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A re-examination of the 2x2 model of perfectionism, burnout, and engagement in sports

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Abstract

Studies examining perfectionism, engagement and burnout in sport have produced different levels of support for the hypotheses of the 2 × 2 model of perfectionism. One explanation for why this is so is that researchers have used different measures of perfectionism when testing the hypotheses. To determine whether this is the case, in the current study we retested the hypotheses of the 2 × 2 model for engagement and burnout using different measures of perfectionism. A sample of 401 adult athletes from various sports and levels completed measures of athlete engagement and burnout, along with two measures of perfectionism. Moderated regression analyses revealed that support for the hypotheses of the 2 × 2 model did indeed differ depending on the measure of perfectionism. This was evident for both burnout (emotional and physical exhaustion and reduced sense of accomplishment) and engagement (dedication and vigor). The findings are aligned with similar work that has found differences in support for the hypotheses of the 2 × 2 model when using other measures of perfectionism for engagement and, importantly, provide the first evidence that this extends to athlete burnout. Researchers will need to consider the influence of the measures of perfectionism used when interpreting, comparing, and summarising future research on the 2 × 2 model for these and other outcomes.

Highlights

- Support for the hypotheses of the 2 × 2 model depended on the measure of perfectionism.
- We confirmed findings of previous studies that this occurs for athlete engagement
- We illustrated for the first time that this also occurs for athlete burnout

Keywords: 2 × 2 model of dispositional perfectionism, personal standards perfectionism, evaluative concerns perfectionism, sport engagement, burnout

A re-examination of the 2 × 2 model of perfectionism, burnout, and engagement in sport

The way athletes respond to the demands of sport varies widely. Some athletes are able to garner considerable enjoyment from their participation even when sport is extremely physically and mentally taxing. Other athletes respond to the same experiences very differently with participation being unenjoyable, stressful, and altogether much more negative. Understanding the factors that make positive and negative experiences in sport more likely is an important task for sport psychologists. With this in mind, in the present study, we re-examine the relationship between perfectionism, athlete burnout, and athlete engagement, with particular emphasis on better understanding how dimensions of perfectionism interact to predict these two opposing outcomes and, importantly, whether the observed relationship depends on the particular dimensions examined and on the measure of perfectionism used.

Burnout and Engagement

Athlete burnout is defined as a cognitive-affective syndrome comprising emotional and physical exhaustion, reduced sense of accomplishment, and devaluation (Raedeke & Smith, 2001). Emotional and physical exhaustion is a depletion of essential resources for participation. Reduced sense of accomplishment is a negative evaluation of one's abilities and achievements. Devaluation is a loss of value attached to sport participation. Attesting to the importance of understanding burnout, research has found it to be related to depressed mood (Gustafsson et al., 2008), performance issues (Gustafsson, et al., 2017), and increased likelihood of dropout (Isoard-Gautheur et al., 2016). In addition, against the backdrop of the pressures and stress that some sports participants report (e.g., Gustafsson et al., 2008), it is a syndrome that appears common in sport and may even be increasing (Gould & Dieffenbach, 2002).

Athlete engagement is a contrasting outcome to burnout. Although at one time proposed to be the conceptual opposite of burnout, it is now largely viewed as a separate construct (Schaufeli, 2013). As such, studying burnout and engagement in tandem, rather than one or the other, provides a fuller picture of potential experiences in sport (DeFreese & Smith, 2013). Athlete engagement is defined as a positive sport-related mental state (Guillen & Martinez-Alvarado, 2014). It is characterized by three dimensions: vigor, dedication, and absorption. Vigor is energy and resilience to setbacks and

difficulties. Dedication is enthusiasm, inspiration, and pride. Absorption is concentration and immersion in the task. In support of the notion that athlete engagement is something to be encouraged, research has found it to be related to more autonomous motives for participation (e.g., intrinsic reasons; Martin & Malone, 2013), enjoyment (Lonsdale et al., 2007), and better sport performance (Stolarski et al., 2020).

Multidimensional Perfectionism

One factor associated with both athlete burnout and engagement is perfectionism. Perfectionism is a multidimensional personality trait that includes unrealistically high standards combined with overly harsh evaluation (Frost et al., 1990). Several models are used to study perfectionism in sport. These include models that focus on whether perfectionistic standards and evaluation are directed towards the self (self-oriented perfectionism) or perceived to be imposed by others (socially prescribed perfectionism), as in Hewitt and Flett's (1991; HF-MPS) model. They also include models that focus on separate features of perfectionism such as high personal standards and striving for perfection, or being overly concerned by mistakes, having persistent doubts about performance, and reacting negatively to mistakes, as in Gotwals et al.'s (2009; S-MPS-2) and Stoeber et al.'s (2007; MIPS) models. Corresponding measures can be used separately or combined to create two higher-order dimensions - personal standards perfectionism (PSP) and evaluation concerns perfectionism (ECP). When combined, PSP is manifested by self-oriented perfectionism, high personal standards, and striving for perfection whereas ECP is manifested by socially prescribed perfectionism, concerns over mistakes, and negative reactions to imperfection (Stoeber & Madigan, 2016).

