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Perfectionism and Training Distress in Junior Athletes: A Longitudinal Investigation

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Abstract

Perfectionistic athletes may train harder and for longer than non-perfectionistic athletes, leaving them susceptible to elevated levels of training distress. So far, however, no study has investigated the relationships between perfectionism and training distress, a key indicator of overtraining syndrome. Furthermore, no study has determined psychological predictors of overtraining syndrome. Using a two-wave design, the present study examined perfectionistic strivings, perfectionistic concerns, and training distress in 141 junior athletes (mean age 17.3 years, range 16-19 years) over 3 months of active training. Multiple regression analyses were employed to test cross-sectional and longitudinal relationships between perfectionism and training distress. In all analyses, perfectionism emerged as a significant predictor, but strivings and concerns showed differential relationships. When the cross-sectional relationships were regarded, perfectionistic concerns positively predicted training distress ($p < .01$), whereas perfectionistic strivings negatively predicted training distress ($p < .001$). When the longitudinal relationships were regarded, only perfectionistic concerns predicted increases in training distress ($p < .05$), whereas perfectionistic strivings did not ($p > .05$). The findings suggest that sports scientists who wish to identify athletes at risk of overtraining syndrome may monitor athletes' perfectionistic concerns as a possible risk factor.

Keywords: perfectionistic strivings, perfectionistic concerns, training distress, overtraining, junior athletes, longitudinal study

Perfectionism and Training Distress in Junior Athletes: A Longitudinal Investigation

To succeed in competitive sports, athletes are required to participate in intensive training regimes. However, excessive training accompanied by inadequate rest can result in overtraining syndrome (Meeusen et al., 2013). Sports scientists have investigated ways to monitor athletes' training responses with the aim of identifying at-risk athletes and intervening to prevent overtraining syndrome. One psychological marker of overtraining syndrome that sport scientists have identified is training distress (Kenttä, Hassmén, & Raglin, 2001; Meeusen et al., 2013; Raglin & Morgan, 1994) which focuses on training-related mood disturbance. Consequently, researchers have sought to determine factors that may predispose athletes to training distress. One such factor may be perfectionism, as perfectionistic athletes may train harder and for longer than non-perfectionistic athletes (Flett & Hewitt, 2014). In support of this suggestion, case studies have shown that athletes who overtrained were characterised by exhibiting a high level of perfectionism (Gould, Tuffey, Udry, & Loehr, 1997; Krane, Greenleaf, & Snow, 1997). In addition, there is evidence that perfectionism is related to associated syndromes such as athlete burnout and compulsive exercise (Hill & Curran, in press; Hill, Robson, & Stamp, 2015; Madigan, Stoeber, & Passfield, 2015). So far, however, the relationships between perfectionism in athletes and training distress have not been investigated. Furthermore, previous research has yet to identify any psychological predictors of training distress. Therefore, the aim of the present study was to provide a first investigation of perfectionism and training distress in junior athletes.

Perfectionism

Perfectionism is a personality disposition characterised by striving for flawlessness and setting exceedingly high standards of performance accompanied by tendencies for overly critical

evaluations of one's behaviour (Flett & Hewitt, 2002). However, perfectionism has various aspects, and there are different dimensions of perfectionism with different characteristics. Consequently, perfectionism is best conceptualized as a multidimensional disposition (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; see Enns & Cox, 2002, for a review). Factor analyses comparing various measures of multidimensional perfectionism have provided support for two higher-order dimensions: *perfectionistic strivings* capturing perfectionist personal standards and a self-oriented striving for perfection and *perfectionistic concerns* capturing concerns about making mistakes, feelings of discrepancy between one's standards and performance, and fears of negative evaluation and rejection by others if one fails to be perfect (see Stoeber & Otto, 2006, for a review).

Differentiating between perfectionistic strivings and perfectionistic concerns is important when investigating perfectionism in sports because the two dimensions show different, and often opposite, patterns of relationships with psychological processes and outcomes. Perfectionistic concerns are consistently associated with negative processes and outcomes (e.g., maladaptive coping, negative affect), whereas perfectionistic strivings are often associated with positive processes and outcomes (e.g., adaptive coping, positive affect) or inversely with negative processes and outcomes. The latter is particularly evident when the overlap between perfectionistic strivings and concerns is controlled for (Gotwals, Stoeber, Dunn, & Stoll, 2012; Stoeber, 2011). In this case "pure perfectionistic strivings" are identified (i.e., as perfectionistic strivings with the negative influence of perfectionistic concerns partialled out; Hill & Curran, in press). Pure perfectionistic strivings are usually more adaptive than perfectionistic strivings because they lack those aspects common to both perfectionistic strivings and concerns (e.g., self-criticism, conditional self-acceptance; Hill, 2014).

