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Profiles of perfectionism, parental climate, and burnout among competitive junior athletes

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Profiles of perfectionism, parental climate, and burnout among competitive junior athletes

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Abstract

3 Recent research suggests that groups of athletes can be identified that differ in terms of
4 perfectionism and perceptions of achievement climate. Moreover, these groups also differ in
5 terms of burnout symptoms. The purpose of the current study was to extend this research by
6 examining whether discernable groups can be identified based on scores of perfectionism and
7 perceptions of parent-initiated climate and, then, whether these groups differ in terms of
8 burnout. Two-hundred and thirty-seven Swedish junior athletes (124 male and 113 female
9 aged 16-19) from a variety of sports completed measures of athlete burnout,
10 multidimensional perfectionism, and parent-initiated motivational climate. Latent profile
11 analysis identified four groups: non-perfectionistic athletes in a task-oriented climate,
12 moderately perfectionistic athletes in a task-oriented climate, highly perfectionistic athletes in
13 a task-oriented climate, and highly perfectionistic athletes in a mixed climate. The latter two
14 groups reported higher levels of burnout in comparison to other groups. The findings suggest
15 that junior athletes high in perfectionism may be at comparatively greater risk to burnout and
16 that this may especially be the case when they perceive their parents to emphasize concerns
17 about failure and winning without trying one's best.

18

19 Keywords: personality, performance, stress, motivation.

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3 1 Profiles of perfectionism, parental climate, and burnout among competitive junior
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5 2 athletes
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7 3 Participation in competitive youth sport can be stressful. Aspiring young athletes
8
9 4 encounter issues associated with both being an adolescent (e.g., increasing school demands)
10
11 5 as well as being an athlete (e.g., increasing training loads and competitive pressure)
12
13 6 (Gustafsson, Kenttä, & Hassmén, 2011). As a consequence of this stressful environment,
14
15 7 junior athletes are exposed to the risk of burnout. The most widely accepted definition of
16
17 8 athlete burnout is that it is a syndrome comprised of three symptoms; emotional and physical
18
19 9 exhaustion, a reduced sense of accomplishment, and sport devaluation (Raedeke & Smith,
20
21 10 2001). The first symptom represents the depletion of the athlete's emotional and physical
22
23 11 resources. The second symptom describes an enduring perception that sport performances
24
25 12 and abilities are deficient. The final symptom is a loss of interest, cynical attitude, and
26
27 13 devaluation of the formerly loved sport. In combination, these symptoms undermine the
28
29 14 performance, motivation, and wellbeing of athletes (Gustafsson, Hassmén, Kenttä, &
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31 15 Johansson, 2008).
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36 16 There are a number of models that explain the onset of burnout (see Eklund &
37
38 17 Cresswell, 2007, for a review). Arguably, the most influential has been Smith's (1986)
39
40 18 cognitive-affective model. In this model burnout is understood as part of the stress-process
41
42 19 and, principally, the result of chronic stress. Specifically, mirroring the stress process,
43
44 20 burnout is thought to develop when demands are continuously appraised to outweigh personal
45
46 21 resources and athletes are unable to employ appropriate coping strategies. In this model
47
48 22 whether burnout develops is ultimately governed by a cognitive appraisal process whereby
49
50 23 the personal meaning given to being unable to meet demands. This model has been popular in
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52 24 sport and has received empirical support with burnout symptoms consistently and strongly
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3 1 associated with stress-related factors (e.g., anxiety and coping) (see Goodger, Gorely,
4
5 2 Lavalley, & Harwood, 2007, for a review).

3 **Multidimensional perfectionism**

4 According to Smith's (1986) model, personality factors contribute to burnout via their
5 influence on the stress-process. One of the most investigated personality factors in relation to
6 athlete burnout has been perfectionism. Broadly, perfectionism is a personality that entails a
7 combination of exceedingly high standards and a preoccupation with extreme self-critical
8 evaluation (e.g., Frost, Marten, Lahart, & Rosenblate, 1990). Perfectionism is considered to
9 be multidimensional by most researchers. This is exemplified by the approach of Frost and
10 colleagues (1990) who measure perfectionism using a combination of intrapersonal and
11 interpersonal dimensions. The two core dimensions of this model, however, are personal
12 standards (reflecting high personal standards of performance) and the tendency to evaluate
13 oneself based on performance) and concern over mistakes (a preoccupation with minor errors
14 and equating them with failure). Along with other similar dimensions, these two features
15 predict a wide array of outcomes among athletes including burnout (see Gotwals, Stoeber,
16 Dunn, & Stoll, 2012, for review).

