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Perfectionism and Achievement Goals in Young Finnish Ice-Hockey Players Aspiring to Make the Under-16 National Team

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Abstract

Research on perfectionism suggests that is it useful to differentiate between perfectionistic strivings and perfectionistic concerns. Regarding the 2 × 2 achievement goal framework, the usefulness of this differentiation was recently demonstrated in a study with university student athletes (Stoeber, Stoll, Pescheck, & Otto, 2008, Study 2) that found perfectionistic strivings associated with mastery-approach and performance-approach goals and perfectionistic concerns with mastery-avoidance, performance-approach, and performance-avoidance goals. Because the study was largely exploratory and only investigated non-elite athletes, the aim of the present research was to replicate and extend these findings by investigating a sample of 138 young elite ice-hockey players, while adding further measures of perfectionism and using structural equation modeling (SEM) to confirm the relationships between perfectionistic strivings, perfectionistic concerns, and the 2 × 2 achievement goals. The SEM results showed that, also in elite athletes, perfectionistic strivings are associated with mastery-approach and performance-approach goals, whereas perfectionistic concerns are associated with mastery-avoidance, performance-approach, and performance-avoidance goals. Findings corroborate the importance of differentiating between perfectionistic strivings and perfectionistic concerns when regarding perfectionism in sports, because only perfectionistic concerns (and not perfectionistic strivings) are associated with maladaptive patterns of achievement goals.

Keywords: Personality; Sport; Motivation; Standards; Mastery; Performance; Approach; Avoidance; Acceptance.

Introduction

According to recent reviews on perfectionism in sport and exercise (Flett & Hewitt, 2005; Hall, 2006), perfectionism in athletes is a negative characteristic that is associated with a pervasive ego orientation, suggesting that perfectionists are preoccupied with performance goals and neglect mastery goals. This view, however, disregards that perfectionism is multidimensional and that performance and mastery goals may follow two orientations: approach and avoidance. A recent study on multidimensional perfectionism and approach and avoidance orientations in mastery and performance goals (Stoeber et al., 2008, Study 2) found a distinct pattern of relationships between perfectionism and goals. Investigating student athletes and differentiating two facets of perfectionism—striving for perfection and negative reactions to imperfection—it was reported that striving for perfection was associated with mastery approach and performance approach goals, whereas negative reactions to imperfection were associated with mastery avoidance, performance approach, and performance avoidance goals. The findings suggest that only athletes high in perfectionistic concerns are preoccupied with performance goals and show an avoidance orientation towards mastery goals, whereas athletes high in perfectionistic strivings show approach orientations including an approach orientation towards mastery goals.

However, the above study was largely exploratory, investigated non-elite athletes (university students), and regarded only two specific facets of perfectionism. Consequently, the question remains whether the findings can be replicated when elite athletes are investigated, when further facets of perfectionism are regarded, and when structural equation modeling (SEM) is used to directly test the relationships in a confirmatory fashion. The present article aims to answer this question.

Perfectionism has been described as a personality style characterised by striving

for flawlessness and setting of excessively high standards for performance accompanied by tendencies for overly critical evaluations of one's behaviour (Flett & Hewitt, 2002; Frost et al., 1990). Research on perfectionism, however, has shown that it is important to differentiate between two major dimensions of perfectionism (Frost et al., 1993; Stoeber & Otto, 2006). On the one hand, there is the dimension of perfectionistic strivings, representing striving for perfection and high personal standards for performance. This dimension has also been described as adaptive, healthy, or positive perfectionism (see Rice et al., 1998; Stumpf & Parker, 2000; Terry-Short et al., 1995). On the other hand, there is the dimension of perfectionistic concerns, representing concern over mistakes, negative reactions to imperfection, and fears about failing to meet others' high expectations. This dimension has also been described as maladaptive, unhealthy, or negative perfectionism (Rice et al., 1998; Stumpf & Parker, 2000; Terry-Short et al., 1995). Studies with nonathletes have found that the two dimensions of perfectionism show differential patterns of relationships. Perfectionistic strivings have been found to be related to positive characteristics, processes, and outcomes (e.g., conscientiousness, active coping, positive affect), whereas perfectionistic concerns are typically related to negative characteristics, processes, and outcomes (e.g., neuroticism, avoidant coping, negative affect; see Stoeber & Otto, 2006).

The distinction between the two dimensions is important also in sports because it can be shown that only those facets associated with the perfectionistic concerns dimension are associated with negative characteristics in athletes such as fear of failure, competitive anxiety, and self-depreciating attributions of success and failure, lower satisfaction with progress, and higher burnout. Alternatively, those facets associated with the positive strivings dimension are associated with positive characteristics such as hope for success, competitive self-confidence, self-serving attributions of success and

failure, higher satisfaction with progress, and lower burnout (Gould et al., 1996; Hill et al., 2008; Stoeber & Becker, in press; Stoeber et al., 2007).

Moreover, perfectionistic strivings and perfectionistic concerns are associated with different patterns of achievement goals, as was recently demonstrated in two studies with student athletes (Stoeber et al., 2008). Regarding perfectionism, two facets of perfectionism were examined (striving for perfection, negative reactions to imperfection), representing the dimensions of perfectionistic strivings and perfectionistic concerns, respectively. Regarding achievement goals, Study 2 followed the 2 × 2 framework of achievement goals (Elliot & McGregor, 2001) and investigated four types of achievement goals that athletes may pursue: mastery-approach, performance-approach, mastery-avoidance, and performance-avoidance goals (Conroy et al., 2003; Elliot & Conroy, 2005). As detailed by Conroy et al. (2003, p. 457), mastery-approach goals represent striving to approach absolute or intrapersonal competence (e.g., striving to master a task) and performance-approach goals represent striving to approach normative competence (e.g., striving to do better than others). In contrast, mastery-avoidance goals represent striving to avoid absolute or intrapersonal incompetence (e.g., striving to avoid doing worse than one has done previously) and performance-avoidance goals represent striving to avoid normative incompetence (e.g., striving to avoid doing worse than others).

