

1 **An Experience Sampling Study of Organizational Stress Processes and**
2 **Future Playing Time in Professional Sport**

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27 This study examined the relationships between daily cognitive appraisals of
28 organizational events, affective responses and coping. In addition, a five-year
29 longitudinal relationship between coping and performance outcomes at the senior
30 professional level was assessed. Using an experience sampling method,
31 professional academy rugby union players ($N = 39$, $M_{\text{age}} = 17.23$ years, $SD =$
32 0.87) completed daily diary measures of appraisals, affective responses, and
33 coping over five weeks of training. Hierarchical linear modeling revealed that
34 daily cognitive appraisals were related to daily affective responses and coping
35 functions enacted by behaviours, after accounting for a series of within- (e.g.,
36 time, day, week) and between-person (e.g., personality, key decision makers)
37 differences. Zero-inflated negative binomial regression revealed that coping
38 related to eliciting support was associated with minutes played at the senior
39 professional level five years later. This study extends theoretical knowledge of
40 the within- and between-person relationships that explain organizational stress
41 experiences. The findings suggest that some coping functions enacted by
42 behaviours may be early indicators of future performance outcomes in
43 professional sport.

44 **Keywords:** Appraisals; coping; diary methods; multilevel; performance;
45 personality

46 **Introduction**

47 Organizational stress is a dynamic and adaptational process. This is characterised by a
48 transaction between an individual and the environmental demands associated with the
49 organization in which they are operating (Fletcher, Hanton, & Mellalieu, 2006). Integral to
50 this conceptualisation are a person's cognitive appraisals of events, affective responses and
51 coping efforts, which interact to mediate the stress process (Lazarus, 1991a). In so far that
52 these mediating processes underline the meanings that individuals give to environmental
53 situations, it has been argued that the relationships between these variables may also be
54 independent of the environment demand encountered (Folkman & Lazarus, 1980). Taken
55 together, these mediating processes explain whether exposure to organizational events will
56 result in positive or negative outcomes for performance (Lazarus, 1991b). To understand how
57 organizational stress in sport may relate to the quality of one's outcomes, researchers have
58 chiefly used cross-sectional designs to measure the organizational stressors that are
59 encountered (Arnold, Edwards, & Rees, 2018; Arnold, Fletcher, & Daniels, 2016), how
60 stressors are appraised (Bartholomew, Arnold, Hampson, & Fletcher, 2017), responded to
61 (Arnold & Fletcher, 2015), and coped with (Arnold, Fletcher, & Daniels, 2017) at single
62 points in time.

63 The research literature to date, however, has typically neglected that transactional
64 stress processes are episodic; therefore, their associations should be examined longitudinally
65 (Didymus & Fletcher, 2012; Fletcher & Arnold, 2017; Larner, Wagstaff, Thelwell, & Corbett,
66 2017; Lazarus, 1999; Roberts, Arnold, Turner, Colclough, & Bilzon, 2019). Moreover,
67 although cross-sectional evidence suggests that organizational stress processes are associated
68 with subjective performance evaluations (Arnold et al., 2017, 2018; Britton, Kavanagh, &
69 Polman, 2019; Tamminen, Sabiston, & Crocker, 2018), no studies to date have examined
70 whether the ability to cope is associated with future proxy indicators of objective performance

71 (e.g., playing time). Therefore, the first purpose of this study is to examine organizational
72 stress processes over time. Using an experience sampling method (ESM; Hektner, Schmidt, &
73 Csikszentmihalyi, 2007), within-person associations of daily cognitive appraisals, affective
74 responses, and coping methods are examined. The second purpose is to assess the association
75 between coping with organizational events and future performance in a specific professional
76 sport context.

77 *Conceptual Background and Hypotheses*

78 Lazarus' cognitive-motivational-relational theory asserts that stress is the result of
79 three interacting processes: cognitive appraisals of events, affective responses, and coping
80 (Lazarus, 1999). Cognitive appraisals of events are the evaluations a person makes in terms of
81 the significance for one's affective well-being and goals (primary appraisal) and the
82 evaluation of coping options (secondary appraisal). According to Lazarus and Folkman
83 (1984), if events are perceived to be significant for well-being and goals, then events will be
84 appraised as a threat, harm/loss, or challenge. Threat appraisals refer to the potential for
85 damage; harm/loss appraisals represent damage which has already occurred; and challenge
86 appraisals refer to the potential for progressing towards one's goals (Lazarus, 1991a). Despite
87 the lack of research examining episodic appraisal-affect associations of organizational events
88 in sport (Fletcher & Arnold, 2017; Fletcher et al., 2006), evidence suggests that sport
89 performers can appraise a range of organizational events as threatening (e.g., barriers to
90 performing one's role), harmful (e.g., conflict with a teammate or coach) and challenging
91 (e.g., rehabilitating from injury) towards attaining their goals (Didymus & Fletcher, 2012;
92 Hanton, Fletcher, & Wagstaff, 2012; Rumbold, Fletcher, & Daniels, 2018). Cognitive
93 appraisals have also been found to mediate the relationship between organizational stressors
94 (for a review, see Arnold & Fletcher, 2012; Arnold, Fletcher, & Daniels, 2013) and basic
95 psychological needs (Bartholomew et al., 2017), and, basic needs are commonly linked to

