University of Kent

Kent Academic Repository

Madigan, Daniel J., Stoeber, Joachim and Passfield, Louis (2016) *Perfectionism and changes in athlete burnout over three months: Interactive effects of personal standards and evaluative concerns perfectionism.* Psychology of Sport and Exercise, 26 . pp. 32-39. ISSN 1469-0292.

Downloaded from

https://kar.kent.ac.uk/55721/ The University of Kent's Academic Repository KAR

The version of record is available from

https://doi.org/10.1016/j.psychsport.2016.05.010

This document version

Author's Accepted Manuscript

DOI for this version

Licence for this version

UNSPECIFIED

Additional information

Versions of research works

Versions of Record

If this version is the version of record, it is the same as the published version available on the publisher's web site. Cite as the published version.

Author Accepted Manuscripts

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding. Cite as Surname, Initial. (Year) 'Title of article'. To be published in *Title of Journal* , Volume and issue numbers [peer-reviewed accepted version]. Available at: DOI or URL (Accessed: date).

Enquiries

If you have questions about this document contact ResearchSupport@kent.ac.uk. Please include the URL of the record in KAR. If you believe that your, or a third party's rights have been compromised through this document please see our Take Down policy (available from https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies).

Madigan, D. J., Stoeber, J., & Passfield, L. (2016). Perfectionism and changes in athlete burnout over three months: Interactive effects of personal standards and evaluative concerns perfectionism. *Psychology of Sport and Exercise, 26,* 32-39. DOI: 10.1016/j.psychsport.2016.05.010

Perfectionism and Changes in Athlete Burnout over Three Months: Interactive Effects of Personal Standards and Evaluative Concerns Perfectionism

Daniel J. Madigan

Joachim Stoeber

Louis Passfield

University of Kent

Author Note

Daniel Madigan and Louis Passfield, School of Sport & Exercise Sciences, University of Kent; Joachim Stoeber, School of Psychology, University of Kent.

Correspondence concerning this article should be addressed to Daniel Madigan, School of Sport & Exercise Sciences, University of Kent, Chatham Maritime, Kent ME4 4AG, United Kingdom. Phone: +44-1634-888903; fax: +44-1634-888890; e-mail: dm412@kent.ac.uk

Abstract

Objectives: A recent longitudinal study with junior athletes (Madigan, Stoeber, & Passfield, 2015) found perfectionism to predict changes in athlete burnout: evaluative concerns perfectionism predicted increases in burnout over a 3-month period, whereas personal standards perfectionism predicted decreases. The present study sought to expand on these findings by using the framework of the 2 × 2 model of perfectionism (Gaudreau & Thompson, 2010) to examine whether evaluative concerns perfectionism and personal standards perfectionism show interactions in predicting changes in athlete burnout.

Design: Two-wave longitudinal design.

Method: The present study examined self-reported evaluative concerns perfectionism, personal standards perfectionism, and athlete burnout in 111 athletes (mean age 24.8 years) over 3 months of active training.

Results and Conclusion: When moderated regression analyses were employed, interactive effects of evaluative concerns perfectionism × personal standards perfectionism were found indicating that personal standards perfectionism buffered the effects of evaluative concerns perfectionism on total burnout and physical/emotional exhaustion. To interpret these effects, the 2 × 2 model of perfectionism provides a useful theoretical framework.

Keywords: perfectionism; athlete burnout; longitudinal study; 2 × 2 model of perfectionism

Introduction

Intense training and competition may leave athletes susceptible to burnout. Athlete burnout is an extreme form of sport disaffection. The symptoms of athlete burnout include a reduced sense of accomplishment, physical and emotional exhaustion (consecutively referred to as exhaustion), and sports devaluation (Raedeke & Smith, 2001). Burnout can have significant negative implications for athletes. Consequently, the psychology of sport and exercise has sought to determine factors that contribute to athlete burnout. One factor that has consistently been associated with burnout is perfectionism (Hill & Curran, in press). Moreover, a recent longitudinal study found perfectionism to predict changes in athlete burnout (Madigan, Stoeber, & Passfield, 2015): Evaluative concerns perfectionism predicted increases in burnout over a three-month period, whereas personal standards perfectionism predicted decreases. The study did not, however, examine whether the two dimensions of perfectionism interact to influence athlete burnout (cf. Hill, 2013). Therefore, the aim of the present study was to expand on Madigan et

al.'s (2015) findings and, inspired by Hill's (2013) study, adopt the 2 × 2 model of perfectionism as a theoretical framework to probe for interaction effects of evaluative concerns perfectionism and personal standards perfectionism in predicting changes in athlete burnout over a three-month period.

Perfectionism

Perfectionism is a personal disposition characterized by striving for flawlessness and setting exceedingly high standards of performance accompanied by tendencies for overly critical evaluations of one's behavior (Flett & Hewitt, 2002). Consequently, perfectionism is best conceptualized as a multidimensional characteristic (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). Factor analytic studies have provided support for two higher-order dimensions: *personal standards perfectionism* (also known as perfectionistic strivings) reflecting exceedingly high personal standards and a striving for perfection and *evaluative concerns perfectionism* (also known as perfectionistic concerns) reflecting concern over mistakes, feelings of discrepancy between one's standards and performance, fear of others' negative evaluations if not perfect, and negative reactions to imperfection (Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Stoeber & Otto, 2006).

Differentiating between personal standards perfectionism and evaluative concerns perfectionism is important when investigating perfectionism in sports because the two dimensions show different, and often opposite, patterns of relationships with various outcomes. Evaluative concerns perfectionism is consistently associated with negative processes and outcomes (e.g., maladaptive coping, negative affect), whereas personal standards perfectionism is often associated with positive processes and outcomes (e.g., adaptive coping, positive affect) or inversely with negative processes and outcomes, particularly when the overlap with evaluative concerns perfectionism is controlled statistically (see Stoeber, 2011, and Gotwals, Stoeber, Dunn, & Stoll, 2012, for reviews).

