

Est.  
1841

YORK  
ST JOHN  
UNIVERSITY

Smith, Esmie P., Hill, Andrew P. ORCID logo ORCID: <https://orcid.org/0000-0001-6370-8901> and Hall, Howard (2018) Perfectionism, Burnout and Depressive Symptoms in Youth Soccer Players: A Longitudinal Study. *Journal of Clinical Sport Psychology*, 12 (2). pp. 179-200.

Downloaded from: <https://ray.yorks.ac.uk/id/eprint/2415/>

The version presented here may differ from the published version or version of record. If you intend to cite from the work you are advised to consult the publisher's version:

<https://doi.org/10.1123/jcsp.2017-0015>

Research at York St John (RaY) is an institutional repository. It supports the principles of open access by making the research outputs of the University available in digital form. Copyright of the items stored in RaY reside with the authors and/or other copyright owners. Users may access full text items free of charge, and may download a copy for private study or non-commercial research. For further reuse terms, see licence terms governing individual outputs. [Institutional Repository Policy Statement](#)

# RaY

Research at the University of York St John

For more information please contact RaY at [ray@yorks.ac.uk](mailto:ray@yorks.ac.uk)

Smith, E. P., Hill, A. P., & Hall, H. K. (in press). Perfectionism, burnout and depression in youth soccer players: A longitudinal study. *Journal of Clinical Sport Psychology*. Accepted for publication 25/08/2017

Perfectionism, Burnout and Depression in Youth Soccer Players: A Longitudinal Study

Esmie P. Smith, Andrew P. Hill and Howard K. Hall

York St John University

Author Note

Esmie P. Smith, Andrew P. Hill, and Howard K. Hall, School of Sport, York St John University.

Correspondence concerning this article should be addressed to Esmie Smith:

e.smith1@yorks.ac.uk

### Abstract

The relationship between perfectionism, burnout and depression among youth soccer players is of interest due to the stressful academy environments that must be navigated in order to become a professional soccer player. Three alternative theoretical models have been proposed to explain the relationship between perfectionism, burnout and depression. These models state that perfectionism is (a) a vulnerability factor for burnout and depression (vulnerability model), (b) a consequence of burnout and depression (complication/scar model), or (c) that the relationships are reciprocal (reciprocal relations model). The purpose of this study was to test these three models in youth soccer players. One hundred and eight male soccer players ( $M = 16.15$  years,  $SD = 1.84$ ) from professional clubs completed measures of perfectionism, burnout symptoms, and depressive symptoms twice, three months apart. Cross-lagged panel analysis provided support for a reciprocal relations model for burnout symptoms and a complication/scar model for depressive symptoms.

*Keywords:* depression, burnout, soccer, perfectionism

## Perfectionism, Burnout and Depressive Symptoms in Youth Soccer Players: A Longitudinal Study

Researchers have recently begun to examine the negative experiences of junior athletes within in youth soccer academies. This is in part because youth soccer academies have the potential to be stressful. Boys can join development centres in soccer academies of professional clubs in the UK from 5 years old. They are formally registered to the club at the age of 9 and, thereafter, undergo an ongoing registration process where they are released on a yearly basis if they do not play to the requisite standard. The next key point in the process is the age of 16, when boys will need to secure a scholarship to continue at the academy. Again, thereafter, the selection process can continue up until the age of 23 when it must be decided whether they are to join the professional first team squad or be released (See Premier League: Elite Player Performance Plan, 2011). Of the minority of players that do secure a scholarship at the age of 16, approximately 98% are no longer playing by the age of 21 and, in total, it is estimated that less than 1% of youth players reach the professional ranks (Gernon, 2016; Green, 2009). For these reasons, the soccer academy environment is intense, fiercely competitive, and for some it can be experienced as unsupportive and marginalizing (Roderick, 2006).

In the hope of better safeguarding junior athletes from the potential negative consequences of pursuing a career in soccer, the current study examined burnout and depressive symptoms among junior athletes attending youth soccer academies. It also examined how, in this context, burnout and depression might be related to perfectionism among junior athletes. We first define and describe athlete burnout, depressive symptoms, and perfectionism, as well as review research examining them in sport. We then discuss research that has examined the relationships between them and offer three alternative

theoretical models that might explain their inter-relationships over time (vulnerability model, complication/scar model, and reciprocal relations model).

### **Athlete Burnout**

Athlete burnout is one possible outcome of competing within a soccer academy.

Athlete burnout is characterised by three core symptoms: a reduced sense of accomplishment, physical and emotional exhaustion, and sport devaluation (Raedeke & Smith, 2001). A reduced sense of accomplishment is an athlete's perception of inadequate sporting abilities and achievement. Athletes come to believe that they are unable to reach their goals or are consistently performing below their capabilities, regardless of objective success. Physical and emotional exhaustion is the depletion of resources beyond the typical demands of routine activities. Athletes feel drained from participation and have difficulty recovering a sense of vitality. Finally, sport devaluation is an athlete's diminished personal interest in their sport participation and their performance (Raedeke & Smith, 2001). While initially athletes may have enjoyed participation, athletes develop resentment towards their sport, adopt a cynical attitude and may drop out of sport as consequence (Raedeke & Smith, 2001).

There are a number of models that explain the development of burnout. The best supported is Smith's (1986) cognitive-affective model. Smith proposed a stress-based model of burnout in sport. Therein, burnout parallels the stress process and is evident in four stages: situational demand (e.g., excessive expectations), cognitive appraisal (e.g., threatening), physiological responses (e.g., anxiety) and behavioural responses (e.g., decreased performance). Personality and motivational factors are considered to be important in the stress and burnout process by framing cognitive appraisal and giving personal meaning to the consequences of coping with, or failing to cope with, situational demands (Smith, 1986). In this regard, personality factors that contribute to heighten levels of threat because goals are tied to self-worth are thought to be especially important (e.g., perfectionism). In this model

burnout develops as a result of perceived overload whereby one's resources are continually appraised as insufficient to meet increasing demands in personally meaningful contexts.

Athlete burnout has been examined extensively in sport. Goodger, Gorely, Lavallee and Harwood (2007) conducted a systematic review on burnout research in sport. In total, they examined 58 published studies, of which 27 were focused on athletes. They found that an athlete's type of motivation, ability to cope with adversity, training load, response to training and recovery, and athletic identity may be important for susceptibility to burnout. For instance, a high athletic identity (strongly identifies with the athletic role) and anxiety (perceive situations as threatening) were related to higher burnout symptoms. Subsequent research has examined other factors such as the motivational climate (e.g., ego-involving climate; Smith, Gustafsson, & Hassmen, 2010), personality characteristics (e.g., trait anxiety; Cremades, Wated, & Wiggins, 2011), and other environment features (e.g., organisational stress; Tabei Fletcher, & Goodger, 2012) and has found support for consideration of a wide array of personality, motivational, and stress-related factors. On the basis of this research, and in light of the description of youth soccer academies by junior athletes, athlete burnout seems to be especially important in this context.

### **Depression**

Another possible outcome of competing within a soccer academy is depression. Depression is the lowering of an individual's mood characterised by a state of sadness (Ingram, Scott & Hamill, 2009). Depression can take various forms from momentary despondency or feelings of sadness to more moderate or acute experiences involving psychological, biological and social elements. In its clinical form, also known as major depressive disorder, it is a pathological syndrome which lasts a minimum of two weeks or longer (Dobson & Dozois, 2011). According to the DSM-V, depressive symptoms include loss of interest and pleasure in activities, feelings of guilt, decreased concentration, fatigue,

disturbed sleep and changes in appetite/weight. The experience of depressive symptoms may last anywhere between a few weeks to years and greater severity is associated with greater maladjustment (Dobson & Dozois, 2011). Although depression is a more extreme outcome in comparison to burnout, initial work on burnout highlighted the similarities between the two (e.g., Oswin, 1978). Moreover, descriptions of the experiences of burnout among athletes often include reference to symptoms of depression (e.g., Gustafsson, Hassmen, Kentta, & Johansson, 2008).