96 affective responses (Lazarus, 1999). Although a few studies have identified cross-sectional
97 associations between cognitive appraisals and anxiety responses in the lead up to competition
98 events (e.g., Quested, Bosch, Burns, Cumming, Ntoumanis, & Duda, 2011; Martinent &
99 Ferrand, 2015), there is a theoretical case for examining appraisal-affect relationships within
100 the context of organizational stress. In line with Lazarus' (1999) relational-meaning centered
101 approach to understanding organizational stress, it was argued that research needs to examine
102 the mediating processes and how they interact within the occupational contexts in which they
103 occur, whilst also being cognisant of individual differences (Lazarus, 1999, p. 131).
104 Moreover, to further understand the explanatory potential of appraisals, it is important to
105 assess how specific appraisals underlie affect and how this relationship may vary over time
106 (Lazarus 1999).

107 *Hypothesis 1:* Threat and harm appraisals of organizational events will be associated with
108 negative affect, whereas challenge appraisals will be associated with positive affect.

109 In follow-up to this hypothesis, it is also important to consider how specific primary
110 appraisals of organizational events initiate coping attempts. Indeed, Didymus and Fletcher
111 (2014) found that appraisal of organizational demands and coping effectiveness appear to be
112 linked to the coping behaviours employed. Furthermore, research in competition contexts
113 (Dias, Cruz, & Fonseca, 2012) has suggested that threat appraisals are associated with
114 emotion-focused coping behaviours (e.g., venting of emotions). Coping however, has many
115 features, including problem-focused and emotion-focused functions (Skinner, Edge, Altman,
116 & Sherwood, 2003). One proactive form of emotion-focused coping is emotional-approach
117 coping, which signifies the active expression of affect (Baker & Berenbaum, 2007). We
118 differentiate between coping functions and behaviours (Skinner et al., 2003), where coping
119 functions are the intended goal of coping (problem-solved or affect expressed) and coping
120 behaviours are enacted to fulfil those goals. In line with organizational psychology models of

121 coping (Daniels, Beesley, Cheyne, & Wismalasiri, 2008; Daniels, Beesley, Wimalasiri, &
122 Cheyne, 2013; Daniels, Boocock, Glover, Hartley, & Holland, 2009), we focus on problem-
123 and emotion-approach coping functions attempted through enacting behaviours targeted at the
124 execution of control or behaviours targeted at eliciting support. In line with transactional
125 stress theory, cognitive appraisals are likely to influence coping behaviours *and* functions
126 simultaneously, which govern the actions and goals of coping (Folkman, 2008).

127 *Hypothesis 2:* Appraisals of organizational events will be associated with problem-focused
128 and emotion-approach functions enacted by coping behaviours.

129 If appraisals are found to be associated with affective responses and coping, then it
130 follows that affective responses should also activate coping efforts (Lazarus, 1991a).
131 Research suggests that affect is linked to problem-focused and emotion-approach coping for
132 several reasons. Firstly, negative affect is traditionally linked to action tendencies through
133 fight or flight responses (Lazarus, 1999). Consequently, negative affect is associated with
134 increased attention to solve problems and attempts to control issues that may initially be
135 perceived as controllable (Folkman, 2008). Negative states may also initiate affective
136 information sharing to facilitate social thinking and reduce distress through venting or social
137 validation. Secondly, expressing positive affect with teammates may result in sustained
138 positive affect by establishing social bonds and adjusting team goals (Rimé, 2009). In contrast
139 to research in sport which links problem-focused coping with positive affect (Arnold et al.,
140 2017), we argue that positive affect is unlikely to lead to problem-focused coping since
141 positive affect represents satisfaction from progressing towards goal attainment (Lazarus &
142 Folkman, 1984). Furthermore, individuals are unlikely to actively change aspects of their
143 organizational environment that they are satisfied with. Similarly, since the function of
144 problem-focused coping is to resolve or remove problems caused by events (Lazarus &
145 Folkman, 1984), individuals are unlikely to seek resources to solve issues that they experience

146 contentment from. In contrast, we would expect positive and negative affect to be associated
147 with emotion-approach coping because the intended goal of this form of coping is to actively
148 express positive affect whilst regulating negative affect (Baker & Berenbaum, 2007).

149 *Hypothesis 3:* Negative affective responses will be associated with problem-focused and
150 emotion-approach coping, whereas positive affective responses will be associated with
151 emotion-approach functions.

152 Research in sport has been limited to measuring single episodes of coping and
153 subjective performance (Fletcher & Arnold, 2017). Beal and colleagues (Beal, Weiss, Barros,
154 & MacDermid, 2005) assert that coping resources are allocated towards or away from tasks
155 when events support or prevent goal attainment, respectively. Hence, future performance
156 outcomes are influenced by the appropriate allocation of coping resources through enactment
157 of behaviours to complete performance tasks. Although appraisals and affective responses can
158 have direct or indirect effects on behaviour (and subsequently performance), behaviour is
159 typically the primary focus of a performance outcome, as action is the translation of thoughts
160 and feelings into something that is either effective or ineffective within our occupational
161 environment (Beal et al., 2005; Beal & Weiss, 2013). Since coping behaviours can include
162 taking control or eliciting support to optimise goal progress (Daniels et al., 2013), we would
163 expect coping functions enacted by coping behaviours to be allied with greater attainment of
164 future performance goals. One of the ways in which coping may be related to long-term
165 performance in professional sport is playing time. From a talent identification perspective,
166 examining how coping may relate to future playing time aligns with recent calls to examine
167 the contribution of psychological attributes in improving predictions of future sport
168 performance (Den Hartigh, Niessen, Frencken, & Meijer, 2018; Tredrea, Dascombe,
169 Sanctuary, & Scanlan, 2017).

