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A Three-Sample Study of Perfectionism and Field Test Performance in Athletes

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Abstract

Field tests are commonly used by sport scientists for performance monitoring and evaluation. While perfectionism predicts performance in a range of contexts, it is currently unclear whether perfectionism predicts performance in such tests. To address this lack of understanding, the present study examined the relationships between perfectionism and fitness-based field test performance across three athlete samples. After completing a measure of perfectionism (striving for perfection and negative reactions to imperfection), sample one (n = 129 student athletes) participated in a series of countermovement jumps and 20-metre sprint trials, sample two (n = 136 student athletes) participated in an agility task, and sample three (n = 116 junior athletes) participated in the Yo-Yo intermittent recovery test (level one). Striving for perfection predicted better sprint and Yo-Yo test performance. Negative reactions to imperfection predicted worse sprint performance. Mini meta-analyses of the combined data (N = 381) showed that striving for perfection was positively related to performance (r^+ = .24), but negative reactions to imperfection was unrelated to performance (r^+ = –.05). The present findings indicate that striving for perfection may predict better fitness-based field test performance, while negative reactions to imperfection appears to be ambiguous.

Keywords: personality, athletes, power, speed, agility, endurance

Introduction

Monitoring the effectiveness of training programmes is an important aspect of sport science support (Cobley, Schorer, & Baker, 2013). So too is the evaluation of athletes' performance. To do so, practitioners will use a range of tests. This includes highly controlled laboratory tests but also more ecologically valid field tests. Although laboratory tests are valuable, field tests are potentially more useful in applied settings given their ease of use and ability to mimic competition-relevant skills and tasks (e.g., Castro-Piñero et al., 2010). As such, it is important to understand the factors that may predict better or worse performance in field tests. In this regard, one factor that has been related to performance in a range of contexts is perfectionism (Madigan, Hill, Mallinson-Howard, Curran, & Jowett, 2018). In the present study, we sought to build on previous work by examining whether perfectionism also predicts performance in a series of fitness-based field tests. In doing so, we recruited three samples of student and junior athletes and explored relationships both within and across these samples.

Perfectionism

Perfectionism is a multidimensional personality characteristic that comprises excessively high personal standards which are accompanied by overly critical evaluations of personal performance (Frost, Marten, Lahart, & Rosenblate, 1990). The various dimensions of perfectionism have been conceptualised and measured in several ways in sport (Gotwals, Stoeber, Dunn, & Stoll, 2012). However, researchers now agree that such complexity can be captured by two higher-order dimensions of perfectionism. First, perfectionistic strivings which encompasses perfectionistic standards and a self-oriented striving for perfection. Second, perfectionistic concerns which reflects concerns over mistakes, feelings of discrepancy between one's standards and performance, and negative reactions to imperfection (Gotwals et al., 2012; Stoeber & Otto, 2006). These two dimensions have been

studied extensively in sport and other performance contexts (e.g., Hill, Mallinson-Howard, & Jowett, 2018).

Perfectionism and Performance

Perfectionism has long been tied to performance. Early theorising proposed that perfectionism may lead to worse performance (e.g., Pacht, 1984). This is because the overly critical evaluations and perceived external pressures incorporated in dimensions of perfectionistic concerns may serve to underpin a debilitating pattern of cognitive, affective, and behavioural consequences (e.g., Limburg, Watson, Hagger, & Egan, 2017). However, others have argued that because perfectionism entails the setting of excessively high-performance standards, it could be a particularly energising characteristic, and these motivational qualities may drive better performance (e.g., Adler, 1956). It is perfectionistic strivings, and its related dimensions (e.g., striving for perfection), that encompass these motivational qualities. These ideas have been extended to the sport context where it is again perfectionistic strivings that have been tied to better performance, and perfectionistic concerns, and its related dimensions (e.g., negative reactions to imperfection), to potentially worse performance (e.g., Stoeber, 2012).