2 × 2 Model of Perfectionism

According to the 2 × 2 model of perfectionism, the two higher-order dimensions of perfectionism coexist to varying degrees within each individual. The 2 × 2 model of perfectionism offers a theoretical framework from which to test interactive effects (Gaudreau & Thompson, 2010). The model suggests that four within-person combinations of personal standards perfectionism (PSP) and evaluative concerns perfectionism (ECP) can be differentiated: Non-perfectionism (low PSP/low ECP); pure personal standards perfectionism

(high PSP/low ECP); pure evaluative concerns perfectionism; and mixed perfectionism (high PSP/high ECP). Furthermore, Gaudreau and Thompson (2010) proposed four testable hypotheses regarding differences between these within-person combinations. Hypothesis 1a states that pure personal standards perfectionism is more adaptive than non-perfectionism, whereas Hypothesis 1b states that it is less adaptive;[1] Hypothesis 2 states that pure evaluative concerns perfectionism is the most maladaptive combination of the four, tested through a comparison to non-perfectionism; Hypothesis 3 states that mixed perfectionism is more adaptive than pure evaluative concerns perfectionism; and Hypothesis 4 states that pure personal standard perfectionism is more adaptive than mixed perfectionism. Overall, research in sport has provided support for Hypothesis 1a, 2, 3, and 4 of the 2 × 2 model of perfectionism (see Gaudreau, in press).

Perfectionism and Athlete Burnout

Studies examining the relationships of personal standards perfectionism and evaluative concerns perfectionism with athlete burnout have found differential patterns of relationships. For example, a recent meta-analysis controlling for the overlap between the two dimensions, found evaluative concerns perfectionism to be positively related to athlete burnout (k = 17, weighted mean r = .40, heterogeneity of the effect [I^2] = 12.07%), whereas personal standards perfectionism was negatively related (k = 17, weighted mean r = −.31, heterogeneity of the effect [I^2] = 0.00%; Hill & Curran, in press). This pattern of relationships has also been found longitudinally. In a longitudinal study with junior athletes, Madigan et al. (2015) found that evaluative concerns predicted longitudinal increases in athlete burnout over a period of three months, whereas personal standards perfectionism predicted longitudinal decreases.

There is, however, also evidence of possible interaction effects of the two perfectionism dimensions on athlete burnout and its symptoms. In a cross-sectional study with junior soccer players, Hill (2013) found that personal standards perfectionism interacted with evaluative concerns perfectionism in predicting sports devaluation. Results of a simple slopes analysis showed that the positive slope of evaluative concerns perfectionism was significant only at low levels of personal standards perfectionism, but not at high levels, indicating that personal

[1]The 2 × 2 model comprises the further hypothesis that pure personal standards perfectionism does not differ from non-perfectionism (Hypothesis 1c). However, since this is a null hypothesis it was not considered in the present study as it cannot be included in the null hypothesis significance testing framework (see Stoeber, 2012).

standards perfectionism buffered the positive effect of evaluative concerns perfectionism on sports devaluation. To interpret the finding, Hill used the theoretical framework of the 2 × 2 model of perfectionism and found partial support for the model depending on which symptom of athlete burnout was considered. Supporting Hypothesis 1a, pure personal standards perfectionism was associated with lower levels of total burnout and reduced sense of accomplishment than non-perfectionism. Supporting Hypothesis 2, pure evaluative concerns perfectionism was associated with higher levels of total burnout and all burnout symptoms than non-perfectionism. Supporting Hypothesis 3, mixed perfectionism was associated with lower levels of total burnout, reduced sense of accomplishment, and sports devaluation than pure evaluative concerns perfectionism; and supporting Hypothesis 4, pure personal standards perfectionism was associated with lower levels of total burnout, reduced sense of accomplishment, and exhaustion than mixed perfectionism.

The Present Study

The aim of the present study was to expand on the findings of Madigan et al. (2015) by adopting the 2 × 2 model of perfectionism and examining whether the two higher-order dimensions also interact in predicting *changes* in athlete burnout in a longitudinal study over a three month period in a different athlete sample. Based on the 2 × 2 model and the findings of Hill's (2013) cross-sectional study, we expected that pure personal standards perfectionism would be associated with lower residual changes in burnout than non-perfectionism (Hypothesis 1a), pure evaluative concerns would be associated with higher residual changes of burnout than non-perfectionism (Hypothesis 2), mixed perfectionism would be associated with lower residual changes in burnout than pure evaluative concerns perfectionism (Hypothesis 3), and pure personal standards perfectionism would be associated with lower residual changes in burnout than mixed perfectionism (Hypothesis 4).

Method

Participants

A sample of 129 athletes (66 male, 63 female) was recruited from university teams and local sports clubs in the south of England to participate in the present study. Participants' mean age was 24.8 years (*SD* = 5.1; range = 20-35 years). Participants were involved in a range of sports (35 in athletics, 22 in netball, 22 in gymnastics, 16 in rugby, 14 in cycling, 13 in soccer, and 7 other sports [e.g., basketball, cricket]) and trained on average 9.4 hours per week (*SD* = 6.4). Of the 129 participants, 111 (59 male, 52 female) provided data for both waves.

Procedure

The study was approved by the university's ethics committee. Informed consent was obtained from all participants. Questionnaires were distributed during training in the presence of the first author, or athletes completed an online version of the questionnaire. Participants were administered all measures twice: first in April 2015 (Time 1) and then again three months later (Time 2). The three-month interval between Time 1 and Time 2 was considered sufficient because previous research has shown that this time interval allows researchers to capture changes in athlete burnout during periods of active training (e.g., Madigan et al., 2015; see also Cresswell & Eklund, 2005).