Historically, models of the development of depression have been rooted in one or two theoretical perspectives. However, models have become increasingly integrative and multifactorial (Ingram et al., 2009). In one of the most recent models, Beck and Bredemeier (2016) integrate clinical, cognitive, neurobiological and evolutionary perspectives. In this model, negative cognitive biases and stress reactivity provide the basis for negative beliefs regarding the self (e.g., “I’m worthless”), the world (“nobody values me”) and the future (e.g., “things can only get worse”). In this model, these depressogenic beliefs trigger depression when negative life events result in the loss of a vital resource (i.e., a resource important to the attainment of basic goals and needs). In this regard, this particular model can help to explain how heavy investment in sport may make athletes vulnerable to depression if they are unable to successfully navigate the academy system.

Three recent reviews of research have identified risk factors of depression in athletes (Frank, Nixdorf, & Beckmann, 2015; Rice et al., 2016; Wolanin, Gross, & Hong, 2015). Some of the risk factors are directly related to features of the sport domain such as poor performance, injuries, overtraining and involuntary career termination. Other factors are more general and applicable beyond the sport domain such as life events, social support, unhelpful coping strategies, and various personality traits. Similar to burnout, then, research suggests that depression in athletes may manifest due to unfavourable environmental conditions

provided by sport as well as characteristics of the athletes themselves. With the overlap between depression and burnout in mind, we find the possibility that youth academies might be a context in which athletes are vulnerable to the development of depressive symptoms to be compelling. Based on Beck and Bredemeier's (2016) notion of depressogenic beliefs, and findings that some personality factors are antecedents of depression and burnout, we now consider the possible role of perfectionism.

### **Multidimensional Perfectionism**

Perfectionism is a trait that is broadly defined as the pursuit of exceedingly high standards accompanied by overly critical evaluations (Frost, Marten, Lahart, & Rosenblate, 1990). In one of the most influential models of perfectionism, Hewitt and Flett's (1991) aimed to capture the source and direction of perfectionism. The model has three dimensions. Self-oriented perfectionism (SOP) is self-directed and involves the requirement of perfectionism from the self. Socially prescribed perfectionism (SPP) is an individual's perception of unrealistically high standards they believe others expect of them. Other oriented perfectionism (OOP) is externally directed and involves unrealistic expectations of others (e.g., friends, family, colleagues or strangers). SOP and SPP are of especial importance in this study. These dimensions reflect unrealistic standards on the self and are more associated with personal outcomes, as opposed to interpersonal outcomes as is the case for OOP.

These dimensions can be studied independently and also studied as part of a higher-order model of perfectionism. A higher-order model is based on factor analysis of multiple instruments designed to measure perfectionism and support for two broad dimensions of perfectionism (e.g., Cox, Enns, & Clara, 2002). These two dimensions are termed perfectionistic strivings (PS) and perfectionistic concerns (PC). PS captures self-oriented striving for perfection and the setting of high personal standards, which can include SOP. PC captures the fear of negative social evaluation, concerns over making mistakes, negative



reactions to imperfection and discrepancies between ones expectations and performance, which can include SPP (Gotwals, Stoeber, Dunn, & Stoll, 2012). While this higher-order approach is not adopted in the current study, it is useful to bear in mind when drawing together research that have used different approaches, as we have to do when considering research examining perfectionism, burnout, and depression.

### **Relationships between Perfectionism, Burnout and Depression**

There is strong evidence from research for a relationship between perfectionism and burnout in athletes. In a recent meta-analysis, Hill and Curran (2016) found that PS had small negative or non-significant relationships with total athlete burnout and burnout symptoms. By contrast, PC had small-to-medium positive relationships with total athlete burnout and burnout symptoms. Eighteen studies (of 19 sport studies) included in the meta-analysis examined the relationship between perfectionism and burnout in youth athletes. Two of these studies examined the relationships between perfectionism and athlete burnout in youth soccer players and provided findings consistent with the wider research (Hill, Hall, Appleton, & Kozub, 2008; Hill, 2013). Overall, the findings of existing research suggest that PC, but not necessarily PS, is associated with burnout. In context of the current study, we would expect subdimensions of PC (i.e., SPP) to be more important to the development of burnout symptoms in youth soccer players than subdimensions of PS (i.e., SOP).

Of particular note are four longitudinal studies that have examined the relationship between perfectionism and athlete burnout. All four studies examined youth athletes. The first study was the only study not to find perfectionism to predict burnout over time (Chen, Kee, & Tsai 2009). The three studies that followed all provided evidence that perfectionism predicts burnout over time (Madigan, Stoeber, & Passfield, 2015, 2016a, 2016b). In two of these studies, examining total burnout and controlling for the relationship between dimensions of perfectionism, PC predicted increases in total burnout and PS predicted

decreases in total burnout across three months (Madigan et al., 2015, 2016b). In the other study, examining burnout symptoms and controlling for the relationship between dimensions of perfectionism, PC predicted increases in reduced sense of accomplishment and PS predicted decreases in reduced sense of accomplishment and devaluation. Neither PS nor PC predicted changes in exhaustion (Madigan et al., 2016a).

In comparison to burnout, there are few studies that have examined the relationship between perfectionism and depression in sport. However, findings are broadly similar with research outside of sport with dimensions of perfectionism similar to PC positively related to depression in athletes (e.g., Nixdorf et al., 2016). Drawing on the considerable number of studies examining the relationship between perfectionism and depression outside of sport, both PS and PC tend to be positively related to depression, although the size of the relationship is larger and more consistent for PC than PS (see Limburg, Watson, Hagger, & Egan, 2016). Notably, Smith et al. (2016) recently conducted a meta-analysis of 10 longitudinal studies and found that both PC and PS displayed a small positive relationship with depression. When controlling for the relationship between PS and PC, the relationship between PS and depression became non-significant. Again, in context of the current study, we would expect subdimensions of PC (i.e., SPP) to predict depression but not subdimensions of PC (i.e., SOP), at least when controlling for the relationship between the two dimensions of perfectionism.

### **Extending previous work and models of perfectionism, burnout and depression**

The current study seeks to build on the aforementioned research in a number of ways. First, while there have been four studies to examine perfectionism and burnout over time in youth athletes, three studies have examined total burnout and only one has examined individual burnout symptoms. Moreover, Madigan et al. (2016a) found dimensions of perfectionism predicted some burnout symptoms over time but not others, these relationships

are worthy of revisiting. Second, to date there have been no studies examining the relationship between perfectionism and depression in athletes over time. Therefore, while perfectionism and depression may be related, it is not clear if perfectionism predicts changes in depression or if there is any reciprocal effects (i.e., depression predicting perfectionism). Third, only one of the studies that examined perfectionism and burnout over time examined reciprocal effects between perfectionism and total burnout, and this study did not examine burnout symptoms (Madigan et al., 2015). With this in mind, there is evidence that the relationships between perfectionism, burnout, and depression may be complex and include reciprocal relationships. Based on these reasons, a study designed to test alternative theoretical models of the relationships between these variables would better our understanding of how each might develop over time. Three such alternate models are described below.

### **Models of relationships: Perfectionism, burnout, and depression**

A vulnerability model proposes that personality traits put individuals at risk of psychological ill-being (Bagby, Quilty, & Ryder, 2008). This model is the most dominant model in the perfectionism literature. There is substantial empirical support for this model as evidenced by the findings of Smith et al.'s (2016) meta-analysis as well as individual studies that have directly tested the model by assessing reciprocal effects. For example, Sherry, Richards, Sherry and Stewart (2014) found that PC predicted depression over 12 months for a group of students, with no reciprocal effects evident. In addition, in sport, Madigan et al.'s (2015) study can also be considered to support this model in that PC predicted athlete burnout over a three month period, again, no reciprocal effects were evident.

An alternative to the vulnerability model is a complication/scar model that proposes that psychological ill-being, especially depression, contributes to changes in personality (Bagby et al., 2008). This is based on the idea that psychopathology may alter or impair key

areas of functioning (psychological, biological or social) and change personality related patterns of behaviour, cognitions, emotional regulation and perceptions (McGrath et al., 2012). In this model, following the experience of psychological ill-being, increases in perfectionism can be temporary when symptoms ill-being symptoms subside (complication effect) or may be more long lasting and remain after ill-being symptoms subside (scar effect). One example of support for this model is provided by Gautreau, Sherry, Mushquash and Stewart (2015) who found that social anxiety positively predicted self-critical perfectionism in students over 12 months with no reciprocal effects evident. In another study, Asseraf and Vaillancourt (2015) also found support for a complication/scar model in that depression positively predicted SPP in adolescents over a two year period. We are not aware of any evidence from longitudinal studies in sport that support a complication/scar model.