The interaction between dimensions of perfectionism has recently become one of the main focuses of researchers in sport. Gaudreau and Thompson (2010) have offered the most popular framework for studying interactions in their 2 × 2 model of perfectionism. The model distinguishes between four within-person combinations of perfectionism: non-perfectionism (low PSP/low ECP), pure PSP (high PSP/low ECP), pure ECP (low PSP/high ECP), and mixed perfectionism (high PSP and high ECP). These combinations are hypothesized to differ in their effects based on the configuration of the two dimensions. Pure PSP is hypothesised to be better (H1a), worse (H1b), or

similar (H1c) to non-perfectionism. Pure ECP is hypothesised to be associated with worse outcomes than non-perfectionism (H2) and mixed perfectionism (H3). Finally, mixed perfectionism is hypothesized to be associated with worse outcomes than pure PSP (H4). The four combinations of perfectionism together with the hypotheses of the 2 × 2 model are presented in Figure 1.

Perfectionism, Engagement, and Burnout

Researchers have examined the hypotheses of the 2 × 2 model for athlete engagement and athlete burnout. In regards to athlete burnout, two studies have taken place to date. In the first study, Hill (2013) found support for H1a and all other hypotheses of the model for reduced sense of accomplishment, support for H1c, H2, and H4, but not H3, for exhaustion, and H1c, H2, and H3, but not H4, for devaluation. In other words, the study indicated that for reduced sense of accomplishment, high PSP is always more beneficial than low PSP regardless of the level of ECP, but for exhaustion and devaluation this was not always the case where sometimes in conferred limited or no benefit. In addition, for reduced sense of accomplishment and devaluation, high ECP is always associated with worse outcomes than low ECP regardless of the level of PSP, but not for exhaustion where its impact was sometimes more muted.

In the second study, an examination of the same relationships over time, Madigan et al. (2016) found the same support as Hill (2013) for H1a and all other hypotheses for reduced sense of accomplishment. However, the study differed to Hill (2013) in regards to the other two symptoms, with the longitudinal study finding support for H1c, H2, and H3, but not H4, for exhaustion and support for H1a and H3, but not H2 and H4, for devaluation. The sources of the difference between the two studies was that the first study found a significant interaction between PSP and ECP in predicting devaluation whereas the second study found a significant interaction between PSP and ECP in predicting exhaustion. Thus, the two studies differ in whether, for exhaustion, a combination of high levels of both ECP and PSP (mixed perfectionism) is associated with better or worse outcomes compared to when either ECP is low (Pure PSP) or PSP is low (Pure ECP). And, for devaluation, whether high levels of PSP (Pure PSP) or high levels of ECP (Pure ECP) are associated with better outcomes than low levels of both (non-perfectionism).

In regards to athlete engagement, one study has been conducted to date (Hill et al., 2020). The study tested the hypotheses of the 2 × 2 model in three samples using different measures of perfectionism in each sample and provided 24 tests per hypothesis. H1a was supported most of the time (75%) and H1c supported the rest of the time (25%). H2 was supported half the time (50%). H3 was supported most of the time (83%). Finally, H4 was supported less than half the time (42%). Key to these findings was that the instrument used to measure perfectionism had an impact on what hypotheses were supported. For example, support was more likely for H4 when using the S-MPS-2 (63%) than either HF-MPS (25%) or the MIPS (40%). In addition, interactions between PSP and ECP only occurred when using the HF-MPS. We take these findings to signal that differences in the results of Hill (2013) and Madigan et al. (2016) for burnout may also be due to the use of different measures in the same way. In addition, the findings also allude to the possibility that other measures of perfectionism may result in different support for the model when examining engagement too.

