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## Perfectionism and competitive anxiety in athletes: Differentiating striving for perfection and negative reactions to imperfection

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### Abstract

Whereas some researchers have argued that perfectionism in sports is maladaptive because it is related to dysfunctional characteristics such as higher competitive anxiety, the present article argues that striving for perfection is not maladaptive and is unrelated to competitive anxiety. Four samples of athletes (high school athletes, female soccer players, and two samples of university student athletes) completed measures of perfectionism during competitions and competitive anxiety. Across samples, results show that overall perfectionism was associated with higher cognitive and somatic competitive anxiety. However, when striving for perfection and negative reactions to imperfection were differentiated, only the latter were associated with higher anxiety, whereas striving for perfection was unrelated to anxiety. Moreover, once the influence of negative reactions to imperfection was partialled out, striving for perfection was associated with lower anxiety and higher self-confidence. The present findings suggest that striving for perfection in sports is not maladaptive. On the contrary, athletes who strive for perfection and successfully control their negative reactions to imperfection may even experience less anxiety and more self-confidence during competitions. © 2006 Elsevier Ltd. All rights reserved.

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## 1. Introduction

Perfectionism is a personality trait characterized by striving for flawlessness and setting excessively high standards for performance, accompanied by tendencies toward overly critical evaluations of one's behavior (Flett & Hewitt, 2002). In sports, some researchers see perfectionism as an adaptive trait that helps to achieve elite performance (Gould, Dieffenbach, & Moffett, 2002). Other researchers, however, see perfectionism as a maladaptive trait that hinders, rather than helps athletic performance (Flett & Hewitt, 2005). Consequently, athletes may face what Hewitt and Flett call the “perfectionism paradox”. Although in many sports athletes are expected to deliver perfect performance outcomes, perfectionism in athletes has been shown to be related to characteristics that may undermine performance, particularly competitive anxiety. Consequently, perfectionism in athletes may prevent the very outcomes that it seeks to promote (Flett & Hewitt, 2005).

However, perfectionism is multidimensional and multifaceted, and only some dimensions and facets are clearly negative, harmful, and maladaptive, while others may be positive, benign, and adaptive (Chang, 2003; Enns & Cox, 2002). Moreover, research has suggested that two major dimensions of perfectionism be differentiated (Stoeber & Otto, 2006): a dimension which has been described as positive, healthy, or adaptive perfectionism and a dimension which has been described as neurotic, unhealthy, or maladaptive perfectionism (Rice & Preusser, 2002; Stumpf & Parker, 2000; Terry-Short, Owens, Slade, & Dewey, 1995). The negative dimension of perfectionism subsumes those facets of perfectionism that relate to perfectionistic concerns such as concern over mistakes, doubts about actions, feelings of discrepancy between expectations and results, and negative reactions to mistakes. This dimension has been associated with negative characteristics such as anxiety (e.g., Bieling, Israeli, & Antony, 2004; Hill et al., 2004; Suddarth & Slaney, 2001). In contrast, the positive dimension of perfectionism subsumes those facets of perfectionism that relate to perfectionistic strivings such as having high personal standards and a self-oriented striving for excellence. This dimension has been shown to be unrelated to negative characteristics such as anxiety, once overlap between positive and negative perfectionism was controlled for (Stoeber & Otto, 2006). Consequently, the distinction between positive and negative facets of perfectionism may also prove crucial when investigating perfectionism and anxiety in competitive athletes.

For competitive athletes, sport is more than just a game (Jones, 1995). As a result, competitions—requiring the fruits of training and experience to be transformed into top performances under the critical evaluation of opponents, teammates, coaches, and spectators—may be associated with heightened competitive anxiety (Martens, Vealey, & Burton, 1990). In the experience of competitive anxiety, three main dimensions have been differentiated: cognitive anxiety, somatic anxiety, and self-confidence (Martens et al., 1990). Cognitive anxiety involves cognitions about possible failure, while somatic anxiety involves the perception of bodily symptoms and heightened negative arousal. Self-confidence, on the other hand, involves cognitions that one is up to the task and able to give one's best possible performance. Consequently, self-confidence prior to and

during competitions usually indicates low competitive anxiety and is often associated with higher performance (Craft, Magyar, Becker, & Feltz, 2003).