170 *Hypothesis 4:* Coping functions enacted by behaviours will be associated with future playing

171 time.

172 The current study furthers research on organizational stress in sport in several ways.

173 Firstly, we examine the dynamism of mediating stress processes as they occur in a

174 professional sport context. We used an experience sampling method (ESM) to collect daily

175 diary data across a 5-week period, to provide greater accuracy than can be gained through

176 retrospective recall (Bolger, Davis, & Rafaeli, 2003). Secondly, we controlled for a wide

177 range of within- (e.g., time, day) and between-person differences (e.g., personality, playing

178 position) given the potential influence of these variables on episodic processes (Lazarus,

179 1991a, 1999). Thirdly, we examined how coping during the daily diary period may be

180 associated with future playing time in professional sport.

181 **Materials and Methods**

182 *Research Design*

183 When utilising an experience sampling design, a number of methodological principles

184 were followed. The methodology requires individuals and teams under investigation to be

185 studied frequently (e.g., multiple daily assessments) over a relatively long period of time (e.g.,

186 a week or longer) in which performers naturally interact together within their organizational

187 environment (Hektner et al., 2007). A key principle of this methodology is to accurately

188 capture participant data as close as possible to when they occurred during the day (e.g., in the

189 past hour). The benefit of this approach is that it reduces memory recall bias of events,

190 perceptions, feelings and behaviours, which can occur through use of retrospective research

191 designs (Bolger et al., 2003). Conducting multiple assessments of daily phenomena over a

192 long period time enables researcher to examine within-person relationships whilst controlling

193 for a series of contextual (e.g., time of day) and individual difference variables (e.g., stable

194 appraisal patterns). ESM designs typically adopt event-contingent schedules (i.e., study

195 variables are assessed immediately some class of events) which should attempt to mirror the

196 organizational context and daily events that commonly occur (Hektner et al., 2007). To
197 achieve suitable power to detect meaningful relationships between appraisals, affective
198 responses and coping, a single professional sports team was recruited for this purpose.

199 *Participants and Procedure*

200 At the beginning of the season, the academy manager of a professional rugby union
201 team based in the United Kingdom was contacted and informed of the study aim. Following
202 institutional ethical approval, parental and player consent, academy players were recruited via
203 the manager's request for volunteers from the squad. The sample consisted of male rugby
204 union players ($n = 39$) with an average age of 17.23 years ($SD = .87$, range = 16-19). At the
205 time of recruitment, 6 of the 39 players had competed internationally at youth and / or junior
206 level. Data were collected using Palm Tungsten personal digital assistants (PDAs). These
207 handheld organisers are programmed to collect daily data whilst participants are operating
208 within their organization. The PDAs administered questions twice daily over one training
209 week (Monday-Friday), for a period of five weeks (ESM period). Due to the varied training
210 schedule of the participants, the PDAs were programmed to 'run on command'. In this way,
211 participants were asked to complete the PDAs at their academy organization in the morning
212 and late afternoon between the hours of 10am and 5pm. Prior to the ESM period, a
213 background questionnaire was distributed to participants, which assessed some control
214 variables¹. At this time, participants were also given a presentation on how to use the PDAs
215 and troubleshooting prior to them being distributed. Participants provided PDA data on 997
216 out of a possible 1880 occasions (after removing participants due to international selection or
217 illness/injury).

218 *Measures*

219 *Cognitive appraisals during the ESM period*

220 Participants were firstly asked to identify an academy-related (i.e., organizational)

221 event² in the past hour that impacted on their role. In line with best practice principles for
222 experience sampling quantitative designs, the selection of these events were based on the
223 common daily events that were occurring within the sampled sport organization. In addition,
224 an hour time period was chosen to capture appraisal data as close as possible to when they
225 occur in the organizational environment and to reduce memory recall bias (Bolger et al.,
226 2003). Participants chose from one of the following: ‘a conflict with another person’, ‘a
227 pleasant social interaction’, ‘barriers to performing your role’, ‘receiving social support’,
228 ‘doing physically difficult work’, ‘doing mentally difficult work’, or ‘other’. Following this,
229 appraisals were assessed by asking participants to indicate the extent to which they rated an
230 academy-related event in the past hour as a threat, challenge, or harm. Following guidelines
231 for conducting ESM research (Bolger et al., 2003; Fisher & To, 2012; Hektner et al., 2007),
232 single item measures for each appraisal were deemed acceptable, given the narrow time frame
233 that participants had to recall specific events.