With the aforementioned studies in mind, the current study sought to extend existing research in two ways. First, we re-examine the perfectionism-burnout relationship to better understand when the hypotheses of the 2 × 2 model are likely to be supported and for which symptoms and, in particular, when interactions may or may not exist, for devaluation (as in Hill, 2013) or exhaustion (as in Madigan et al., 2016). Second, in the same way, we also re-examine the perfectionism-engagement relationship to do the same and further examine the notion that different measures of perfectionism may produce different findings. To do both of these things, in the current study we retest the hypotheses of the 2 × 2 model using multiple measures of perfectionism: measures of perfectionism that have been used in existing research (S-MPS-2) and measures not yet used when examining the interactive effects of perfectionism on burnout and engagement (a sport specific version of the HF-MPS, Performance Perfectionism Scale-Sport; Hill et al., 2016). This allowed us to determine whether support for the hypotheses of the model and interaction effects, especially, differ for engagement and burnout depending on the measure of perfectionism used.

Aim and Hypotheses

The aim of the current study is to re-examine the interaction between PSP and ECP in predicting burnout and engagement so to compare findings when using different measures of

perfectionism. To do so, we tested the hypotheses of the 2 × 2 model and then systematically compared support for them when using different instruments. We expected findings to differ for each instrument with greater differences indicative of our overall hypothesis that measures of perfectionism produce different findings for the model. The four discreet hypotheses of the model are:

(H1a) Pure PSP is associated with lower burnout and higher engagement than non-perfectionism.

(H2) Pure ECP is associated with the highest level of burnout and the lowest level of engagement.

(H3) Mixed perfectionism is associated with lower burnout and higher engagement than pure ECP.

(H4) Mixed perfectionism is associated with higher burnout and lower engagement than pure PSP.

Method

Participants and procedure

A total of 401 Polish athletes took part in the study. Participants were recruited via a company specializing in panel research (Pollster) and completed an online questionnaire. To ensure the highest quality of the data, we excluded all entries from participants who did not finish the survey or failed one of three attention checks (e.g., "In this question select 'I strongly disagree'."). The final sample was 377 athletes (201 females, 176 males) aged 18 to 40 (M = 26.13, SD = 6.01) from various sports (e.g., running, football, volleyball) and levels (87 recreational, 166 amateur, 105 semi-professional, and 19 professional). Ethical approval was granted by the ethics board at the institution of the first author.

By way of benchmarking the sample size, others have noted that interaction effects of perfectionism in sport range from ΔR^2 <.010 to .046 (e.g., Crocker et al., 2014; Gaudreau & Verner-Filion, 2012; Madigan et al., 2016) and that detection of typical interaction effects require samples between 152 and 256 in hierarchical regression analysis (ΔR^2 .03 to .05; α = .05, power = .80, tested predictors =1, total predictors = 3; Hill et al, 2020). In these regards, the current sample size is large and allows detection of $\Delta R^2 \geq .02$ (α = .05; power = .80).

Measures

Engagement. Athlete engagement was measured using the Polish adaptation of the Sport Engagement Scale (SES; Guillen & Martinez-Alvarado, 2014). The Polish version was created by Stolarski et al. (2020). Like the original scale, it comprises three subscales: vigor (5 items; e.g., "I am very persistent in my sport activity"), dedication (5 items; e.g., "My sport activity is a self-challenge"), and absorption (5 items; e.g., "I am absorbed in my sport activity"). Validation of the scale included the assessment of the factor structure, internal reliability, and associations with burnout in several sport samples (Stolarski et al., 2020).

Burnout. Athlete Burnout was measured using the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001) in the Polish adaptation by Cichosz-Dziadura et al. (2019). It comprises three subscales: emotional and physical exhaustion (5 items; e.g., "I feel physically worn out from [sport]"), sport devaluation (5 items; e.g., "I have negative feelings toward [sport]"), and reduced sense of accomplishment (5 items; e.g., "I feel less successful at [sport]"). Raedeke and Smith (2001) provide evidence for the adequate reliability and validity of the measure, based on the factor structure and internal consistency, while Cichosz-Dziadura et al. (2019) provide evidence for reliability and validity of the Polish adaptation, based on the internal reliability, and associations with the Polish adaptation of Sport Motivation Scale - 6 (Blecharz et al., 2015)

Perfectionism. Perfectionism was measured using two scales. The first was the Sport-Multidimensional Perfectionism Scale-2 (S-MPS-2; Gotwals & Dunn, 2009). This is a sport-specific adaptation of the Multidimensional Perfectionism Scale (Frost et al., 1990). Two of its six subscales were used in the current study: personal standards (PS; e.g., "I have extremely high goals for myself in my sport") and concern over mistakes (COM; "I should be upset if I make a mistake in competition"). The second was the Performance Perfectionism Scale–Sport (PPS-S; Hill et al., 2016). This scale is based on Hewitt and Flett's (1991) model of perfectionism. Two of its three subscales were used in the current study: self-oriented performance perfectionism (SOPP; 4 items; e.g., "I put pressure on myself to perform perfectly"), and socially prescribed performance perfectionism (SPPP; 4 items; "People always expect my performances to be perfect"). We used PS and SOPP as indicators of PSP, and COM and SPPP as indicators of ECP. In doing so, we followed the recommendations of

Stoeber and Madigan (2016) who identify these subdimensions as appropriate markers of the two-higher dimensions of perfectionism. In addition, this approach mirrors previous research on 2 × 2, burnout (Hill, 2013; Madigan et al., 2016) and engagement (Hill et al., 2020) who used the same or equivalent measures.