Investigating how perfectionism in athletes was related to these four types of goals, Stoeber et al. (2008) found a distinct pattern of relationships. Striving for perfection showed positive correlations with mastery-approach and performance-approach goals, suggesting that the striving dimension of perfectionism is associated with an approach orientation in both mastery and performance goals. In comparison, negative reactions to imperfection showed positive correlations with mastery-avoidance, performance-approach, and performance-avoidance goals, suggesting that the concerns

dimension of perfectionism is associated with an avoidance orientation in both mastery and performance goals, but also with an approach orientation in performance goals.

The findings of Stoeber et al. (2008) have important implications for the understanding of perfectionism in athletes and perfectionism in general. First, they corroborate previous findings that perfectionism in athletes is closely associated with performance goal orientations (Dunn et al., 2002; Hall et al., 1998; Lemyre et al., 2008; Ommundsen et al, 2005). Second, they show that it is important to differentiate between perfectionistic strivings and perfectionistic concerns as well as between approach and avoidance orientations. Third, they provide support for the dual process theory of perfectionism (Slade & Owens, 1998) which suggests that perfectionistic strivings are associated with approach motivation, whereas perfectionistic concerns are associated with avoidance motivation—except for the finding that perfectionistic concerns were also associated with performance-approach goals, which was not predicted from the dual process theory.

Stoeber et al.'s (2008) study had some limitations. First, only non-elite athletes (university students majoring in sports sciences) were examined rather than elite athletes. Because research following the expert-novice paradigm has shown that elite athletes may differ in goal setting and self-regulatory strategies from non-elite athletes (e.g., Kitsantas & Zimmerman, 2002; McPherson, 2000), it would be important to examine whether the relationships that Stoeber et al. (2008) reported for non-elite athletes also apply for elite athletes. Second, Stoeber et al. investigated only two facets of perfectionism: striving for perfection and negative reactions to imperfection. Although the two facets are valid indicators of the perfectionistic strivings dimension and the perfectionistic concerns dimension respectively, they may not capture all characteristics of the two dimensions. In particular, perfectionistic strivings may not capture perfectionistic personal standards which are a defining characteristic of

perfectionistic strivings dimension, and negative reactions may not capture perfectionistic concerns over mistakes which are a defining characteristic of the perfectionistic concerns dimension (see Stoeber & Otto, 2006). Moreover, except for Stoeber et al.'s (2008) study, all previous studies on perfectionism and achievement goals have included personal standards and concern over mistakes (Dunn et al., 2002; Hall et al., 1998; Lemyre et al., 2008; Ommundsen et al., 2005). Consequently, it would be important to include perfectionistic personal standards and concerns over mistakes when investigating the relationship between perfectionistic strivings, perfectionistic concerns, and achievement goals. Finally, because no previous research had investigated how perfectionism in athletes related to the achievement goals following the 2 × 2 framework, the study by Stoeber et al. (2008) was largely exploratory, investigating only bivariate correlations and partial correlations instead of testing the whole pattern of multivariate relationships in a single confirmatory analysis.

In this study we addressed these limitations. First, we investigated elite athletes by assessing perfectionism and achievement goals in young ice-hockey players aspiring to make the Finnish U16 national team. Second, we included two additional facets of perfectionism: personal standards and concern over mistakes (Dunn et al., 2006; Frost et al., 1990). Personal standards are a defining facet of the strivings dimension of perfectionism and concern over mistakes a defining facet of the concerns dimension (see Stoeber & Otto, 2006). Consequently, the inclusion of these two facets should provide a more comprehensive representation of the two dimensions of perfectionism than was achieved by Stoeber et al. (2008). Finally, following the pattern of associations that Stoeber et al.'s study found in the partial correlations (when controlling for the overlap between the two perfectionism facets), we specified a theoretical model of the expected multivariate relationships to be tested using structural equation modeling (see Figure 1). The theoretical model made three predictions. First, it hypothesised that

striving for perfection and personal standards are indicators of a latent variable representing perfectionistic strivings, whereas concern over mistakes and negative reactions to imperfection are indicators of a latent variable representing perfectionistic concerns. Second, in line with previous findings showing substantial correlations between perfectionistic strivings and perfectionistic concerns (e.g., Dunn et al., 2006; Stoeber et al., 2007, 2008), the model hypothesised that perfectionistic strivings and perfectionistic concerns will be correlated. Finally and most importantly, the model hypothesised that the relationships between perfectionism and achievement goals that Stoeber et al. (2008) reported with student athletes can be replicated in elite athletes, namely that perfectionistic strivings are associated with mastery-approach and performance-approach goals whereas perfectionistic concerns are associated with mastery avoidance, performance-approach, and performance-avoidance goals.

Method

Participants and Procedure

A sample of 138 Finnish ice-hockey players (all male) was recruited at the training camp organised by the International Ice Hockey Centre of Excellence, Vierumäki, Finland. The aim of the training camp was to select 30 ice-hockey players for the U16 (under 16) national team. The Finnish Ice Hockey Association invited 180 ice-hockey players aged 14 or 15 years from the best youth teams in Finland to the camp. Overall, 153 players followed the invitation and registered for the camp. Questionnaires were distributed and collected by the camp organisers. Over 90% of these questionnaires were returned.