Measures

Perfectionism. To measure perfectionism, we followed a multi-measure approach (Stoeber & Madigan, in press) and used four subscales from two multidimensional measures of perfectionism in sport: the Sport Multidimensional Perfectionism Scale (SMPS; Dunn et al., 2006) and the Multidimensional Inventory of Perfectionism in Sport (MIPS; Stoeber, Otto, Pescheck, Becker, & Stoll, 2007). To measure personal standards perfectionism, we used two indicators: the 7-item SMPS subscale capturing personal standards (e.g. "I have extremely high goals for myself in my sport") and the 5-item MIPS subscale capturing striving for perfection ("I strive to be as perfect as possible"), and then standardized the scale scores before combining them to measure personal standards perfectionism (cf. Dunkley, Zuroff, & Blankstein, 2003). To measure evaluative concerns perfectionism, we also used two indicators, the 8-item SMPS subscale capturing concerns over mistakes ("People will probably think less of me if I make mistakes in competition") and the 5-item MIPS subscale capturing negative reactions to imperfection ("I feel extremely stressed if everything does not go perfectly"), and again standardized the scale scores before combining them to measure evaluative concerns perfectionism. The four subscales have demonstrated reliability and validity in numerous studies (e.g., Dunn et al., 2006; Madigan, Stoeber, & Passfield, 2016; Stoeber, Stoll, Salmi, & Tiikkaja, 2009). Moreover, both are reliable and valid indicators of personal standards perfectionism and evaluative concerns perfectionism (e.g., Gotwals et al., 2012; Stoeber & Madigan, in press). Participants were asked to indicate to what degree each statement characterized their attitudes in their sport responding on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Athlete burnout. To measure burnout, we used the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001). The ABQ comprises three 5-item subscales capturing the key

symptoms of athlete burnout: reduced sense of accomplishment (e.g., "I am not achieving much in my sport"), exhaustion ("I am exhausted by the mental and physical demands of my sport"), and devaluation ("I'm not into my sport like I used to be"). The subscales were combined to create a total score of athlete burnout (cf. Hill, 2013; Madigan et al., 2015). The ABQ is the most widely-used measure of athlete burnout and has demonstrated reliability and validity in numerous studies (e.g. Cresswell & Eklund, 2005; Lemyre, Roberts, & Stray-Gundersen, 2007; Lonsdale & Hodge, 2011). Participants were asked how often they experienced the symptoms described in the statements responding on a scale from 1 (*almost never*) to 5 (*almost always*).

Data Screening

Because only two item responses were missing, the missing responses were replaced with the mean of the item responses of the corresponding scale (ipsatized item replacement; Graham, Cumsille, & Elek-Fisk, 2003). Next, we computed Cronbach's alphas for our variables (see Table 1) which were all satisfactory (alphas > .70) except for reduced sense of accomplishment at Time 2 (alpha = .68) which was acceptable. As multivariate outliers can severely distort the results of correlation and regression analyses, we inspected the scores for multivariate outliers. No participant showed a Mahalanobis distance larger than the critical value of $\chi^2(10) = 29.59$, $p < .001$, indicating there were no multivariate outliers (Tabachnick & Fidell, 2007). Finally, we conducted a Box's *M* test to examine if the variance–covariance matrices showed any differences between gender (Tabachnick & Fidell, 2007). The test was nonsignificant with $F < 1.08$, $p = .34$, so all further analyses were collapsed across gender.

Results

Bivariate Correlations

First, we inspected the bivariate correlations between all variables (see Table 1). All cross-sectional correlations were in line with previous cross-sectional findings (Hill & Curran, in press) except that evaluative concerns perfectionism did not show significant positive correlations with athlete burnout. As regards longitudinal correlations, again only personal standards perfectionism showed significant negative correlations with athlete burnout.

Moderated Regression Analyses

Total burnout. Next, we conducted a moderated regression analysis with personal standards perfectionism, evaluative concerns perfectionism, and total burnout at Time 1 as predictors and total burnout at Time 2 as dependent variable. In this, personal standards

perfectionism, evaluative concerns perfectionism, and total burnout Time 1 were centered ($M = 0$; Cohen, Cohen, West, & Aiken, 2003). The regression analyses comprised three steps. In Step 1, we entered burnout at Time 1 to control for baseline levels of burnout (Taris, 2000). In Step 2, we entered personal standards perfectionism and evaluative concerns perfectionism. In Step 3, we entered the interaction of personal standards perfectionism and evaluative concerns perfectionism (see Table 2, total burnout).

The results of the moderated regression analysis indicated that personal standards perfectionism had a negative effect and evaluative concerns perfectionism a positive effect in predicting residual changes in total burnout from Time 1 to Time 2. In addition, the two dimensions of perfectionism showed a significant interaction effect. To examine the interaction effect, we conducted a simple slopes analysis following Aiken and West (1991) and plotted the interaction (see Figure 1). Furthermore, we probed the differences between the four within-person combinations of perfectionism of the 2 × 2 model following the procedures recommended by Gaudreau (2012). First we examined the slopes of evaluative concerns perfectionism (see Figure 1). Results showed that the positive slope of evaluative concerns perfectionism was only significant at low levels of personal standards perfectionism ($t = 3.20$, $p < .01$, Cohen's $d = 0.61$), but not at high levels of personal standards perfectionism ($t = 1.55$, $p = .12$, $d = 0.30$). Next, we examined the slopes of personal standards perfectionism.[2] Results showed that the negative slope of personal standards perfectionism was significant at low levels of evaluative concerns perfectionism ($t = -2.51$, $p < .05$, $d = 0.48$) and high levels of evaluative concerns perfectionism ($t = -3.91$, $p < .001$, $d = 0.75$). Taken together, the findings provide support for Hypotheses 1a, 2, and 3 of the 2 × 2 model: Pure PSP was associated with lower residual changes in total burnout than non-perfectionism (Hypothesis 1a), and pure ECP was associated with higher residual changes in total burnout than non-perfectionism (Hypothesis 2) and mixed perfectionism (Hypothesis 3). There was no difference between pure PSP and mixed perfectionism (Hypothesis 4). What is more, Figure 1 shows that only pure ECP predicted a positive increase in residual

[2]Whereas the slopes for personal standards perfectionism are not shown in Figures 1-4, they are represented by the difference between non-perfectionism and pure PSP (representing the slope for personal standards perfectionism at low levels of evaluative concerns perfectionism) and the difference between pure ECP and mixed perfectionism (representing the slope for personal standards perfectionism at high levels of evaluative concerns perfectionism; see Gaudreau, 2012, Fig. 2).

burnout from Time 1 to Time 2, whereas non-perfectionism predicted a near-zero increase, and mixed perfectionism and pure PSP predicted *negative* increases (i.e., decreases) in residual burnout from Time 1 to Time 2.