Empirical support for this pattern of relationships is strongest for perfectionistic strivings. For example, in a recent narrative review, Madigan et al. (2018) found that perfectionistic strivings was a relatively consistent predictor of better performance in a range of contexts. Support for the proposed debilitating pattern of performance consequences for perfectionistic concerns is more mixed. Across the domains of sport and education, findings for perfectionistic concerns are particularly ambiguous, with no clear pattern of relationships emerging (see also Stoeber, 2012). A recent meta-analysis in sport reiterates the findings of previous narrative reviews. Specifically, Hill et al. (2018) showed across six studies that perfectionistic strivings was a significant, small-to-medium positive predictor of sport

performance (r^+ = .24), whereas perfectionistic concerns was a nonsignificant, small positive predictor of sport performance (r^+ = .06). Similar findings are also evident in more recent studies and reviews in relation to basketball training performance (Madigan, Stoeber, Culley, Passfield, & Hill, 2018), physical education performance (Gaudreau, Louvet, & Kljajic, 2019), and academic performance (Madigan, 2019).

We note however that there are a number of key limitations to existing research. In this regard, we think there are three important issues. First, only a small number of studies have examined the relationship between perfectionism and performance in sport (e.g., k = 6 in Hill et al., 2018). Second, many of these studies have used laboratory tasks that lack ecological validity (e.g., Hill, Hall, Duda, & Appleton, 2011). Third, most studies have been underpowered, relying on small samples. As a particular example, Anshel and Mansouri (2005) examined perfectionism and performance in a body-balance task that included a failure manipulation in a sample of only 30 athletes. Overall, then, there appear to be several significant limitations of previous research and it is these limitations that may help explain the discrepancies between theory and research.

The Present Study

The aim of the present study was to examine the relationship between perfectionism and fitness-based field test performance in athletes. In doing so, we sought to address the aforementioned limitations of previous research and did so in three ways. First, we tested the relationships between perfectionism and performance over multiple samples of athletes. Second, we sought to quantify the effects across these samples and used a relatively new analytical technique – mini meta-analysis – to do so (Goh, Hall, & Rosenthal, 2016). This analysis is important because it provides more accurate estimations of effect sizes by combining effects from multiple samples. Finally, we examined these relationships using a range of ecologically valid and commonly used fitness-based field tests as our performance

measures (Krustrup et al., 2003). Specifically, then, we extended previous research by testing the perfectionism-performance relationship in context of jump, sprint, agility, and endurance field tests both within and across three samples of student and junior athletes. In terms of our expectations, based on the theoretical assertions and empirical findings articulated above, we expected that a dimension of perfectionism associated with perfectionistic strivings (i.e., striving for perfection) would be a positive predictor of performance, whereas we expected a dimension of perfectionism associated with perfectionistic concerns (i.e., negative reactions to imperfection) would be an ambiguous predictor of performance.

Method

Participants

For the present study, we recruited three unique samples of athletes.

Sample 1. The participants were 129 undergraduate student-athletes from a UK university (44.44% female, *M*age = 18.84 ± 1.23). The majority of the sample participated in invasion games (61%; e.g., football, rugby, and netball) and the remainder participated in other moderate-to-high dynamic sports requiring power, speed, agility, and endurance (49%; e.g., athletics, gymnastics, and net/racket/wall games). Participants were involved in their sport at recreational (*n* = 26), club/university (*n* = 74), county/regional (*n* = 13), national (*n* = 5), and unspecified levels (*n* = 11). They trained for an average of 6.59 ± 4.78 hours per week.

Sample 2. The participants were 136 undergraduate student-athletes from a UK university (41.18% female, *M*age = 19.10 ± 1.58). The majority of the sample participated in invasion games (56%; e.g., football, rugby, and netball) and the remainder participated in other moderate-to-high dynamic sports requiring power, speed, agility, and endurance (44%; e.g., athletics, gymnastics, and net/racket/wall games). Participants were involved in their sport at recreational (*n* = 21), club/university (*n* = 47), county/regional (*n* = 58), national (*n* =

2), semi-professional (*n* = 1), international (*n* = 2), and unspecified levels (*n* = 5). They trained for an average of 5.95 ± 5.35 hours per week.