So far, three studies have investigated the relationship between perfectionism and competitive anxiety in athletes (Frost & Henderson, 1991; Hall, Kerr, & Matthews, 1998; Koivula, Hassmén, & Fallby, 2002). Frost and Henderson (1991) investigated perfectionism and competitive anxiety in female college athletes. Results showed that overall perfectionism showed a positive correlation with competitive anxiety and an inverse correlation with self-confidence in competitions. When the facets of perfectionism were inspected, however, only concern about mistakes (a facet of negative perfectionism) was positively correlated with anxiety and inversely with self-confidence. Personal standards (a facet of positive perfectionism) were unrelated to anxiety and self-confidence. Hall et al. (1998) investigated perfectionism and competitive anxiety in high school athletes who were to compete in a cross-country meet, measuring cognitive anxiety, somatic anxiety, and self-confidence at four points of time: 1 week, 2 days, 1 day, and 30 min before competition. At all points, overall perfectionism showed a positive correlation with cognitive anxiety. At the facet level, however, only concern over mistakes showed a positive correlation with cognitive anxiety. Personal standards did not show a positive correlation with cognitive anxiety (except 30 min before competition), but showed a positive correlation with self-confidence at all points of time (including 30 min before competition). Finally, Koivula et al. (2002) investigated competitive anxiety in Swedish elite athletes comparing different groups of perfectionists. Three groups are of particular interest in the present context of differentiating positive and negative facets of perfectionism: (a) positive perfectionists, that is athletes with high levels of personal standards and low levels of concern over mistakes; (b) negative perfectionists, that is athletes with low levels of personal standards and high levels of concern over mistakes; and (c) overall perfectionists, that is athletes with overall high levels of perfectionism. When the three groups were compared with respect to competitive anxiety, positive perfectionists showed higher self-confidence and lower cognitive anxiety than both negative perfectionists and overall perfectionists. Moreover, they also showed lower somatic anxiety than negative perfectionists.

Because personal standards represent a core facet of perfectionistic strivings, the positive dimension of perfectionism (Stoeber & Otto, 2006), the findings of Hall et al. (1998) and Koivula et al. (2002) suggest that athletes who strive for perfection may be more self-confident and less anxious in competitions than athletes who do not strive for perfection. Some open questions remain, however. First, the findings have not been consistent across studies. Only two of three studies (Hall et al., 1998; Koivula et al., 2002) found that personal standards were associated with higher levels of self-confidence and lower levels of competitive anxiety, whereas one did not (Frost & Henderson, 1991). Thus, the question of how perfectionistic strivings relate to competitive anxiety warrants further investigation. Second, all three studies investigated athletes' general perfectionism, not athletes' perfectionism regarding their sport. A recent study comparing athletes' perfectionistic orientations across different domains (sport, school, general life) found that athletes reported significantly higher perfectionism regarding their sport than regarding school or general life (Dunn, Gotwals, & Dunn, 2005), indicating that athletes' general perfectionism does not accurately reflect the degree of their perfectionism in sport. Consequently, when investigating the relationships between perfectionism and competitive anxiety in athletes, it is crucial to use measures that are specifically designed to capture perfectionism in sport. Finally, research has shown that athletes set different types of goals during training and competitions (Munroe-Chandler, Hall, & Weinberg,

2004). For example, athletes' focus during training is on goals such as training effectively, making the most of the opportunity to practice, or just having fun, whereas their focus during competitions is on goals such as winning the competition or beating an opponent. Therefore, when investigating the relationship of perfectionism with competitive anxiety, one should focus on competitions and measure athletes' perfectionism during competitions.

Against this background, the aim of the present study was to investigate further the relationship between perfectionism and competitive anxiety in athletes, focusing on perfectionism during competitions. As regards perfectionism during competitions, two facets were differentiated: *striving for perfection* which has been found to represent the core element of the positive dimension of perfectionism (Stoeber & Otto, 2006) and *negative reactions to imperfection* which have been found to be closely related to concern over mistakes and maladaptive perfectionism (Frost & Henderson, 1991; Rice & Preusser, 2002). In line with previous findings on perfectionistic strivings, perfectionistic concerns, and anxiety (Stoeber & Otto, 2006) and with previous findings on perfectionism and competitive anxiety in athletes, we expected overall perfectionism (combining striving for perfection and negative reactions to imperfection) to show positive correlations with competitive anxiety. When the two facets are differentiated, however, we expected only negative reactions to imperfection to show positive correlations with competitive anxiety. In contrast, we expected striving for perfection to be unrelated to competitive anxiety or, once overlap with negative reactions to imperfection is partialled out, to show inverse correlations with competitive anxiety and positive correlations with self-confidence.