Training Distress

Excessive training accompanied by inadequate recovery (and possible non-training stressors) can result in an overtraining syndrome which is characterised by a sport-specific decrease in performance that can persist for weeks and sometimes months (Meeusen et al., 2013). Whereas there is no single diagnostic tool to identify athletes suffering from overtraining syndrome, monitoring training responses allows for early identification of at-risk athletes and may give practitioners a chance to reduce the negative consequences of excessive training. There are numerous indicators of training responses associated with overtraining syndrome including biochemical, physiological, immunological, and psychological indicators which all have limitations (Meeusen et al., 2013). A recent systematic review, however, suggests that psychological indicators capturing athletes' subjective responses to training can help identify athletes at risk of overtraining syndrome and do so more effectively than physiological indicators (Saw, Main, & Gastin, in press).

In particular, measures of training distress have shown promise in capturing athletes' subjective responses to training (Meeusen et al., 2013). One such measure is the Training Distress Scale (TDS; Raglin & Morgan, 1994). The TDS is a widely used mood-based measure of training distress and is derived from the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971), which has itself been found to be an effective tool in assessing training stress and overtraining syndrome risk. Moreover, depression is one of the more serious outcomes of overtraining syndrome and training distress is derived largely from POMS depression items (Armstrong & VanHeest, 2002). Although the POMS has shown a dose-response relationship with training load (Raglin & Wilson, 2000), the TDS has shown to be more accurate in identifying overtrained athletes (Kenttä et al., 2001; Raglin & Morgan, 1984). Still, despite

attempts (e.g., Raglin & Wilson, 2000), no study has identified psychological factors that longitudinally predispose athletes to greater risk of developing an overtraining syndrome, and this information would provide a very useful (and currently missing) diagnostic tool for preventing the development of the overtraining syndrome in athletes.

The Present Study

Against this background, the aim of the present study was to provide a first investigation of the relationships between perfectionism and training distress in athletes examining cross-sectional and longitudinal relationships between perfectionistic strivings, perfectionistic concerns, and training distress. Based on previous theory and empirical evidence from cross-sectional studies on perfectionism and compulsive exercise (e.g., Hill et al., 2015), we hypothesised that perfectionism would predict training distress. In this, however, we expected only perfectionistic concerns to be a positive predictor, whereas we expected perfectionistic strivings to be either a negative predictor or to show nonsignificant relationships. Based on previous theory and empirical evidence from a longitudinal study on perfectionism and burnout (Madigan et al., 2015), we further expected perfectionism to predict longitudinal changes in training distress, but expected only perfectionistic concerns to be a positive predictor.

Method

Participants

A sample of 141 junior athletes (125 male, 16 female) was recruited at two sports academies (92 from one academy, 49 from the other) to participate in the present study. Sports academies are part of the United Kingdom's further education system. Their main purpose is to recruit and develop promising junior athletes by providing them with a professional coaching environment while they study alongside their sporting commitments. Academy athletes are

selected based on their ability (competitive performance in trials to enter the academy) and regularly compete at a regional, national, or international level. Participants' mean age was 17.3 years (*SD* = 0.8; range = 16-19 years). Participants were involved in a range of sports (60 in soccer, 36 in rugby, 18 in basketball, 14 in athletics, and 13 in other sports [e.g., cycling, squash]) and trained on average 9.6 hours per week (*SD* = 5.6).

Procedure

The study was approved by the university's ethics committee. Informed consent was obtained from all participants. In addition, parental consent was obtained from participants below the age of 18 (as per the ethics committee's recommendation). Questionnaires were distributed during training in the presence of the first author, or athletes completed an online version of the questionnaire. Participants were administered all measures twice separated by three months, once in October (Time 1) and then again in January (Time 2). During this period, all participants were in regular seasonal training and competition with the exception of those involved in athletics who were in pre-seasonal training. Furthermore, a three-month period has been found sufficient in longitudinal research on perfectionism and athlete burnout (Madigan et al., 2015).