Sample 3. The participants were 116 junior sports academy athletes (17.00% female, *M*age = 17.37 ± 0.83). All participants competed in invasion games (e.g., football, rugby). Participants were involved in their sport at county/regional (*n* = 88) and national levels (*n* = 28). They trained for an average of 10.97 ± 5.52 hours per week.

Procedure

Following ethical approval, participants were invited to take part in the studies during a practical class (Samples 1 and 2) or at training (Sample 3). All participants provided written informed consent. Participation involved completing the study questionnaire, which comprised two subscales from the Multidimensional Inventory of Perfectionism in Sport (MIPS; Stoeber, Otto, & Stoll, 2006). The subscales were striving for perfection (5 items, e.g., '*I feel the need to be perfect*'), which, if combined with dimensions from other models of perfectionism, would be indicative of perfectionistic strivings, and negative reactions to imperfection (5 items, e.g. '*I feel extremely stressed if everything doesn't go perfectly*'), which, if combined with dimensions from other models of perfectionism, would be indicative of perfectionistic concerns (Stoeber & Madigan, 2016). Participants responded on a five-point Likert scale (1 = "*never*" to 5 = "*always*").[1] Previous literature has cited support for the validity and reliability of the MIPS (e.g., Madigan, 2016; Stoeber & Madigan, 2016). In the current study, all perfectionism subscales demonstrated acceptable internal consistency: Sample 1 (striving for perfection: α = .89; negative reactions to imperfection: α = .85),

[1]In keeping with the original scale development paper, participants in Sample 2 responded on a 1 (*never*) to 6 (*always*) Likert scale (Stoeber et al., 2006).

Sample 2 (striving for perfection: $\alpha = .87$; negative reactions to imperfection: $\alpha = .82$), and Sample 3 (striving for perfection: $\alpha = .83$; negative reactions to imperfection: $\alpha = .80$).

Sample 1. On completing the study questionnaire, participants completed a countermovement jump test and a 20-metre sprint test. Countermovement jump height was captured using OptoJump™ (Microgate, Bolzano, Italy) and 20-metre sprint times were captured using a timing gate (Witty™, Microgate, Bolzano, Italy). Each test comprised three trials with a five-minute rest period between bouts to minimise fatiguing effects (Beckett, Schneiker, Wallman, Dawson, & Guelfi, 2009). At the start of each test, participants were asked to "Give it your best". No feedback was given to participants between trials as studies have demonstrated that providing feedback can influence effort on subsequent athletic performance trials (e.g. Hill et al., 2011). An average score across trials was then calculated.

Sample 2. On completing the study questionnaire, participants completed a series of five agility trials over 20-metres. Trial times were recorded using the Smartspeed™ system (Fusion Sport, Brisbane, Australia). When preparing themselves at Gate 1, the experimenter verbally gave participants a standardised 'Give your best performance' instruction. The timer started when the participant breached the light beam at Gate 1. As they breached the light beam at Gate 2 (10-metres), either Gate 3a or Gate 3b flashed at random indicating the finishing gate that they had to run to. The timer stopped when they breached the light beam at the correct finishing gate (Gate 3a or Gate 3b). This decision-making element was included to enhance the ecological validity of the trial. All trials were completed during a single session, interspersed with five-minute rest periods to minimise fatiguing effects, and again no feedback was given to participants between trials and an average score across trials was calculated.

Sample 3. On completing the study questionnaire, participants completed the Yo-Yo intermittent recovery test level one (Bangsbo, Iaia, & Krustrup, 2008). The test involves

running 20-meter shuttles with a five-second recovery period between bouts. The pace increases over time and is regulated by an auditory signal. The level achieved corresponds with the distance covered, time taken, and predicted VO2max. Moreover, there is evidence for validity and reliability and that scores correspond to on-pitch performance and VO2max (e.g., Schmitz et al., 2018). At the start of the test, participants were instructed to "Keep going until you can no longer keep up with the bleep".