Burnout symptoms. To examine whether the interaction effect was present for all three burnout symptoms, we conducted further moderated regression analyses with the three individual symptoms at Time 2 as dependent variables (see Table 2, reduced sense of accomplishment, exhaustion, devaluation). The results showed that the personal standards perfectionism × evaluative concerns perfectionism interaction was significant only for exhaustion. Plotting the interaction and conducting simple slopes analysis (see Figure 2) showed that the positive slope of evaluative concerns perfectionism was only significant at low levels of personal standards perfectionism ($t = 2.78$, $p < .01$, $d = 0.53$), but not at high levels of personal standards perfectionism ($t = 0.19$, $p = .85$, $d = 0.04$). Next, we examined the slopes of personal standards perfectionism. Results showed that the negative slope of personal standards perfectionism was only significant at high levels of evaluative concerns perfectionism ($t = -3.21$, $p < .01$, $d = 0.61$), but not at low levels of evaluative concerns perfectionism ($t = -1.10$, $p = .27$, $d = 0.21$). Taken together, the findings provide support for Hypotheses 2 and 3 of the 2 × 2 model: Pure ECP was associated with higher residual changes in exhaustion than both non-perfectionism (Hypothesis 2) and mixed perfectionism (Hypothesis 3), whereas there was no difference between pure PSP and non-perfectionism (Hypothesis 1a) or mixed perfectionism (Hypothesis 4). Only pure ECP predicted a positive increase in residual exhaustion from Time 1 to Time 2, whereas non-perfectionism predicted a near-zero increase, and mixed perfectionism and pure PSP predicted decreases in residual exhaustion from Time 1 to Time 2.

Whereas the 2 × 2 model of perfectionism allows for testing the interaction of personal standards perfectionism and evaluative concerns perfectionism, the interaction does not need to be significant for the hypotheses of the model to be tested. Consequently, we tested the hypotheses for reduced sense of accomplishment and devaluation ignoring the nonsignificant interaction term (see Gaudreau, 2012, for details). Results for reduced sense of accomplishment indicated that personal standards perfectionism ($t = -3.80$, $p < .001$, $d = 0.72$) was a significant negative predictor of residual changes in reduced sense of accomplishment whereas evaluative concerns perfectionism ($t = 3.35$, $p < .01$, $d = 0.64$) was a significant positive predictor (see Figure 3). With this, the findings provide support for Hypotheses 1a, 2, 3, and 4 of the 2 × 2 model: Pure PSP was associated with lower residual changes in reduced sense of accomplishment

than non-perfectionism (Hypothesis 1a) and mixed perfectionism (Hypothesis 4), and pure ECP was associated with higher residual changes in reduced sense of accomplishment than non-perfectionism (Hypothesis 2) and mixed perfectionism (Hypothesis 3).

Results for devaluation showed that personal standards perfectionism ($t = -2.57$, $p < .05$, $d = 0.49$) was a significant negative predictor of residual changes in devaluation whereas evaluative concerns perfectionism ($t = 1.69$, $p = .10$, $d = 0.32$) was a nonsignificant predictor (see Figure 4). With this, the findings provide support for Hypotheses 1a and 3 of the 2 × 2 model: Pure PSP was associated with lower residual changes in devaluation than non-perfectionism (Hypothesis 1a), and pure ECP was associated with higher residual changes in devaluation than mixed perfectionism (Hypothesis 3), whereas there was no difference between pure ECP and non-perfectionism (Hypothesis 2) and no difference between pure PSP and mixed perfectionism (Hypothesis 4).

Discussion

The aim of the present study was to expand on the findings of Madigan et al. (2015) by examining interaction effects of the two higher-order dimensions of perfectionism in predicting changes in athlete burnout over a three month period in a different athlete sample. We found the two higher-order dimensions to show longitudinal interaction effects. In this, personal standards perfectionism buffered the incremental effect that evaluative concerns perfectionism had in predicting residual changes in total burnout and exhaustion. Moreover, the findings provided support for the hypotheses of the 2 × 2 model of perfectionism (Gaudreau & Thompson, 2010) which, however, varied depending on which symptom of burnout was evaluated.

All previous research examining the longitudinal relationships of perfectionism and athlete burnout has focused on the main effects of the perfectionism dimensions (Chen, Kee, & Tsai, 2009; Madigan et al., 2015). By including a test of the interaction effects of the two higher-order dimensions of perfectionism, the present study expands our understanding of these relationships. Whereas Hill (2013) found similar cross-sectional effects for sports devaluation in junior soccer players, this is the first study to show longitudinal interactions effects of personal standards perfectionism (PSP) and evaluative concerns perfectionism (ECP) on athlete burnout.

Pure ECP—the combination of low PSP and high ECP—appeared to be the most detrimental within-person combination of perfectionism, being the only combination to predict residual increases in athlete burnout with this finding being robust over all symptoms. Moreover, our findings provided support for Hypothesis 2 of the 2 × 2 model indicating that pure ECP was

associated with higher residual changes in total burnout, reduced sense of accomplishment, and exhaustion than non-perfectionism. The same pattern of relationships has been found for all symptoms of athlete burnout in previous cross-sectional research (Hill, 2013). Moreover, the negative consequences of pure ECP have been reported for a range of outcomes (e.g., need thwarting; Mallinson & Hill, 2011). The present findings, therefore, add further support to the assumption that those athletes with excessive concern over mistakes and those who react negatively to imperfection are at risk of maladaptive outcomes in sports and may be the most susceptible to experiencing burnout. In addition, our findings confirm the 2 × 2 model's proposition that it is important to differentiate between non-perfectionism (low PSP, low ECP) and pure ECP (low PSP, high ECP) instead of combining the two as does the tripartite model of perfectionism (cf. Gaudreau & Thompson, 2010; Stoeber & Otto, 2006).