Measures

Perfectionism. To measure perfectionism, we used four scales: two scales measuring perfectionistic strivings and two scales measuring perfectionistic concerns. All scales were from established questionnaires measuring multidimensional

perfectionism in sports: the Multidimensional Inventory of Perfectionism in Sport (MIPS; Stöber et al., 2004) and the Sport Multidimensional Perfectionism Scale (Sport-MPS; Dunn et al., 2006). Both questionnaires have been tested in a number of studies and have shown good reliability and validity (e.g., Dunn et al., 2006; Dunn et al., 2006; Stoeber & Becker, in press; Stoeber et al., 2007; Stoeber et al., 2008; Vallance et al., 2006). As the first measure of perfectionistic strivings, we used the short form of the MIPS Striving for Perfection scale (Stoeber et al., 2007) comprising five items that capture individual differences in striving for perfection (e.g., "I strive to be as perfect as possible"). As the second measure, we used the Personal Standards scale of the Sport-MPS comprising seven items that capture perfectionistic personal standards (e.g., "It is important to me that I be thoroughly competent in everything I do in my sport"). However, due to a copy-and-paste error, one item (Sport-MPS Item 28) was accidentally deleted so that only six items were administered. As the first measure of perfectionistic concerns, we used the Concern over Mistakes scale of the Sport-MPS comprising eight items capturing perfectionistic concerns (e.g., "If a team-mate or opponent [who plays a similar position to me] plays better than me, then I feel like I failed to some degree"). As the second measure, we used the short form of the MIPS Negative Reactions to Imperfection scale (Stoeber et al., 2007) comprising five items that capture negative reactions to not achieving perfect results (e.g., "I feel extremely stressed if everything does not go perfectly"). All items were presented on one page entitled "Your Personal Standards in Ice Hockey," and participants were told to indicate to what degree each statement characterised their personal standards in ice hockey by responding on a 5-point scale from "strongly disagree" (1) to "strongly agree" (5). Scales scores were computed by averaging across items. With Cronbach's alphas > .60 (see Table 1), all scores displayed reliabilities (internal consistencies) acceptable for research purposes (Nunnally & Bernstein, 1994).

Achievement goals. To measure achievement goals following the 2 × 2 framework, we used the Achievement Goals Questionnaire for Sport (AGQ-S; Conroy et al., 2003). The AGQ-S has been tested in a number of studies and has shown good reliability and validity (e.g., Conroy & Elliot, 2004; Conroy et al., 2003; Conroy et al., 2006). It comprises four scales with three items each to capture mastery-approach goals (e.g., "It is important to me to perform as well as I possibly can"), performance-approach goals (e.g., "It is important to me to perform better than others"), mastery-avoidance goals (e.g., "I worry that I may not perform as well as I possibly can"), and performance-avoidance goals ("I just want to avoid performing worse than others"). All items were presented on one page entitled "Your Achievement Goals in Ice Hockey," and participants were told to indicate to what degree each statement characterised their achievement goals in ice hockey by responding on a 5-point scale from "strongly disagree" (1) to "strongly agree" (5). Scores on the scales were computed by averaging across items. With Cronbach's alphas > .60 (see Table 1), all scores displayed acceptable reliabilities (internal consistencies) with the exception of mastery-approach scores which displayed a Cronbach's alpha of .51 only. The most likely reason for this low alpha is that mastery-approach goals were substantially skewed (see *Preliminary Analyses*): As can be expected from young aspiring athletes invited to a national training camp, most participants reported high levels of mastery-approach goals ($M = 4.19$, $SD = 0.53$) which may have lead to reduced variance in the items of the mastery-approach scale and, because internal consistency is a function of item correlations (and reduced variance means reduced correlations which are standardized covariances), to a reduced Cronbach's alpha of scale scores (Cronbach, 1951). However, because mastery-approach goals are central to the theoretical model we wanted to test (see Figure 1), Cronbach's alphas between .50 and .60 can be acceptable in early stages of research (Nunnally, 1967, p. 226), and SEM takes measurement errors into account (mastery

approach: see err5 in Figures 1-3), we decided to retain the mastery-approach scores despite the low alpha.

Translation. All measures were translated from English to Finnish by two bilingual postgraduate students following recommended back-translation procedures (e.g., Brislin et al., 1973): one student translated the original measures from English to Finnish; the other student, independently from the first, translated the Finnish translations back to English; discrepancies between original versions and back-translations were discussed in a conference (involving the two students and the first author); and final versions of the Finnish measures were agreed. (The Finnish measures are available from the first author upon request.)

Preliminary Analyses

Inspection of all scores indicated that mastery-approach goals showed a substantial negative skewness of –0.79, $SE = 0.21$, $z = -3.82$, $p < .001$ (see Tabachnick & Fidell, 2007, p. 79, formulas [4.4] and [4.5]). (No other scores showed substantial skewness.) Because skewness may cause problems in multivariate analyses (Tabachnick & Fidell, 2007), scores were first log-transformed following the formula provided by Tabachnick and Fidell and then inversed so that higher values again corresponded to higher degrees of the construct (in SPSS syntax: NEWX = –LG10[K–X] with X = the untransformed mastery-approach score and K = 6; see Tabachnick & Fidell, 2007, p. 89, Table 4.3). The resulting log mastery-goal scores showed a negligible negative skewness of –0.03, $SE = 0.21$, $z = -0.15$, *ns*, while correlating $r = .98$ with the original scores. Another problem for multivariate analyses are multivariate outliers (Tabachnick & Fidell, 2007). Consequently, variables were screened for multivariate outliers following the procedures recommended by Tabachnick and Fidell (2007, pp. 99-104). Two participants were detected who represented significant outliers showing a Mahalanobis distance greater than the critical value of $\chi^2(8) = 26.12$, $p < .001$. They

were deleted from the data set, and all consecutive analyses were conducted with 136 participants.

Results

First we inspected the bivariate correlations between the variables (see Table 1). All facets of perfectionism displayed high intercorrelations, particularly those facets that were expected to be indicators of the same dimension, namely striving for perfection and personal standards (both of which represent perfectionistic strivings) and concern over mistakes and negative reactions to imperfection (both of which represent perfectionistic concerns). Regarding the correlations between perfectionism and achievement goals, all correlations were significant in the expected direction.