Measures

Perfectionism. To measure perfectionism, we followed a multi-measure approach (Stoeber & Madigan, in press) and used four subscales from two multidimensional measures of perfectionism in sport: the Sport Multidimensional Perfectionism Scale (Dunn et al., 2006) and the Multidimensional Inventory of Perfectionism in Sport (Stoeber, Otto, Pescheck, Becker, & Stoll, 2007). To measure perfectionistic strivings, we used two indicators: the 7-item Sport Multidimensional Perfectionism Scale subscale capturing personal standards (e.g. "I have

extremely high goals for myself in my sport"; *M* = 3.35, *SD* = 0.71) and the 5-item Multidimensional Inventory of Perfectionism in Sport subscale capturing striving for perfection ("I strive to be as perfect as possible"; *M* = 3.21, *SD* = 0.79), and then standardised the scale scores before combining them to measure perfectionistic strivings (cf. Dunkley, Zuroff, & Blankstein, 2003). To measure perfectionistic concerns, we also used two indicators, the 8-item Sport Multidimensional Perfectionism Scale subscale capturing concerns over mistakes ("People will probably think less of me if I make mistakes in competition"; *M* = 2.89, *SD* = 0.77) and the 5-item Multidimensional Inventory of Perfectionism in Sport subscale capturing negative reactions to imperfection ("I feel extremely stressed if everything does not go perfectly"; *M* = 2.89, *SD* = 0.83), and again standardised the scale scores before combining them to measure perfectionistic concerns. The four subscales have demonstrated reliability and validity in previous studies (e.g., Madigan, Stoeber, & Passfield, in press; Stoeber, Stoll, Salmi, & Tiikkaja, 2009). Moreover, both are reliable and valid indicators of perfectionistic strivings and perfectionistic concerns (e.g., Gotwals et al., 2012; Stoeber & Madigan, in press). Participants were asked to indicate to what degree each statement characterised their attitudes in their sport responding on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Training Distress. To measure training distress, we used the Training Distress Scale (TDS; Raglin & Morgan, 1994). The TDS is comprised of ten items, seven items capturing training distress (e.g., "worthless", "miserable", "bad tempered") and three filler items (e.g., "helpful") which are ignored when calculating TDS scores. The TDS has demonstrated reliability and validity in numerous studies (e.g., Kenttä et al., 2001; Raglin & Morgan, 1994). Participants were asked to indicate how often within the last week ("During training last week, I felt…") they had been feeling as described in each item responding on a scale from 1 (*not been*

feeling this way) to 5 (*been feeling extremely like this*).

Data Screening

First, we inspected the data for missing values. Because very few item responses were missing (i = 12), missing responses were replaced with the mean of the item responses of the corresponding scale (ipsatised item replacement; Graham, Cumsille, & Elek-Fisk, 2003). Next we computed Cronbach's alphas for our variables which were all satisfactory (see Table 1). Following recommendations by Tabachnick and Fidell (2007), data were screened for multivariate outliers. One participant showed a Mahalanobis distance larger than the critical value of $\chi^2(4) = 18.47$, $p < .001$, and was excluded from further analyses. Finally, we conducted two Box's M tests to examine if the variance–covariance matrices showed any differences between academies or gender. Both tests were nonsignificant with Fs < 1.14, ps > .21 despite the test being so sensitive to minor differences that the recommended significance level for this test is $p < .001$ (Tabachnick & Fidell, 2007). Therefore, all further analyses were collapsed across academies and gender. Because 35 participants did not complete the measures on both occasions, the final cross-sectional sample size was N = 140 (124 male, 16 female) and the final longitudinal sample size was N = 106 (90 male, 16 female).

Results

Bivariate Correlations

Next, we inspected the bivariate correlations between all variables (see Table 1). As in previous research (e.g., Madigan et al., in press), the dimensions of perfectionism showed a significant positive correlation with each other. Furthermore, training distress at Time 1 showed a significant positive correlation with training distress at Time 2. Perfectionistic concerns showed significant positive correlations with training distress at Time 1 and Time 2, whereas

perfectionistic strivings showed no significant correlations with training distress at either time point.