There is an increasing evidence that personal standards perfectionism (i.e., striving for perfection and high personal standards) can be adaptive in sport (Gotwals et al., 2012; Stoeber, 2011). In line with this suggestion and congruent with previous cross-sectional research (Hill, 2013), our findings provided support for Hypothesis 1a of the 2 × 2 model indicating that pure PSP (high PSP, low ECP) was associated with lower residual changes in total burnout, in reduced sense of accomplishment, and in sports devaluation than non-perfectionism. Furthermore, the present study's findings suggest that personal standards perfectionism is not only adaptive when viewed in isolation but also when in combination with evaluative concerns perfectionism. As such, and in agreement with Hill (2013), our findings provided support for Hypothesis 3 of the 2 × 2 model indicating that mixed perfectionism (high PSP, high ECP) was associated with lower residual changes in total burnout and all symptoms than pure ECP. There was, however, only partial support for Hypothesis 4 of the 2 × 2 model as pure PSP was associated with lower residual changes than mixed perfectionism only with respect to reduced sense of accomplishment. Whereas the same effect was nonsignificant for total burnout, the effect was still meaningful if we consider its effect size (d = 0.30). Moreover, Hill's (2013) cross-sectional study found the same relationships for total burnout, exhaustion, and reduced sense of accomplishment. This is of theoretical importance because many researchers consider mixed perfectionism—the combination of high PSP and high ECP—the combination of perfectionism that reflects "true" perfectionists (cf. Stoeber, 2014). Moreover, the tripartite model of perfectionism regards mixed perfectionism as the most maladaptive combination of perfectionism, whereas the 2 × 2 model regards pure ECP as the most maladaptive combination

(Gaudreau & Thompson, 2010). The present findings support the 2 × 2 model in suggesting that, when high levels of evaluative concerns perfectionism are accompanied by low levels of personal standards perfectionism (pure ECP), athletes are more susceptible to burnout than when evaluative concerns perfectionism accompanied by high levels of personal standard perfectionism (mixed perfectionism). Hence, it appears that personal standards perfectionism does not exacerbate the maladaptive effects of evaluative concerns perfectionism. Instead, personal standards perfectionism appears to "buffer" the maladaptive effects of evaluative concerns perfectionism and protect athletes from burning out in their sport (cf. Madigan et al., 2015).

Limitations and Future Research

The present study has a number of limitations. First, with 111 athletes, the sample was relatively small. Thus, the study may have lacked statistical power to detect smaller meaningful effects.[3] This may be particularly important in regards to the interaction effects. For example, the interaction of personal standards perfectionism × evaluative concerns perfectionism explained almost 2% of unique variance in residual changes in reduced sense of accomplishment, which is notable given that it was estimated in a saturated model and that interaction effects are difficult to detect (McClelland & Judd, 1993). Future studies should therefore reinvestigate the present findings employing larger samples. Furthermore, larger samples may allow for the use of more data-intensive statistical analyses (e.g., moderated structural equation modeling) to examine further, smaller-sized effects. Second, we note that in the present study burnout showed a relatively small test-retest association (r = .54). As such, there was a greater amount of variance to explain with our independent variables (i.e., perfectionism). Future studies should therefore be aware that the interaction effects found in the present study may not reach statistical significance in samples in which the test-retest association of burnout is much higher (e.g., in a design with a shorter passage of time between measurement waves). Third, it is unclear to what degree the difference between Hill's (2013) finding (a cross-sectional interaction effect for sports devaluation) and our finding (longitudinal interaction effects for total burnout and exhaustion) can be explained by the two studies using different measures of personal standard perfectionism and evaluative concerns perfectionism. Whereas the present study combined scales from the

[3]Note, however, that when we analysed the data using all 126 athletes and estimating missing data with the full information maximum likelihood procedure (Graham, 2009), the results were the same.

Sport Multidimensional Perfectionism Scale (SMPS) and the Multidimensional Inventory of Perfectionism in Sport (see measures section), Hill combined scales from the SMPS with scales from the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991). Future studies may consider including all three measures to explore whether it makes a difference how the two higher-order dimensions of perfectionism are measured. Finally, the present study did not include any mediators, that is, variables that could explain the two dimensions' opposite effects and the buffer effect of personal standards perfectionism. For example, findings from cross-sectional studies suggest that elements of self-determination theory such as basic psychological need satisfaction/thwarting and the quality of motivation mediate the perfectionism–burnout relationship (Jowett, Hill, Hall, & Curran, 2013, 2016). Future studies should therefore include such variables in longitudinal investigations of the perfectionism–burnout relationship (cf. Cole & Maxwell, 2003).

Conclusions

The present study makes an important contribution toward our understanding of the perfectionism-athlete burnout relationship, being the first study to show that the higher-order dimensions of perfectionism interact to predict changes in athlete burnout. These findings provide further evidence that personal standards perfectionism can buffer the negative effects of evaluative concerns perfectionism which is critical given that the two higher-order dimensions of perfectionism coexist to varying degrees within each individual.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Chen, L. H., Kee, Y. H., & Tsai, Y.-M. (2009). An examination of the dual model of perfectionism and adolescent athlete burnout: A short-term longitudinal research. *Social Indicators Research, 91*, 189-201. doi: 10.1007/s11205-008-9277-9

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558-577. doi: 10.1037/0021-843X.112.4.558

Cresswell, S. L., & Eklund, R. C. (2005). Changes in athlete burnout and motivation over a 12-week league tournament. *Medicine and Science in Sports and Exercise, 37*, 1957-1966. doi: 10.1249/01.mss.0000176304.14675.32

Dunkley, D. M., Blankstein, K. R., Halsall, J., Williams, M., & Winkworth, G. (2000). The relation between perfectionism and distress: Hassles, coping, and perceived social support as mediators and moderators. *Journal of Counseling Psychology, 47*, 437-453. doi: 10.1037/0022-0167.47.4.437

Dunkley, D. M., Zuroff, D. C., & Blankstein, K. R. (2003). Self-critical perfectionism and daily affect: Dispositional and situational influences on stress and coping. *Journal of Personality and Social Psychology, 84*, 234-252. doi: 10.1037/0022-3514.84.1.234

Dunn, J. G. H., Causgrove Dunn, J., Gotwals, J. K., Vallance, J. K. H., Craft, J. M., & Syrotuik, D. G. (2006). Establishing construct validity evidence for the Sport Multidimensional Perfectionism Scale. *Psychology of Sport and Exercise, 7*, 57-79. doi: 10.1016/j.psychsport.2005.04.003

Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issues. In P. L. Hewitt & G. L. Flett (Eds.), *Perfectionism* (pp. 5-31). Washington, DC: American Psychological Association. doi: 10.1037/10458-001

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468. doi: 10.1007/BF01172967

Gaudreau, P. (2012). A methodological note on the interactive and main effects of dualistic personality dimensions: An example using the 2 × 2 model of perfectionism. *Personality and Individual Differences, 52*, 26-31. doi: 10.1016/j.paid.2011.08.022

Gaudreau, P. (in press). The 2 × 2 model of perfectionism in sport, dance, and exercise. In A. P. Hill (Ed.), *The psychology of perfectionism in sport, dance and exercise*. London: Routledge.