## 2. Method

### 2.1. Participants and procedure

To investigate if findings would generalize across different samples of athletes, four samples from four independent studies were inspected. Sample 1 consisted of  $N = 115$  university student athletes (53 male, 62 female) majoring in sport and exercise studies at the Institute of Sports Science, University of Halle-Wittenberg, Germany. Mean age was 21.0 years ( $SD = 2.1$ ; range: 18–31 years). Sample 2 consisted of  $N = 74$  female soccer players from fourth league (Verbandsliga Sachsen-Anhalt) and fifth league (Landesliga Mitte-Ost) teams in Saxony Anhalt, Germany. Mean age was 24.1 years ( $SD = 6.3$ ; range: 15–43 years). Sample 3 consisted of  $N = 204$  high school athletes (131 male, 73 female) from two athletics high schools (so-called “Sportgymnasien”) in Saxony-Anhalt, Germany. Sportgymnasien are special high schools for students with outstanding athletic abilities and provide students with regular training sessions in various disciplines as an integral part of the curriculum. Mean age was 15.8 years ( $SD = 0.9$ ; range: 14–18 years). Sample 4 consisted of  $N = 147$  university student athletes (90 male, 57 female) majoring in sport and exercise studies at the Institute of Sports Science, University of Halle-Wittenberg and the Faculty of Sports Science, University of Leipzig, Germany. Mean age was 22.8 years ( $SD = 3.0$ ; range: 19–42 years). Informed consent was obtained from all athletes. In addition, parental consent was obtained from high school athletes under the age of 18.

As regards Samples 1 and 4 (university student athletes), questionnaires were distributed during lectures. Participants were asked to indicate their main discipline (e.g., soccer, volleyball, track

and field athletics) and to respond to all subsequent measures with respect to their main discipline only. As regards Sample 2 (female soccer players), teams were visited during training. Overall 120 questionnaires were distributed together with prestamped return envelopes. With 68% of questionnaires returned, the return rate was satisfactory. As regards Sample 3 (high school athletes), questionnaires were distributed during classes. Like the university student athletes, high school athletes were asked to indicate their main discipline and to respond to all subsequent measures with respect to their main discipline only.

## 2.2. Measures

### 2.2.1. Perfectionism during competitions

To measure striving for perfection and negative reactions to imperfection during competitions, the 10 items from the Multidimensional Inventory of Perfectionism in Sport (Stöber, Otto, & Stoll, 2004) that showed the highest factorial validity and consistency across the four samples were selected (a table summarizing these analyses is available upon request): five items from the scale measuring striving for perfection during competitions and five items from the scale measuring negative reactions to imperfection during competitions (see Appendix). Participants were asked to indicate how they generally felt during competitions/league games and responded on a scale from 1 = “never” to 6 = “always”. To measure overall perfectionism during competitions, a total score was computed combining the striving for perfection and the negative reactions to imperfection items. Across samples, all three measures showed satisfactory reliability: striving for perfection during competitions (Samples 1–4: Cronbach’s  $\alpha = .93, .90, .90, .93$ ), negative reactions to imperfection during competitions ( $\alpha = .92, .86, .84, .84$ ), overall perfectionism during competitions ( $\alpha = .93, .90, .86, .91$ ).

### 2.2.2. Competitive anxiety

To measure competitive anxiety, the Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) was used. The CSAI-2 taps three facets of competitive anxiety, each with nine items: cognitive anxiety (e.g., “I am concerned about losing”), somatic anxiety (e.g., “I feel my stomach sinking”), and self-confidence (e.g., “I am confident about performing well”). The CSAI-2 has shown adequate reliability and validity across different studies and samples (see Martens et al., 1990, for details). For the present study, the original scale was translated into German using a standard backtranslation procedure involving a native English speaker: First, all items were translated into German; then, a native English speaker translated the items back into English; finally, all discrepancies with the original version were discussed with the native speaker and the respective translations amended. For Samples 1–3, instructions and response format were modified to measure habitual competitive anxiety: Athletes were asked how they usually felt and what they usually thought during competitions/league games and responded on a scale from 1 = “never” to 6 = “always” (Stöber & Pescheck, 2004). To investigate if findings would also generalize to competitive state anxiety, instructions and response format in Sample 4 were modified to measure competitive state anxiety. For this, athletes were asked how they felt and what they thought during their last competition/league game and responded on a scale from 1 = “totally disagree” to 6 = “totally agree”. Across all samples, the three measures showed the same factorial structure as the original scales. Moreover, all reliability estimates were satisfactory and comparable to those

of the original scales: cognitive anxiety ( $\alpha = .90, .93, .79, .87$ ), somatic anxiety ( $\alpha = .91, .88, .80, .85$ ), self-confidence ( $\alpha = .93, .90, .83, .90$ ).