Unlike for engagement and burnout, Polish versions of these two scales were not available. Therefore, for the purpose of this study, the scales were translated by the first author and then back-translated by an independent sport psychologist. We also assessed the factor structures of the two scales using confirmatory factor analyses (CFA) with maximum likelihood estimation and conventional criteria for assessing fit (Marsh et al., 2004). CFA provided support for the hypothesised two-factor structures of the scales with all items loading significantly on the target subscales (p <.05). Fit indices for S-MPS-2 were $\chi^2 = 132.07$, $p < 0.001$, df = 78, χ^2/df = 1.69, RMSEA [90% CI] =.04 [0.03, 0.06], CFI =.97, TLI =.96, SRMR =.04. Fit indices for PPS-S were $\chi^2 = 47.23$, $p < 0.001$, df = 15, χ^2/df = 3.15, RMSEA [90% CI] =.08 [0.05, 0.10], CFI =.97, TLI =.95, SRMR =.04. The Polish versions of the PPS-S and SMPS-2 used in the current study are provided in Supplementary materials.

Analytical strategy

First, we calculated correlations between all subscales of perfectionism, engagement, and burnout. Second, we used moderated regression analyses to examine the main and interactive effects of dimensions of perfectionism. This included examining a regression model with both dimensions of perfectionism and their interaction term. If the interaction term was not statistically significant, a main effects model was estimated without the interaction term (Gaudreau, 2012). Perfectionism variables were centred prior to creating the interaction term. Statistical analyses were conducted using IBM SPSS and AMOS 27.0 and PROCESS macro version 3.5 (Hayes, 2017).

Results

Preliminary analyses

Before the main analyses, we screened the data for missing values and none were found. Next, we screened for univariate outliers, removing five participants (z-score ≥ 3.29), and for multivariate outliers, removing one participant (Mahalanobis distance > critical value at p < 0.001)

(Tabachnick & Fidell, 2007). Finally, we used MacDonald's omega to assess internal reliabilities of scales and all were satisfactory (see Table 1).

Descriptive statistics and correlations

Descriptive statistics and bivariate correlations are displayed in Table 1. All indicators of PSP and ECP were positively correlated. All dimensions of engagement were positively correlated with indicators of PSP and unrelated to indicators of ECP (with the exception of a positive correlation between COM and absorption). By contrast, all symptoms of burnout were positively correlated with the indicators of ECP and unrelated to indicators of PSP (with the exceptions of a negative correlation between reduced sense of accomplishment and PS and a positive correlation between SOPP and exhaustion).

Moderated regressions

The results of moderated regressions are presented in Table 2 and support for hypotheses summarised in Table 3. Additional plotting of statistically significant interactions is provided in Supplementary materials.

Athlete Engagement

PPS-S. SOPP was a significant positive predictor of all dimensions of engagement, while SPPP was a significant negative predictor of all dimensions of engagement (p <.05). The overall models explained between 8.3 and 13.9% variance in dimensions of engagement. The interaction term was significant in all models, explaining an additional 1.6% of variance in absorption, 2.7% in dedication, and 1.5% in vigor. The pattern of effects provided support for H1a, H2, and H3 (but not H4) for all subscales of engagement.

S-MPS-2. PS was a significant positive predictor of all dimensions of engagement, while COM was a significant negative predictor of dedication and vigor (p <.05). The overall models explained between 13.1 and 21.7% variance in dimensions of engagement. The interaction term was significant in all models, explaining an additional 1.8% of variance in absorption, 1.7% in dedication, and 1.0% in vigor. The pattern of effects provided support for H1a, H2, H3, and H4 for dedication and vigor, and H1a, H2, and H3 (but not H4) for absorption.

Athlete Burnout

PPS-S. SOPP was a significant predictor of devaluation and reduced sense of accomplishment, while SPPP was a significant positive predictor of all symptoms of burnout (p <.05). The overall models explained between 3.5 and 11.2% variance in symptoms of burnout. The interaction term was insignificant in all models. After excluding the interaction term, all three models were significant.