Next, we investigated if the theoretical model specified in Figure 1 fitted the empirical data by means of SEM using Amos 6.0 (Arbuckle, 2005). Following Hoyle and Panther's (1995) recommendations, we examined multiple indices of fit to take different aspects of fit into account (for a detailed explanation of these fit indices, see, e.g., Byrne, 2001 or Kline, 2005). The model (see Figure 2) provided only an acceptable fit to the data, except for the root mean square error of approximation (RMSEA) which was only marginally acceptable. First, the chi-square statistic associated with the model was significant with $\chi^2(18) = 35.20$, $p < .01$, indicating a significant difference between sample and estimated population covariance matrices. Furthermore, an inspection of the fit indices showed that the model did not provide a good fit of the data: While the goodness of fit index (GFI) was above .90, GFI = .942, the adjusted goodness of fit index (AGFI), taking the available degrees of freedom into account, was below .90, AGFI = .885; and while the comparative fit index (CFI) was above .95, CFI = .954, the non-normed fit index (NNFI) was below .95, NNFI = .928, and the root mean square error of approximation (RMSEA) was .084 and thus marginally above the .08 criterion value that is usually seen as the cut-off value for acceptable fit.

Therefore, modification indices were inspected. The largest modification index was associated with the covariance between the error term for performance-approach goals (err6) and the error term for performance-avoidance goals (err8), suggesting that model fit would significantly improve if the covariance between the two errors terms were treated as a free parameter to be estimated. Consequently, a modified model was estimated that allowed errors of performance-approach goals and errors of performance-avoidance goals to be correlated (see Figure 3). With this modification, the model showed a significant increment in fit compared to the previous model, as was indicated by a significant χ^2 difference test, $\chi^2(1) = 16.84$, $p < .001$. Moreover, sample and estimated population covariance matrices now showed a nonsignificant difference, as indicated by a nonsignificant chi-square statistic for the modified model, $\chi^2(17) = 18.36$, $p = .37$. Furthermore, all fit indices now indicated a good fit of the model as GFI = .968 and AGFI = .933 were well above the critical value of .90, both CFI = .996 and NNFI = .994 now indicated a close fit, and RMSEA = .024 was well below the critical value of .05 that indicates a good fit. This was confirmed when the inspection of the modification indices indicated no further modifications that would significantly improve model fit. Consequently, the model was accepted as the final model.

In regard to the standardized coefficients of the initial model (Figure 2) and the final model (Figure 3), the results show that all paths were significant in the expected direction as hypothesised in our the theoretical model (except for the correlated errors in the final model which we did not hypothesise). First, striving for perfection and personal standards showed high loadings on the latent factor representing perfectionistic strivings whereas concern over mistakes and negative reactions to imperfection showed high loadings on the latent factor representing perfectionistic concerns. Second, the two latent factors representing perfectionistic strivings and perfectionistic concerns showed a substantial correlation, corroborating previous

findings that striving to achieve perfection and concerns about not achieving perfection are highly correlated (e.g., Dunn, Gotwals, et al., 2006; Stoeber et al., 2008). Finally and most importantly, all expected relationships between the two factors of perfectionism and the four types of achievement goals were significant: Corroborating the findings that Stoeber et al. obtained investigating partial correlations (see Stoeber et al., 2008, Study 2, Table 2), perfectionistic strivings predicted mastery-approach and performance-approach goals whereas perfectionistic concerns predicted mastery-avoidance, performance-approach, and performance-avoidance goals.

Discussion

We attempted to replicate and extend the findings of Stoeber et al. (2008) by investigating elite athletes while considering further facets of perfectionism (personal standards, concern over mistakes), and employing structural equation modeling (SEM) to test the expected multivariate relationships. We combined striving for perfection and personal standards to represent the perfectionistic strivings dimension of perfectionism, and concern over mistakes and negative reactions to imperfection to represent the perfectionistic concerns dimension (Stoeber & Otto, 2006). Furthermore, a theoretical model was hypothesised in which perfectionistic strivings were associated with mastery-approach and performance-approach goals, whereas perfectionistic concerns were associated with mastery-avoidance, performance-approach, and performance-avoidance goals (see Figure 1). Using structural equation modeling, we found a close fit between the theoretical model and the empirical data. As was expected, perfectionistic strivings predicted mastery-approach and performance-approach goals, whereas perfectionistic concerns predicted mastery-avoidance, performance-approach, and performance-avoidance goals (see Figure 2 and Figure 3).

The present findings confirm that the pattern of relationships that Stoeber et al. (2008) found in non-elite athletes investigating partial correlations of the 2 × 2

achievement goals with two perfectionism facets (striving for perfection, negative reactions to imperfection) was replicated when elite athletes were investigated, further facets of perfectionism were included, and SEM was applied to test the expected relationships in one single confirmatory model. Yet, the present study has limitations too. First, it investigated male elite athletes aged 14 to 15 years. Thus, future research needs to demonstrate that the present findings can be generalized to female elite athletes and to older age-groups, as researchers have pointed out that perfectionism in athletes may show gender-specific relationships (e.g., Haase et al., 1999) and achievement goal orientations in athletes may change when athletes grow older (Elliot & Conroy, 2005; Spray & Keegan, 2005). Second, post-hoc respecifications of models allowing measurement errors to correlate represent one of the greatest strengths of SEM, but have been criticized because they may capitalize on random, sample-specific characteristics of the data (Cole et al., 2007). Consequently, future researchers need to cross-validate our final model. Finally, we used a cross-sectional design. Consequently, the relationships between perfectionism and achievement goals should not be interpreted directionally. While there is first evidence that perfectionistic concerns lead to increases in mastery-avoidance goals (Stoeber et al., 2008), further longitudinal studies are needed to ascertain the directionality of the relationships between perfectionism and achievement goals in athletes.