17 Consistent with Smith's (1986) model, one of the reasons why dimensions of
18 perfectionism are thought to be important when considering the likelihood of athlete burnout
19 is due to their influence on stress-related processes (e.g., Hill et al., 2010). Specifically,
20 concern over mistakes and similar dimensions are thought to predispose individuals to more
21 pronounced and prolonged periods of stress (Hewitt & Flett, 2002). This is because they
22 encompass a self-evaluative process whereby continual achievement is necessary in order to
23 maintain a sense of self-worth (Greenspon, 2000). Athletic achievement therefore carries an
24 irrational sense of importance that evokes higher levels of threat and anxiety via the cognitive
25 appraisal process. As described by Lemyre, Hall, and Roberts (2008), when athletes give

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3 1 meaning to achievement in this manner, it is simply a matter of time before chronic and
4
5 2 overwhelming levels of anxiety develop, rendering athletes disaffected and burned out. In
6
7 3 accord with this perspective, research has found that it is not the presence of high personal
8
9 4 standards, per se, that contributes to higher burnout but the presence of high concern over
10
11 5 mistakes (for a recent meta-analysis of the perfectionism-burnout relationship, see Hill &
12
13 6 Curran, in press).

16 7 While research has helped establish the perfectionism-burnout relationship, to date
17
18 8 research has largely focused on the influence of perfectionism on burnout separate from the
19
20 9 social environment in which perfectionism is exhibited. This reflects a wider absence in this
21
22 10 area which has prompted a number of researchers to note that the influence of the social
23
24 11 environment on the development of burnout has been neglected (e.g., Goodger et al., 2007).
25
26 12 Here we focus on the notion that perfectionistic junior athletes will find themselves in
27
28 13 different social environments initiated by parents and this will contribute to vulnerability to
29
30 14 burnout. We center on parents for a number of reasons. Firstly, they are known to play an
31
32 15 influential role in shaping the experience of junior athletes (Keegan, Spray, Harwood, &
33
34 16 Lavalley, 2010). Secondly, they have also been identified as both a source of pressure or
35
36 17 potential support that may foster or waylay athlete burnout (e.g., Gould, et al., 1996; Raedeke
37
38 18 et al., 2002). Thirdly, perfectionism is thought to be acquired in part in response to parental
39
40 19 behavior ~~with perceptions of parents' expectations and criticism~~ so may be especially
41
42 20 relevant for adolescents (Flett, Hewitt, Oliver, & Macdonald, 2002).

21 **Achievement goal theory and parent-initiated motivational climate**

22 22 Achievement goal theory (Nicholls, 1984) offers a means of understanding the
23
24 23 influence of parents on burnout. According to this theory, achievement contexts are
25
26 24 conceptualized through the goal structures and expectations that shape perspectives on
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28 25 success, referred to as achievement climates. Ames (1992) identified two motivational
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Running head: PERFECTIONISM, PARENTS, AND BURNOUT

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3 1 climates, a task-involving climate and ego-involving climate. A task-involving climate entails
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5 2 emphasizing and rewarding effort and cooperation, focusing on learning, and self-referenced
6
7 3 criteria for success. In contrast, an ego-involving climate entails reinforcement of social
8
9 4 comparison and evaluation, within-group competition, and punishment of mistakes. In
10
11 5 combination with dispositional tendencies to be task-involved and ego-involved (goal-
12
13 6 orientations), the motivational climate determines goal involvement and motivational
14
15 7 outcomes. In general, a task-involving climate is associated with adaptive motivation-related
16
17 8 responses and an ego-involving climate with maladaptive motivation-related responses. This
18
19 9 is evident in sport where the comparative benefits of a task-involving climate have received
20
21 10 extensive support (e.g., Harwood, Keegan, Smith, Raine, 2015; Braithwaite, Spray,
22
23 11 ~~Warburton, 2011~~).

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26
27 12 Along with coaches and peers, parents are an important source of motivational
28
29 13 climate (White, 1996; White, Duda, & Hart, 1992). Parent-initiated motivational climate
30
31 14 includes three main elements: (a) learning/enjoyment, that is the extent to which parents
32
33 15 emphasize enjoyment, effort, and learning new skills; (b) worry-conducive, which is the
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35 16 extent to which parents emphasize concerns about failure and mistakes; and (c) success-
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37 17 without-effort, which is to what extent parents emphasize performing without trying one's
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39 18 best. The first element reflects a task-involving climate, whereas the other two reflect an ego-
40
41 19 involving climate (White et al, 1992). Although few studies have examined parent-initiated
42
43 20 climate in sport, findings so far are similar to wider research with elements of a task-
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45 21 involving parent-initiated climate predicting more adaptive patterns of achievement goals
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47 22 (e.g., Morris & Kavussanu, 2008), sportsmanship (e.g., LaVoi & Babkes Stellino, 2008), and
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49 23 anxiety (e.g., O'Rourke, Smith, Small, & Cumming, 2011), in comparison to elements of an
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51 24 ego-involving parent-initiated climate.
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3 1 The divergence between the two motivational climates extends to athlete burnout. In
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5 2 describing the relationship between motivational climates and burnout, Lemyre et al. (2008)
6
7 3 argued that a task-involving climate provides situational cues that promote a desire for
8
9 4 challenge, intrinsic interest, and motivationally enhancing attributions for achievement
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11 5 outcomes, protecting athletes from burnout. In contrast, an ego-involving climate provides
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13 6 situational cues that promote an intense focus on validating self-worth, fosters perceptions of
14
15 7 incompetence, and heightens a sense of personal threat and anxiety, rendering athletes
16
17 8 vulnerable to burnout. Research has provided some support for these suggestions, with coach-
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19 9 and peer-created task-involving climates typically negatively related to burnout and coach-
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21 10 and peer-created ego-involving climates positively related to burnout (e.g., Lemyre et al.,
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23 11 2008; Smith, Gustafsson, & Hassmén, 2010). Surprisingly, no research to date has examined
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25 12 the influence of parent-initiated climate on burnout; however, findings regarding motivational
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27 13 climate more generally suggest that athletes who perceive the parent-initiated climate to be
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29 14 more ego-involving are likely to also report higher levels of burnout.
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34 **Profiles of perfectionism and motivational climate**