Results

Preliminary Analyses

Following the recommendations of Tabachnick and Fidell (2007), the data were screened for missing data and univariate and multivariate outliers.

Sample 1. Small amounts of missing data were present for the perfectionism subscales (i = 5) and 20-metre sprint trials (n = 3) but no missing data were present for the countermovement jump trials. Of those participants with missing data, no participant had more than two missing data points. As the number of missing points was small, missing data were replaced by the mean of non-missing subscales or trials for each participant, respectively (Graham, Cumsille, & Elek-Fisk, 2003). No univariate (+/- 3.29, $p > .001$) or multivariate outliers were identified ($\chi^2_{[4]} = 18.48$, $p > .001$).

Sample 2. No missing data were present for the perfectionism subscales, but small amounts of missing data were present for the agility trials (20 of 680 trials = 2.94%). Of those participants with missing data, no participant had more than three missing agility trials: M = 1.25, SD = 0.58, which equated to: M = 0.15, SD = 0.45 missing trials per participant across the whole sample. As the number of missing trials was small, missing trial data were replaced by the mean of non-missing trials for each participant (Graham et al., 2003). Three univariate outliers (+/- 3.29, $p < .001$) and four multivariate outliers ($\chi^2_{[3]} = 16.27$, $p < .001$) were identified and removed.

Sample 3. Small amounts of missing data were present for the perfectionism subscales (i = 5). Of those participants with missing data, no participant had more than two missing data points. As the number of missing points was small, missing data were replaced by the mean of non-missing subscales or trials for each participant (Graham et al., 2003). No univariate (+/- 3.29, $p > .001$) or multivariate outliers were identified ($\chi^2_{[3]} = 16.27$, $p > .001$).

Descriptive Statistics and Bivariate Correlations

Descriptive statistics and bivariate correlations are displayed in Table 1.

Sample 1. Bivariate correlations indicated that striving for perfection had a significant, small, positive correlation with average countermovement jump height and a significant, small, negative correlation with average 20-meter sprint time. Negative reactions to imperfection showed no significant correlations with either outcome variable.

Sample 2. Bivariate correlations indicated that striving for perfection had a significant, small, negative correlation with agility time. Negative reactions to imperfection showed no significant correlation with agility time.

Sample 3. Bivariate correlations indicated that striving for perfection had a significant, small-to-medium, positive correlation with Yo-Yo test performance. Negative reactions to imperfection showed no significant correlation with Yo-Yo test performance.

Multiple Regression

As gender and number of hours spent training have previously been shown to affect performance in fitness-based field tests (e.g., Mujika, Santisteban, Impellizzeri, & Castagna, 2009), a hierarchical multiple regression was conducted for each of the samples and tests. In Step 1 of the model, gender and training hours were entered. In Step 2 of the model, striving for perfection and negative reactions to imperfection were entered.

Sample 1. For countermovement jump height, Step 1 was significant, $F(2,120) = 49.09$, $p = .001$. A combination of gender and training hours accounted for 45% of the variance in

countermovement jump height. In Step 2, the addition of striving for perfection and negative reactions to imperfection explained a non-significant 2% of additional variance in countermovement jump height, $\Delta F(2,118) = 2.38$, $p = .10$. In this regard, striving for perfection was a nonsignificant predictor ($\beta = .14$, $p = .07$) and negative reactions to imperfection was a nonsignificant predictor ($\beta = .12$, $p = .10$).

For 20-metre sprint trial time, Step 1 was significant, $F(2,120) = 81.52$, $p = .001$. A combination of gender and training hours accounted for 58% of the variance in 20-metre sprint trial time. In Step 2, the addition of striving for perfection and negative reactions to imperfection explained a significant 3% of additional variance in 20-metre sprint trial time, $\Delta F(2,118) = 4.44$, $p = .01$. In this regard, striving for perfection was a significant negative predictor ($\beta = -.17$, $p = .01$) and negative reactions to imperfection was a significant positive predictor ($\beta = .14$, $p = .03$).

