns are likely to have substantial psychological costs for athletes.

Perfectionistic striving and psychological need thwarting

The finding that lower levels of perfectionistic striving may be associated with lower levels of psychological need thwarting and, therefore, higher levels of this dimension of perfectionism may contribute to higher levels of perceived need thwarting was unexpected. This dimension of perfectionism is typically unrelated to negative outcomes and, in some instances, related to positive consequences (Stoeber & Otto, 2006). Stoeber and colleagues (Stoll, Lau, & Stoeber, 2008; Stoeber et al., 2009), for example, have demonstrated through the use of a unitary measure of perfectionistic striving that this feature may energise higher levels of investment and lead to greater athletic performance. However, the current findings indicate that perfectionistic striving may be associated with higher levels of need thwarting. As a consequence, perfectionistic striving may also have some of the same costs associated with perfectionistic concerns that arise as a consequence of psychological need thwarting (e.g., anti-social behaviour, drop-out, burnout and ill-being).

There are a number of possible explanations for this unexpected finding. It is possible that it reflects the broad and multifaceted nature of perfectionistic striving when measured as a latent factor. In particular, as manifested through personal standards, other-oriented and self-oriented perfectionism, perfectionistic striving includes both self and other-evaluative tendencies that extend the construct beyond the act of achievement striving. This possibility is reflected in some of its sub-dimensions. The nature of self-oriented perfectionism, for example, is currently unclear and appears to have the potential to contribute to both positive and negative outcomes (Flett & Hewitt, 2006). It is also possible that the finding reflects the absence of perfectionistic concerns as a covariate in the canonical correlation analysis. As noted elsewhere (e.g., Aldea & Rice, 2006; Wu & Wei, 2008), when the relationship between dimensions of perfectionism are controlled, they may become polarised and appear more adaptive or maladaptive. A final possibility is that the findings may reflect the influence of

moderating variables (e.g., levels of satisfaction, achievement and perfectionistic concerns; Besser, Flett, & Hewitt, 2004; Hewitt et al., 2002; Stoeber, Kempe, & Keogh, 2008). Overall, the findings allude to a complex relationship between perfectionistic striving and psychological need fulfilment that requires further examination.

Comparative importance of sub-dimensions of perfectionism

The findings attest to the subversive role of perfectionistic concerns sub-dimensions and the utility of differentiating between the inter-personal and intra-personal expression of perfectionism when considering its relationship with need thwarting. Inter-personal dimensions of perfectionistic concerns (perceived coach and parental pressure) predicted autonomy and relatedness thwarting, whereas an intra-personal dimension of perfectionistic concerns (concern over mistakes) predicted perceptions of competence thwarting. These findings are consistent with the notion that the fulfilment of the three psychological needs in sport may be inhibited by different personal and social-contextual factors (Deci & Ryan, 2000). For example, Gagné et al. (2003) found that perceptions of parental autonomy support only predicted relatedness satisfaction, whereas perceptions of coach autonomy support predicted both relatedness and autonomy satisfaction in junior gymnasts. Similarly, Reinboth et al., (2004) found that autonomy, relatedness and competence satisfaction were derived from different sources (autonomy support, social support and personal improvement).

Unexpectedly, personal standards also emerged as a negative predictor of perceived competence thwarting. Although perfectionistic concerns sub-dimensions were expected to play a more active role in subverting need fulfilment, it is possible that if features of perfectionism promote need satisfaction, they may also contribute to need thwarting in an antithetical manner. In this instance, high personal standards may be indicative of feelings of ability and agency that directly oppose perceptions of need thwarting. It should be noted, however, that this finding is indicative of the benefits of endorsing high personal standards

when the influences of other dimensions of perfectionism are controlled (semi-partial correlation with competence thwarting). In this form, the high personal goals are likely to reflect 'pure personal standards' (DiBartolo, Frost, Chang, LaSota, & Grills, 2004) and be primarily autonomously motivated. Such autonomously motivated goals have been found to lead to need satisfaction in athletes (Smith, Ntoumanis, & Duda, 2007).