Finally, a reciprocal relations model proposes that a vulnerability model and complication/scar model should not be viewed as mutually exclusive. Rather, they operate in tandem. Perfectionism may contribute to changes in psychological ill-being and vice versa (Judd, Schettler, & Akiskal, 2002). Like the other models, there is some support for this model. For example, McGrath et al (2012) found reciprocal effects between PS, PC and depression in students across a three week period. Specifically, McGrath et al. found that PC positively predicted depression and vice versa, whereas PS negatively predicted depression and depression positively predicted PS across three waves. Shahar, Blatt, Zuroff, Kuperminc, and Leadbetter (2004) also found a positive reciprocal relationship between self-critical perfectionism and depression in adolescent females over a one year period. Again, we are not aware of any studies in sport that have provided support for a reciprocal relations model.

### **Current Study**

The purpose of the study was to examine the relationship between perfectionism, burnout and depressive symptoms over time in youth soccer players. In doing so, the study

provides the first test of three possible models in sport: vulnerability model, complication/scar model, and reciprocal relations model. Based on previous findings in sport and elsewhere, it was hypothesised that perfectionism would positively predict changes in burnout symptoms but not the reverse (vulnerability model) and that perfectionism and depressive symptoms would positively predict changes in each other (reciprocal relations model).

## Methods

### Participants

A sample of youth male soccer players ( $N = 162$  in total and  $N = 108$  complete cases for both time points) were recruited from professional soccer academies in England. Drop-outs were absent at the time of the second data collection. Players average age was 16.15 years ( $SD = 1.84$ , range 14 – 21). Soccer academies are training centres set up by professional soccer clubs to identify, develop and nurture talent. In these academies players are categorised into three pathways: Foundation Phase (under 9's to under 11's), Youth Development Phase (under 12's to under 16's) and Professional Development Phase (under 17's to under 21's). Participants had joined an academy at around 11.75 years old ( $SD = 2.89$ ) and spent an average of 3.65 years at their current club ( $SD = 2.95$ ). Participants rated their participation in soccer as extremely important in comparison to all other activities they take part in ( $M = 9.6$ ,  $SD = 0.65$ , 1 = *not at all important* to 10 = *extremely important*).

### Procedures

The study was approved by the York St John University's ethics committee and informed consent was obtained from all participants. Clubs were recruited through direct contact via telephone or email with gatekeepers (i.e., coaches and other support staff). On agreement of involvement, a date and time was arranged to provide participants with information about the study. Parental consent was obtained for all participants below the age

of 18. Questionnaires were distributed and then collected by the first author at the beginning or end of a training session on two occasions over a three month period (time 1 and time 2). Time 1 measurement was taken across November/December 2015 and Time 2 measurement was taken across February/March 2016. The timing of the measurement was selected to coincide with activities of the academies. In particular, season length and decision on release/retention of players (particularly around February/March time). In addition, recent research has found a similar three-month interval is sufficient to observe how perfectionism predicts changes in burnout (e.g., Madigan et al., 2015).

### **Measures**

***Perfectionism.*** The Hewitt and Flett's (1991) Multidimensional Perfectionism Scale brief version (HMPS: Cox, Enns & Clara, 2002) was used to assess self-oriented perfectionism (SOP) and socially prescribed perfectionism (SPP). Other oriented perfectionism (OOP) was not assessed in this study. Each subscale of the brief HMPS contains 5 items, and each item is measured on a seven point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). The stem was adapted to ensure that participants focussed on the statements in relation to their soccer participation (e.g., "In football..."). The SOP subscale reflects exceedingly high standards from one's self, accompanied by harsh self-criticism (e.g., "I strive to be as perfect as I can be."). The SPP subscale reflects the perception of exceedingly high standards from others and the perception of the extent to which they will be exposed to critical evaluation from others (e.g., "I feel that people are too demanding of me."). Evidence to support the validity and reliability of this instrument has been provided by Cox et al. (2002). The brief MPS has demonstrated adequate internal consistency in youth soccer players (e.g., Hill, 2013).

***Burnout.*** The Athlete Burnout Questionnaire (ABQ: Raedeke & Smith, 2001) was used to assess burnout. The ABQ is a 15 item measure with three subscales of 5 items that

assess reduced sense of accomplishment (RA: e.g., “I am not performing up to my ability in football.”), emotional and physical exhaustion (EE: e.g., “I am exhausted by the mental and physical demands of football.”) and sport devaluation (D: e.g., “The effort spent in football would be better spent doing other things.”). Each item is measured on a 5 point Likert scale (1 = *almost never* to 5 = *almost always*). Evidence to support the validity and reliability of this instrument has been provided by Raedeke and Smith (2001). The ABQ has demonstrated adequate internal consistency in youth soccer players (e.g., Hill et al., 2008).

***Depressive Symptoms.*** The Center for Epidemiological Studies Depression Scale (CES-D: Radloff, 1977) was used to measure the incidence of depressive symptoms (DS). The instrument was selected because it is an appropriate measure for non-clinical adolescent populations. As such, the instrument is used to examine depressive symptoms, as opposed to examining clinical levels of depression (Radloff, 1991). The CES-D comprises 20-items whereby participants are asked to reflect on their feelings/behaviours over the past week (e.g., “My sleep was restless”, “I felt depressed”, and “I did not feel like eating; my appetite was poor.”) on a four point Likert scale (0 = *rarely or none of the time* to 3 = *most or all of the time*). A higher score indicates greater frequency of depressive symptoms; the cut off for mild to major depressive symptoms on the CES-D is a score  $\geq 16$ . Evidence to support the validity and reliability of this instrument has been provided by Radloff (1991). The CES-D has demonstrated adequate internal consistency in youth athletes (e.g., Nixdorf et al., 2016).

### **Analytical approach**

To test the three theoretical models cross-lagged panel analysis was used. Cross-lagged effects compare the relationship between variable *X* (e.g., perfectionism) at time 1 and variable *Y* at time 2 (e.g., burnout) in the presence of the relationship between variable *Y* (e.g., burnout) at time 1 and variable *X* (e.g., perfectionism) at time 2. In doing so, cross-lagged panel analysis enables the researcher to establish the likely causal direction of the

relationships over time (Kenny, 2005). In the current study we are interested in whether (a) perfectionism predicts burnout and depressive symptoms over time (vulnerability model), (b) burnout and depressive symptoms predicts perfectionism over time (complication/scar model), or (c) the relationship is reciprocal over time (reciprocal relations model).

Cross-lagged panel analysis consists of three types of correlations; synchronous correlations, autocorrelations and cross-lagged correlations (Campbell & Stanley, 1963). Synchronous correlations measure relationships between variables at each time point and indicate the size and direction of the cross-sectional relationships (e.g., the relationship between perfectionism at T1 and depressive symptoms at T1). Autocorrelations measure the relationship between the same variable at T1 and T2 (e.g., the relationship between depressive symptoms at T1 and T2) and indicates the stability of the variable over time. Finally, cross-lagged correlations provide a test of the relationships between variables over time. Cross-lagged correlations are depicted by the diagonal relationships in the model between one variable on another over time (e.g., the relationship between perfectionism at T1 on depressive symptoms at T2).

IBM SPSS AMOS (version 20; Arbuckle, 2011) was used to conduct cross-lagged panel analysis. The analysis was conducted with measured variables and full information likelihood estimation (FIML). To evaluate model fit the comparative fit index (CFI), Tucker-Lewis Index (TLI) and root mean square error of approximation (RMSEA) were used. Adequate fit was indicated if CFI >.90, TLI >.90, RMSEA <.08 (Hu & Bentler, 1999). Chi-square difference tests were used to compare the fit between nested models.