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36 16 A small number of studies have examined if different profiles of perfectionism and
37
38 17 motivational climate are associated with different patterns of burnout. In this regards two
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40 18 studies are especially relevant. Gotwals (2011) found four groups of perfectionists among
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42 19 varsity student-athletes ('parent-oriented unhealthy perfectionists', 'doubt-oriented unhealthy
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44 20 perfectionists', 'healthy perfectionists', and 'non-perfectionists') and that these four groups
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46 21 exhibited differences in levels of burnout symptoms so that the healthy perfectionists group
47
48 22 was the most maladaptive. In the only study to seek to also integrate measures of the social
49
50 23 environment, Lemyre et al (2008) identified two groups among elite senior and junior athletes
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52 24 who differed in terms of personal standards, concern over mistakes and perceptions of a
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54 25 coach created climate, along with other motivational variables. Notably, the group who
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1 reported higher concern over mistakes and personal standards in combination with higher
2 levels of an ego-involving coach created climate and lower levels of a task-involving coach
3 created climate ('maladaptive motivation') also reported higher levels of all symptoms of
4 burnout. Consequently, research suggests that different groups of perfectionists in different
5 achievement climates can be identified and they differ in terms of athlete burnout.

6 In seeking to identify different groups, these two studies exemplify a person-centred
7 approach. A person-oriented approach places emphasis on the individual rather than
8 variables. As such, the individual is viewed holistically and his/her interwoven characteristics
9 considered simultaneously (Bergman & Andersson, 2010). As highlighted by Gotwals
10 (2011), in context of examining perfectionism and burnout, this approach is highly
11 appropriate as it more readily treats perfectionism as a multidimensional construct and
12 identifies burnout as a phenomenon that inflicts individuals, not variables. However, Gotwals
13 (2011) and Lemyre et al (2008) also used cluster analysis. This is a useful technique when
14 seeking to identify naturally occurring groups and examine their differences but, despite its
15 strengths, it is also an exploratory technique that can provide highly unstable solutions with
16 few means of differentiating between cluster solutions objectively. For these reasons,
17 researchers have begun to utilise other techniques such as latent profile analysis. Latent
18 profile analysis offers an alternative model-based approach to identifying naturally occurring
19 groups with the notable advantages of providing probability estimates of group membership
20 and providing fit indices to differentiate between multiple possible cluster solutions (Marsh,
21 Lüdtke, Trautwein, & Morin, 2009). In light of these advantages, we adopt this approach here
22 for the first time among research examining the relationship between perfectionism and
23 burnout.

24 In summary, the purpose of the current study was to build upon research in this area
25 that has examined perfectionism, achievement climates, and burnout, as well as research

1 using person-oriented approaches, by (i) examining whether discernable groups can be
2 identified among junior athletes based on levels of perfectionism and perceptions of parent-
3 initiated climate in sport, and (ii) whether these groups differ in terms of athlete burnout
4 symptoms. Based on the findings of others in this area, it was expected that groups would
5 emerge that varied in both perfectionism and perceptions of parent climate and that higher
6 levels of burnout would be evident among groups that reported higher concerns over mistakes
7 and an ego-involving climate.

8 **Method**

9 **Participants and procedure**

10 Participants were 237 Swedish junior athletes (124 males, 113 females, M age = 16.99
11 years, SD = 0.80 years, range = 16 to 19 years) recruited from a range of team (n = 178; e.g.,
12 football, hockey, and rugby) and individual sports (n = 59, athletics, tennis, and swimming).
13 The athletes were recruited from a designated sport high school under the surveillance of the
14 Swedish national sport federation. The junior athletes reported that they spent 8.71 (SD =
15 5.44) hours per week training and competing and had participated in their sport for 9.08 years
16 (SD = 2.71). Ethical approval was gained from the research ethics committee of the first
17 author's university prior to conducting the study.

18 **Instruments**

19 **Burnout.** The Athlete Burnout Questionnaire (ABQ; Raedeke & Smith. 2001) was
20 used to measure burnout. This includes three 5-item subscales that assess three symptoms:
21 reduced sense of athletic accomplishment (RA; e.g., 'I am not performing up to my ability in
22 my sport'), emotional and physical exhaustion (EE; e.g., 'I feel overly tired from my sport
23 participation'), and sport devaluation (D; e.g., 'The effort I spend participating in my sport
24 would be better spent doing other things'). Items are measured on a 5-point Likert scale (1 =
25 *almost never* to 5 = *almost always*). Evidence for the validity and reliability of this instrument

1 has been provided by Raedeke and Smith (2001) via assessment of factorial structure
2 (confirmatory factor analysis) and internal consistency (all α s \geq .84). The scale has been used
3 in a range of sports (e.g., swimmers and soccer) and has been used with junior athletes (e.g.,
4 Hill, 2013). The Swedish version of the ABQ has shown to have acceptable factor structure
5 and internal reliability (e.g., Smith et al., 2010).