Limitations and future directions

The findings must be considered within the context of the study's limitations. The non-experimental and cross-sectional design does not allow inference of causality between perfectionism and need thwarting. Longitudinal and prospective studies have proven useful in research that has examined basic needs theory (see Gagné & Blanchard, 2007, for a review of prospective diary studies) and provide a means of further unpacking the relationship between multidimensional perfectionism, need thwarting and motivational outcomes. The potential bi-directional relationship between perfectionism and need thwarting is a particularly important avenue for future research. Previous research highlights the possibility that sub-dimensions of perfectionism (e.g., perceptions of coach pressure) may precede perceptions of need thwarting (Smoll & Smith, 2002). However, based on descriptions of the origins of perfectionism (Flett, Hewitt, Oliver, & Macdonald, 2002), and the purposed influence of need thwarting in childhood (Ryan, 2005), another interesting possibility is that perfectionism may be an accommodation strategy that arises as a consequence of perceptions of need thwarting. It would also be interesting to re-examine the current relationships in terms of need satisfaction. Research suggests that need thwarting and need satisfaction can co-occur in a given context (Bartholomew et al., 2011). This highlights the possibility that some dimensions of perfectionism may predict higher levels of some facets of need satisfaction (e.g., competence), as well as facets of need thwarting (e.g., relatedness). The degree to which the findings generalise beyond the context of after-school sports clubs and a sample of

14-18 year old sports participants is also necessary. Given suggestions that ability or success may moderate the impact of perfectionism (Flett & Hewitt, 2005), examining these relationships in more elite samples appears particularly important. Finally, it is noteworthy that other-oriented perfectionism did not load substantially on the perfectionistic striving canonical variate. Consequently, as the implications of the absence of this dimension on the nature of perfectionistic striving are not clear, findings concerning this dimension should be interpreted cautiously.

Conclusion

The relative benefits and costs associated with promoting perfectionism in athletes are currently being debated. Previous research suggests that while perfectionistic concerns may be problematic for athletes, perfectionistic striving is less problematic and may even have some benefits. The current study provides some initial evidence that both perfectionistic concerns and perfectionistic striving may have some psychological costs in the form of the thwarting of basic psychological needs. Concern over mistakes and perceived pressure from coaches and parents emerged as especially problematic in terms of predicting individual facets of need thwarting. This suggests that different beliefs and perceptions responsible for the malaise that accompanies perfectionism are important when considering the perfectionism-need relationship. Overall, while perfectionism may energise large quantities of motivation, it may also serve to undermine the potential for participation in sport to be a fulfilling experience for junior athletes.

Footnote

[1]The terms perfectionistic striving and perfectionistic concerns have been used here instead of other previously adopted terms (e.g., personal standards perfectionism and evaluative concerns perfectionism) because we believe the current labels more clearly convey the notion that these are broad dimensions of perfectionism, rather than forms or types of perfectionism.

References

Adie, J., Duda, J.L., & Ntoumanis, N. (2008). Autonomy support, basic need satisfaction and the optimal functioning of adult male and female sport participants: A test of basic needs theory. *Motivation and Emotion, 32,* 189-199.

Aldea, M.A., & Rice, K. (2006). The role of emotional dysregulation in perfectionism and psychological distress. *Journal of Counseling Psychology, 53,* 498–510.

Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., & Thøgersen-Ntoumani, C. (2011). Psychological need thwarting in the sport context: Assessing the darker side of athletic experience. *Journal of Sport & Exercise Psychology, 33,* 75-102.

Besser, A., Flett, G. L., & Hewitt, P. L. (2004). Perfectionism, cognition, and affect in response to performance failure versus success. *Journal of Rational-Emotive & Cognitive Behavior Therapy, 22,* 301-328.

Bieling, P. J., Israeli, A. L., & Antony, M. M. (2004). Is perfectionism good, bad, or both? Examining models of the perfectionism construct. *Personality and Individual Differences, 36,* 1373-1385.

Blankstein, K. R., Dunkley, D. M., & Wilson, J. (2008). Evaluative concerns and personal standards perfectionism: Self-esteem as a mediator and moderator of relations with personal and academic needs and estimated GPA. *Current Psychology, 27,* 29-61.