## **Results**

### **Preliminary Analyses**

The data was screened prior to analyses to check for errors, missing values and outliers (see Tabachnick & Fidell, 2013, for details of this procedure). Twelve univariate



outliers ( $z > +/- 3.29$ ) were removed from the data before analysis (i.e., participants that demonstrated extreme  $z$  scores above  $+/- 3.29$  on one or more variables). No multivariate outliers were identified as no participant showed a Mahalanobis distance larger than the critical value of  $\chi^2(12) = 32.91, p < .001$ , when considering scores on all variables.

Depressive symptoms and devaluation deviated from normal (positive skewness). This is unsurprising given the non-clinical sample and that soccer is highly meaningful for the sample. Positive skewness has also been reported by others for burnout and depression in similar circumstances (e.g., De Francisco, Arce, Pilar Vilchez, & Vales, 2016). Following the removal of outliers, we proceeded with multivariate analysis as Byrne (2009) has suggested that the maximum likelihood estimators in SEM are sufficiently robust to cope with small/moderate deviations from normality in the data. Descriptive statistics, Cronbach's alphas and bivariate correlations are displayed in Table 1.

### **Descriptive statistics and bivariate correlations**

Participants demonstrated high SOP scores and medium levels of SPP at times 1 (T1) and 2 (T2). The mean scores of depressive symptoms and burnout were generally low. Scores on all variables were similar at T1 and T2. SOP had slightly decreased at T2 whereas SPP had slightly increased. Depressive symptoms (DS), reduced accomplishment (RA) and exhaustion (EE) had marginally increased at T2, except for devaluation (D) which decreased slightly. Of particular note is that, at T1, 24% of the sample reported mild to major depressive symptoms ( $CES-D \geq 16$ ) and 11% reported major depressive symptoms ( $CES-D \geq 23$ ). At T2, 33% of the sample reported mild to major depressive symptoms ( $CES-D \geq 16$ ) and 16% reported major depressive symptoms ( $CES-D \geq 23$ ). In regards to the bivariate relationship, SOP and SPP displayed a small relationship with each other and over time. At T1 SOP displayed a small-to-medium negative relationship with DS and burnout symptoms at T1 and

T2 ( $r = -.16$  to  $-.40$ ). SPP at T1 displayed a small-to-medium positive relationship with DS and burnout symptoms and this was consistent at T2 ( $r = .16$  to  $.27$ ).

### **Cross-Lagged Panel Analysis**

The results of the cross-lagged panel analysis are reported in full in Table 2 and depicted in Figures 1 and 2. Athlete burnout and depressive symptoms were examined separately. For athlete burnout and depressive symptoms, four statistical models were tested that included a baseline model and the three alternative theoretical models.

Statistical model 1 included synchronous correlations and autocorrelations only to test the direct paths between the same variables (perfectionism T1 to perfectionism T2 and ill-being T1 to ill-being T2). All other paths between variables are constrained to zero in this model. This model is used for comparison against the other theoretically informed models.

Statistical model 2 tested a vulnerability model and included cross-lagged paths from perfectionism at T1 to burnout/depressive symptoms at T2. Having cross-lagged paths in the manner tests the vulnerability model as only the perfectionism to ill-being pathways are free to vary. All other cross-lagged paths between variables are constrained to zero.

Statistical model 3 tested a complication/scar model and included cross-lagged paths from burnout/depressive symptoms at T1 to perfectionism at T2. Having cross-lagged paths in the manner tests complication/scar model as only the ill-being to perfectionism pathways are free to vary. All other cross-lagged paths between variables are constrained to zero.

Statistical model 4 tested the reciprocal relations model and included all cross-lagged paths (simultaneously testing perfectionism T1 to ill-being T2 and ill-being T1 to perfectionism T2). All paths in this model were free to vary.

***Cross-Lagged Effects of Perfectionism and Burnout Symptoms.*** Model 1 provided adequate fit to the data. Perfectionism had high stability: SOP T1 to T2  $\beta = .62$  and SPP T1 to T2  $\beta = .62$ ,  $ps < .001$ . Burnout symptoms had medium-to-high stability: RA T1 to T2  $\beta = .64$ ,

EE T1 to T2  $\beta = .57$  and D T1 to T2  $\beta = .44$ ,  $ps < .001$ . Model 2 provided adequate fit to the data. The model provided some support for the cross-lagged effects of perfectionism on burnout symptoms. Specifically, SPP at T1 had a small positive significant relationship with EE and D at T2: SPP T1 to EE T2  $\beta = .16$  and SPP T1 to D T2  $\beta = .17$ ,  $ps < .05$ ). No other cross-lagged effects in this model were statistically significant ( $ps > .05$ ).

Model 3 provided adequate fit to the data. The model also provided some support for the influence of burnout symptoms on perfectionism. Specifically, D at T1 had a medium positive significant relationship with SPP T2: D T1 to SPP T2  $\beta = .28$ ,  $p < .01$ . No other cross-lagged effects of burnout symptoms on perfectionism in this model were statistically significant ( $ps > .05$ ). Model 4 provided adequate fit to the data. The model also provided support for reciprocal cross-lagged effects between perfectionism and burnout symptoms. Specifically, SPP at T1 had a small positive significant relationship with D T2 and EE T2: SPP T1 to EE T2  $\beta = .16$  and SPP T1 to D T2  $\beta = .17$ ,  $ps < .05$ . In addition, D T1 had a medium positive significant relationship with SPP T2: D T1 to SPP T2  $\beta = .28$ ,  $p < .01$ . There were no other statistically significant cross-lagged effects ( $ps > .05$ ).

In terms of comparing fit of the models, model 3 (complication/scar model) and model 4 (reciprocal relations model) provided significantly better fit than the baseline model ( $p < .05$ ). However, model 2 (vulnerability model) did not provide significantly better fit than the baseline model ( $p > .05$ ). Model 4 did not provide significantly better fit than model 2 or model 3 ( $p > .05$ ). Based on an assessment of fit, model 3 and model 4 both offer tenable models. However, the presence of two small-to-medium significant cross-lagged effects of SPP on burnout symptoms in model 4 (EE and D) means that model 4 is the most informative in terms of the relationship between perfectionism and burnout over time (i.e., model 4 explains more variance in burnout symptoms than model 3). Model 4 is presented in Figure 1.

*Cross-Lagged Effects of Perfectionism and Depressive Symptoms.* Model 1 provided adequate fit (though it is noted that TLI was below the desirable threshold) fit to the data. Perfectionism had high stability: SOP T1 to T2  $\beta = .63$  and SPP T1 to T2  $\beta = .59$ , ( $ps < .001$ ). Depressive symptoms had high stability: DS T1 to T2  $\beta = .62$ ,  $p < .001$ . Model 2 provided adequate fit to the data. The model did not provide support for the influence of perfectionism on depressive symptoms. Specifically, SOP T1 to DS T2  $\beta = -.11$  and SPP T1 to DS T2  $\beta = .12$  were not statistically significant ( $ps > .05$ ).

Model 3 provided adequate fit to the data. The model provided support for the influence of depressive symptoms on perfectionism. Specifically, DS at T1 had a small positive significant relationship with SPP T2  $\beta = .17$ ,  $p < .05$ . The cross-lagged effect of DS T1 on SOP T2 was non-significant  $\beta = .04$  ( $p > .05$ ). Model 4 provided adequate fit to the data. The model provided support for the cross-lagged effects between depressive symptoms and perfectionism. Specifically, DS T1 had a small positive significant relationship with SPP T2  $\beta = .17$ ,  $p < .05$ . There were no other statistically significant cross-lagged effects ( $ps > .05$ ).

In terms of comparing fit of the models, only model 4 (reciprocal relations model) provided significantly better fit than the baseline model ( $p = .049$ ). Model 2 (vulnerability model) and model 3 (complication/scar model) did not provide significantly better fit than the baseline model ( $p > .05$ ). Model 4 did not provide significantly better fit when compared to model 2 ( $p = .084$ ) or model 3 ( $p = .12$ ). Based on an assessment of fit, model 4 offers the most tenable model. However, in estimating this model it is noteworthy that the only significant cross-lagged effect was between DS T1 to SPP T3, supporting a complication/scar model. Model 4 is presented in figure 2 which depicts all cross-lagged pathways.