Gaudreau, P., & Thompson, A. (2010). Testing a 2 × 2 model of dispositional perfectionism. *Personality and Individual Differences, 48*, 532–537. doi: 10.1016/j.paid.2009.11.031

Gotwals, J. K., Stoeber, J., Dunn, J. G. H., & Stoll, O. (2012). Are perfectionistic strivings in sport adaptive? A systematic review of confirmatory, contradictory, and mixed evidence. *Canadian Psychology, 53*, 263-279. doi: 10.1037/a0030288

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60*, 549-576. doi: 10.1146/annurev.psych.58.110405.085530

Graham, J. W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J. A. Schinka & W. F. Velicer (Eds.), *Handbook of psychology: Research methods in psychology* (Vol. 2, pp. 87-114). New York: Wiley. doi: 10.1002/9781118133880.hop202004

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology, 60*, 456-470. doi: 10.1037/0022-3514.60.3.456

Hill, A. P. (2013). Perfectionism and burnout in junior soccer players: A test of the 2 × 2 model of dispositional perfectionism. *Journal of Sport and Exercise Psychology, 35*, 18-29.

Hill, A. P., & Curran, T. (in press). Multidimensional perfectionism and burnout: A meta-analysis. *Personality and Social Psychology Review.* doi: 10.1177/1088868315596286

Jowett, G. E., Hill, A. P., Hall, H. K., & Curran, T. (2013). Perfectionism and junior athlete burnout: The mediating role of autonomous and controlled motivation. *Sport, Exercise, and Performance Psychology, 2*, 48-61. doi: 10.1037/a0029770

Jowett, G. E., Hill, A. P., Hall, H. K., & Curran, T. (2016). Perfectionism, burnout and engagement in youth sport: The mediating role of basic psychological needs. *Psychology of Sport and Exercise, 24*, 18-26. doi: 10.1016/j.psychsport.2016.01.001

Lemyre, P.-N., Roberts, G. C., & Stray-Gundersen, J. (2007). Motivation, overtraining, and burnout: Can self-determined motivation predict overtraining and burnout in elite athletes? *European Journal of Sport Science, 7*, 115-126. doi: 10.1080/17461390701302607

Lonsdale, C., & Hodge, K. (2011). Temporal ordering of motivational quality and athlete burnout in elite sport. *Medicine and Science in Sports and Exercise, 43*, 913-921. doi: 10.1249/MSS.0b013e3181ff56c6

Madigan, D. J., Stoeber, J., & Passfield, L. (2015). Perfectionism and burnout in junior athletes: A three-month longitudinal study. *Journal of Sport & Exercise Psychology, 37,* 305-315. doi: 10.1123/jsep.2014-0266

Madigan, D. J., Stoeber, J., & Passfield, L. (2016). Perfectionism and attitudes towards doping in junior athletes. *Journal of Sports Sciences, 34,* 700-706. doi: 10.1080/02640414.2015.1068441

Mallinson, S. H., & Hill, A. P. (2011). The relationship between multidimensional perfectionism and psychological need thwarting in junior sports participants. *Psychology of Sport and Exercise, 12,* 676-684. doi: 10.1016/j.psychsport.2011.05.009

McClelland, G.H., & Judd, C.M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 114,* 376–390. doi:10.1037/0033-2909.114.2.376

Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport & Exercise Psychology, 23,* 281-306.

Stoeber, J. (2011). The dual nature of perfectionism in sports: Relationships with emotion, motivation, and performance. *International Review of Sport and Exercise Psychology, 4,* 128-145. doi: 10.1080/1750984X.2011.604789

Stoeber, J. (2012). The 2 × 2 model of perfectionism: A critical comment and some suggestions. *Personality and Individual Differences, 53,* 541-545. doi: 10.1016/j.paid.2012.04.029

Stoeber, J. (2014). Perfectionism in sport and dance: A double-edged sword. *International Journal of Sport Psychology, 45*, 385-394.

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

Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review, 10,* 295-319. doi: 10.1207/s15327957pspr1004_2

Stoeber, J., Otto, K., Pescheck, E., Becker, C., & Stoll, O. (2007). Perfectionism and competitive anxiety in athletes: Differentiating striving for perfection and negative reactions to imperfection. *Personality and Individual Differences, 42*, 959-969. doi: 10.1016/j.paid.2006.09.006

Stoeber, J., Stoll, O., Salmi, O., & Tiikkaja, J. (2009). Perfectionism and achievement goals in young Finnish ice-hockey players aspiring to make the Under-16 national team. *Journal of Sports Sciences, 27,* 85-94. doi: 10.1080/02640410802448749

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

Taris, T. W. (2000). *A primer in longitudinal analysis*. Thousand Oaks, CA: Sage.

Table 1. *Descriptive Statistics, Cronbach's Alphas, and Bivariate Correlations*

Variable	1	2	3	4	5	6	7	8	9	10
Time 1										
1. Personal standards perfectionism										
2. Evaluative concerns perfectionism	.78***									
3. Total burnout	–.29**	–.02								
4. Reduced sense of accomplishment	–.33***	–.08	.88***							
5. Exhaustion	–.13	.08	.84***	.55***						
6. Devaluation	–.32	–.07	.92***	.79***	.64***					
Time 2										
7. Total burnout	–.31**	–.05	.54***	.46***	.46***	.49***				
8. Reduced sense of accomplishment	–.29**	–.02	.38***	.43***	.26**	.33***	.82***			
9. Exhaustion	–.21*	–.02	.48***	.32**	.53***	.39***	.80***	.42***		
10. Devaluation	–.29**	–.09	.48***	.42***	.35***	.50***	.90***	.68***	.58***	
M	0.00	0.00	2.28	2.43	2.27	2.15	2.20	2.31	2.18	2.10
SD	0.91	0.95	0.82	0.84	0.99	0.97	0.52	0.58	0.64	0.64
Cronbach's alpha	.80	.89	.85	.81	.91	.88	.79	.68	.75	.78

Note. $N = 111$. Time 2 = (three months later than Time 1).