Blankstein**,** K. R., Lumley, C. H., & Crawford, A. (2007). Perfectionism, hopelessness and suicide ideation: Revisions to diathesis-stress and specific vulnerability models. *Journal of Rational-Emotive and Cognitive Behavior Therapy, 25,* 279-319.

Burns, D. D. (1980). The perfectionists script for self-defeat. *Psychology Today,* 34-51.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychological Assessment, 14*, 365-373.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York, NY: Plenum.

Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227-268.

DiBartolo, P. M., Frost, R. O., Chang, P., LaSota, M., & Grills, A. E. (2004). Shedding light on the relationship between personal standards and psychopathology: The case for contingent self-worth. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 22,* 241–254.

Duda, J. L. (2005). Motivation in sport: The relevance of competence and achievement goals. In A. J. Elliot, & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 318-335). New York, NY: Guildford Publications.

Dunkley, D. M., & Blankstein, K. R. (2000). Self-critical perfectionism, coping, hassles and current distress: A structural equation modeling approach. *Cognitive Therapy and Research, 24*, 713-730.

Dunkley, D. M., Blankstein, K. R., Halsall, J., Williams, M., & Winkworth, G. (2000). The relation between perfectionism and distress: Hassles, coping and perceived social support as mediators and moderators. *Journal of Counseling Psychology*, *47*, 437-453.

Dunkley, D. M., & Kyparissis, A. (2008). What is DAS self-critical perfectionism really measuring? Relations with the five-factor model of personality and depressive symptoms. *Personality and Individual Differences, 44*, 1295-1305.

Dunn, J. G. H., Causgrove Dunn, J., Gotwals, J. K., Vallance, J. K. H., Craft, J. M., & Syrotuik, D. G. (2006). Establishing construct validity evidence for the Sport Multidimensional Perfectionism Scale. *Psychology of Sport and Exercise, 7,* 57-79.

Dunn, J. G. H., Causgrove Dunn, J., & Syrotuik, D. G. (2002). Relationship between multidimensional perfectionism and goal orientations in sport. *Journal of Sport & Exercise Psychology, 24,* 376-395.

Enns, M. W., Cox, B. J., & Clara, I. (2002). Adaptive and maladaptive perfectionism: Developmental origins and association with depression proneness. *Personality and Individual Differences, 33,* 921-935.

Flett, G. L., & Hewitt, P. L. (2005). The perils of perfectionism in sports and exercise. *Current Directions in Psychological Science, 14,* 14-18.

Flett, G. L., & Hewitt, P. L. (2006). Positive versus negative perfectionism in psychopathology. *Behaviour Modification, 30,* 472-495.

Flett, G. L, Hewitt, P. L., Blankstein, K. R., & Mosher, S. W. (1995). Perfectionism, life events and depressive symptoms: A test of diathesis-stress model. *Current Psychology, 14,* 112-128.

Flett, G. L., Hewitt, P. L., & De Rosa, T. (1996). Dimensions of perfectionism, psychosocial adjustment and social skills. *Personality and Individual Differences, 20,* 143-150.

Flett, G. L, Hewitt, P. L, Garshowitz, M., & Martin, T. R. (1997). Personality, negative social interactions and depressive symptoms. *Canadian Journal of Behavioural Science, 29,* 28-37.

Flett, G. L., Hewitt, P. L., Oliver, J. L., & Macdonald, S. (2002). Perfectionism in children and their parents: A developmental analysis. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research and treatment* (pp. 89-132). Washington, DC: American Psychological Association.

Flett, G. L., Hewitt, P. L., Shapiro, B., & Rayman, J. (2001-2002). Perfectionism, beliefs and adjustment in dating relationships. *Current Psychology, 20,* 289-311.

Frost, R. O., & Henderson, K. J. (1991). Perfectionism and reactions to athletic competition. *Journal of Sport and Exercise Psychology, 13,* 323-335.

Frost, R. O., & Marten, P. A. (1990). Perfectionism and evaluative threat. *Cognitive Therapy and Research, 14,* 559-572.

Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of two measures of perfectionism. *Personality and Individual Differences, 14,* 119-126.

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 5,* 449-468.