The present findings nonetheless have important implications. Regarding research on perfectionism in general, the results again demonstrate the importance of differentiating between perfectionistic strivings and perfectionistic concerns (Stoeber & Otto, 2006). Moreover, they confirm that perfectionistic strivings are associated with approach motivation, as posited by the dual process theory of perfectionism (Slade & Owens, 1998), whereas perfectionistic concerns are associated with both approach and avoidance motivation which corroborates Stoeber et al. (2008). Regarding research on

perfectionism in sport, the present findings add to the previous work with student athletes (Stoeber et al., 2008) and thus provide further support for the position that perfectionistic strivings are associated with a pattern of achievement goal orientations that can be considered adaptive (viz. a combination of mastery-approach and performance-approach goals). Thus, the findings provide further evidence in support of the position that not all aspects of perfectionism in athletes are necessarily maladaptive, as a recent review on perfectionism in sport may suggest (Flett & Hewitt, 2005). On the contrary, perfectionistic strivings in athletes seem to be related to characteristics that can be considered adaptive such as competitive self-confidence, hope of success, and self-serving attributions of success and failure (Stoeber & Becker, in press; Stoeber et al., 2007). Consequently, perfectionistic strivings may form part of a "healthy pursuit of excellence" (Shafran et al., 2002, p. 778) and represent the form of adaptive perfectionism that Gould et al. (2002) found in the interviews they conducted with Olympic champions.

In contrast, perfectionistic concerns (concern over mistakes, negative reactions to imperfection) were associated with a pattern of achievement goals that must be considered maladaptive (viz. a combination of mastery-avoidance, performance-approach, performance-avoidance goals) as demonstrated by research findings from studies following the extended framework of achievement goals (for reviews, see Elliot & Conroy, 2005; Moller & Elliot, 2006; Stoeber et al., 2008). Particularly, mastery-avoidance goals and performance-avoidance goals in athletes have been associated with maladaptive characteristics and outcomes such as fear of failure and loss of motivation (Conroy et al., 2003, 2006). Because perfectionistic strivings and perfectionistic concerns are intimately related, it is understandable why prominent researchers have cautioned that perfectionism in sport may have detrimental effects on athletes' performance and development (Flett & Hewitt, 2005; Hall, 2006). Consequently,

disentangling the positive and negative aspects of perfectionism in athletes—and counteracting the negative aspects—remains a challenging task not only for researchers investigating perfectionism in athletes, but also for sport scientists and applied sport psychologists working with perfectionistic athletes and their coaches.

But how can the negative aspects of perfectionism be counteracted? In our view, there are three approaches from theory and research in clinical psychology that seem promising in this regard, and that could readily be adopted in to the sporting context. The first approach is based on perfectionism/acceptance theory (Lundh, 2004) which holds that perfectionistic strivings are adaptive when combined with the acceptance of imperfections (i.e., failures, mistakes, shortcomings) (Lundh et al., 2008). According to Lundh (2004), perfectionistic strivings are not unhealthy or dysfunctional as such. However, they become so when "striving for perfection turns into a *demand* for perfection, defined as an inability to *accept* being less than perfect" (p. 255). Adopting Lundh's view to the sport context, coaches and athletes should learn to distinguish perfectionistic strivings from perfectionistic demands and validate perfectionistic strivings as something healthy and functional, while at the same time accepting imperfections. The second approach is based on findings that perfectionistic strivings are only maladaptive when self-worth is made contingent on achieving perfection and when non-achievement of perfection is followed by harsh self-criticism (DiBartolo et al., 2004; see also Dunkley et al., 2006). Consequently, coaches and athletes should learn to hold "pure personal standards" (DiBartolo et al., 2004) and strive for perfection without putting down one's effort, performance, and self-worth should results be less than perfect. Finally, coaches and athletes may consult Antony and Swinson's (1998) self-help book which contains procedures that have been shown to be effective in helping perfectionists to cope with the negative aspects of perfectionism by identifying and challenging maladaptive perfectionistic thoughts and behaviours (see Pleva &

Wade, 2007). If perfectionistic athletes learn to accept imperfections, make their pursuit of perfection independent of self-worth, and are able cope with the negative aspects of perfectionism, perfectionism does not have to be a negative characteristic that is detrimental to athletes' performance and development, but can be a characteristic that is associated with positive motivational orientations.

References

Antony, M. M., & Swinson, R. P. (1998). *When perfect isn't good enough: Strategies for coping with perfectionism.* Oakland, CA: New Harbinger.

Arbuckle, J. L. (2005). Amos 6.0 [Computer software]. Chicago, IL: SPSS.

Brislin, R. W., Lonner, W. J., & Thorndike, R. M. (1973). *Cross-cultural research methods.* New York: Wiley.

Byrne, B. M. (2001). *Structural equation modeling with AMOS*. Mahwah, NJ: Lawrence Erlbaum Associates.

Cole, D. A., Ciesla, J. A., & Steiger, J. H. (2007). The insidious effects of failing to include design-driven correlated residuals in latent-variable covariance structure analysis. *Psychological Methods, 12*, 381-398.

Conroy, D. E., & Elliot, A. J. (2004). Fear of failure and achievement goals in sport: Addressing the issue of the chicken and the egg. *Anxiety, Stress, & Coping, 17*, 271-285.

Conroy, D. E., Elliot, A. J., & Hofer, S. M. (2003). A 2 × 2 achievement goals questionnaire for sport: Evidence for factorial invariance, temporal stability, and external validity. *Journal of Sport & Exercise Psychology, 25*, 456-476.

Conroy, D. E., Kaye, M. P., & Coatsworth, J. D. (2006). Coaching climates and the destructive effects of mastery-avoidance achievement goals on situational motivation. *Journal of Sport & Exercise Psychology, 28*, 69-92.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297-334.

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.

Dunkley, D. M., Zuroff, D. C., & Blankstein, K. R. (2006). Specific perfectionism components versus self-criticism in predicting maladjustment. *Personality and Individual Differences, 40*, 665-676.