### 2.3. Preliminary analyses

To analyze the normality of the measures employed, Kolmogorov–Smirnov  $z$ -tests were computed (see Table 1). There were no significant deviations from normality, with two exceptions. In the high school students and in the university students of Sample 4, striving for perfection deviated significantly from normality with distributions of scores skewed towards higher scores, indicating that most athletes showed high levels of striving for perfection during competitions. Moreover, correlations between striving for perfection and negative reactions to imperfection during competitions were inspected. Across all samples, striving for perfection and negative reactions to imperfection were significantly correlated:  $r = .63$  (university student athletes, Sample 1),  $r = .58$  (female soccer players),  $r = .35$  (high school athletes), and  $r = .56$  (university student athletes, Sample 4), all  $ps < .001$ . The correlations show that athletes who strive for perfection during competitions are also likely to react negatively when they do not achieve perfect results. Additionally, they show that it is important to control for the overlap between striving for perfection and negative reactions to imperfection when examining correlates of these two facets of perfectionism (cf. Stoeber & Otto, 2006).

Table 1  
Descriptive and normality statistics

Variables	Sample 1: University student athletes ( $N = 115$ )			Sample 2: Female soccer players ( $N = 74$ )			Sample 3: High school athletes ( $N = 204$ )			Sample 4: University student athletes ( $N = 142$ )		
	$M$	$SD$	$z(KS)$	$M$	$SD$	$z(KS)$	$M$	$SD$	$z(KS)$	$M$	$SD$	$z(KS)$
Perfectionism												
Overall perfectionism	3.88	1.05	1.29	4.30	0.90	1.07	4.09	0.86	0.70	3.90	1.01	1.05
Striving for perfection	4.24	1.19	1.09	4.84	0.90	1.10	4.77	1.04	2.31***	4.54	1.22	1.61*
Negative reactions to imperfection	3.52	1.13	0.75	3.76	1.12	0.84	3.41	1.05	1.30	3.26	1.06	0.86
Competitive anxiety <sup>a</sup>												
Cognitive anxiety	3.00	0.87	1.29	2.54	0.97	0.84	3.04	0.99	1.02	2.97	1.00	0.86
Somatic anxiety	3.49	1.00	1.00	3.34	0.90	0.65	3.35	1.13	1.00	3.56	0.99	0.64
Self-confidence	3.69	0.88	0.76	3.60	0.88	0.63	3.65	0.99	1.07	4.01	0.89	0.71

Note. All scores are mean scores with a possible range of 1–6. Overall perfectionism = combined score of striving for perfection and negative reactions to imperfection.  $z(KS)$  = Kolmogorov–Smirnov  $z$ -test for normality.

\*  $p < .05$ , \*\*\*  $p < .001$ , two-tailed.

<sup>a</sup> In all samples, habitual competitive anxiety (i.e., anxiety as usually experienced during competitions/league games) was measured, except for Sample 4 in which competitive anxiety during the last competition/league game was measured.

### 3. Results

First, zero-order correlations between perfectionism during competitions and competitive anxiety were inspected (see Table 2). In line with expectations, overall perfectionism showed significant positive correlations with cognitive and somatic anxiety across samples. Moreover, in the university students of Sample 4, overall perfectionism showed an inverse correlation with self-confidence. As regards the two facets of perfectionism, striving for perfection during competitions was unrelated to competitive anxiety across samples. Only in the university student athletes of Sample 1 did striving for perfection show a positive correlation with cognitive anxiety during competitions, but not somatic anxiety. In the high school athletes, however, striving for perfection showed a positive correlation with self-confidence during competitions. In contrast, negative reactions to imperfection showed positive correlations with both cognitive and somatic anxiety and inverse correlations with self-confidence across all samples. Further confirmation that striving for perfection and negative reactions to imperfection clearly showed different correlations with competitive anxiety and self-confidence was obtained when the correlations of striving for perfection and negative reactions to imperfection were compared and the differences between them