Frost, R. O., Turcotte, T. A., Heimberg, R. G., Mattia, J. I., Holt, C. S., & Hope, D. A. (1995). Reactions to mistakes among subjects high and low in perfectionistic concern over mistakes. *Cognitive Therapy and Research, 19,* 195-205.

Gagné, M., & Blanchard, C. (2007). Self-determination theory and well-being in athletes. In M. S. Hagger & N. L. D. Chatzisarantis (Eds.), *Intrinsic motivation and self-determination in exercise and sport* (pp. 243-254). Champaign, IL: Human Kinetics.

Gagné, M., Ryan, R. M., & Bargmann, K. (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology, 15,* 372-390.

Gaudreau, P., & Antl, S. (2008). Athletes' broad dimensions of perfectionism: Examining change in life-satisfaction and the mediating role of motivation and coping. *Journal of Sport & Exercise Psychology, 30,* 356-382.

Gaudreau, P., & Thompson, A. (2010). Testing a 2 x 2 model of dispositional perfectionism. *Personality and Individual Differences, 48,* 532-537.

Gotwals, J. K., & Dunn, J. G. H. (2009). A multi-method multi-analytic approach to establishing internal construct validity evidence: The Sport Multidimensional Perfectionism Scale-2. *Measurement in Physical Education and Exercise Science, 13,* 71-92.

Gotwals, J. K., Dunn, J. G. H., & Wayment, H. A. (2003). An examination of perfectionism and self-esteem in intercollegiate athletes. *Journal of Sport Behaviour, 26,* 17-38.

Graham, J. W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J. A. Schinka & W. F. Velicer (Eds.), *Research methods in psychology* (pp. 87-112). New York, NY: Wiley.

Hall, H. K., Kerr, A. W., & Matthews, J. (1998). Precompetitive anxiety in sport: The contribution of achievement goals and perfectionism. *Journal of Sport and Exercise Psychology, 20,* 194-217.

Haring, M., Hewitt, P. L., & Flett, G. L. (2003). Perfectionism, coping and quality of intimate relationships. *Journal of Marriage and the Family, 65,* 143-158.

Hewitt, P. L., Caelian, C. F., Flett, G. L., Sherry, S. B., Collins, L., & Flynn, C. A. (2002). Perfectionism in children: Associations with depression, anxiety and anger. *Personality and Individual Differences, 32,* 1049–1061.

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment and association with psychopathology. *Journal of Personality and Social Psychology, 60,* 456-470.

Hill, A. P., Hall, H. K., Appleton, P. R., & Kozub, S. R. (2008). Perfectionism and burnout in junior elite soccer players: The mediating influence of unconditional self-acceptance. *Journal of Sport and Exercise Psychology, 9,* 630-644.

Hill, R. W., Zrull, M. C., & Turlington, S. (1997). Perfectionism and inter-personal problems. *Journal of Personality Assessment, 69,* 81-103.

Hollembeak, J., & Amorose, A. (2005). Perceived coaching behaviors and college athletes' intrinsic motivation: A test of self-determination theory. *Journal of Applied Sport Psychology, 17*, 20-36.

Kaye, M. P., Conroy, D. E., & Fifer, A. M. (2008). Individual differences in incompetence avoidance: A comparison of multiple dimensions of perfectionism and fear of failure. *Journal of Sport and Exercise Psychology, 30,* 110-132.

Lemyre, P. N., Hall, H. K., & Roberts, G. C. (2008). A social cognitive approach to burnout in elite athletes. *Scandinavian Journal of Medicine and Science in Sports, 18,* 221-224.

Mills, J. S., & Blankstein, K. R. (2000). Perfectionism, intrinsic vs. extrinsic motivation and motivated strategies for learning: A multidimensional analysis of university students. *Personality and Individual Differences, 29*, 1191-1204.

Mor, S., Day, H. I., Flett, G. L., & Hewitt, P. L. (1995). Perfectionism, control and components of performance anxiety in professional performers. *Cognitive Therapy and Research, 19*, 207-225.