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

Dunn, J. G. H., Gotwals, J. K., Dunn, J. C., & Syrotuik, D. G. (2006). Examining the relationship between perfectionism and trait anger in competitive sport. *International Journal of Sport & Exercise Psychology, 4*, 7-24.

Elliot, A. J., & Conroy, D. E. (2005). Beyond the dichotomous model of achievement goals in sport and exercise psychology. *Sport & Exercise Psychology Review, 1*, 17-25.

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80*, 501-519.

Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issues. In P. L. Hewitt & G. L. Flett (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 5-31). Washington, DC: American Psychological Association.

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

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, 14*, 449-468.

Gould, D., Dieffenbach, K., & Moffett, A. (2002). Psychological characteristics and their development in Olympic champions. *Journal of Applied Sport Psychology, 14*, 172-204.

Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1996). Burnout in competitive junior tennis players: I. A quantitative psychological assessment. *The Sport Psychologist, 10*, 322-340.

Haase, A. M., Prapavessis, H., & Owens, R. G. (1999). Perfectionism and eating attitudes in competitive rowers: Moderating effects of body mass, classification and gender. *Psychology and Health, 14*, 643-657.

Hall, H. K. (2006). Perfectionism: A hallmark quality of world class performers, or a psychological impediment to athletic development? In D. Hackfort & G. Tenenbaum (Eds.), *Essential processes for attaining peak performance* (Vol. 1, pp. 178-211). Oxford, UK: Meyer & Meyer.

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

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

Hoyle, R. H., & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 158-176). Thousand Oaks, CA: Sage.

Kitsantas, A., & Zimmerman, B. J. (2002). Comparing self-regulatory processes among novice, non-expert, and expert volleyball players: A microanalytic study. *Journal of Applied Sport Psychology, 14*, 91-105.

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford Press.

Lemyre, P.-N., Hall, H. K., & Roberts, G. C. (2008). A social cognitive approach to burnout in athletes. *Scandinavian Journal of Medicine & Science in Sports, 18*, 221-234.

Lundh, L.-G. (2004). Perfectionism and acceptance. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 22*, 255-269.

Lundh, L.-G., Saboonchi, F., & Wångby, M. (2008). The role of personal standards in clinically significant perfectionism. A person-oriented approach to the study of patterns of perfectionism. *Cognitive Therapy and Research, 32*, 333-350.

McPherson, S. L. (2000). Expert-novice differences in planning strategies during collegiate singles tennis competition. *Journal of Sport & Exercise Psychology, 22*, 39-62.

Moller, A. C., & Elliot, A. J. (2006). The 2 × 2 achievement goal framework: An overview of empirical research. In A. V. Mitel (Ed.), *Focus on educational psychology research* (pp. 307-326). New York: Nova Science.

Nunnally, J. C. (1967). *Psychometric theory*. New York: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. (1994). *Psychometric theory* (3rd ed.). New York: 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.

Pleva, J., & Wade, T. D. (2007). Guided self-help versus pure self-help for perfectionism: A randomised controlled trial. *Behaviour Research and Therapy, 45*, 849-861.

Rice, K. G., Ashby, J. S., & Slaney, R. B. (1998). Self-esteem as a mediator between perfectionism and depression: A structural equation analysis. *Journal of Counseling Psychology, 45*, 304-314.

Shafran, R., Cooper, Z., & Fairburn, C. G. (2002). Clinical perfectionism: A cognitive-behavioural analysis. *Behaviour Research and Therapy, 40*, 773-791.

Slade, P. D., & Owens, R. G. (1998). A dual process model of perfectionism based on reinforcement theory. *Behavior Modification, 22*, 372-390.

Spray, C. M., & Keegan, R. J. (2005). Beyond the dichotomous model of achievement goals in sport and exercise psychology: Comment on Elliot and Conroy (2005). *Sport & Exercise Psychology Review, 1*, 47-49.

Stöber, J., Otto, K., & Stoll, O. (2004). Mehrdimensionales Inventar zu Perfektionismus im Sport (MIPS) [Multidimensional Inventory of Perfectionism in Sport (MIPS)]. In J. Stöber, K. Otto, E. Pescheck, & O. Stoll, *Skalendokumentation "Perfektionismus im Sport"* (Hallesche Berichte zur Pädagogischen Psychologie No. 7, pp. 4-13). Halle/Saale, Germany: Martin Luther University of Halle, Department of Educational Psychology.

Stoeber, J., & Becker, C. (in press). Perfectionism, achievement motives, and attribution of success and failure in female soccer players. *International Journal of Psychology*.

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

Stoeber, J., Otto, K., Pescheck, E., Becker, C., & Stoll, O. (2007). Perfectionism and competitive anxiety in athletes: Differentiating striving for perfection and negative reactions to imperfection. *Personality and Individual Differences, 42*, 959-969.

Stoeber, J., Stoll, O., Pescheck, E., & Otto, K. (2008). Perfectionism and goal orientations in athletes: Relations with approach and avoidance orientations in mastery and performance goals. *Psychology of Sport and Exercise, 9*, 102-121.

Stumpf, H., & Parker, W. D. (2000). A hierarchical structural analysis of perfectionism and its relation to other personality characteristics. *Personality and Individual Differences, 28*, 837-852.

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

Terry-Short, L. A., Owens, R. G., Slade, P. D., & Dewey, M. E. (1995). Positive and negative perfectionism. *Personality and Individual Differences, 18*, 663-668.

Vallance, J. K. H., Dunn, J. G. H., & Dunn, J. L. C. (2006). Perfectionism, anger, and situation criticality in competitive youth ice hockey. *Journal of Sport & Exercise Psychology, 28*, 326-386.