6 **Multidimensional Perfectionism.** Personal standards and concern over mistakes
7 were measured using subscales from the short-version of Frost et al.'s (1990)
8 Multidimensional Perfectionism Scale (Cox, Enns, & Clara, 2002). Specifically, personal
9 standards (5-items, e.g., 'I set higher goals than most people.') and concern over mistakes (5-
10 items, e.g., 'If I fail partly, it is as bad as being a complete failure.') were used. Responses are
11 measured on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Evidence to
12 support the validity and reliability of the instrument has been provided by Cox et al. (2002) in
13 the form of assessing factor structure (confirmatory factor analysis) and internal consistency
14 (α = .63 to .90). The subscales of the shortened version are highly correlated with the
15 originals (r = .87 to .98) and has the advantage of better factor structure (see Cox et al.,
16 2002). The Swedish version of MPS has been translated and successfully used with athletes
17 (e.g., Koivula, Hassmén, & Fallby, 2002).

18 **Perceived Motivational Climate.** White and colleagues' (White et al., 1992; White,
19 1996, 1998) Parent-Initiated Motivational Climate Questionnaire (PIMCQ-2) was used to
20 assess perceptions of the parent-climate. This includes perceptions that the junior athletes'
21 mother or father promotes learning and enjoyment climate (LE; 9-items, e.g., 'Believes
22 enjoyment is very important in developing new skills'), a worry-conducive climate (WC; 5-
23 items, e.g., 'Makes me worried about failing.'), and a success-without-effort climate (SWE;
24 4-items, e.g., 'Says it is important for me to win without trying hard'). This scale includes 36-
25 items (18-items repeated twice and focused on either mother or father) measured on 5-point

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3 1 Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Evidence to support the reliability
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5 2 and validity of the scale has been provided by White and colleagues (e.g., White et al., 1992;
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7 3 White, 1996, 1998). This includes explorative factor analysis with support for the three
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9 4 dimensional structure and internal consistency ($\alpha = .72$ to $.90$). In the current study a Swedish
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11 5 version was created using a ‘translation-back-translation’ procedure (Geisinger, 2003). The
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13 6 original scale was translated into Swedish by a Swedish native speaker and then translated
14
15 7 back to English by a bilingual translator. Minor adjustments were made to the items
16
17 8 following this procedure.¹ The two parent-climates were standardised and added together to
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19 9 create a measure of parent climate (rather than mother of father climates). This strategy has
20
21 10 been used by others (e.g., Morris & Kavussanu, 2008) and was adopted here because we were
22
23 11 interested in overall perceptions of parents and perceptions of the climate initiated by mothers
24
25 12 and fathers were highly correlated (LE $r = .67$, WC $r = .67$, and SWE $r = .68$).

13 **Statistical Analysis**

14 Initial data screening, descriptive statistics and bivariate correlations were calculated
15
16 15 with the IBM SPSS Statistics version 22. The latent profile analysis (LPA) was conducted
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18 16 with *Mplus* version 7.3 (Muthén & Muthén, 1998–2012). The LPA was conducted to uncover
19
20 17 homogenous subgroups within the sample based on their scores on the perfectionism and
21
22 18 parental climate variables (Marsh et al., 2009; Pastor, Barron, Miller, & Davis, 2007). These
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24 19 subgroups are considered latent because the participants’ class membership is not directly
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26 20 observed but instead inferred from the relationship between the measured variables.
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28 21 Following Marsh et al. (2009) recommendations, we estimated solutions with varying
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30 22 numbers of classes and selected the solution that made most sense in relation to theory,
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32 23 previous research, interpretability of the classes, and also statistical criteria. We used nested
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34 24 model comparisons and tested whether more complex models (i.e., more classes) had a better
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36 25 fit to the data than more parsimonious models (i.e., fewer classes). In this study we estimated
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1-6 classes to identify the appropriate number of classes. A number of statistical criteria were used to assess model fit. The Bootstrap Likelihood Ratio Test (BLRT) was used to compare a k -class model with a $k-1$ class model. A significant BLRT p value indicates a better model fit for k -class model compared to the $k-1$ class model (Nylund, Muthén, & Asparouhov, 2007). The Bayesian Information Criterion (BIC) and sample-size adjusted BIC (SSA-BIC) were also used and are relative measures of how well a model fit the data with lower values indicating a better model fit (Raftery, 1995). To examine the precision of the classification of the participants into classes, entropy values were used (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993). Entropy values range from 0 to 1 where a higher value indicates better precision (Berlin, Williams, & Parra, 2013). To further examine the precision of the latent class categorization, the average latent class probabilities were also inspected. Although no clear cut-offs have been proposed, Berlin et al. (2013) suggested that probabilities of .85 and higher indicate some degree of adequacy. In determining the appropriate number of classes, we considered the numbers of cases within each class as small numbers are considered less feasible (Berlin et al., 2013; Marsh et al. 2009). We used 500 random start values for each model, with the 50 best retained for the final solution. To avoid local maxima the final solution was replicated with 1500 random start values (Geiser, 2013).