Ntoumanis, N., & Standage, M. (2009). Prosocial and antisocial behavior in sport: A self-determination theory perspective. *Journal of Applied Sport Psychology, 21*, 365-380.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Ommundsen, Y., Roberts, G. C., Lemyre, P. N., & Miller, B. W. (2005). Peer relationships in adolescent competitive soccer: Associations to perceived motivational climate, achievement goals and perfectionism. *Journal of Sports Sciences, 23*, 977-989.

Owens, R. G., & Slade, P. D. (2008). So perfect it's positively harmful? Reflections on the adaptiveness and maladaptiveness of positive and negative perfectionism. *Behaviour Modification, 32,* 928-937.

Pacht, A. J. (1984). Reflections on perfection. *American Psychologist, 39*, 386-390.

Perreault, S., Gaudreau, P., Lapointe, M.-C., & Lacroix, C. (2007). Does it take three to tango? Psychological need satisfaction and athlete burnout. *International Journal of Sport Psychology, 38,* 437-451.

Quested, E., & Duda, J. L. (2010). Exploring the social-environmental determinants of well- and ill-being in dancers: A test of basic needs theory. *Journal of Sport & Exercise Psychology, 32,* 39-60.

Reinboth, M., & Duda, J. L. (2006). Perceived motivational climate, need satisfaction and indices of well-being in team sports: A longitudinal perspective. *Psychology of Sport and Exercise, 7,* 269-286.

Reinboth, M., Duda, J. L., & Ntoumanis, N. (2004). Dimensions of coaching behaviour, need satisfaction and the psychological welfare of young athletes. *Motivation and Emotion, 28,* 297-313.

Ryan, R. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality, 63,* 397–427.

Ryan, R. M., & Deci, E. L. (2002). An overview of self-determination theory. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-33). Rochester, NY: University of Rochester Press

Ryan, R. M., & Deci, E. L. (2007). Active human nature: Self-determination theory and the promotion and maintenance of sport, exercise and health. In M. S. Hagger & N. L. D. Chatzisarantis (Eds.), *Intrinsic motivation and self-determination in exercise and sport* (pp. 1-19). Champaign, IL: Human Kinetics.

Sarrazin, P., Vallerand, R., Guillet, E., Pelletier, L., & Cury, F. (2002). Motivation and dropout in female handballers: A 21-month prospective study. *European Journal of Social Psychology, 32,* 395-418.

Sherry, S. B., Hewitt, P. L., Flett, G. L., & Harvey, M. (2003). Perfectionism dimensions, perfectionistic attitudes, dependent attitudes and depression in psychiatric patients and university students. *Journal of Counseling Psychology, 50*, 373-386.

Smith, A. L., Ntoumanis, N., & Duda, J. L. (2007). Goal striving, goal attainment and well-being: An adaptation of the self-concordance model in sport. *Journal of Sport and Exercise Psychology, 29*, 763-782.

Smoll, F. L., & Smith, R. E. (2002). Coaching behaviour research and intervention in youth sports. In F. L. Smoll & R. E. Smith (Eds.), *Children and youth in sport: A biopsychosocial perspective* (pp. 211–233). Dubuque, IA: Kendall-Hunt.

Stoeber, J., Kempe, T., & Keogh, E. J. (2008). Facets of self-oriented and socially prescribed perfectionism and feelings of pride, shame and guilt following success and failure. *Personality and Individual Differences, 44*, 1506-1516.

Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence and challenges. *Personality and Social Psychology Review, 10,* 295-319.

Stoeber, J., Uphill, M. A., & Hotham, S. (2009). Predicting race performance in triathlon: The role of perfectionism, achievement goals and personal goal setting. *Journal of Sport and Exercise Psychology, 31,* 211-245.

Stoll, O., Lau, A., & Stoeber, J. (2008). Perfectionism and performance in a new basketball training task: Does striving for perfection enhance or undermine performance? *Psychology of Sport and Exercise, 9,* 620-629.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn and Bacon.

Vallance, J. K., Dunn, J. G. H., & Causgrove Dunn, J. (2006). Perfectionism, anger and situation criticality in competitive youth ice hockey. *Journal of Sport & Exercise Psychology, 28*, 383-406.