Multiple Regression Analyses

We then conducted two multiple regression analyses (see Table 2). The first regression analysis investigated the cross-sectional relationships between perfectionism and training distress to examine the unique relationships of the two perfectionism dimensions by controlling for their overlap. For this, we entered perfectionistic strivings and perfectionistic concerns simultaneously into the regression. Results showed that the model explained 11% of the variance in training distress ($R^2 = .114$, $p < .001$) and the perfectionism dimensions showed opposite relationships with training distress: Perfectionistic concerns positively predicted training distress ($\beta = .39$, $p < .001$), whereas perfectionistic strivings negatively predicted training distress ($\beta = -.28$, $p < .01$).

The second regression analysis investigated the longitudinal relationship between perfectionism and training distress. First, we controlled for baseline levels of training distress by entering training distress at Time 1 in Step 1. We then entered the two perfectionism dimensions simultaneously in Step 2. Results showed that perfectionistic concerns predicted residual increases in training distress over time, whereas perfectionistic strivings emerged as a nonsignificant predictor.

Discussion

The aim of the present study was to investigate the relationships between perfectionism in athletes and training distress differentiating perfectionistic strivings and perfectionistic concerns. Providing a first investigation of both cross-sectional and longitudinal relationships, we found perfectionism to be significantly related to training distress, but the two dimensions of

perfectionism showed different relationships with training distress. When the cross-sectional relationships were regarded, perfectionistic concerns positively predicted training distress, whereas perfectionistic strivings negatively predicted training distress. When the longitudinal relationships were regarded, only perfectionistic concerns positively predicted residual increases in training distress, whereas perfectionistic strivings was as a nonsignificant predictor.

This is the first study to show that perfectionism is related to training distress in athletes. The finding that perfectionistic concerns in athletes show positive cross-sectional and longitudinal relationships with training distress is in agreement with case studies indicating that athletes who overtrain are characterised by high levels of perfectionism (Gould et al., 1997; Krane et al., 1997). They are also in agreement with findings from research on perfectionism and compulsive exercise, showing perfectionistic athletes to have higher levels of compulsion to exercise (Hill et al., 2015). More importantly, the present findings suggest that perfectionism may be a factor contributing to the development of training distress in athletes. As training distress is a psychological marker of overtraining syndrome, perfectionistic athletes may be susceptible to the negative consequences of this syndrome. However, only perfectionistic concerns appear to be a risk factor, not perfectionistic strivings.

Differently from perfectionistic concerns, perfectionistic strivings showed a negative cross-sectional relationship with training distress. This dovetails with previous research on perfectionism in sport suggesting that the strivings dimension of perfectionism often shows positive relationships with processes and outcomes that can be considered adaptive or, as in the present study, negative relationships with processes and outcomes that can be considered maladaptive (for details, see Gotwals et al., 2012; Stoeber, 2011). Note, however, that perfectionistic strivings showed a negative relationship with training distress only in the cross-

sectional analyses, but not in the longitudinal analyses. This finding suggests that perfectionistic strivings may not have a protective effect for athletes in regard to training distress, and it highlights the importance of using longitudinal designs when investigating the relationships of perfectionism in sport. Note, however, that differences in findings could be explained by the larger sample size and consequently improved statistical power for our cross-sectional analyses enabling us to detect smaller effects. Furthermore, we note that the negative cross-sectional relationship with training distress only emerged after controlling for the overlap with perfectionistic concerns, suggesting that the relationship only holds for "pure perfectionistic strivings," that is, perfectionistic strivings with the negative influence of perfectionistic concerns partialled out (Hill & Curran, in press).

Previously, no study has identified any psychological predictors of overtraining syndrome. What may explain why perfectionistic concerns are such a predictor? One explanation may be differences in training load. Athletes high in perfectionistic concerns may have trained more excessively than athletes low in perfectionistic concerns leading to increased training distress. If this suggestion is correct, this effect of perfectionistic concerns could be countered through targeted monitoring and better management of training load by the coach and/or support staff (Meeusen et al., 2013). Another explanation may be that athletes high in perfectionistic concerns experienced more non-training stressors than athletes low in perfectionistic concerns. The sport environment can be highly stressful for athletes, and athletes differ in how they cope with stress. Research has shown that perfectionistic concerns are associated with maladaptive coping in sports (Hill, Hall, & Appleton, 2010). Consequently, athletes high in perfectionistic concerns may have coped less well with the stress associated with high training demands and experienced greater training distress. An effect of perfectionistic concerns contributing to training distress

could be attenuated by helping athletes to better cope with stress (cf. Meeusen et al., 2013; see also Antony & Swinson, 2009).