For exhaustion, $F(2, 368) = 22.83$, $p < .001$, R2 = .11, SPPP was a significant predictor (B = 0.27, 95% CI = 0.18 to 0.35, $p < .001$) but SOPP was not (B = -0.05, 95% CI = −0.12 to 0.03, p = .210).

For reduced sense of accomplishment, $F(2, 368) = 6.36$, $p = .002$, R2 = .03, SPPP was a significant predictor (B = 0.13, 95% CI = 0.06 to 0.20, $p < .001$) but SOPP was not (B = -0.06, 95% CI = −0.12 to 0.04, $p = .069$).

For devaluation, $F(2, 368) = 12.99$, p < .001, R2 = .07, SPPP (B = 0.20, 95% CI = 0.12 to 0.28, $p < .001$) and SOPP (B = -0.07, 95% CI = -0.14 to -0.03, $p = .041$) were significant predictors.

The pattern of effects provided support for H1c, H2, and H4 (but not H3) for exhaustion and reduced sense of accomplishment, and H1a, H2, H3, and H4 for devaluation.

S-MPS-2. PS was a significant negative predictor of all symptoms of burnout, while COM was a significant positive predictor of all symptoms of burnout (p <.05). The overall models explained between 7.8 and 15.1% variance in symptoms of burnout. The interaction term was insignificant in all models (noting devaluation $p = .056$ and explaining 0.9% of additional variance). After excluding the interaction terms all three main effects models were significant.

For exhaustion, $F(2, 368) = 28.26$, $p < .001$, $R^2 = .13$, with PS (B = -0.19, 95% CI = -0.32 to -0.06, $p = .005$) and COM (B = 0.43, 95% CI = 0.32 to 0.55, $p < .001$) significant predictors.

For reduced sense of accomplishment, $F(2, 368) = 30.86$, $p < .001$, $R^2 = .14$, with PS (B = -0.34, 95% CI = -0.45 to -0.23, $p < .001$) and COM (B = 0.34, 95% CI = 0.25 to 0.44, $p < .001$) significant predictors.

For devaluation, $F(2, 368) = 13.49$, $p < .001$, $R^2 = .07$, with PS (B = -0.19, 95% CI = -0.31 to -0.07, $p = .003$) and COM (B = 0.29, 95% CI = 0.18 to 0.39, $p < .001$) significant predictors.

This pattern of effects provided support for H1a, H2, H3, and H4 for all symptoms of burnout.

Discussion

The main aim of the study was to re-examine the interaction between PSP and ECP in predicting athlete burnout and engagement to compare findings using different measures of perfectionism and when testing the hypotheses of the 2 × 2 model of perfectionism. We expected findings to differ for each instrument with greater differences indicating that measures of perfectionism produce different findings for the model. For engagement, the measures produced the same findings for all dimensions of engagement for three of the four hypotheses. However, differences emerged for two of the three dimensions (dedication and vigor) for one of the four hypotheses (H4). For burnout, differences were more pronounced. The measures produced different findings for two of the three symptoms (reduced sense of accomplishment and emotional and physical exhaustion) for two of the four hypotheses (H1 and H3).

Revisiting burnout and engagement

The current study provides the first evidence that using different measures of perfectionism will yield different levels of support for the hypotheses of the 2 × 2 model when assessing athlete burnout. Notably, whether support was found for H1 and H3 depended on whether the PPS-S or the S-MPS-2 was used to measure perfectionism. Of note, when using PPS-S, no comparable benefits were evident for having high PSP (SOPP) when accompanied by either low (H1) or high (H3) ECP (SPPP) for exhaustion and reduced sense of accomplishment. However, when using S-MPS-2, the comparable benefits of high PSP (PS) were evident for these symptoms. As such, it appears to be the case that not all indicators of PSP and ECP have similar effects and support for the 2 × 2 model will in part depend on the instrument used. Some combinations of perfectionism will appear more beneficial, problematic or neutral than others. Researchers and practitioners will need to consider the influence of the measures chosen when testing the 2 × 2 model in the future and when seeking to determine which athletes are most at risk of burnout.

This issue has the potential to partly explain the differences in findings between previous

studies examining the 2 × 2 model of perfectionism and athlete burnout (Hill, 2013; Madigan et al., 2016). For example, why Hill (2013) found an interaction effect for devaluation but Madigan et al. (2016) found an interaction effect for exhaustion, and why the overall pattern of support for the hypotheses of the 2 × 2 model differed in the studies. However, our study is somewhat ambiguous in resolving previous discrepancies with no statistically significant interaction terms, plus both similarities and differences to the two studies in regards to support for the hypotheses. For example, for devaluation, like Hill (2013) we found full support for H2 but, like Madigan et al (2016), we also found full support for H1a. While we cannot resolve the differences between studies, the overall findings clearly indicate the potential for the use of different measures in the two studies to be at least one reason for inconsistent findings for burnout.