Sample 2. For agility trial time, Step 1 was significant, $F(2,118) = 30.79$, $p = .001$. A combination of gender and training hours accounted for 34% of the variance in agility trial time. In Step 2, the addition of striving for perfection and negative reactions to imperfection explained a non-significant 2% of additional variance in agility trial time, $\Delta F(2,116) = .70$, $p = .50$. In this regard, striving for perfection was a nonsignificant predictor ($\beta = -.10$, $p = .27$) and negative reactions to imperfection was a nonsignificant predictor ($\beta = .01$, $p = .93$).

Sample 3. For Yo-Yo test performance, Step 1 was significant, $F(2,72) = 16.20$, $p = .001$. A combination of gender and training hours accounted for 31% of the variance in Yo-Yo test performance. In Step 2, the addition of striving for perfection and negative reactions to imperfection explained a significant 6% of additional variance in Yo-Yo test performance, $\Delta F(2,70) = 3.31$, $p = .04$. In this regard, striving for perfection was a significant positive predictor ($\beta = .26$, $p = .02$) and negative reactions to imperfection was a nonsignificant predictor ($\beta = -.03$, $p = .75$).

Mini Meta-Analysis

To determine the size of perfectionism-performance correlations across the three samples, we conducted a mini meta-analysis (Goh et al., 2016; see Madigan et al., 2019 for a recent example of this approach in sport). To do so, we followed Goh et al.'s recommendations and used fixed effects models. This analysis computes the inverse variance weighted mean correlation coefficients across our samples[2]. We calculated separate effects for striving for perfection and negative reactions to imperfection. Because only one effect from each sample should be used in meta-analysis (Lipsey & Wilson, 2001), we averaged the two effects from Sample 1. This resulted in an overall sample of $N = 381$. In addition, because effects are in both directions (e.g., a faster time = better performance and a higher level = better performance), we changed the signs of the correlations so that in all instances a positive correlation means better performance and a negative correlation means worse performance. Striving for perfection showed a small-to-medium positive and significant meta-correlation with performance ($r^+ = .24$ [95% CI = .15 to .34]). Negative reactions to imperfection showed a small negative and nonsignificant meta-correlation with performance ($r^+ = –.05$ [95% CI = –.16 to .05]).

Discussion

The aim of the present study was to examine the relationship between perfectionism and performance in a series of fitness-based field tests within and across a range of athlete samples. We expected that striving for perfection would be related to better performance and that negative reactions to imperfection would be an ambiguous predictor of performance. In line with our expectations, we found that striving for perfection predicted better sprint and Yo-Yo Test performance. Negative reactions to imperfection predicted worse sprint performance. When relationships were considered across samples (and tests), we found that

[2] Note, mini meta-analysis is based on bivariate relationships.

striving for perfection was positively related to performance (r^+ = .24), and, in line with our expectations, negative reactions to imperfection was unrelated to performance (r^+ = –.05).

Perfectionistic Strivings and Performance

Perfectionistic strivings, including striving for perfection, has long been tied to better performance (e.g., Stoeber & Otto, 2006). The present findings reiterate and extend this idea in context of fitness-based field test performance. This was the case both within samples (with differing performance tasks) and across samples (when the combined data were analysed). Importantly, findings within samples were evident even after a very large amount of the variance was already explained by gender and training hours. These findings are similar to previous findings both inside (Hill et al., 2018) and outside of sport (Madigan, 2019). Moreover, the small-to-medium size of the combined effect is similar to previous meta-analyses of perfectionism and performance (Hill et al., 2018; Madigan, 2019). As to why this relationship exists, previous work suggests that motivational processes may be highly relevant (e.g., autonomous motivation and mastery goals; Madigan et al., 2018) and may drive behaviours conducive to better performance (e.g., greater effort). Overall, then, the present findings show that striving for perfection appears central to the idea that perfectionism may confer performance benefits (Adler, 1956).