234 *Affective responses during the ESM period*

235 Affective responses were assessed by asking players to rate in the past hour how they
236 felt in response to academy-related events. The four items that measured affect were anxiety,
237 anger, sadness, and happiness. These items were selected as they signify a basic set of core
238 relational states by which threat, harm, loss and challenge appraisals are theorized to be
239 associated (Lazarus & Folkman, 1984; Power & Dalgleish, 2008). Principal components
240 analysis revealed a two-dimensional solution. Thus, variables were split into negative and
241 positive affect. This is consistent with research that has identified negative and positive affect
242 as the major dimensions of affective well-being (Watson & Clark, 1984). Negative affect
243 (NA; $\alpha = .71$) was assessed with anxiety, anger, and sadness items. Positive affect (PA) was
244 assessed with happiness.

245 *Coping functions and behaviours during the ESM period*

246 Coping was assessed by asking participants to rate how they coped with academy-
247 related events in the past hour. Two items were used to evaluate each form of problem-
248 focused and emotional-approach coping enacted by executing control over one's role or
249 eliciting support from others. These items were adapted from measures used in organizational
250 psychology research whereby the discriminant validity has been supported previously
251 (Daniels et al., 2009; 2013; 2014). In this study, *executing control to solve problems* (CHA-
252 SP; $\alpha = .76$) measured the extent to which players changed aspects of their behaviour to solve
253 problems. *Eliciting support to solve problems* (DIS-SP; $\alpha = .86$) measured the degree to
254 which players discussed events with others to solve problems. *Executing control to express*
255 *affect* (CHA-EA; $\alpha = .71$) measured the degree to which players changed tasks to allow them
256 to express affect. *Eliciting support to express affect* (TAL-EA; $\alpha = .80$) assessed the extent to
257 which players talked to others to express affect. All of the appraisal, affect and coping items
258 were rated on a five-point scale (1 = 'Not at all', 5 = 'Very much so').

259 *Control variables*

260 A series of situational and dispositional variables were included as control variables.
261 According to Lazarus' stress theory, individual variability in affect and coping attempts may
262 be subject to ongoing changes over time. Therefore, the week (i.e., weeks 1-5), day (i.e.,
263 Monday to Friday) and time period (i.e., morning, afternoon) in which participants completed
264 the PDAs were dummy coded as within-person controls (e.g., 0 = 'not week 1', 1 = 'week 1').
265 In addition, Lazarus argued that individuals may hold stable styles of appraisal and affect,
266 which represent learned beliefs about the conjunction between what is occurring in the
267 environment and one's personality (Lazarus, 1991a, p. 192). Therefore, participants' average
268 levels for episodic appraisals and affect were included as between-person control variables.

269 Research has also shown that neuroticism and extraversion are strongly linked to
270 affect (Watson & Clark, 1984) and coping (Allen, Greenlees, & Jones, 2011). Thus,

271 neuroticism and extraversion were included as between-person controls. The International
272 Personality Item Pool (IPIP: Goldberg et al., 2006) version of the revised NEO personality
273 inventory (NEO-PI-R: Costa & McCrae, 1992) provided 20 items for both neuroticism ($\alpha =$
274 $.94$) and extraversion ($\alpha = .96$). Participants rated the extent to which each item described
275 them accurately on a five-point scale (1 = ‘strongly disagree’, 5 = ‘strongly agree’). To assess
276 the notion that situational contexts may shape a person’s emotional responses and coping
277 attempts (Lazarus, 1991a), participants' playing position (0 = ‘backs’, 1 = ‘forwards’) and key
278 decision makers in the playing squad (0 = ‘not a key decision maker’, 1 = ‘key decision
279 maker’) were dummy coded as between-person control variables. The manager and assistant
280 coach identified five key decision makers from the squad who displayed leadership
281 behaviours and made considerable decisions for the team.

282 *Playing time*

283 To assess the association between academy players’ coping abilities during the ESM
284 period and playing time at the senior professional level, an online database was used. The
285 database (www.statbunker.com) supplies free-to-view performance data on professional
286 rugby union players worldwide. In so far that rugby academies in the United Kingdom
287 typically develop players up to the age of 21, the average age of the participants during the
288 ESM period ($M_{\text{age}} = 17.23$ years) suggested that a 5-year lag would be appropriate to measure
289 the extent to which these players had since played for senior professional rugby union teams.
290 Therefore, total playing time data accrued over a 5-year period was collected 5 years post the
291 rugby union season in which ESM data was collected. Playing time was measured by coding
292 for the number of minutes played at the senior professional level 5 years post the ESM period.

293 *Data Analysis*

294 Multilevel regressions were conducted using Hierarchical Linear Modeling software
295 with restricted maximum likelihood (HLM 7.01; Raudenbush et al., 2011). A two-level model

296 was used to estimate the within-person associations between appraisals, affect and coping
297 (Level 1), whilst accounting for within-person (Level 1) and between-person controls (Level
298 2). Robust standard errors were examined to ensure that any violations of the assumption of
299 normality had not affected the results (Raudenbush et al., 2011). Consistent with
300 recommendations to remove between-person variance from repeated measurements from the
301 same people over time, all of the independent variables were person mean centered (i.e.,
302 centered within cluster, CWC; Enders & Tofighi, 2007) in the level 1 equation with within-
303 person control variables (i.e., week, day, time), with regression slopes for the appraisal
304 variables allowed to vary between people. Where the variability of regression slopes was not
305 significantly different from zero, the slopes were fixed to be invariant across people.³
306 Between-person variance in the independent variables was represented by the average for
307 each person across the ESM period. Between-person variables were then entered
308 incrementally and grand mean centered at the overall mean (Enders & Tofighi, 2007).