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. *Summary of Moderated Regression Analyses Predicting Residual Changes in Athlete Burnout from Time 1 to Time 2.*

	Total burnout Time 2		Reduced sense of accomplishment Time 2		Exhaustion Time 2		Devaluation Time 2	
Predictors at Time 1	ΔR^2	*B*	ΔR^2	*B*	ΔR^2	*B*	ΔR^2	*B*
Step 1	.288***		.183***		.280***		.253***	
DV		.37***		.32***		.37***		.36***
Step 2	.068**		.100**		.026		.046*	
DV		.30***		.24***		.34***		.31***
Personal standards perfectionism		–.27**		–.36***		–.20		–.27*
Evaluative concerns perfectionism		.19***		.28**		.12		.16
Step 3	.025*		.019		.046**		.002	
DV		.28***		.23***		.30***		.31***
Personal standards perfectionism		–.31***		–.39***		–.27*		–.28*
Evaluative concerns perfectionism		.22**		.31**		.18		.17
Personal standards perfectionism × evaluative concerns perfectionism		–.10*		–.09		–.16***		–.03

Note. N = 111. Time 2 = three months later than Time 1. DV = dependent variable at Time 1.

*p < .05. **p < .01. ***p < .001.

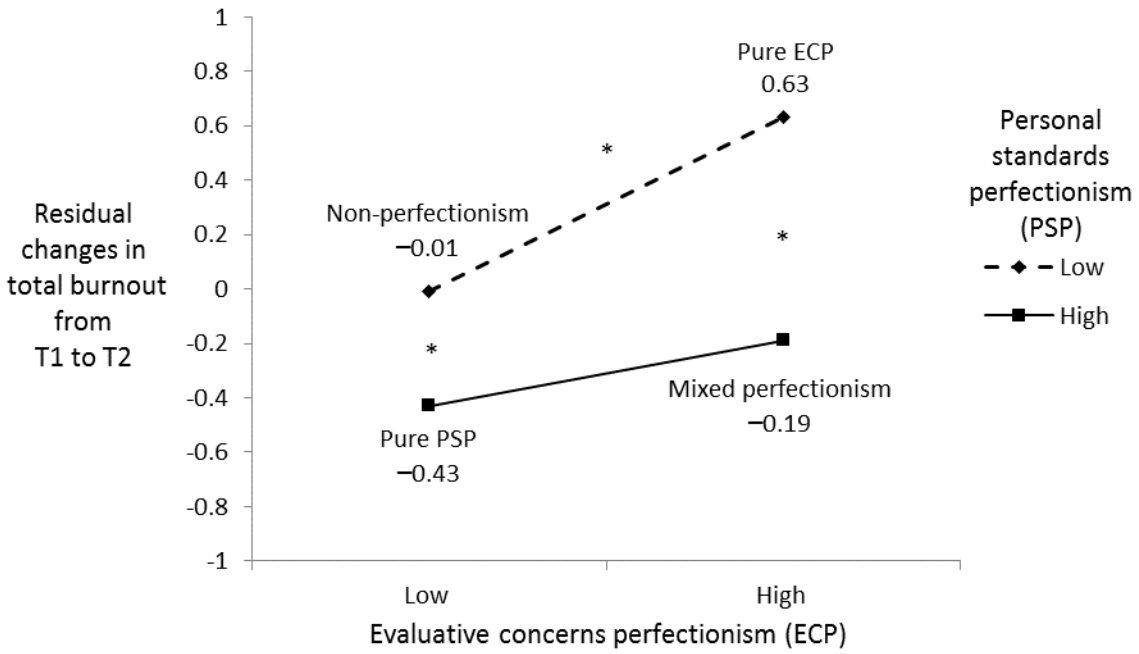

Figure 1. Predicted values of residual change in total burnout at Time 2 across the four within-person combinations of perfectionism. T1 = Time 1, T2 = Time 2 (three months later). *difference between within-person combinations significant at $p < .05$.

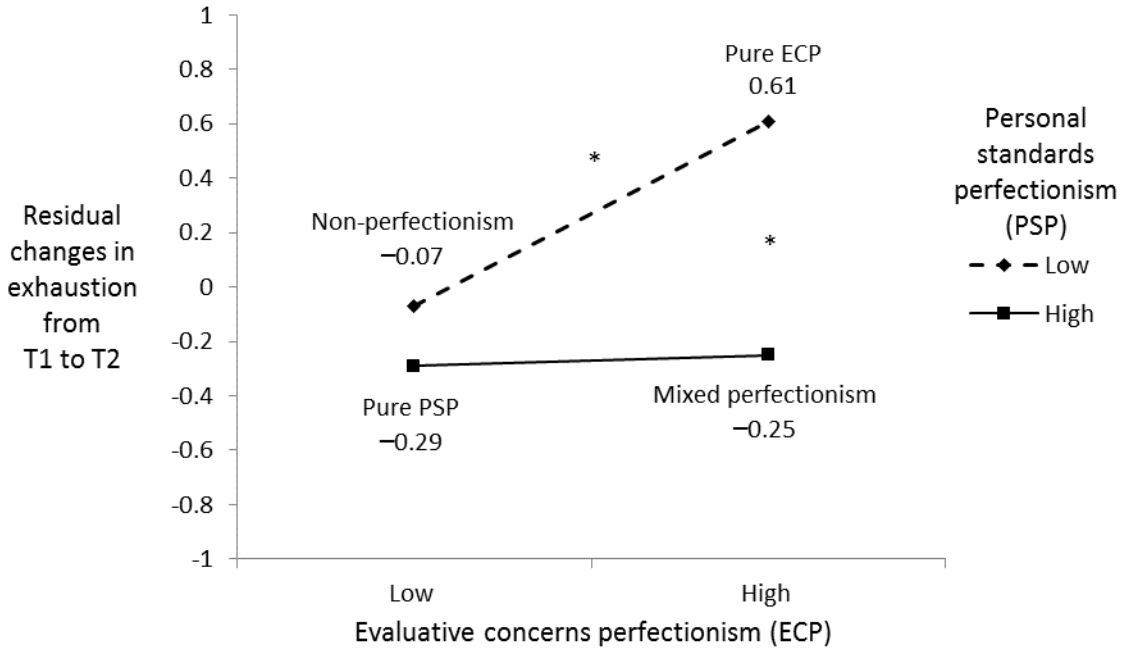

Figure 2. Predicted values of residual change in exhuation at Time 2 across the four within-person combinations of perfectionism. T1 = Time 1, T2 = Time 2 (three months later). *difference between within-person combinations significant at $p < .05$