Table 1

Perfectionism and Achievement Goals: Means, Standard Deviations, and Correlations

Variable	α	*M*	*SD*	Correlation						
				1	2	3	4	5	6	7
Perfectionism										
1. Striving for perfection	.68	3.13	0.65							
2. Personal standards	.66	3.04	0.56	.60***						
3. Concern over mistakes	.71	2.41	0.56	.42***	.41***					
4. Negative reactions	.77	2.42	0.67	.49***	.47***	.68***				
Achievement goals										
5. Mastery approach	.51	–0.24	0.13	.49***	.40***	.27**	.21*			
6. Performance approach	.71	3.36	0.74	.47***	.53***	.48***	.44***	.29**		
7. Mastery avoidance	.79	3.12	0.76	.30***	.32***	.52***	.48***	.24**	.38***	
8. Performance avoidance	.67	3.09	0.81	.23**	.26**	.30***	.37***	.06	.49***	.32***

Note. $N = 136$. Negative reactions = negative reactions to imperfection. α = Cronbach's alpha of original score. All scores were computed by averaging across items to that scores have a possible range of 1–5 ("strongly disagree"–"strongly agree") except mastery-approach scores which are log-transformations of the original scores ($M = 4.19$, $SD = 0.53$); see *Preliminary Analyses* for details.
*$p < .05$, **$p < .01$, ***$p < .001$, two-tailed.

Figure Caption

Figure 1. Path diagram of theoretical model. Negative reactions = negative reactions to imperfection; err1–err8 = error terms. All paths are positive.

Figure 2. Path diagram of initial model (N = 136). Negative reactions = negative reactions to imperfection; mastery approach = log-transformed scores; err1–err8 = error terms. All coefficients are standardized coefficients. (A table with the unstandardized coefficients is available from the first author upon request.) $^{**}p < .01$, $^{***}p < .001$, two-tailed.

Figure 3. Path diagram of final accepted model (N = 136). Negative reactions = negative reactions to imperfection; mastery approach = log-transformed scores; err1–err8 = error terms. All coefficients are standardized coefficients. (A table with the unstandardized coefficients is available from the first author upon request.) $^{*}p < .05$, $^{***}p < .001$, two-tailed.

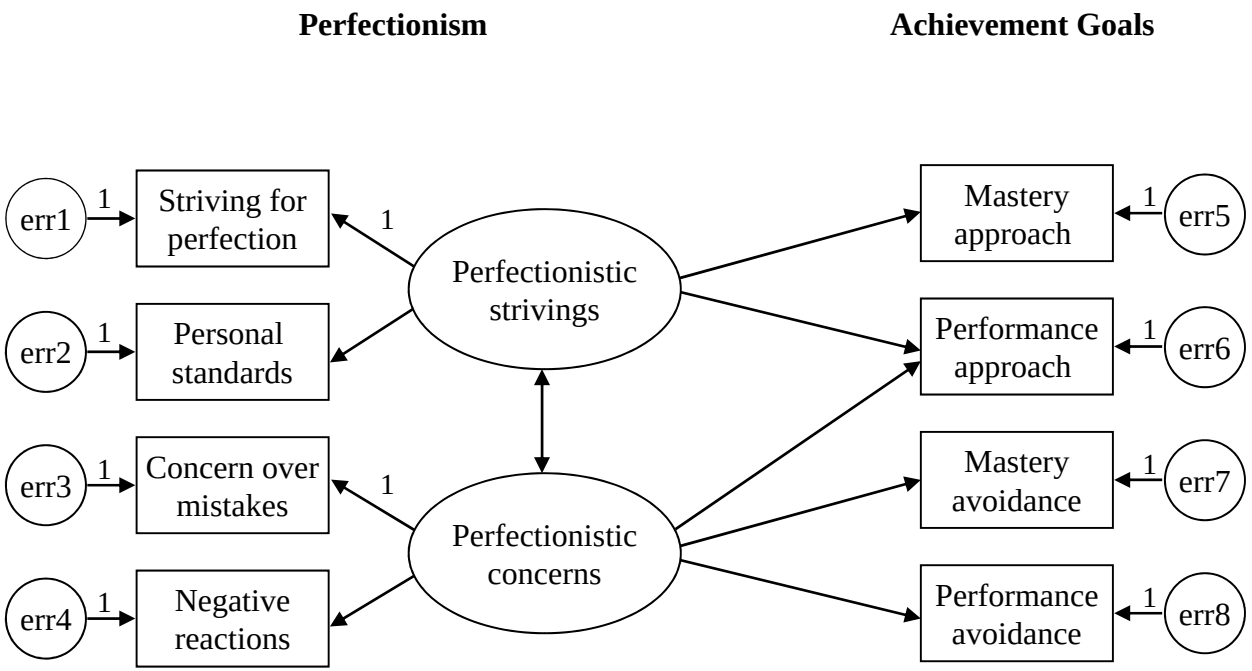
Perfectionism
Achievement Goals
err1
1
Striving for perfection
1
Perfectionistic strivings
Mastery approach
1
err5
err2
1
Personal standards
Performance approach
1
err6
err3
1
Concern over mistakes
1
Perfectionistic concerns
Mastery avoidance
1
err7
err4
1
Negative reactions
Performance avoidance
1
err8