A multivariate analysis of variance (MANOVA) was used to examine differences between the classes in terms of perfectionism and climate variables. This was followed by univariate analyses and pairwise Bonferroni corrected comparisons with 95% bias corrected bootstrap estimates of differences between classes. These were necessary so as to compensate for lack of homogeneity of covariance between groups and associated increased risk of type 1 error (Finch, 2005). An overall test and pairwise class comparisons between the latent class categorization and the three burnout symptoms were conducted using a Wald chi-square test (DU3STEP in *Mplus*). This procedure is referred to as the three-step method and uses

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3 1 auxiliary variables (i.e., the three burnout symptoms) as distal outcomes that are compared
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5 2 between the classes (Asparouhov & Muthén, 2014). Bonferroni correction of the significance
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7 3 level ($.05/6 = .008$) was applied within each of the burnout symptoms to reduce the risk of
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9 4 type 1 errors due to multiple tests.

5 **Results**

6 **Preliminary Analysis**

7 Prior to the main analyses, a missing value analysis was conducted on the data. Due to
8 large amounts of missing data ($> 5\%$), 20 participants were removed from the sample.
9 Subsequently, there were then 209 complete cases and 8 cases with incomplete data. For
10 those with incomplete data, the average number of missing values was the equivalent of less
11 than 2 items ($M = 1.13$, $SD = 0.35$, range 1 to 2). An inspection of the pattern of missing data
12 suggested a non-systematic mechanism for the missing data. Specifically, only two common
13 missing data patterns were evident (i.e., the same two items missing) with all other
14 individuals displaying a unique pattern (i.e., missing different items). Consequently, the
15 missing data was considered as missing at random and estimated using the full information
16 maximum likelihood (FIML) function (Enders, 2010). Following this procedure, the data was
17 then screened for univariate outliers (standardised z -scores larger than 3.29, $p < .001$, two-
18 tailed) using the protocol described by Tabachnick and Fidell (2007). This led to the removal
19 of 1 of the participants. In the absence of outliers, the data was considered sufficiently
20 univariate normal. Finally, internal reliability analysis (Cronbach's alpha) indicated that all
21 instruments demonstrated adequate internal consistency ($\alpha = .69$ to $.94$, see Table 1).

22 **Descriptive statistics**

23 Descriptive statistics are reported in Table 1. Overall, the junior athletes reported
24 moderate-to-high perceptions of a parent-initiated climate that was task-oriented, low levels
25 of a parent-initiated climate that was worry conducive, and moderate-to-low levels of a

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3 1 parent-initiated climate that emphasised success-without-effort. The athletes reported low
4
5 2 levels of concern over mistakes and moderate levels of personal standards. They also reported
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7 3 low-to-moderate levels of symptoms of burnout. A parent-initiated task-oriented climate was
8
9 4 negatively related to concern over mistakes. A parent-initiated climate that was worry
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11 5 conducive was positively associated with concern over mistakes, personal standards, and all
12
13 6 three burnout symptoms, whereas a climate that emphasised success-without-effort was
14
15 7 positively related to concern over mistakes and two of the burnout symptoms (EXH and
16
17 8 DEV). Personal standards and concern over mistakes were positively related to all burnout
18
19 9 symptoms.

10 **Latent Profile Analysis**

11 The model fit of the six estimated latent profile solutions are displayed in Table 2.
12 According to the statistical criteria, the model fit improved for each successive class that was
13 added. Although the five-class solution, and to some extent the six-class solution, indicated a
14 slight improvement in model fit, they contained very small classes ($n \approx 11$). Therefore, in
15 order to avoid the possibility of low power and precision, we choose to retain a more
16 parsimonious solution (Berlin et al., 2013). Hence, based on the combination of statistical
17 criteria and interpretability, we retained the four-class solution as our final model.

18 Using the four-class solution, distinct profiles based on the athletes' perfectionism and
19 climate scores were generated (Table 3). Athletes in class 1 reported high levels of task-
20 oriented climate and moderate levels of worry-conducive climate, success-without-effort
21 climate, concern over mistakes, and personal standards. Class 1 is labeled as "moderately
22 perfectionistic athletes in a task-oriented climate". Athletes in class 2 reported relatively high
23 levels on task-oriented climate and relatively low levels on worry-conducive climate,
24 success-without-effort climate, concern over mistakes, and personal standards. Class 2 is
25 labeled as "non-perfectionistic athletes in a task-oriented climate". Athletes in class 3

1 reported relatively high levels on task-oriented climate, low levels on worry-conductive
2 climate and success-without-effort climate, and relatively high levels on concern over
3 mistakes and personal standards. Class 3 is labeled as “highly perfectionistic athletes in a
4 task-oriented climate”. Finally, athletes in class 4 reported relatively high levels on the
5 perceived parental climate and the perfectionism variables. Class 4 is labeled as “highly
6 perfectionistic athletes in a mixed climate”.