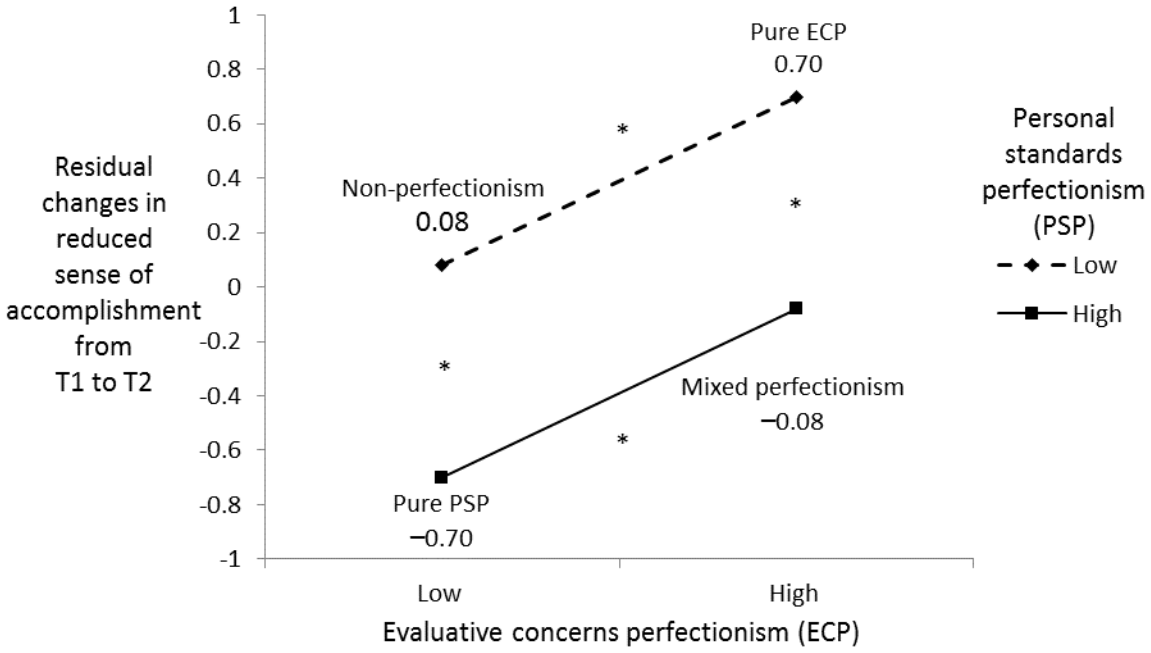

Figure 3. Predicted values of residual change in reduced sense of accomplishment at Time 2 across the four within-person combinations of perfectionism. T1 = Time 1, T2 = Time 2 (three months later). *difference between within-person combinations significant at $p < .05$

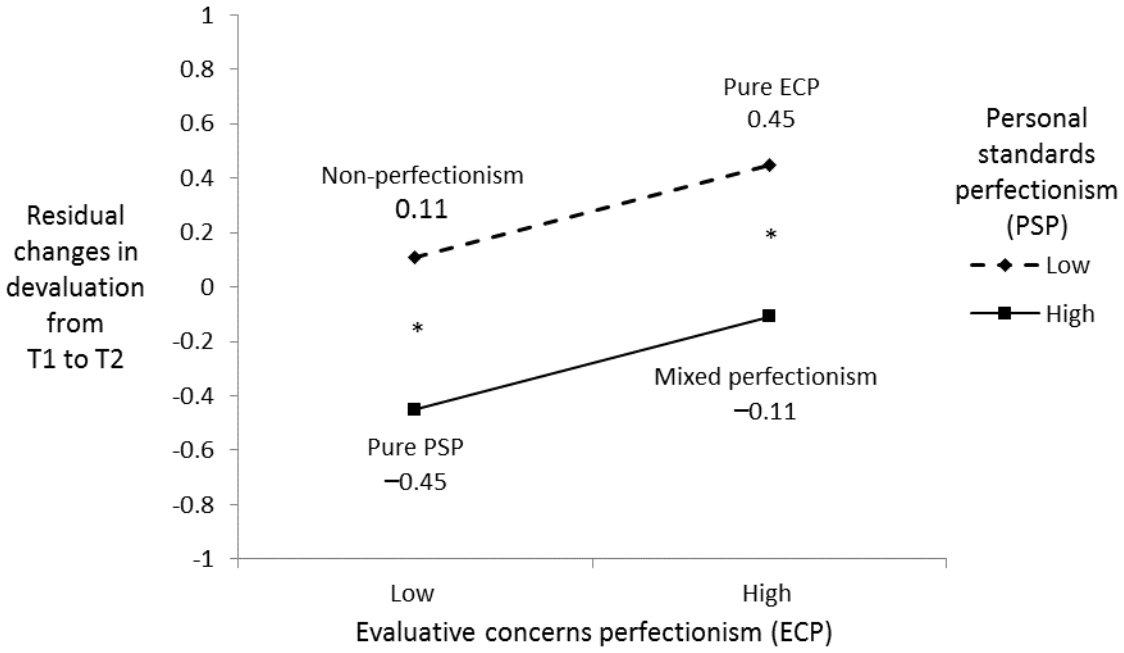

Figure 4. Predicted values of residual change in devaluation at Time 2 across the four within-person combinations of perfectionism. T1 = Time 1, T2 = Time 2 (three months later). *difference between within-person combinations significant at $p < .05$