309 To assess hypothesis 4, zero-inflated negative binomial regression was conducted
310 using the 'ZEROINFL' R plug-in for SPSS to assess the longitudinal relationships between
311 person-averaged coping measured during the ESM period and senior professional minutes
312 played 5 years later. This method of regression is preferred over others (e.g., ordinary least-
313 squares, poisson) when the dependent variable has over-dispersion and contains a high
314 proportion of zero counts (Yang, Harlow, Puggioni & Redding, 2017).

315 **Results**

316 Table 1 shows the means, standard deviations, reliabilities, and correlations for the
317 ESM, control and senior playing time variables respectively.

318 *Within-Person Appraisals and Affective Responses*

319 Table 2 shows the results of the multilevel regression analyses of appraisals on
320 affective responses.⁴ Hypothesis 1 proposed that threat and harm appraisals would be

321 associated with negative affect (NA), whereas challenge appraisals would be associated with
322 positive affect (PA). The findings revealed that threat ($B = 0.22, p < .001$) and harm
323 appraisals ($B = 0.25, p < .001$) were strongly associated with NA. The appraisals accounted
324 for 31% of the within-person variance. These results support the hypothesis whilst
325 considering the role of within- and between-person differences. Person-averaged threat ($B =$
326 $0.54, p < .01$) and harm appraisals ($B = 0.38, p < .05$) were also significantly related to NA.

327 When investigating the relationships between appraisals and PA, it was found that
328 challenge ($B = 0.15, p < .01$) and harm appraisals ($B = -0.10, p < .05$) were both associated.
329 The episodic appraisals accounted for 13.4% of the within-person variance. These results
330 supported hypothesis 1 whilst controlling for within- and between-person differences. In
331 addition, person-averaged challenge appraisals ($B = 0.65, p < .001$) were significantly related
332 to PA.

333 *Within-Person Appraisals, Affective Responses and Coping*

334 Table 2 also shows the results of the multilevel regressions of appraisals and affective
335 responses on coping. Hypothesis 2 proposed that appraisals would be significantly related to
336 problem-focused and emotion-approach coping. In addition, hypothesis 3 proposed that NA
337 would be related to both problem-focused and emotion-approach coping, whereas PA would
338 only be associated with emotion-approach coping. Counter to hypothesis 2, there were no
339 significant associations between appraisals and executing control to solve problems (CHA-
340 SP; p range = .08-.48). In support of hypothesis 3, there was an association between NA and
341 CHA-SP ($B = 0.22, p < .001$). Appraisals and affect accounted for 20.3% of the within-person
342 variance, with 9.4% of this unique variance attributable to appraisals. Threat ($B = 0.06, p <$
343 $.05$) and challenge appraisals ($B = -0.06, p < .05$) were associated with eliciting support to
344 solve problems (DIS-SP). In relation to hypothesis 3, NA displayed a positive association
345 with DIS-SP ($B = 0.09, p < .01$). In total, appraisals and affect accounted for 16.2% of the

346 within-person variance.

347 When examining the regressions for appraisals and affect on emotion-approach
 348 coping, in support of hypothesis 2, threat appraisals ($B = 0.14, p < .01$) were significantly
 349 associated with executing control to express affect (CHA-EA). Appraisals accounted for
 350 15.1% of the within-person variance. In partial support of hypothesis 3, NA ($B = 0.20, p <$
 351 $.001$) was significantly associated with CHA-EA but PA was not ($p = .16$). Affective
 352 responses provided an additional 5.5% of within-person variance. For eliciting support to
 353 express affect (TAL-EA), partial support for hypothesis 2 was found, whereby challenge
 354 appraisals were inversely associated ($B = -0.06, p < .01$). In contrast, threat and harm
 355 appraisals were not associated ($p = .08$). The appraisals accounted for 11.2% of the within-
 356 person variance in TAL-EA. In addition, NA ($B = 0.15, p < .001$) and PA ($B = 0.06, p < .05$)
 357 were significantly associated with TAL-EA, although the additional within-person variance
 358 explained by the inclusion of affect was less than 1%. These results supported hypothesis 3
 359 whilst controlling for within- and between-person differences. Furthermore, both key decision
 360 makers ($B = 1.24, p < .001$) and the afternoon time period ($B = 0.17, p < .01$) were associated
 361 with eliciting support to express affect (TAL-EA).

362 *Between-Person Coping and Senior Playing Time*

363 Kendall's tau point-biserial correlations were conducted to determine the order in
 364 which person-averaged coping variables were entered into the regression model, as follows:
 365 (a) eliciting social support to solve problems (DIS-SP; $\tau = .21, p < .10$), (b) executing control
 366 to solve problems (CHA-SP; $\tau = .14, p > .10$), (b), (c) executing control to regulate emotions
 367 (CHA-EA; $\tau = .14, p > .10$), and (d) eliciting social support to regulate emotions (TAL-EA; τ
 368 $= .09, p > .10$). Zero-inflated negative binomial regression indicated that eliciting social
 369 support to solve problems (DIS-SP; $B = -2.37, z = -2.20, p < 0.05$) and eliciting social support
 370 to regulate emotions (TAL-EA; $B = 1.50, z = 1.91, p = 0.05$) were both significantly

371 associated senior minutes played, whilst other coping variables were not associated. These
372 results provide partial support for hypothesis 4; players reporting lower levels of eliciting
373 social support to solve problems (DIS-SP) and higher levels of eliciting social support to
374 regulate emotions (TAL-EA) respectively during the ESM period were more likely to play a
375 greater number of minutes 5 years later at the senior professional level.