Although there are performance benefits to striving for perfection, if perfectionistic strivings was considered in its entirety there may be instances when its excessive and self-oriented elements may undermine performance. This idea is captured in Flett and Hewitt's (2016) notion of perfectionistic reactivity, which posits that perfectionistic strivings are a significant risk factor for distress when people fail to meet their own or external performance standards. Sport is rife with opportunities for failure and there is growing evidence to support the link between perfectionism and aversive reactions to failure in sport (Curran & Hill, 2018; Hill et al., 2011). Nonetheless, the pursuit of high personal standards in and of itself is

not problematic. Indeed, the endorsement of high personal standards is an integral part of sports participation. When the pursuit of high personal standards becomes excessive, however, this is likely to become problematic for athletes.

Perfectionistic Concerns and Performance

Perfectionistic concerns – comprising negative reactions to imperfection, concerns over mistakes, and socially prescribed elements of perfectionism – has been found to be a consistent predictor of negative cognitions, feelings, and behaviours, including many clinical outcomes (e.g., Limburg et al., 2017). However, research has provided mixed results with respect to performance (e.g., Stoeber, 2012). Hence, we expected that negative reactions to imperfection would be an ambiguous predictor of fitness-based field test performance. In one of the four tasks, namely 20-metre sprint, negative reactions to imperfection was a negative predictor of performance but when data were combined across samples, negative reactions to imperfection was unrelated to performance. This finding is in line with previous research in sport (Hill et al., 2018). Due to these complexities, once again, we reiterate calls for more studies examining perfectionistic concerns and performance (e.g., Madigan et al., 2018), though, we add, that it may well soon be time for us to change the conditions under which we examine dimensions related to perfectionistic concerns and performance. Lizmore, Dunn, Causgrove Dunn, and Hill (2019) recently provided an apt example of this. They examined competitive golf-putting performance under conditions of competitive failure and showed that putting performance was worse under conditions of failure as perfectionistic concerns increased. Further research of this nature appears necessary if the theoretically debilitating nature of perfectionistic concerns for sport performance is to be understood.

Considering the above, although there may only be a small (if any) direct relationship between negative reactions to imperfection and performance, there are likely numerous other indirect pathways through which negative reactions to imperfection may interfere with

performance. For example, perfectionistic concerns have been linked with overtraining, injury, and negative pre-competition emotions (Donachie, Hill, & Madigan, 2019; Madigan, Stoeber, Forsdyke, Dayson, & Passfield, 2018; Madigan, Stoeber, & Passfield, 2017). As such, further studies are required that also account for these complexities. Season-long studies that include multiple measures (e.g., training load, injury, and performance) and allow the disaggregation of between- and within-person effects may be particularly useful in this regard.

Practical Implications

The present findings may be useful for making recommendations to those working in sport. In particular, for sport scientists, being aware of and perhaps monitoring athletes' levels of striving for perfection may be useful to ensure that athletes are focused on pursuing high personal standards rather than excessively high personal standards that are likely to engender problematic outcomes. Monitoring negative reactions to imperfection may also be worthwhile. Although the performance effects of negative reactions to imperfection are ambiguous, it is still important to reiterate the myriad ways perfectionistic concerns are harmful to athletes. To monitor both striving for perfection and negative reactions to imperfection, sports scientists may wish to adopt the MIPS as a brief, 10-item measure of perfectionism for the athletes that they work with (see Madigan, 2016 for the items and 5-point response format). We also would like to reiterate that in order to capture the full complexity of perfectionism, sport scientists should follow the recommendations of Stoeber and Madigan (2016) and include multiple indicators of perfectionistic strivings and perfectionistic concerns when monitoring athletes. There is also growing evidence that coaches may play a role in the development of negative reactions to imperfection (Madigan et al., 2019). One way to mitigate the development of such outcomes would be to adopt an autonomy supportive coaching style (e.g., Mallinson & Hill, 2011). This approach has

benefits that would reach far beyond mitigating against the development of negative reactions to imperfection, including helping to promote the setting and pursuit of personal (achievable) goals (e.g., Conroy & Coatsworth, 2007).