Limitations and Future Research

The present study had a number of limitations. First, our study focused on a sample comprised exclusively of junior athletes therefore the generalizability of our findings may be limited. However, previous research has shown that junior athletes experience lifetime rates of overtraining syndrome equivalent to adult non-elite athletes. Furthermore, previous research has shown that experiencing overtraining syndrome at a young age may predispose athletes to an increased lifetime risk of developing overtraining syndrome (Raglin, Sawamura, Alexiou, Hassmén, & Kenttä, 2000; Meeusen et al., 2013). Second, the study did not include any mediators, that is, variables that may explain why perfectionistic concerns predicted increases in training distress. Future longitudinal studies on perfectionism may therefore consider designs that include mediators such as training load and coping in addition to perfectionism and training distress (cf. Cole & Maxwell, 2003). Third, we may have found larger effects if we had investigated only those sports that involve high levels of physical conditioning as the risk of overtraining syndrome may be higher in these sports (Kenttä et al., 2001). Finally, the study only examined training distress. Whereas training distress is a key indicator of overtraining syndrome, future research would benefit from including further indicators (cf. Meeusen et al., 2013) to explore whether the relationships we found between perfectionism and training distress replicate with a wider range of indicators for overtraining syndrome.

Conclusion

The present study makes an important contribution to our understanding of the relationships between perfectionism in sport and training distress, being the first to identify both

cross-sectional and longitudinal relationships in a large sample of athletes. Even though the effects we found were only small- to medium-sized (Cohen, 1992) and perfectionism explained only a modest percentage of variance in training distress, the present study is the first to identify a psychological predictor of increased training distress. Moreover, even small-sized effects matter as they may accumulate over time (Prentice & Miller, 1992). Consequently, sports scientists monitoring athletes' training responses to identify athletes at risk of overtraining syndrome may want to monitor athletes' perfectionistic concerns as a factor predisposing athletes to experience higher levels of training distress that may further increase over time putting athletes at risk of developing overtraining symptoms.

References

Antony, M. M., & Swinson, R. P. (2009). *When perfect isn't good enough: Strategies for coping with perfectionism* (2nd ed.). Oakland, CA: New Harbinger.

Armstrong, L. E., & VanHeest, J. L. (2002). The unknown mechanism of the overtraining syndrome: Clues from depression and psychoneuroimmunology. *Sports Medicine, 32*, 185-209.

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

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558-577.

Dunkley, D. M., Zuroff, D. C., & Blankstein, K. R. (2003). Self-critical perfectionism and daily affect: Dispositional and situational influences on stress and coping. *Journal of Personality and Social Psychology, 84*, 234-252.

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.

Enns, M. W., & Cox, B. J. (2002). The nature and assessment of perfectionism: A critical analysis. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism* (pp. 33-62). Washington, DC: American Psychological Association.

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* (pp. 5-31). Washington, DC: American Psychological Association.

Flett, G. L., & Hewitt, P. L. (2014). “The perils of perfectionism in sports” revisited: Toward a

broader understanding of the pressure to be perfect and its impact on athletes and dancers. *International Journal of Sport Psychology, 45*, 395-407.

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468.

Gotwals, J. K., Stoeber, J., Dunn, J. G. H., & Stoll, O. (2012). Are perfectionistic strivings in sport adaptive? A systematic review of confirmatory, contradictory, and mixed evidence. *Canadian Psychology, 53*, 263-279.

Gould, D., Tuffey, S., Udry, E., & Loehr, J. (1997). Burnout in competitive junior tennis players: III. Individual differences in the burnout experience. *The Sport Psychologist, 11*, 257-276.

Graham, J. W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J. A. Schinka & W. F. Velicer (Eds.), *Handbook of psychology: Research methods in psychology* (Vol. 2, pp. 87-114). New York: Wiley.

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. (2014). Perfectionistic strivings and the perils of partialling. *International Journal of Sport and Exercise Psychology, 12*, 302-315.

Hill, A. P., & Curran, T. (in press). Multidimensional perfectionism and burnout A meta-analysis. *Personality and Social Psychology Review*.

Hill, A. P., Hall, H. K., & Appleton, P. R. (2010). Perfectionism and athlete burnout in junior elite athletes: The mediating influence of coping tendencies. *Anxiety, Stress, & Coping, 23*, 415-430.