The findings for engagement were less supportive of the notion that different measures of perfectionism will produce different levels of support for the 2 × 2 model. Differences in findings were more limited and evident only for H4 for dedication and vigor. For other dimensions and hypotheses, the measures produced the same findings. Unlike for burnout, for example, the benefits of high PSP were evident when accompanied by both low and high ECP most of the time, regardless of the measure of perfectionism or indicator of PSP (SOPP or PS). In addition, significant interactions were found for all facets of engagement and for both measures of perfectionism. In all, then, the two instruments generally provided similar results. At least, the findings were more similar than those reported by Hill et al. (2020) when comparing other perfectionism instruments when predicting engagement. It appears, then, that while perfectionism instruments produce markedly different support for the hypotheses of the 2 × 2 model for engagement, some instruments are more similar than others.

One of the advantages of including both burnout and engagement in the current study is that we can compare how measures of perfectionism predict these two different outcomes. For engagement, there were more instances of similarity than differences, with differences only emerging for H4. For burnout, differences were more evident and included H1 and H3. As such, we can also note that the differences in support for the 2 x 2 model when using different measures may also depend on the outcome being measured. In these regards, a more complex picture emerges for

researchers interested in the interactive effects of perfectionism and the 2 × 2 model, in particular, whereby the predictive ability and utility of the model will vary depending on instrument and outcome, and likely other factors, too (e.g., sample characteristics). Future research will need to better chart these differences and build a more nuanced picture of when perfectionistic dimensions interact with each other to create discernibly different experiences for sports participants. Otherwise, we may erroneously generalise and assume effects and differences across studies.

Practical implications

Our results provide several practical implications for both researchers and practitioners. First, the fact that measures differ in providing support for the hypotheses of the 2 × 2 model highlights how important it is to choose a measure that captures dimensions of perfectionism most pertinent to the study aims. Besides doing so, and considering issues of reliability, we also encourage researchers to select the measure that provides the best theoretical footing for the research and hypotheses. Second, as the measures are so influential they need to be considered when interpreting, comparing, and summarising research using the 2 × 2 model and examining burnout and engagement. Instruments appear to be a key moderating factor in the model that, to this point, have been underappreciated. Third, although we have focused on burnout and engagement in the current study, it is likely that the findings extend to other outcomes in the 2 × 2 model (e.g., positive affect; Gaudreau & Verner-Filion, 2012; Mallinson-Howard et al., 2019). As such, differences in findings in these studies, too, may be accounted for by measures of perfectionism. Finally, practitioners seeking to translate research findings into an applied context are strongly advised to consider the measures used. As evidenced here, some dimensions of perfectionism, and some subtypes, are comparably better or worse, depending on the particular features. This has direct consequences for their ability to identify those at risk of burnout or in need of engagement. The type of intervention, too, will also differ depending on the particular subtypes being exhibited. Although complex, knowledge of what particular perfectionism dimensions interact, in what ways, and for what outcomes, is quickly becoming essential for those seeking to support perfectionistic athletes in sport.

Limitations and future directions

The current study has several limitations. First, the study was cross-sectional, thus we make

no claims to causality between the measured variables. Second, the generalisability of the findings needs to take into account the sample characteristics. This includes age, gender, and sport, along with other factors (Hill et al., 2018). We note that our study is one of the few to include a sample not draw from North American or Britain. Increasing diversity among samples in this area is ultimately required to better understand perfectionism. For now, the features of the sample and how they differ to previous studies are also possible explanatory factors for differences in findings. Third, a related issue is how the use of adapted instruments, to allow their use in a Polish sample, may have affected the findings. Our analyses indicate the instruments have adequate validity and reliability but differences between these and original instruments may also explain differences in our findings. Last, it is possible that other factors moderate the relationship between perfectionism, engagement and burnout, such as current form or satisfaction, again accounting for differences between studies. Researchers should consider including these factors in future research.

Conclusion

We have found evidence that support for the hypotheses of the 2 × 2 model depended on the measure of perfectionism used for both athlete engagement and burnout. This confirms previous findings when examining engagement and provides the first evidence that this may be the case for athlete burnout. Researchers will need to consider the influence of the measures of perfectionism used when interpreting, comparing, and summarising future research on the 2 × 2 model for these and other outcomes.