Limitations and Future Research

The present study has several limitations. First, the findings may not generalise beyond the present samples. This may be particularly the case for elite athletes where variance in performance is likely much smaller. Future studies should therefore re-examine these relationships in additional samples including in elite athletes. Second, the study represents cross-sectional snapshots of performance in athletes of varying abilities. In order to better establish temporal and causal relations between perfectionism and field test performance, longitudinal studies are required. Although there are studies examining perfectionism and performance over a tournament/competition (e.g., Hill, Stoeber, Brown, & Appleton, 2014), studies that employ a longer study period would be useful in terms of determining whether the present effects persist over time.

Third, due to pragmatic reasons (time constraints when testing in a field setting), the present study only measured striving for perfection and negative reactions to imperfection, which limits the insights that can be gleaned into the two, broad, higher-order dimensions of perfectionism (Stoeber & Madigan, 2016). Researchers should re-examine the present relationships with multiple measures of perfectionistic strivings and perfectionistic concerns. In addition to the one used in the present study, the Sport-Multidimensional Perfectionism Scale-2 would be particularly useful (Gotwals & Dunn, 2009). Fourth, whilst the tests included in this study are arguably higher in ecological validity than previous protocols (e.g., Hill et al., 2011), the level of evaluative threat experienced during these fitness-based field tests was probably quite low because there was no element of competition, criterion performance standards and performance feedback were not provided, and there were no

people present who could meaningfully evaluate the athletes' performance. To view the potentially more destructive elements of perfectionism, such evaluative threat may be necessary to activate feelings of discrepancy between one's standards and performance. To test this possibility, future studies should ensure elements of competition, feedback, or criteria for self-evaluation are sufficiently emphasised.

Fifth, the amount of variance explained by perfectionism, having controlled for gender and training volume, could be considered relatively small (≤ 6%). While not trivial, particularly in terms of performance, the size of this effect should be weighted accordingly when working with athletes. Finally, the study adopted an independent effects approach to examine the unique (or residual) effects of striving for perfection and negative reactions to imperfection (Jowett, Mallinson, & Hill, 2016). However, it should be noted that striving for perfection and negative reactions to imperfection coexist to differing degrees within athletes. Therefore, to further enhance our understanding of the perfectionism-performance relationship in sport, adopting an approach that allows the combined (or interactive) effects of striving for perfection and negative reactions to imperfection to be examined would be worthwhile (see Lizmore et al., 2019 for a recent example of this approach).

Conclusion

It appears that perfectionism is important for fitness-based field test performance. In this regard, the present findings indicate that striving for perfection may predict better performance, while negative reactions to imperfection appears to be ambiguous.

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Table 1. *Descriptive statistics and bivariate correlations for all three samples.*

	M	*SD*	1	2	3
Sample 1					
1. Striving for perfection	3.53	0.80			
2. Negative reactions to imperfection	2.39	0.77	.33**		
3. Countermovement jump height	27.38	7.42	.21*	–.14	
4. 20-metre sprint time	3.53	0.33	–.24**	.16	–.75**
Sample 2					
1. Striving for perfection	4.19	0.95			
2. Negative reactions to imperfection	3.18	1.09	.47**		
3. Agility trial time	3.26	0.37	–.24**	–.10	
Sample 3					
1. Striving for perfection	3.19	0.80			
2. Negative reactions to imperfection	2.80	0.78	.48**		
3. Yo-Yo test level	15.81	1.69	.26**	.11	

Note. Sample 1, $N = 129$. Sample 2, $N = 136$. Sample 3, $N = 116$. *$p < .05$. **$p < .01$.