Hill, A. P., Robson, S. J., & Stamp, G. M. (2015). The predictive ability of perfectionistic traits

and self-presentational styles in relation to exercise dependence. *Personality and Individual Differences, 86*, 176-183.

Kenttä, G., Hassmén, P., & Raglin, J. S. (2001). Training practices and overtraining syndrome in Swedish age-group athletes. *International journal of sports medicine, 22*, 460-465.

Krane, V., Greenleaf, C. A., & Snow, J. (1997). Reaching for gold and the price of glory: A motivational case study of an elite gymnast. *The Sport Psychologist, 11*, 53-71.

Madigan, D. J., Stoeber, J., & Passfield, L. (2015). Perfectionism and burnout in junior athletes: A three-month longitudinal study. *Journal of Sport & Exercise Psychology, 37*, 305-315.

Madigan, D. J., Stoeber, J., & Passfield, L. (in press). Perfectionism and attitudes towards doping in junior athletes. *Journal of Sports Sciences*.

McNair, D. M., Lorr, M., & Droppleman, L. F. (1971). *Manual for the Profile of Mood States*. San Diego, CA: Educational and Industrial Testing Services.

Meeusen, R., Duclos, M., Foster, C., Fry, A., Gleeson, M., Nieman, D., ... & Urhausen, A. (2013). Prevention, diagnosis and treatment of the overtraining syndrome: Joint consensus statement of the European College of Sport Science (ECSS) and the American College of Sports Medicine (ACSM). *European Journal of Sport Science, 13*, 1-24.

Prentice, D. A., & Miller, D. T. (1992). When small effects are impressive. *Psychological Bulletin, 112*, 160-164.

Raglin, J. S., & Morgan, W. P. (1994). Development of a scale for use in monitoring training-induced distress in athletes. *International Journal of Sports Medicine, 15*, 84-88.

Raglin, J. S., Sawamura, S., Alexiou, S., Hassmén, P., & Kenttä, G. (2000). Training practices and staleness in 13-18 year old swimmers: A cross-cultural study. *Pediatric Sports Medicine, 12*, 61-70.

Raglin, J. S., & Wilson, G. S. (2000). Overtraining in athletes. In Y. L. Hanin (Ed.), *Emotions in sport* (pp. 191-207). Champaign, IL: Human Kinetics.

Saw, A. E., Main, L. C., & Gastin, P. B. (in press). Monitoring the athlete training response: Subjective self-reported measures trump commonly used objective measures: A systematic review. *British Journal of Sports Medicine.*

Stoeber, J. (2011). The dual nature of perfectionism in sports: Relationships with emotion, motivation, and performance. *International Review of Sport and Exercise Psychology, 4,* 128-145.

Stoeber, J., & Madigan, D. J. (in press). Measuring perfectionism in sport, dance, and exercise: Review, critique, recommendations. In A. P. Hill (Ed.), *The psychology of perfectionism in sport, dance, and exercise*. London: Routledge.

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., Salmi, O., & Tiikkaja, J. (2009). Perfectionism and achievement goals in young Finnish ice-hockey players aspiring to make the Under-16 national team. *Journal of Sports Sciences, 27,* 85-94.

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

Table 1

Descriptive Statistics, Cronbach's Alphas, and Bivariate Correlations

Variable	1	2	3	4
1. Perfectionistic strivings				
2. Perfectionistic concerns	.54***			
3. Training distress Time 1	–.07	.24**		
4. Training distress Time 2	.09	.33**	.56***	
M	0.00	0.00	1.89	2.07
SD	0.91	0.93	0.92	0.71
Cronbach's alpha	.79	.85	.90	.77

Note. $N = 140$ for Time 1. $N = 106$ for Time 2. Time 2 = 3 months after Time 1.

**$p < .01$. ***$p < .001$.

Table 2

Multiple Regression Predicting Longitudinal Changes in Training Distress

	Training distress Time 2	
	ΔR^2	β
Step 1: Training distress Time 1	.319***	
Training distress Time 1		.56***
Step 2: Perfectionism	.046*	
Training distress Time 1		.51***
Perfectionistic strivings		–.02
Perfectionistic concerns		.23*

Note. N = 106. Time 2 = 3 months after Time 1.

*p < .05. ***p < .001.