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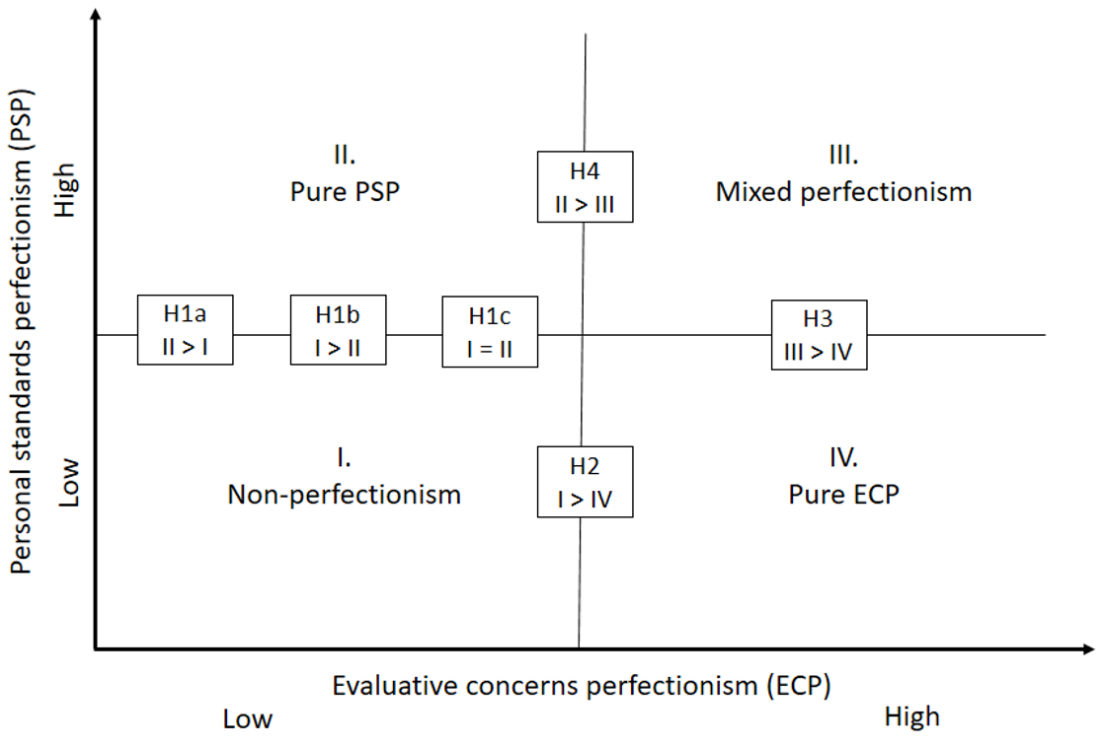

Figure 1. The four within-person combinations of perfectionism and the hypotheses of the 2 × 2 model of perfectionism.

Note. ‘>’ denotes better outcomes, ‘=’ denotes equivalent outcomes.

Table 1. Descriptives and bivariate correlations between perfectionism, engagement, and burnout.

Variable	M	SD	ω	1	2	3	4	5	6	7	8	9	10
1. High personal standards	3.26	0.67	.78	-									
2. Concern over mistakes	2.65	0.77	.84	.51***	-								
3. Self-oriented performance perfectionism	4.21	1.27	.82	.58***	.54***	-							
4. Socially prescribed performance perfectionism	3.21	1.08	.75	.41***	.54***	.56**	-						
5. Absorption	3.83	0.66	.80	.33***	.12*	.33**	.08	-					
6. Dedication	3.98	0.62	.84	.34***	-.08	.22**	-.03	.72***	-				
7. Vigor	3.81	0.67	.84	.40***	.01	.25**	.04	.70***	.82***	-			
8. Physical/emotional exhaustion	2.25	0.79	.84	.06	.34***	.13*	.33***	-.26***	-.39***	-.41***	-		
9. Sport devaluation	2.51	0.72	.73	-.02	.21***	.05	.24***	-.27***	-.39***	-.37***	.70***	-	
10. Reduced sense of accomplishment	2.62	0.64	.68	-.14**	.23***	-.01	.16**	-.33***	-.50***	-.46***	.59***	.64***	-

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, two-tailed.

Table 2. Moderated regression for perfectionism predicting engagement and burnout.