7 The MANOVA showed that there were significant differences between the classes in
8 terms of the combination of variables: Pillai’s Trace (15, 630) = 0.99, $p < .001$. Follow-up
9 univariate tests confirmed differences between classes for all variables: concern over
10 mistakes, $F(3, 212) = 195.25$, personal standards, $F(3, 212) = 36.37$, LOC $F(3, 212) =$
11 13.51, WCC, $F(3, 212) = 496.85$, and SWE, $F(3, 212) = 18.11$, $ps < .001$. Bonferroni
12 pairwise comparisons are displayed in Table 3. Class 1 reported lower levels of task-oriented
13 climate and higher levels of worry-conductive climate and success-without effort climate
14 compared to class 2 and class 3. Class 1 also reported lower levels of worry-conductive
15 climate compared to class 4, higher levels of concerns over mistakes and personal standards
16 compared to class 2, and reported lower levels of concern over mistakes and personal
17 standards compared to class 3 and 4. Class 2 reported higher levels of task-oriented climate
18 and lower levels of worry-conductive climate and success-without effort climate compared to
19 class 4. Class 2 also reported lower levels of success-without effort climate compared to class
20 4 and reported lower levels of concerns over mistakes and personal standards compared to
21 class 3 and class 4. Class 3 reported higher levels of task-oriented climate and lower levels of
22 worry-conductive climate and success-without effort climate compared to class 4. Class 3 also
23 reported higher levels of personal standards compared to class 4.

24 As seen in Table 4, the Wald chi-square tests showed that there were statistically
25 significant overall differences between the four classes in all self-reported burnout symptoms.

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3 1 Specific pairwise comparisons showed that the moderately perfectionistic athletes in a task-
4 oriented climate (C1) reported lower levels of reduced sense of accomplishment and
5 exhaustion compared to the highly perfectionistic athletes in a mixed climate (C4). The non-
6 perfectionistic athletes in a task-oriented climate (C2) reported lower levels on reduced sense
7 of accomplishment and devaluation compared to the highly perfectionistic athletes in a task-
8 oriented climate (C3) and lower levels on all three burnout symptoms compared to the highly
9 perfectionistic athletes in a mixed climate (C4).

18 **Discussion**

20 The purpose of the current study was to (i) examine whether discernable groups could
21 be identified among junior athletes based on levels of perfectionism and perceptions of
22 parent-initiated climate in sport, and (ii) whether these groups differed in terms of athlete
23 burnout symptoms. It was hypothesized that groups would emerge that varied in both
24 perfectionism and perceptions of parent climate and that higher levels of burnout would be
25 evident among groups that reported higher concerns over mistakes and perceptions of an ego-
26 involving climate. In partial support of these hypotheses, four groups emerged that varied in
27 level of perfectionism and, to a lesser degree, perceptions of the achievement climate and
28 groups that were characterized by higher perfectionism and comparable levels of an ego-
29 involving climate to a task-involving climate reported higher levels of burnout

30 In line with the first hypothesis, the four groups that emerged varied in terms of level
31 of perfectionism they reported and in perceptions of the parent-initiated motivational climate.
32 This included non-perfectionistic, moderately perfectionistic, and highly perfectionistic junior
33 athletes who perceived largely task-involving climates or a mixed climate. The groups cannot
34 be directly compared to groups from other research as the measures used to classify
35 participants are different. However, the findings are consistent with other studies such as
36 Gotwals (2011) and Lemyre et al (2008) in that, when using a person-oriented approach,
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1 groups can be identified that differ in terms of perfectionism and measures of the social
2 environment. Notably, for the first time we illustrate that this includes perceptions of the
3 parent initiated climate.

4 Based on differences between the groups in terms of perfectionism and perceptions of
5 the parent-initiated climate, differences emerged in terms of burnout symptoms. This was
6 evident in two ways. Firstly, the presence of higher levels of perfectionism corresponded with
7 the presence of comparatively higher levels of burnout regardless of the level of task-
8 involving climate. Secondly, the only group to report similar levels of an ego-involving
9 climate to a task-involving climate alongside high perfectionism reported higher burnout than
10 two of the other groups. These findings suggest that higher perfectionism among junior
11 athletes might be a risk factor for higher burnout and this may especially be the case when
12 perceptions of an ego-involving climate are comparable to perceptions of a task-involving
13 climate initiated by parents.

14 The findings were limited to groups of perfectionistic junior athletes who perceived
15 largely task-involving climates. The tendency of junior athletes to report relatively higher
16 task-involving climates is a common finding in research and has also been found in terms of
17 parent initiated climate (e.g., Kavussanu, White, Jowett, & England, 2011). Therefore, in this
18 regard, this particular finding is unsurprising. However, as a result we cannot comment on the
19 influence of an increasingly ego-involving climate (unaccompanied by a task-involving
20 climate) on burnout symptoms. Lemyre et al (2008) identified a group of athletes who
21 reported higher perfectionism and higher perceptions of an ego-involving climate. Why such
22 a group did not emerge here might reflect a number of differences between the two studies.
23 For example, Lemyre et al included elite senior athletes and focused on coach created
24 climates. It may be that in elite senior contexts and when coaches are assessed, perceptions of
25 more ego-involving climates are more likely or varied. Equally, our more robust model-based

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3 1 approach to identifying groups (i.e., latent class analysis) may explain the difference in
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5 2 findings. Future studies are required to examine these possibilities.