### **Discussion**

The relationships between perfectionism, burnout symptoms and depressive symptoms in youth soccer players were examined over a three month period. A vulnerability

model, a complication/scar model, and a reciprocal relations model were tested. It was hypothesised that perfectionism would positively predict changes in burnout symptoms but not the reverse (vulnerability model) and that perfectionism and depressive symptoms would positively predict changes in each other (reciprocal relations model). Cross-lagged panel analysis revealed that SPP positively predicted increases in exhaustion (vulnerability model) and also revealed a positive reciprocal relationship between SPP and devaluation (reciprocal relations model). SPP did not predict depressive symptoms over time but depressive symptoms did predict increases in SPP over time (complication/scar model). SOP did not predict, nor was it predicted by, burnout symptoms or depressive symptoms over time.

### **The relationship between perfectionism and burnout**

The finding that SPP predicts increases in exhaustion over time is in line with the well-established vulnerability model of perfectionism and ill-being. In the only other longitudinal study to examine a similar relationship in sport, Madigan et al (2016a) found the relationship between PC and exhaustion to be non-significant. However, because the overall difference in the size of the relationship in the two studies is quite small ( $\beta = .12$  vs  $.16$ ), we tentatively suggest that the two relationships are comparable and indicative of the possibility that SPP, and PC generally, is likely to have a small positive influence on the development of exhaustion over time for youth athletes and youth soccer players. In regards to why this is the case, others have suggested that self-worth contingent on the attainment of external standards and a disposition to higher levels of anxiety may partly explain the relationship between SPP and exhaustion (Hill et al., 2008). It is easy to imagine how, over time, trying to meet the standards of others will have an exhaustive toll, particularly when the standards are perceived to be uncontrollable and unrealistic or when the external environment reinforces the need to meet high standards to obtain approval, as is the case in soccer academies.

One of the most interesting findings of the current study is that SPP predicted changes in devaluation and at the same time devaluation predicted changes in SPP. The first part of the reciprocal relationship was expected. As with SPP and exhaustion, the relationship between SPP and devaluation was not statistically significant in Madigan et al.'s (2016a) longitudinal study but was very similar in size ( $\beta = .16$  vs  $.17$ ). Therefore, again, we tentatively suggest that the findings of the two studies are consistent in identifying SPP, and PC generally, as possible risk factors for this burnout symptom in youth athletes and youth soccer players. It seems that in addition to an exhaustive toll, SPP may also contribute to increases in a more negative attitude towards soccer participation while attending soccer academies. This may reflect stress-related processes whereby, over time, SPP prompts greater distancing from the sport as a means of coping with stress. This idea is supported by research that has found SPP to be related to the use of avoidance coping strategies (e.g., Hill, Hall, Appleton, 2010). The finding may also reflect a motivational process whereby SPP promotes a progressive shift from intrinsic motivation (i.e., playing soccer for enjoyment) to amotivation (i.e., the absence of motivation; Vallerand, 2001). These processes have been described by athletes reporting burnout symptoms (e.g., Gustafsson et al., 2008) and are consistent with models of burnout (e.g., Lonsdale, Hodge, & Rose, 2009).

The second part of the reciprocal relationship between devaluation and SPP was unexpected. To our knowledge it is the first time the influence of devaluation on SPP has been examined over time. Consequently, there are also no studies to directly compare with. However, a study by Martinet Decret, Guillet-Descas and Isoard-Gauthier (2014) found something similar in that devaluation predicted increases in external motivation (behaviour regulated by rewards and fear of punishment/coercion; Vallerand, 2001) and amotivation over two months in youth athletes. External regulation and amotivation are characteristic of SPP. This is because SPP encompasses perceptions of externally imposed goals, a desire to

validate one's self-worth through the approval of others, and subsequent feelings of helplessness (Appleton & Hill, 2012). In explaining their findings, Martinent et al (2014) proposed that athletes in intensive training centres who have a negative attitude towards sport will still have a sense of obligation to participate and, because they lack intrinsic reasons for doing so, they may well eventually become more dependent on external direction for motivation (e.g., coach or parental approval). It is possible that what is being observed in the current study is similar, with negative attitudes towards sport leading to increases in reliance on external types of motivation in a manner consistent with the externally focused SPP.

The only instance in which SPP did not predict a burnout symptom was for a sense of reduced accomplishment. This relationship is evident in Madigan et al.'s (2016a) study. For this particular difference, we are mindful of the possible contextual differences between our sample and the sample in Madigan et al.'s study. Soccer academies include players that have continually demonstrated exceptional performance and have met the required standards to remain in the academy. Those that do not are quickly removed. This is not the same environment described in Madigan et al. which included student athletes from university teams that compete alongside their studies or with local sport clubs at a range of levels. Therefore, put simply, those that perceived their accomplishments to be inadequate may be underrepresented in our sample (i.e., sample/contextual differences may moderate the SPP-reduced accomplishment relationship). Alternatively, the difference in findings may reflect the different measures of perfectionism used in the two studies. Here, we used SPP whereas Madigan et al used a combination of subdimensions from other instruments to capture PC (concern over mistakes and negative reactions to mistakes). Therefore, examination of moderating factors (e.g., context and instruments) in the PC-reduced accomplishment relationship may be a fruitful avenue for future research seeking to reconcile the findings here and those of Madigan et al. (2016a).

Unlike SPP, SOP did not predict any burnout symptoms over time nor was it predicted by any burnout symptoms. We therefore found no evidence of any protection or resiliency offered by SOP in regards to the development of burnout symptoms over time. This is perhaps the most notable difference between the findings of the current study and Madigan et al.'s (2016a) study in which PS negatively predicted both a reduced sense of accomplishment and devaluation over time. Again, the different measures of perfectionism used in the two studies may explain these findings. Here, we used SOP and Madigan et al. used a combination of subdimensions from other instruments to capture PS (personal standards and striving for perfection). SOP is considered to be particularly complex dimension of perfectionism in that it includes motivational components that mask vulnerability to psychological difficulties (Flett & Hewitt, 2006). It is not clear whether the instruments used by Madigan et al. have similar complexity. Based on the difference in findings, PS may capture something more beneficial for youth athletes to possess than SOP. As recommend by Madigan et al., we therefore also recommend that future work compares the relationship between different subdimensions of perfectionism with burnout symptoms, particularly to clarify whether SOP or PS holds any benefits in terms of burnout symptoms over time.

### **The Relationship between Perfectionism and Depression**

The relationship between perfectionism and depression symptoms was more ambiguous than the relationship between perfectionism and burnout. As expected, based on a comparison of the three models a reciprocal relations model was the most tenable. However, contrary to expectations, based on the presence of significant cross-lagged effects, the relationship between perfectionism and depression was best represented by a complication/scar model. This is because the only statistically significant cross-lagged effect was depressive symptoms to SPP. This is a finding that directly replicates another study



testing a reciprocal relations model between SPP and depression (Asseraf & Vaillancourt, 2015). On the basis of our findings, we tentatively suggest that the current study provides the first evidence of a complication/scar model to explain the relationship between perfectionism and depression in youth soccer players. That is depressive symptoms within soccer academies may contribute to more socially prescribed perfectionistic beliefs. However, this novel finding requires further scrutiny for a number of reasons. First, as described earlier, comparison of models indicated that while the cross-lagged effects of perfectionism to depressive symptoms were not statistically significant, they are also best not considered zero. Second, there is a considerable amount of research that has examined the relationship between SPP and depression which supports a vulnerability model (e.g., Smith et al., 2016).

These issues notwithstanding, support for a complication/scar model has been provided recently by others and suggests that this model is worthy of further examination (e.g., Asseraf & Vaillancourt, 2015). In speculating on why depressive symptoms might precede increases in SPP, Asseraf and Vaillancourt argued that depression may increase prominence of negative schemas and attitudes (e.g., negative thoughts about self and others) or intensify concerns associated with SPP (e.g., mistakes equate to absolute failure). In addition, depression may contribute to dysfunctional behaviours such as seeking out negative feedback or criticism that will affirm perceptions embedded within SPP. We are also particularly intrigued by Asseraf and Vaillancourt's suggestion that the models are not mutually exclusive and the relationship between perfectionism and depression may vary across childhood, adolescence and adulthood. They argue that SPP may be a complication of depression (complication/scar model) in childhood and adolescence but as perfectionism becomes engrained it becomes a risk factor for depression in adulthood (vulnerability model) and the two eventually come to act on each other (reciprocal relations model). These suggestions offer interesting explanations for the findings observed here and align well with

Beck and Bredemeier's (2016) model of depression in which depressogenic beliefs (e.g., "nobody values me") are proposed to be reinforced by the experience of depression.