376 **Discussion**

377 This study extends understanding of: (a) how daily cognitive appraisals of
378 organizational events relate to affect, (b) how appraisals and affective responses relate to
379 coping functions through behaviours, and (c) how coping relates to future performance.
380 Consistent with stress appraisal frameworks (Lazarus, 1991a; 1999), hypothesis 1 was
381 supported in highlighting that positive affect (PA) may be experienced when events are
382 appraised as a challenge to progress towards one's goals and when events are not appraised as
383 harmful to one's goal progress. Moreover, negative affect (NA) may be experienced when
384 events are perceived as threatening or harmful.

385 Partial support was found for the second hypothesis, whereby threat appraisals were
386 positively related to eliciting support to solve problems (DIS-SP) and executing control to
387 express affect (CHA-EA). Additionally, challenge appraisals were inversely associated with
388 DIS-SP and eliciting support to express affect (TAL-EA). To explain these findings,
389 secondary appraisals of available resources and controllability may direct effort towards
390 solving the appraisal of an event, or allocating resources to regulate feelings (Beal et al.,
391 2005; Lazarus, 1999). It is conceivable, therefore, that high levels of threat may lead to taking
392 control over tasks to change or sustain affect, particularly when perceptions of controllability
393 are high (Didymus & Fletcher, 2014). In comparison, when perceptions of control are low,
394 then threat appraisals may lead to sharing feelings with others.

395 In so far that affect drives coping attempts (Lazarus, 1991a), support was found for

396 hypothesis 3 such that NA was strongly related to all coping subscales. In addition, PA was
397 significantly associated with eliciting support to express affect (TAL-EA). These results
398 support organizational psychology research in emphasizing that individuals concurrently
399 employ a range of control and support seeking behaviours to solve problems and express
400 affect (Daniels et al., 2009; 2013, Daniels, Glover & Mellor, 2014). Previous stress literature
401 indicates that active problem solving designed to control the situation (i.e., CHA-SP) is
402 typically adopted when events are initially perceived as controllable (Folkman, 2008).
403 Moreover, controlling behaviours that involve temporarily removing oneself to vent or sustain
404 positive affect (i.e., CHA-EA) may be constructive in restoring previously depleted resources
405 (Beal et al., 2005). Talking to team members to express affect (i.e., TAL-EA) may also serve
406 an important function for regulating NA *and* PA in organizations. In accordance with Rimé
407 (2009), sharing affect with others could enhance social bonds through the celebration and re-
408 organization of team goals, which in turn may help to regulate affect.

409 In accordance with Beal et al. (2005), hypothesis 4 found that eliciting support to
410 solve problems (DIS-SP; inversely) and eliciting support to express affect (TAL-EA) were
411 significantly associated with senior minutes played. DIS-SP and TAL-EA both signify
412 eliciting support and communicating with others about improving individual and team
413 performance through problem solving or regulating affect (Daniels et al., 2013). The positive
414 relationship with TAL-EA would suggest that talking about how one feels in a team
415 environment encourages others to talk about their feelings. This social sharing of affect can
416 strengthen empathic understanding, unity and reciprocal liking (Rimé, 2009). Such
417 behaviours are likely to represent favourable citizenship behaviours, which combined with
418 evaluations of game performance may be linked to selection decisions in professional sport
419 (Whiting & Maynes, 2016). On the basis that key decision makers reported higher levels of
420 eliciting support to solve problems and express affect (i.e., DIS-SP and TAL-EA) during the

421 ESM period, this would suggest that key players in the academy team perceived eliciting
422 support as an important behaviour to enact to facilitate being selected.

423 Previous research linking coping and sport performance has used subjective
424 evaluations as a means of exploring relationships with performance (e.g., Arnold et al., 2017,
425 2018; Didymus & Fletcher, 2017). From a talent development perspective, playing time may
426 not only offer an additional method of assessing *future* performance attainment (Tredrea et
427 al., 2017), but may capture a novel indication of successful athlete adaptation, since the goal
428 of professional academies is to facilitate successful transitions to the senior level (Rothwell,
429 Rumbold, & Stone, 2019). In this regard, future selection decisions (i.e., playing time) may be
430 influenced by players' consistent and fluctuating tendencies to use coping resources enacted
431 by eliciting support to complete performance tasks in training environments. With support
432 and cooperation being key to team functioning, managers and head coaches are likely to value
433 players who demonstrate these coping attributes, to aid the creation and maintenance of a
434 high-performing cohesive team (Whiting & Maynes, 2016).

435 **Strengths, Limitations and Future Research Directions**

436 A strength of the study was the use of experience sampling methods (ESM) to provide
437 ecologically valid information on the organizational stress processes that vary over time
438 within a professional sport environment. Using innovative electronic diaries allowed for
439 greater measurement accuracy than other field research measures and can improve power
440 estimates by providing a large number of daily observations (Bolger et al., 2003). However,
441 although ESM procedures have the advantage of collecting data in ecologically valid settings,
442 the varied training schedule of the rugby players precluded the ability to programme alerts in
443 to the personal digital assistants to remind the players to complete the questionnaires at fixed
444 time points during the day; which may have affected our compliance rate. Future researchers
445 interested in applying experience sampling methodology are encouraged to identify proactive

446 and technical ways to remind participants to regularly complete diary data. Although the
447 sample size was small in this study, power was not an issue for the main purpose, as the unit
448 of analysis was the daily assessment of organizational stress processes ($k = 698$).