Table 2  
Correlations

Competitive anxiety	Correlation			<i>z</i> (diff)	Partial correlation	
	Overall perfectionism	Striving for perfection	Negative reactions to imperfection		Striving for perfection	Negative reactions to imperfection
Sample 1: University student athletes ( <i>N</i> = 115)						
Cognitive anxiety	.40 <sup>***</sup>	.20 <sup>*</sup>	.54 <sup>***</sup>	4.71 <sup>***</sup>	-.23 <sup>*</sup>	.55 <sup>***</sup>
Somatic anxiety	.29 <sup>***</sup>	.11	.42 <sup>***</sup>	4.02 <sup>***</sup>	-.22 <sup>*</sup>	.46 <sup>***</sup>
Self-confidence	-.06	.15	-.26 <sup>**</sup>	-5.00 <sup>***</sup>	.42 <sup>***</sup>	-.46 <sup>***</sup>
Sample 2: Female soccer players ( <i>N</i> = 74)						
Cognitive anxiety	.52 <sup>***</sup>	.20	.67 <sup>***</sup>	5.03 <sup>***</sup>	-.31 <sup>**</sup>	.69 <sup>***</sup>
Somatic anxiety	.35 <sup>**</sup>	.17	.43 <sup>***</sup>	2.50 <sup>*</sup>	-.10	.41 <sup>***</sup>
Self-confidence	-.19	-.03	-.28 <sup>*</sup>	-2.25 <sup>*</sup>	.16	-.31 <sup>**</sup>
Sample 3: High school athletes ( <i>N</i> = 204)						
Cognitive anxiety	.37 <sup>***</sup>	.03	.57 <sup>***</sup>	7.31 <sup>***</sup>	-.22 <sup>**</sup>	.60 <sup>***</sup>
Somatic anxiety	.35 <sup>***</sup>	.04	.54 <sup>***</sup>	6.62 <sup>***</sup>	-.18 <sup>**</sup>	.56 <sup>***</sup>
Self-confidence	-.13	.18 <sup>*</sup>	-.39 <sup>***</sup>	-7.15 <sup>***</sup>	.36 <sup>***</sup>	-.49 <sup>***</sup>
Sample 4: University student athletes ( <i>N</i> = 142)						
Cognitive anxiety	.31 <sup>***</sup>	.10	.46 <sup>***</sup>	4.69 <sup>***</sup>	-.20 <sup>*</sup>	.49 <sup>***</sup>
Somatic anxiety	.20 <sup>*</sup>	.07	.31 <sup>***</sup>	3.11 <sup>**</sup>	-.13	.33 <sup>***</sup>
Self-confidence	-.17 <sup>*</sup>	.02	-.34 <sup>***</sup>	-4.49 <sup>***</sup>	.26 <sup>**</sup>	-.42 <sup>***</sup>

*Note.* Correlation = zero-order correlation. *z*(diff) = *z*-value of the difference between the correlation of striving for perfection and that of negative reactions to imperfection (Meng et al., 1992). Partial correlation = correlation of striving for perfection controlling for negative reactions to imperfection, and vice versa. Else, see note to Table 1.

\* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001, one-tailed.

tested for significance (Meng, Rosenthal, & Rubin, 1992). All differences were significant (see *z*-values in Table 2).

Finally, partial correlations were inspected. Across all samples, striving for perfection during competitions showed inverse correlations with cognitive anxiety during competitions, once negative reactions to imperfection during competitions were partialled out. Moreover, striving for perfection showed inverse correlations with somatic anxiety in two and positive correlations with self-confidence in three of the four samples (see Table 2 for details).

Whereas the partial correlations of striving for perfection showed a more positive pattern of correlations than the zero-order correlations, negative reactions to imperfection continued to show significant positive correlations with cognitive and somatic anxiety and significant negative correlations with self-confidence across all samples, once striving for perfection was partialled out. Thus, only striving for perfection displayed a markedly different pattern when partial correlations were computed. This is particularly evident for cognitive anxiety. When zero-order correlations were regarded, striving for perfection appeared to be unrelated (or even positively related) to cognitive anxiety, because the overlap with negative reactions to imperfection suppressed the inverse relationship between striving for perfection and competitive anxiety. Once the influence of negative reactions to imperfection was partialled out, however, striving for perfection during competitions was inversely correlated with cognitive and somatic anxiety and also showed positive correlations with self-confidence, indicating that “pure striving for perfection” is related to lower competitive anxiety.