3 **Applied implications**

4 Our findings point to the importance of intervention aimed at altering the behaviors of
5 parents of junior athletes. There are only a very small number of intervention studies in sport
6 that have included parents (e.g., Harwood & Swain, 2002; Smoll, Smith, & Cumming, 2007).
7 However, these have provided support for the notion that educational programmes can be
8 used to change parental behavior and that the effects can be seen in junior athletes. In terms
9 of the focus of any intervention, as perfectionism may prove more difficult to change,
10 promoting a more optimal motivational atmosphere by discouraging an ego-involving climate
11 and encouraging a task-involving climate may be more fruitful in terms of reducing burnout.
12 This includes, for example, setting goals that emphasize task mastery and effort and
13 deemphasize interpersonal competition and comparative ability. For the practicalities of
14 doing so, readers are deferred to the studies cited above as they adopted interventions based
15 on achievement goal theory in parents and to other studies that have done so with coaches
16 (e.g., Smith, Cumming, & Smoll, 2007). These studies offer both empirical support and some
17 practical guidance for implementing interventions based on this theory.

18 **Limitations and other future studies**

19 The study is cross-sectional and therefore causality cannot be inferred from the
20 relationships between the variables. Longitudinal research can help address this issue.
21 Perfectionism was also measured at a general level, rather than domain-specific level. This
22 was primarily because we used the only measure of perfectionism that has been translated
23 into Swedish and used in research in this area. Although perfectionistic tendencies of athletes
24 can be measured at a global level (e.g., Gaudreau & Antl, 2008), research suggests that
25 domain-specific measurement may be best as individuals tend to express perfectionism in

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3 1 specific areas of their lives (e.g., Dunn, Causgrove Dunn, & McDonald, 2012). Therefore,
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5 2 once translated, researchers may wish to use domain-specific instruments to replicate the
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7 3 current study. Another noteworthy issue in this regard is that we used two specific
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9 4 dimensions of perfectionism from an array available. Other instruments and dimensions may
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11 5 result in the identification of different groups (e.g., doubt-oriented perfectionists; Gotwals,
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13 6 2011). Therefore, our findings are likely to capture only a few of the multiple groups of
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15 7 perfectionists that may exist. Finally, as in most other research in this area, the levels of
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17 8 burnout observed was not high, even in the high perfectionism groups. As such, our findings
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19 9 speak to comparative risk or vulnerability to burnout, rather than burnout per se.
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22 **Perspectives**

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25 11 The findings build upon research that has used person-oriented approaches to identify
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27 12 groups of junior athletes who differ in terms of perfectionism and perceptions of the social
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29 13 environment and illustrated that these groups differ in terms of burnout. Consistent with this
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31 14 research, in the current study junior athletes with varying degrees of perfectionism and
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33 15 perceptions of a parent-initiated climate also reported different levels of burnout. Higher
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35 16 levels of perfectionism regardless of the parent-initiated climate corresponded with higher
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37 17 levels of burnout. In addition, junior athletes with higher perfectionism and comparable levels
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39 18 of an ego-involving climate to task-involving climate reported the highest levels of burnout.
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41 19 The findings suggest that junior athletes high in perfectionism may be at comparatively
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43 20 greater risk to burnout and that this may especially be the case when they perceive their
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45 21 parents to emphasize concerns about failure and winning without trying one's best.
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49 **Footnotes**

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52 23 ¹Confirmatory factor analysis indicated that the initial model provided unacceptable fit: χ^2
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54 24 ₍₁₃₂₎ = 467.98, $p < .001$, CFI = .85, NNFI = .83, RMSEA = .11, 90% CI .10 to .12, SRMR =
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56 25 .14. Subsequently, 3 items from the learning and enjoyment climate subscale were removed
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1 due to low factor loadings (<.30): Item 1 (“Is most satisfied when I learn something new”),
2 item 5 (“Pays special attention to whether I’m improving my skills”), and item 7, (“makes
3 sure that I learn one thing before teaching me another”). The resulting model provided
4 acceptable fit: $\chi^2_{(87)} = 252.84, p < .001, CFI = .92, NNFI = .90, RMSEA = .09, 90\% CI .08$ to
5 $.11, SRMR = .09$.

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PROOF

Table 1

Descriptives, Coefficient Alphas, and Bivariate Correlations of the Study Variables (N = 216)

	<i>M (SD)</i>	α	1	2	3	4	5	6	7
1. LE	3.98 (0.71)	.88							
2. WCC	1.77 (0.86)	.94	-.32***						
3. SWE	2.48 (0.71)	.75	-.10	.46***					
4. COM	2.24 (0.94)	.85	-.14*	.46**	.18**				
5. PS	2.77 (0.90)	.80	.10	.27***	.12	.68***			
6. RA	2.59 (0.69)	.69	-.08	.32***	.10	.48***	.49***		
7. EXH	2.41 (0.94)	.90	-.07	.32***	.17*	.49***	.31***	.37***	
8. DEV	2.33 (0.96)	.85	-.11	.36***	.26***	.45***	.62***	.62***	.57***

Notes. L/E = Learning/enjoyment climate, WCC = worry-conducive climate, SWE = success without effort climate, COM = concern over mistakes, PS = personal standards, RA = reduced sense of accomplishment, EXH = exhaustion, DEV = devaluation.