449 Future research could develop these efforts by examining how organizational stress
450 processes fluctuate within a sport team throughout a season. In addition, researchers should
451 continue to test the influence of appraisals and affective responses in predicting a wider range
452 of coping functions enacted by behaviours. Future studies also need to improve the causality
453 of our claims that specific coping functions enacted by behaviours may be associated with
454 future performance. An appropriate way to extend our findings would be to measure coping
455 more regularly on an annual basis. Professional sport is suitable for testing these relationships,
456 as the digital availability of performance data is naturally occurring (Whiting & Maynes,
457 2016). From an applied perspective, this study suggests that organizational stress management
458 programmes may be important for improving adaptation to threatening or harmful
459 environments. Surprisingly, the evaluation of these interventions in sport is in its infancy
460 (Didymus & Fletcher, 2017; Fletcher & Arnold, 2017; Rumbold, Fletcher, & Daniels, 2012,
461 2018). Coaches, sport scientists and practitioners operating in sport organizations should
462 encourage transitioning players to develop planned responses to potentially threatening or
463 harmful situations, to promote proactive coping efforts. This encouragement needs to be
464 accompanied with an awareness of potential personal (e.g., stable appraisals, personality) and
465 situational factors (e.g., key decision makers) that may influence players' appraisal and coping
466 tendencies. In the context of the present sample, developing coping resources and behaviours
467 will benefit those individuals who continually need to adapt in professional sport academies.
468 Specifically, eliciting support from teammates and staff who operate in the same sport
469 organization should be encouraged. Performers should also be educated on the individual and
470 team benefits that may ensue from seeking support to solve problems and regulate affect.

471 **Conclusion**

472 In conclusion, this study makes a unique contribution to theoretical and empirical
473 knowledge of organizational stress in the context of professional sport. Our study highlights
474 how daily cognitive appraisals measured over a five-week period relate to daily affective
475 responses. Secondly, we highlight how daily appraisals and affective responses relate to daily
476 coping. In doing so, this is one of the first studies in sport to examine a vast range of within-
477 and between-group differences to explain how sport performers may respond to and cope with
478 organizational events. To our knowledge, this study is also one of the first to assess how
479 coping in high-level junior athletes is associated with future proxy indicators of objective
480 performance, namely, minutes played at the senior professional level. In supporting calls to
481 examine how psychological attributes may explain future performance (Den Hartigh et al.,
482 2018; Tredrea et al., 2017), our findings suggest that eliciting support to solve problems and
483 regulate affect within academy environments may be linked to future playing time at the
484 senior professional level.

485 *Declaration of interest*

486 The authors report no conflict of interest.

487 Footnote

- 488 1. A copy of the background questionnaire is available from the first author on request.
- 489 2. By 'event', we refer to characteristics of a specific organizational environment that influence a person's
490 experience of thoughts, feelings and behaviours (Beal & Weiss, 2013). Although the term may be compared with
491 the terms 'demands' and 'stressors', events represent a broader definition by which a range of environmental
492 variables encapsulate daily demands, social constraints and opportunities (Lazarus, 1999, p. 63). Events relevant
493 to the specific organizational environment in this study were identified in consultation between the first author
494 and the academy staff in a staff meeting that occurred prior to the data collection period.
- 495 3. An incremental forward stepwise approach was adopted to check for significant variation in regression slopes
496 at level 1. For example, to test hypothesis 1, negative affect was entered as the level 1 outcome, and all
497 appraisals were person mean centered (CWC) as the level 1 independent variables. Within-person control
498 variables (e.g., week, day, time) were all entered prior to the inclusion of independent variables and left in their
499 raw metric form. For each equation, level 1 slopes were initially allowed to vary across individuals (i.e., random
500 slopes). Where slopes had non-significant variance components ($p < .10$) or low reliabilities ($<.05$), they were
501 fixed to be invariant across participants (Raudenbush et al., 2011). This step was then repeated to check for

502 further invariance in slopes. This approach was continued until only random slopes were left to vary between
503 participants in the equation at that step. Following this step, between-person control variables were entered
504 incrementally at level 2: (a) person-averaged threat appraisals, (b) person-averaged challenge appraisals, (c)
505 person-averaged harm appraisals, (d) person-averaged negative affect, (e) person-averaged positive affect, (f)
506 neuroticism, (g) extraversion, (h) key decision makers, and (i) playing position. All control variables were grand
507 mean centered at the overall mean of the participant sample to provide meaning to the intercept.

508 4. To check for the robustness of results, we examined each hypothesis by comparing two regression models.
509 The first model ($n = 39$, $df = 997$) included level 2 control variables (i.e., averaged appraisals and affect,
510 neuroticism and extraversion, key decision makers and playing position). In comparison, the second model ($n =$
511 28 , $df = 698$) included level 1 control variables (i.e., week, day, time) in addition to the level 2 controls. In all
512 cases, the hypotheses were supported. However, because some level 1 controls were significantly associated
513 with affect and coping variables, it was decided to accept the hypotheses based on the findings presented from
514 the second model.