Dependent variable	Absorption			Dedication			Vigor			Physical/emotional exhaustion			Sport devaluation			Reduced sense of accomplishment		
	B (*SE B*)	β	95 % CI	*B* (*SE B*)	β	95 % CI	*B* (*SE B*)	β	95 % CI	*B* (*SE B*)	β	95 % CI	*B* (*SE B*)	β	95 % CI	*B* (*SE B*)	β	95 % CI
Self-oriented (SOPP) and socially prescribed performance perfectionism (SPPP)																		
	R^2 = .139, *F* (3,367) = 19.81, *p* < .001			R^2 = .101, *F* (3,367) = 14.84, *p* < .001			R^2 = .083, *F* (3,367) = 12.17, *p* < .001			R^2 = .112, *F* (3,367) = 15.36, *p* < .001			R^2 = .067, *F* (3,367) = 4.25, *p* < .001			R^2 = .035, *F* (3,367) = 4.48, *p* = .004		
SOPP	.24** (.03)	.45**	(0.17, 0.30)	.19** (.03)	.40**	(0.14, 0.25)	.19** (.03)	.37**	(0.13, 0.26)	-.04 (.04)	-.06	(-0.12, 0.04)	-.08* (.04)	-.13*	(-0.15, -0.01)	-.06* (.03)	-.13*	(-0.13, -0.00)
SPPP	-.11* (.04)	-.17*	(-0.18, -0.04)	-.14** (.04)	-.25**	(-0.21, -0.08)	-.10* (.04)	-.16*	(-0.18, -0.03)	.26** (.04)	.36**	(0.18, 0.35)	.21** (.04)	.31**	(0.13, 0.29)	.14** (.04)	.23**	(0.06, 0.21)
SOPP x SPPP	.05* (.02)	.13*	(0.01, 0.10)	.07** (.02)	.17**	(0.03, 0.11)	.05* (.02)	.13*	(0.01, 0.10)	.02 (.03)	.04	(-0.03, 0.07)	-.01 (.02)	-.03	(-0.06, 0.04)	-.02 (.02)	-.05	(-0.06, 0.02)
High personal standards (PS) and concern over mistakes (COM)																		
	R^2 = .131, *F* (3,367) = 18.42, *p* < .001			R^2 = .216, *F* (3,367) = 33.72, *p* < .001			R^2 = .217, *F* (3,367) = 33.94, *p* < .001			R^2 = .133, *F* (3,367) = 18.79, *p* < .001			R^2 = .078, *F* (3,367) = 10.28, *p* < .001			R^2 = .151, *F* (3,367) = 21.77, *p* < .001		
PS	.39** (.06)	.39**	(0.27, 0.50)	.50** (.05)	.54**	(0.40, 0.60)	.54** (.05)	.55**	(0.44, 0.65)	-.19* (.07)	-.16*	(-.032, -0.06)	-.21** (.06)	-.19**	(-0.33, -0.08)	-.36** (.06)	-.37**	(-0.46, -0.25)
COM	-.07 (.05)	-.09	(-0.17, 0.02)	-.29** (.04)	-.35**	(-0.37, -0.20)	-.23** (.05)	-.27**	(-0.32, -0.14)	.43** (.06)	.42**	(0.32, 0.55)	.29** (.06)	.31**	(0.19, 0.40)	.35** (.05)	.42**	(0.26, 0.44)
PS x COM	.14* (.05)	.13*	(0.04, 0.24)	.13* (.05)	.13*	(0.04, 0.22)	.11* (.05)	.10*	(0.01, 0.20)	.00 (.06)	.00	(-0.12, 0.12)	-.11 (.06)	-.10	(-0.22, 0.00)	-.09 (.05)	-.09	(-0.18, 0.01)

Note. *B* = unstandardized beta coefficient. *SE B* = standard error of *B*. β = standardized regression coefficient. 95% CI = 95% confidence interval. ***p* < .001. **p* < .05, two-tailed.

Table 3. Summary of support for hypotheses of the 2x2 model of perfectionism.

	Hypothesis 1 Pure PSP vs. non-perfectionism	Hypothesis 2 Non-perfectionism vs. Pure ECP	Hypothesis 3 Mixed perfectionism vs. Pure ECP	Hypothesis 4 Pure PSP vs. Mixed perfectionism
Measure: PPS-S/S-MPS-2				
Athlete Engagement				
Absorption	H1a/H1a	*/*	*/*	ns/ns
Dedication	H1a/H1a	*/*	*/*	ns/*†
Vigor	H1a/H1a	*/*	*/*	ns/*†
Athlete burnout				
Physical/Emotional Exhaustion	H1c/H1a†	*/*	ns/*†	*/*
Reduced Sense of Accomplishment	H1c/H1a†	*/*	ns/*†	*/*
Sport Devaluation	H1a/H1a	*/*	*/*	*/*

Note. * denotes a significant difference in two subtypes in the predicted direction ($p < .05$) and so the hypothesis is supported; ns denotes a non-significant difference between two subtypes ($p > .05$) and so the hypothesis is unsupported. PSP = personal standards perfectionism, ECP = evaluative concerns perfectionism.† = denotes differences in support for hypotheses based on measure used.