In a similar manner to SOP and burnout symptoms, SOP did not predict depressive symptoms over time. To our knowledge, no other study has examined the relationship between SOP and depression in youth athletes. However, recent meta-analytical evidence has found SOP to have a small positive correlation with depression that disappeared when controlling for PC or baseline depression in clinical and non-clinical samples (Limburg et al., 2016; Smith et al., 2016). Our findings are consistent with this research. Specifically, after controlling for the influence of SPP and baseline depression, SOP has little association with depression three months later. This is an important finding because within Time 1 and Time 2 SOP had a small negative correlation with depressive symptoms. This might lead one to conclude that SOP is a resiliency factor for depression and something to be encouraged among junior athletes in youth soccer academies. However, as described by Smith et al (2016), cross-sectional evidence appears to cloud a more ambiguous relationship between PS and depression. Examining the factors that buffer and exacerbate the SOP-depression relationship over time offers a means of better understanding if and when SOP will be problematic for junior athletes in youth soccer academies.

### **Limitations and Future Directions**

This study has a number of noteworthy limitations. First, from Time 1 to Time 2 there was a 33% dropout rate. The high dropout may be due to a number of factors such as the release of players from academies over the duration of the study. One subsequent consideration is that youth soccer players who dropped out of the study may have been experiencing higher levels of burnout or depression. Future research will need to build in procedures to retain these participants after they have been removed from the setting. Second, the current study provided short-term longitudinal examination of relationships across two

waves across three months. This is a relatively short period of time to capture this relationship. Examining perfectionism, burnout, and depression over longer periods seems warranted especially given that relationships may change across the lifespan (Asseraf & Vaillancourt, 2015). Third, SOP and SPP had low internal reliability at time point one. As a result, this will have attenuated relationships between variables including across time. Future studies might consider using other measures alongside or instead of the brief HMPS (Cox, Enns & Clara, 2002; Hewitt & Flett, 1991) to capture perfectionism (e.g., Hill, Appleton, & Mallinson-Howard, 2016). Fourth, cross-lagged panel analysis has a number of limitations (see Kenny, 2005). Other statistical approaches suited to assessing change over time offer means of testing the three alternative models in future research when larger samples and more time points are available (e.g., latent growth curve analysis). Finally, participants were male, predominantly adolescent age and in an elite youth soccer context. This limits the generalisability of findings. Differences between the current findings and previous research may reflect this issue (e.g., Madigan et al., 2016a). Future research will need to explore these relationships in different samples to assess generalisability (e.g., females and different ages and sports).

### **Conclusion**

The current findings suggest the relationship between perfectionism and burnout symptoms in youth soccer players may be best represented by a reciprocal relations model wherein dimensions of perfectionism act upon burnout symptoms and, in turn, burnout symptoms act upon perfectionism. The relationship between perfectionism and depression symptoms in youth soccer players is more ambiguous. However, the current study provides the first evidence of a complication/scar model for athletes, wherein depressive symptoms act upon perfectionism over time but not the reverse.

### References

- Appleton, P. R., & Hill, A. P. (2012). Perfectionism and athlete burnout in junior elite athletes: The mediating role of motivation regulations. *Journal of Clinical Sport Psychology, 6*, 129-145.
- Arbuckle J. L. (2011). *AMOS 20.0 user's guide*. Crawfordville, FL: Amos Development Corporation.
- Asseraf, M., & Vaillancourt, T. J. (2015). Longitudinal links between perfectionism and depression in children. *Journal of Abnormal Child Psychology, 43*, 895-908.
- Bagby, R. M., Quilty, L. C., & Ryder, A. C. (2008). Personality and depression. *Canadian Journal of Psychiatry, 53*, 14-25.
- Beck, A. T., & Bredemeier, K. (2016). A unified model of depression: Integrating clinical, cognitive, biological and evolutionary perspectives. *Clinical Psychological Science, 4*, 596-619.
- Byrne, B. (2009). *Structural equation modelling with AMOS: Basic concepts, applications, and programming*. New York, NY: Routledge.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental design for research*. Chicago, US: Rand McNally.
- 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.
- Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychological Assessment, 14*, 365-373.

- Cremades, J. G., Wated, G., & Wiggins, M. S. (2011). Multiplicative measurements of a trait anxiety scale as predictors of burnout. *Measurement in Physical Education and Exercise Science, 15*, 220-233.
- De Francisco, C., Acre, C., Pilar Vilchez, M., & Vales, A. Antecedents and consequences of burnout in athletes: Perceived stress and depression. *International Journal of Clinical and Health Psychology, 16*, 239-246.
- Dobson, K. S., & Dozois, D. J. A. (2011). *Risk Factors in depression*. Cambridge, MA: Academic Press.
- Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issues. In G. L. Flett & P. Hewitt, L. (Eds.), *Perfectionism: Theory, research and treatment* (pp. 5-31). Washington, DC: American Psychological Association.
- Flett, G. L., & Hewitt, P. L. (2006). Positive versus negative perfectionism in psychopathology. *Behaviour Modification, 30*, 472–495.
- Frank, R., Nixdorf, I., & Beckmann, J. (2015). Depression among elite athletes: Prevalence and psychological factors. *Deutsche Zeitschrift für Sportmedizin [German Journal of Sports Medicine], 64*, 320-326.
- Frost, R. O., Marten, P. A., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468.
- Gautreau, C. M., Sherry, S. B., Mushquash, A. R., & Stewart, S. H. (2015). Is self-critical perfectionism an antecedent of or a consequence of social anxiety, or both? A 12-month, three-wave longitudinal study. *Personality and Individual Differences, 82*, 125-130.
- Gernon, A. (2016). *Retired: What happens to footballers when the game's up*. Sussex, BN: Pitch Publishing.

- Green, C. (2009). *Every boy's dream*. London: A & C Black Publishers.
- Goodger, K., Gorely, T., Lavallee, D., & Harwood, C. (2007). Burnout in sport: A systematic review. *Sport Psychologist, 21*, 127-151.
- 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.
- Gustafsson, H., Hassmén, P., Kenttä, G., & Johansson, M. (2008). A qualitative analysis of burnout in elite Swedish athletes. *Psychology of Sport & Exercise, 9*, 800-816.
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology, 60*, 456-470.
- Hill, A. P. (2013). Perfectionism and burnout in junior elite soccer players: A test of the 2 x 2 model of dispositional perfectionism. *Journal of Sport & Exercise Psychology, 35*, 18-29.
- Hill, A. P., Appleton, P. R., & Mallinson-Howard, S. H. (2016). Development and initial validation of the performance perfectionism scale for sport (PPS-S). *Journal of Psychoeducational Assessment, 34*, 653-669.
- Hill, A. P., & Curran, T. (2016). Multidimensional perfectionism and burnout: A meta-analysis. *Personality and Social Psychology Review, 20*, 269-288.
- Hill, A. P., Hall, H. K., & Appleton, P. R. (2010). Perfectionism and athlete burnout in junior elite athletes: The mediating role of coping tendencies. *Anxiety, Stress, & Coping, 23*, 415-430.
- Hill, A. P., Hall, H. K., Appleton, P. R., & Kozub, S. A. (2008). Perfectionism and burnout in junior elite soccer players: The mediating influence of self-acceptance. *Psychology of Sport and Exercise, 9*, 630-644.

- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Ingram, R. E., Scott, W. D., & Hamill, S. (2009). Depression: Social and cognitive aspects. In P. H. Blaney & T. Millon (Eds.), *Oxford textbook of psychopathology* (pp. 230-252). New York, NY: Oxford University Press.
- Judd, L. L., Schettler, P. J., & Akiskal, H. S. (2002). The prevalence, clinical relevance, and public health significance of subthreshold depressions. *Psychiatric Clinic of North America, 2*, 685-698.
- Kenny, D. A. (2005). Cross-lagged panel design. In B. S. Everitt & D. S. Howell, D. C (Eds.), *Encyclopaedia of statistics in behavioural science* (pp. 450-451). Chichester, UK: John Wiley & Sons.
- Limburg, K., Watson, H. J., Hagger, M. S., & Egan, S. J. (2016). The relationship between perfectionism and psychopathology: A meta-analysis. *Journal of Clinical Psychology, 00*, 1-26.
- Lonsdale, C., Hodge, K., & Rose, E. (2009). Athlete burnout in elite sport: A self-determination perspective. *Journal of Sports Sciences, 27*, 785-795.
- Madigan, D. J., Stoeber, J., & Passfield, L. (2015). Perfectionism and burnout in junior athletes: A three-month longitudinal study. *Journal of Sport and Exercise Psychology, 37*, 305-315.
- Madigan, D. J., Stoeber, J., & Passfield, L. (2016a). 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.
- Madigan, D. J., Stoeber, J., & Passfield, L. (2016b). Motivation mediates the perfectionism–burnout relationship: A three-wave longitudinal study with junior athletes. *Journal of Sport and Exercise Psychology, 38*, 341-354.

- Martinent, G., Decret, J-C., Guillet-Descas, E., & Isoard-Gautheur, S. (2014). A reciprocal effects model of the temporal ordering of motivation and burnout among youth table tennis players in intensive training settings. *Journal of Sport Sciences*, *32*, 1648-1658.
- McGrath, D. S., Sherry, S. B., Stewart, S. H., Mushquash, A. R., Allen, S. L., Nealis, L. J., & Sherry, D. L. (2012). Reciprocal relations between self-critical perfectionism and depressive symptoms: Evidence from a short-term, four-wave longitudinal study. *Canadian Journal of Behavioural Science*, *44*, 169-181.
- Nixdorf, I., Frank, R., & Beckmann, J. (2016). Comparison of athletes' proneness to depressive symptoms in individual and team sports: Research on psychological mediators in junior elite athletes. *Frontiers in Psychology*, *7*, 893.
- Oswin, M. (1978). *Children living in long stay hospitals*. London, UK: Heinemann.
- Premier League. (2011). *Elite Player Performance Plan*. London: Premier League
- Radloff (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*, 385-401.
- Radloff, L. S. (1991). The use of center for epidemiologic studies depression scale in adolescents and youth adults. *Journal of Youth and Adolescence*, *20*, 149-166.
- Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport and Exercise Psychology*, *23*, 281-305.
- Rice, S. M., Purcell, R., De Silva, S., Mawren, D., McGorry, P. D., & Parker, A. G. (2016). The mental health of elite athletes: A narrative systematic review. *Sport Medicine*, *46*, 1333-1353.
- Roderick, M. (2006). *The work of professional football: A labour of love*. London: Routledge
- Shahar, G., Blatt, S. J., Zuroff, D. C., Kuperminc, G. P., & Leadbetter, B. J. (2004). Reciprocal relations between depressive symptoms and self-criticism (but not



- dependency) among early adolescent girls (but not boys). *Cognitive Therapy and Research*, 28, 85-103.
- Sherry, S. B., Richards, J. E., Sherry, D. L., & Stewart, S. H. (2014). Self-critical perfectionism is a vulnerability factor for depression but not anxiety: A 12-month, 3-wave longitudinal study. *Journal of Research in Personality*, 52, 1-5.
- Smith, A. L., Gustafsson, H., & Hassmen, P. (2010). Peer motivational climate and burnout perceptions of adolescent athletes. *Psychology of Sport & Exercise*, 11, 453-460.
- Smith, R. E., (1986). Toward a cognitive-affective model of athletic burnout. *Journal of Sport Psychology*, 8, 36-50.
- Smith, M. M., Sherry, S. B., Rnic, K., Saklofske, D. H., Enns, M., & Gralnick, T. (2016). Are perfectionism dimensions vulnerability factors for depressive symptoms after controlling for neuroticism? A meta-analysis of 10 longitudinal studies. *European Journal of Personality*, 30, 201-212.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6<sup>th</sup> ed). Essex, England: Pearson Education Limited.
- Tabei, Y., Fletcher, D., & Goodger, K. (2012). The relationship between organizational stressors and athlete burnout in soccer players. *Journal of Clinical Sport Psychology*, 6, 146-165.
- Vallerand, R.J. (2001). A hierarchical model of intrinsic and extrinsic motivation in sport and exercise. In G.C. Roberts (Ed.), *Advances in motivation in sport and exercise* (pp. 263-320). Champaign, IL: Human Kinetics
- Wolanin, A., Gross, M., & Hong, E. (2015). Depression in Athletes: Prevalence and risk factors. *Current Sports Medicine Reports*, 14, 56-60.

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

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Time 1												
1. SOP												
2. SPP	-.03											
3. DS	-.20*	.27**										
4. BO: RA	-.25**	.27**	.51**									
5. BO: EE	-.32**	.24**	.44**	.57**								
6. BO: D	-.40**	.16	.44**	.54**	.51**							
Time 2												
7. SOP	.62**	-.14	-.09	-.09	-.22*	-.25**						
8. SPP	-.06	.63**	.33**	.23*	.18	.33**	.01					
9. DS	-.23*	.27**	.66**	.47**	.34**	.40**	-.16	.40**				
10. BO: RA	-.16	.16	.48**	.67**	.52**	.37**	-.17	.09	.65**			
11. BO: EE	-.20*	.27**	.38**	.35**	.64**	.22*	-.16	.26**	.40**	.51**		
12. BO: D	-.18	.27**	.37**	.36**	.38**	.44**	-.19*	.27**	.53**	.60**	.55**	
<i>M</i>	5.49	3.60	0.55	2.16	2.05	1.55	5.27	3.65	0.62	2.18	2.02	1.52
<i>SD</i>	0.71	0.93	0.40	0.64	0.70	0.51	0.83	0.94	0.47	0.64	0.75	0.61
$\alpha$	.64	.63	.86	.75	.84	.68	.75	.70	.89	.68	.86	.76

*Note.* T1 = Time point 1 and T2 = Time point 2. SOP = self-oriented perfectionism. SPP = socially prescribed perfectionism. DS = depressive symptoms. BO = burnout. RA = reduced accomplishment. EE = exhaustion. D = devaluation. \* =  $p < .05$ , \*\*  $p < .01$  (two-tailed).

Table 2. Fit indices and Model Comparisons for Perfectionism and Ill-being

Model (M)	$\chi^2$	df	p	CFI	TLI	RMSEA [95% CI]	Model Comparisons			
							$\Delta\chi^2$	$\Delta df$	p	
<u>Burnout symptoms</u>										
M1: Stability Coefficients Only	35.06	20	.02	.97	.92	.07 [.03, .11]				
M2/VM: Perfectionism T1 → BO T2	25.99	14	.03	.98	.90	.07 [.03, .12]	M1 vs. M2	9.08	6	.17
M3/SCM: BO T1 → Perfectionism T2	22.06	14	.08	.98	.94	.06 [.00, .11]	M1 vs. M3	13.00	6	.04
M4/RM: Reciprocal Effects	13.42	8	.10	.99	.92	.07 [.00, .12]	M1 vs. M4	21.64	12	.04
							M2 vs. M4	12.56	6	.05
							M3 vs. M4	8.64	6	.20
<u>Depressive symptoms</u>										
M1: Stability Coefficients Only	11.73	6	.07	.97	.89	.08 [.00, .14]				
M2/VM: Perfectionism T1 → DS T2	7.14	4	.13	.98	.91	.07 [.00, .15]	M1 vs. M2	4.59	2	.10
M3/SCM: DS T1 → Perfectionism T2	6.37	4	.17	.99	.93	.06 [.00, .15]	M1 vs. M3	5.36	2	.07
M4/RM: Reciprocal Effects	2.17	2	.34	1.00	.99	.02 [.00, .16]	M1 vs. M4	9.55	4	.05
							M2 vs. M4	4.96	2	.08
							M3 vs. M4	4.19	2	.12

*Note.* M1-M4 = the four different models tested. *df* = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval. VM = vulnerability model; SCM = Scar/complication model; RM = Reciprocal model. BO = Burnout Symptoms; DS = Depressive Symptoms.