Figure 1

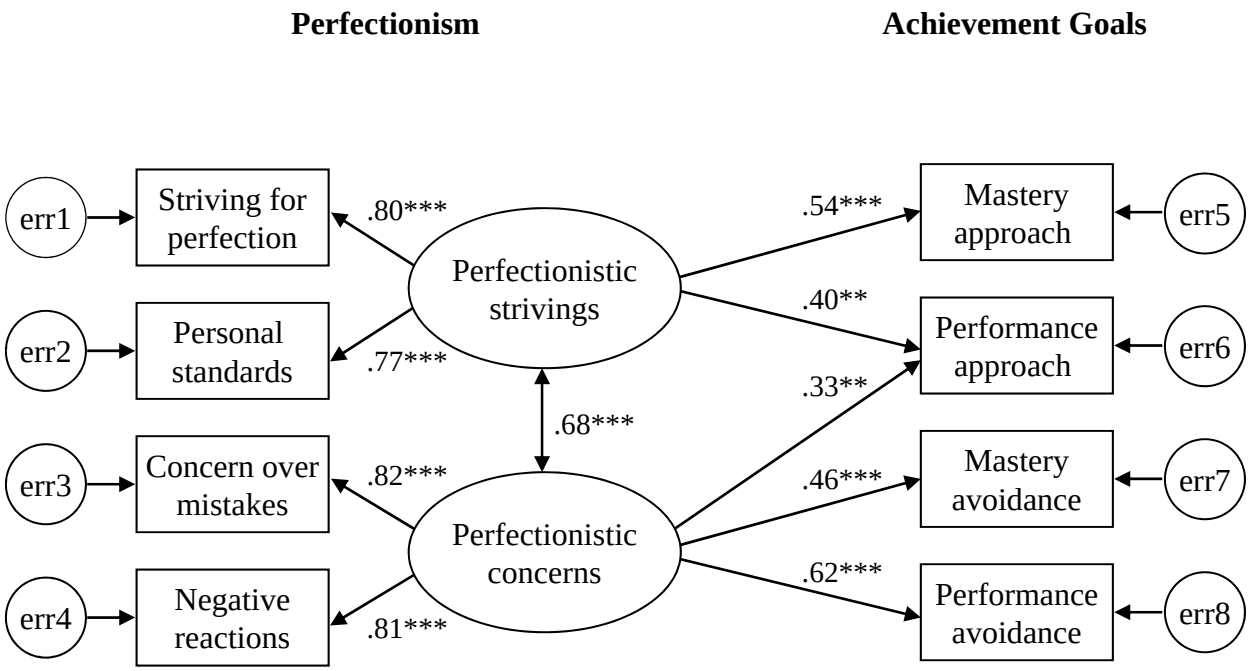
Perfectionism
Achievement Goals
err1
Striving for perfection
.80***
Perfectionistic strivings
.54***
Mastery approach
err5
.40**
err2
Personal standards
.77***
Performance approach
err6
.33**
.68***
err3
Concern over mistakes
.82***
.46***
Mastery avoidance
err7
Perfectionistic concerns
.62***
err4
Negative reactions
.81***
Performance avoidance
err8

Figure 2

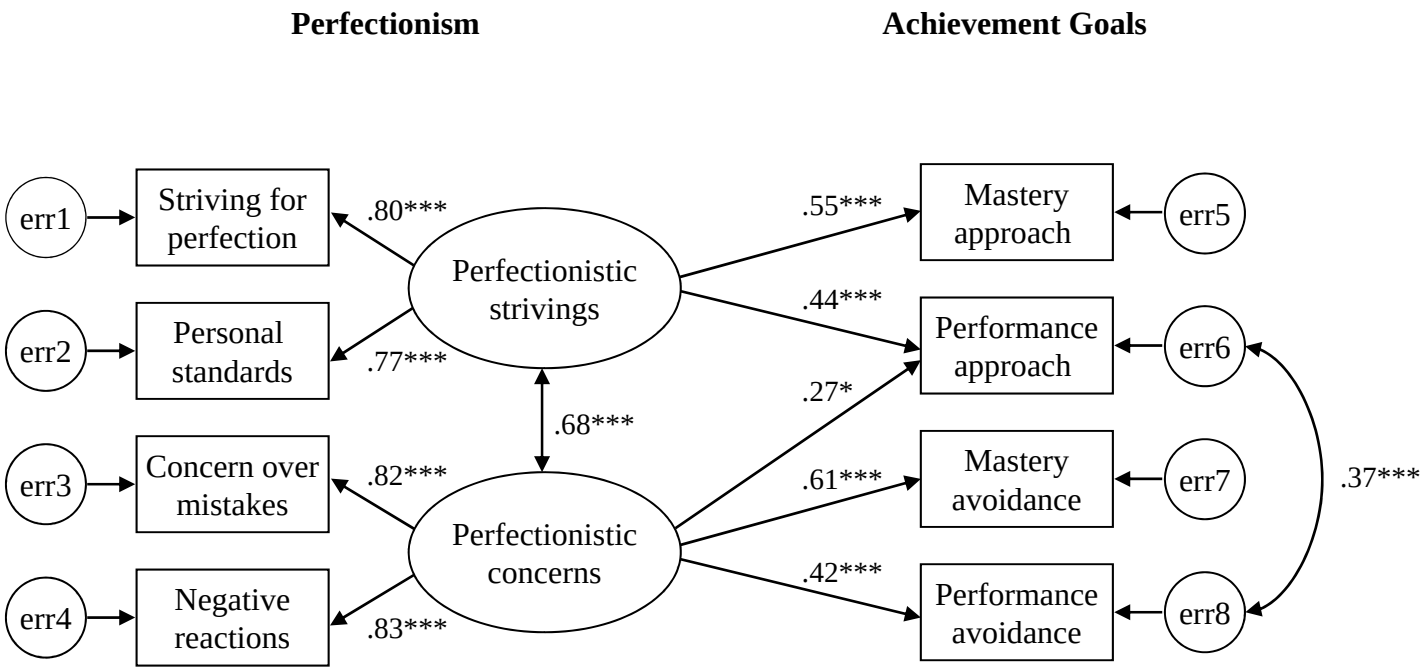
Perfectionism
Achievement Goals
err1
Striving for perfection
.80***
Perfectionistic strivings
.55***
Mastery approach
err5
err2
Personal standards
.77***
.44***
Performance approach
err6
.68***
.27*
err3
Concern over mistakes
.82***
Perfectionistic concerns
.61***
Mastery avoidance
err7
.37***
err4
Negative reactions
.83***
.42***
Performance avoidance
err8

Figure 3