Table 2

Fit Indices of the Different Latent Profile Solutions (N = 216)

Classes	BIC	SSA-BIC	Entropy	BLRT	
				<i>p</i> value	
1	2674.707	2643.019	NA	NA	
2	2498.686	2447.984	.907	.000	
3	2473.343	2403.629	.940	.000	
4	2446.010	2357.282	.879	.000	
5	2431.835	2324.094	.892	.000	
6	2439.511	2312.758	.834	.008	

Average Latent Class Probabilities for Most Likely Latent Class Membership

Two-class model	$\approx n$ (%) ^a	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
Class 1	145.0 (67.1)	.984	.016				
Class 2	71.0 (32.9)	.047	.953				
Three-class model							
Class 1	63.8 (29.6)	.949	.026	.024			
Class 2	135.7 (62.8)	.007	.993	.000			
Class 3	16.4 (7.6)	.071	.000	.929			
Four-class model							
Class 1	25.7 (11.9)	.890	.001	.100	.010		
Class 2	28.6 (13.2)	.000	.899	.000	.101		
Class 3	111.1 (51.4)	.035	.000	.960	.005		
Class 4	50.6 (23.4)	.008	.049	.023	.920		
Five-class model							
Class 1	107.1 (49.6)	.959	.035	.006	.000	.000	
Class 2	27.9 (12.9)	.114	.880	.006	.000	.000	
Class 3	40.0 (18.5)	.010	.008	.930	.052	.000	
Class 4	29.9 (13.9)	.000	.003	.094	.885	.018	
Class 5	11.0 (5.1)	.000	.000	.005	.045	.950	
Six-class model							
Class 1	32.3 (14.9)	.833	.167	.000	.000	.000	.000
Class 2	80.9 (37.4)	.085	.868	.038	.008	.000	.000
Class 3	21.9 (10.1)	.000	.076	.919	.004	.000	.000
Class 4	39.5 (18.3)	.000	.014	.005	.926	.055	.000
Class 5	30.3 (14.0)	.000	.000	.002	.083	.896	.020
Class 6	11.2 (5.2)	.000	.000	.000	.005	.037	.958

Note. NA = not applicable, BIC = Bayesian information criterion, SSA-BIC = sample-size

adjusted Bayesian information criterion, BLRT = bootstrapped likelihood ratio test.

^aapproximated class sizes based on the average latent class probabilities.

Table 3

Description (M, S.E.) of the Four Latent Classes (N = 216)

	Class 1 (n = 51)		Class 2 (n = 112)		Class 3 (n = 24)		Class 4 (n = 29)		Pairwise comparisons
	<i>M</i>	<i>S.E.</i>	<i>M</i>	<i>S.E.</i>	<i>M</i>	<i>S.E.</i>	<i>M</i>	<i>S.E.</i>	
TASK	3.608	.078	4.167	.066	4.316	.133	3.626	.111	abef
WCC	2.443	.044	1.155	.021	1.313	.067	3.328	.089	abcdef
SWE	2.689	.070	2.310	.063	2.042	.010	3.125	.110	abcef
COM	2.412	.099	1.630	.049	3.342	.128	3.352	.133	abcde
PS	2.828	.106	2.348	.069	3.825	.120	3.421	.138	abcdef

Note. a = class 1 differs from class 2, b = class 1 differs from class 3; c = class 1 differs from class 4; d = class 2 differs from class 3; e = class 2 differs from class 4; f = class 3 differs from class 4; *S.E.* and comparisons are based on 95% bias-corrected bootstrapped estimates. TASK = task-oriented climate, WCC = worry-conducive climate, SWE = success without effort climate, COM = concern over mistakes, PS = personal standards.

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Table 4

Description of the Four Latent Classes and χ^2 test for Differences between the Classes in Burnout Symptoms (N = 216)

	RA		EXH		DEV	
	M	S.E.	M	S.E.	M	S.E.
Class 1	2.562	.105	2.516	.144	2.403	.164
Class 2	2.344	.064	2.051	.114	1.976	.097
Class 3	2.975	.137	2.858	.279	2.719	.237
Class 4	3.295	.070	3.227	.083	3.254	.329

Class comparisons	RA		EXH		DEV	
	χ^2	p value	χ^2	p value	χ^2	p value
Overall test	104.544	.000	80.560	.000	27.185	.000
1 vs. 2	3.094	.079	6.104	.013	4.854	.028
1 vs. 3	5.651	.017	1.189	.276	1.199	.273
1 vs. 4	32.312	.000	16.703	.000	3.710	.054
2 vs. 3	15.369	.000	5.278	.022	6.929	.008
2 vs. 4	101.669	.000	69.408	.000	14.025	.000
3 vs. 4	4.327	.038	1.599	.206	1.745	.187

Note. The significance level was Bonferonni corrected within each variable (.05/6) and set to .008. RA = reduced sense of accomplishment, EXH = exhaustion, DEV = devaluation.