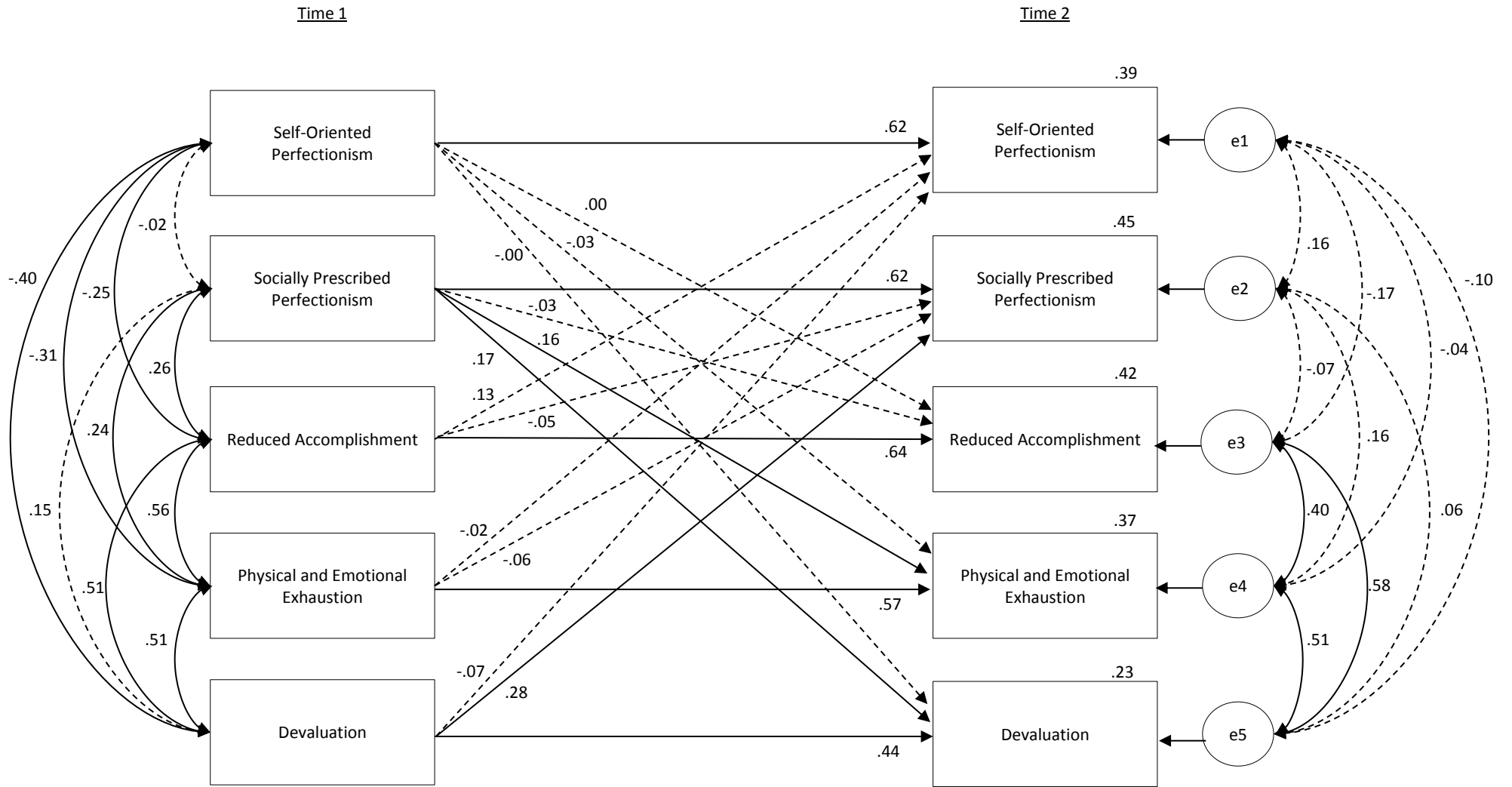


Figure 1. Perfectionism and burnout cross-lagged panel analysis with standardized coefficients (M4). Dashed lines depict nonsignificant pathways ( $p > .05$ )

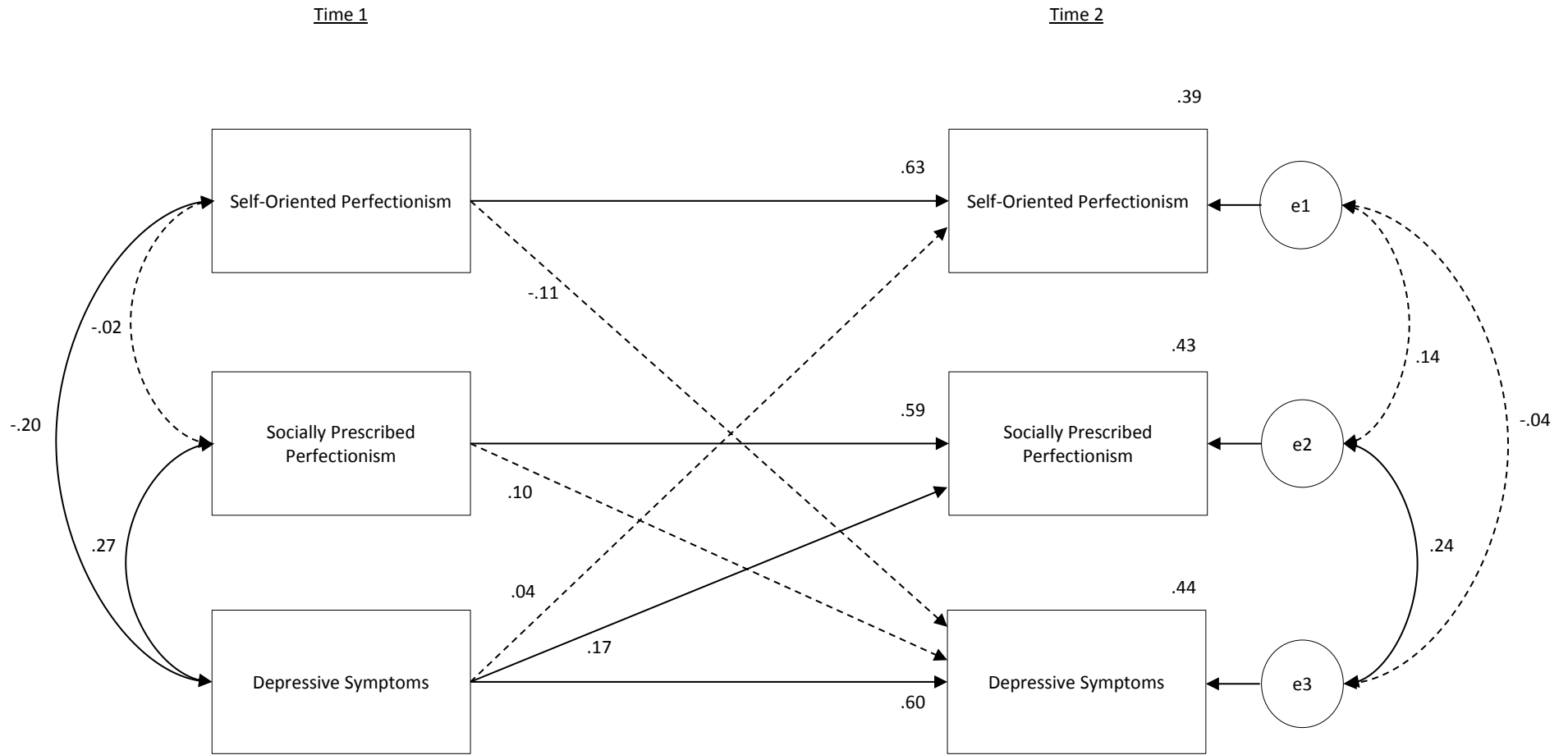


Figure 2. Perfectionism and depressive symptoms cross-lagged panel analysis with standardized coefficients (M4). Dashed lines depict nonsignificant pathways ( $p > .05$ ).