#### **4. Discussion**

The aim of the present research was to further investigate the relationship between perfectionism and competitive anxiety in athletes, focusing on perfectionism during competitions and differentiating two facets of perfectionism: striving for perfection and negative reactions to imperfection. Across four different samples of athletes, overall perfectionism (combining striving for perfection and negative reactions to imperfection) showed positive correlations with cognitive and somatic anxiety during competitions, a finding dovetailing with claims that perfectionism in sport and exercise is a trait associated with dysfunctional characteristics (Flett & Hewitt, 2005). However, when striving for perfectionism and negative reactions to imperfection were differentiated, only negative reactions to imperfection showed positive correlations with competitive anxiety and inverse correlations with self-confidence during competitions. In contrast, striving for perfection was unrelated to competitive anxiety when zero-order correlations were inspected. Moreover, once the overlap with negative reactions to imperfection was partialled out, striving for perfection showed inverse correlations with competitive anxiety, particularly with the cognitive component. This finding indicates that striving for perfection in athletes itself is not maladaptive. On the contrary, striving for perfection may even be associated with fewer thoughts about failure (cognitive anxiety), fewer bodily reactions of nervousness (somatic anxiety), and higher self-confidence during competitions in athletes who focus on the attainment of the best possible performance, but do not react in an overly negative fashion if they fail to attain it. Consequently, the present findings suggest that, while overall perfectionism may have paradoxical effects (Flett & Hewitt, 2005), striving for perfection may have positive effects—if athletes do not despair when they do not attain what they are striving for.

The present findings have some limitations, however. First, we investigated high school athletes, university student athletes, and women soccer players who played in lower regional leagues. Thus, the findings may be limited to student athletes and other nonprofessional athletes and may not generalize to professional or elite athletes. As adaptive perfectionism has been identified as a psychological characteristic of Olympic champions (Gould et al., 2002), future studies should investigate whether the present findings also hold for top athletes. Second, our study focused only on two facets of perfectionism, namely striving for perfection and negative reactions to imperfection. Consequently, it is important that future studies replicate the present findings by employing different multidimensional measures of perfectionism in sport and investigating different facets associated with adaptive and maladaptive perfectionism (e.g., Anshel & Eom, 2003; Dunn et al., 2006). Finally, recent studies have raised concerns regarding the use of the Competitive State Anxiety Inventory-2 (CSAI-2), indicating that the CSAI-2 may have low factorial validity and may need to be revised (e.g., Lundqvist & Hassmén, 2005). Moreover, a recent meta-analysis on the relationship between the CSAI-2 and sport performance indicates that, whereas self-confidence is consistently positively related to athletes' performance, the relationship between cognitive and somatic anxiety and performance is less clear, casting doubts that the inventory can be used to examine the anxiety–performance relationship (Craft et al., 2003). Consequently, our findings on striving for perfection, negative reactions to imperfection, and cognitive and somatic anxiety do not allow predictions about how perfectionism during competitions relates to athletic performance and competitive success.

Nonetheless, the present findings have important implications for the understanding of perfectionism in sports, as they demonstrate that perfectionism during competitions is not necessarily maladaptive. Instead, only the negative aspects of perfectionism are maladaptive, whereas striving for perfection without being overly concerned about imperfection may be associated with positive characteristics that may promote, rather than undermine athletic performance. Thus, the present findings add further support to the cumulative evidence from studies with non-athletes in which perfectionistic strivings were related to positive outcomes once overlap between perfectionistic strivings and perfectionistic concerns was partialled out (Stoeber & Otto, 2006). Moreover, the present findings are in line with recent findings that “pure personal standards” (i.e., perfectionistic standards without making one's self-worth contingent on meeting these standards) are related to adaptive outcomes (DiBartolo, Frost, Chang, LaSota, & Grills, 2004). Consequently, we suggest that it is adaptive when athletes strive for perfection in their discipline, as long as they are not overly dissatisfied, angry, or frustrated when things do not turn out perfectly. If negative reactions to imperfection are kept at bay, striving for perfection in sports may form part of a healthy pursuit of excellence and may eventually lead to improved performance, if not perfect performance.

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## Appendix. Perfectionism during competitions: subscales and items

### *Striving for perfection*

During competitions/league games, I strive to be as perfect as possible.

During competitions/league games, it is important to me to be perfect in everything I attempt.

During competitions/league games, I feel the need to be perfect.

During competitions/league games, I am a perfectionist as far as my targets are concerned.

During competitions/league games, I have the wish to do everything perfectly.

### *Negative reactions to imperfection*

During competitions/league games, I feel extremely stressed if everything does not go perfectly.

After competitions/league games, I feel depressed if I have not been perfect.

During competitions/league games, I get completely furious if I make mistakes.

During competitions/league games, I get frustrated if I do not fulfill my high expectations.

If something does not go perfectly during competitions/league games, I am dissatisfied with the whole competition/game.

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