Vansteenkiste, M., Niemiec, C., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends and future directions. In T. Urdan & S. Karabenick (Eds.), *Advances in motivation and achievement, vol. 16* (pp. 105-166). Bingley, UK: Emerald Group Publishing Limited.

Wu, T.-F., & Wei, M. (2008). Perfectionism and negative mood: The mediating roles of validation from self and others. *Journal of Counseling Psychology, 55,* 276-288.

Table 1 *Descriptive statistics and bivariate correlation coefficients between variables*

	Mean	*s*	α	1	2	3	4	5	6	7	8	9	10	11
1. Self-oriented perfectionism	4.78	1.23	.86											
2. Socially prescribed perfectionism	3.27	1.28	.81	.46**										
3. Other-oriented perfectionism	4.03	1.15	.76	.05	-.13									
4. Personal standards	3.13	0.80	.85	.63**	.54**	-.01								
5. Concern over mistakes	2.73	0.84	.86	.38**	.59**	-.04	.66**							
6. Doubts about actions	2.84	0.90	.84	.24**	.56**	-.14	.54**	.64**						
7. Perceived parental pressure	2.39	0.91	.92	.30**	.63**	-.05	.59**	.64**	.61**					
8. Perceived coach pressure	2.83	0.84	.86	.28**	.60**	-.01	.60**	.64**	.66**	.73**				
9. Organisation	2.88	1.03	.93	.43**	.34**	.05	.52**	.38**	.36**	.43**	.44**			
10. Autonomy thwarting	3.54	1.25	.81	.18**	.31**	-.02	.30**	.40**	.38**	.35**	.41**	.21**		
11. Competence thwarting	3.39	1.29	.83	.12	.23**	-.04	.16*	.33**	.33**	.29**	.31**	.19**	.75**	
12. Relatedness thwarting	3.11	1.31	.81	.05	.28**	-.15	.18*	.31**	.31**	.35**	.28**	.15*	.64**	.78**

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

Table 2 *Canonical correlation between perfectionistic concerns and psychological need thwarting*

Variable	Canonical factor loadings (r_s)	(r_s^2) (%)
SPP	.69	48.61
COM	.88	77.44
DAA	.84	70.56
PPP	.80	64.32
PCP	.89	79.21
Adequacy		68.03
Autonomy	.99	98.01
Competence	.80	64.16
Relatedness	.75	56.25
Adequacy		72.81
Canonical correlation (Rc)		.46
Rc^2		21.20

Note. SPP = Socially prescribed perfectionism; COM = Concern over mistakes; DAA = Doubts about actions; PPP = Perceived parental pressure; PCP = Perceived coach pressure

Table 3 *Canonical correlation between perfectionistic striving and psychological need thwarting*

Variable	Canonical factor loadings (r_s)	(r_s^2) (%)
SOP	-.39	15.21
OOP	-.24	5.76
PS	-.94	88.36
ORG	-.52	27.04
Adequacy		34.09
Autonomy	-.88	77.44
Competence	-.49	24.01
Relatedness	-.69	47.61
Adequacy		49.69
Canonical correlation (Rc)		.33
Rc^2		10.90

Note. SOP = Self-oriented perfectionism; OOP = Other-oriented perfectionism; PS = Personal standards; ORG = Organisation

Table 4 *The predictive ability of dimensions of perfectionism in relation to psychological need thwarting*

				β								
Criterion variable	*F*	df	R^2	SOP	SPP	OOP	PS	COM	DAA	PPP	PCP	ORG
Autonomy	5.61**	9, 189	.21	.07	-.01	.01	-.08	.20	.13	.02	.22*	-.00
Competence	4.31**	9, 189	.17	.11	-.06	-.02	-.30*	.25*	.18	.08	.13	.06
Relatedness	4.25**	9, 189	.17	-.07	.08	-.11	-.11	.17	.09	.22*	-.03	.04

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

Note. SOP = Self-oriented perfectionism; SPP = Socially prescribed perfectionism; OOP = Other-oriented perfectionism; PS = Personal standards; COM = Concern over mistakes; DAA = Doubts about actions; PPP = Perceived parental pressure; PCP = Perceived coach pressure; ORG = Organisation.