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Table 1. Means, Standard Deviations, Internal Consistencies, and Correlations

	<i>M</i>	<i>SD</i>	<i>α</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Threat appraisals	1.67	0.48	-	—	.04	.42	.52	-.11	.27	.22	.37	.28					
2. Challenge appraisals	3.19	0.88	-	-.02	—	-.02	.06	.34	.02	-.03	.08	.04					
3. Harm appraisals	1.52	0.49	-	.55	-.16	—	.47	-.18	.32	.23	.29	.22					
4. NA	1.72	0.48	.71	.62	-.06	.57	—	-.22	.35	.24	.36	.28					
5. PA	3.24	0.78	-	-.16	.45	-.25	-.14	—	-.05	.01	-.02	.07					
6. CHA-SP	1.49	0.66	.76	.28	.07	.40	.31	-.06	—	.57	.57	.45					
7. DIS-SP	1.60	0.71	.85	.20	.08	.29	.24	.08	.55	—	.40	.61					
8. CHA-EA	1.75	0.67	.64	.27	.05	.33	.29	.02	.62	.41	—	.54					
9. TAL-EA	1.94	0.76	.78	.23	.15	.22	.30	.16	.40	.59	.51	—					
10. Neuroticism	2.21	0.63	.94	.22	.02	.19	.21	-.15	.13	-.05	.14	-.00	—				
11. Extraversion	3.08	0.81	.96	.10	.02	.23	.08	-.00	.16	.11	.15	.08	.00	—			
12. KDM	0.13	0.34	-	-.05	.00	-.06	-.01	.32	.03	.23	.14	.20	.00	-.09	—		
13. Playing position	0.56	0.50	-	.17	-.15	.40	.17	-.27	.17	.11	.21	.17	.00	.18	-.13	—	
14. Playing Time	0.51	0.51	-	.06	-.11	-.01	-.04	-.02	.14	.21	.14	.09	-.04	.05	.22	-.03	—

Note. $N = 39$; N of observations = 997. NA = negative affect; PA = positive affect; CHA-SP = executing control to solve problems; DIS-SP = eliciting support to solve problems; CHA-EA = executing control to express affect; TAL-EA = eliciting support to express affect; KDM = key decision makers. Correlations aggregated for the experience sampling methodology (ESM) and control variable data are shown below the main diagonal. Correlations for the experience sampling method (ESM) are above the main diagonal. $r > |.23|$, $p < .05$, $r > |.30|$, $p \leq .01$. Significance tests (2-tailed) are not shown for ESM data because of non-independence of observations.

Table 2. Multilevel Regressions of Appraisals, Affective Responses and Coping

	NA		PA		CHA-SP		DIS-SP		CHA-EA		TAL-EA	
	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>
Threat appraisals	0.22	6.13***	-0.11	-0.73	0.04	1.74	0.06	2.24*	0.14	3.31**	0.08	1.81
Challenge appraisals	0.03	1.09	0.15	3.09**	-0.03	-1.82	-0.06	-2.37*	0.03	1.03	-0.06	-2.64**
Harm appraisals	0.25	4.73***	-0.10	-1.94*	0.03	0.72	0.09	1.63	0.02	0.52	0.10	1.83
NA	-	-	-	-	0.22	3.90***	0.09	2.54**	0.20	3.93***	0.15	3.27***
PA	-	-	-	-	0.03	1.75	0.03	1.59	0.03	1.39	0.06	2.36*
^c Threat appraisals averaged	0.54	3.47**	-0.54	-1.30	-0.18	-0.50	-0.28	-0.56	0.55	1.43	0.26	0.48
^c Challenge appraisals averaged	0.03	0.72	0.65	5.81***	0.12	1.05	0.27	1.69	0.10	0.80	0.23	1.37
^c Harm appraisals averaged	0.38	2.13*	0.33	0.69	0.73	1.93	0.64	1.29	0.34	0.85	0.03	0.05
^c NA averaged	-	-	-	-	-0.06	-0.14	-0.02	-0.04	-0.25	-0.59	0.08	0.14
^c PA averaged	-	-	-	-	-0.00	-0.02	-0.02	-0.10	0.01	0.04	-0.08	-0.39
^c Neuroticism	0.31	2.77**	-0.05	-0.17	0.18	0.78	0.10	0.32	0.31	1.24	0.17	0.50
^c Extraversion	-0.12	-1.30	0.00	0.01	-0.00	-0.01	0.01	0.02	-0.01	-0.08	-0.12	-0.46
^c Key decision makers	0.13	1.29	0.59	2.15*	0.18	0.81	0.93	3.13**	0.45	1.95	1.24	3.89***
^c Playing position	0.03	0.32	-0.34	-1.48	0.00	0.03	-0.10	-0.45	0.32	1.84	0.39	1.62
^c Week 1	0.16	1.97*	0.40	2.92**	0.01	0.10	-0.09	-1.18	0.03	0.39	-0.04	-0.40
^c Week 2	0.06	0.67	0.28	1.93*	0.05	0.70	0.02	0.29	0.05	0.61	-0.04	-0.35
^c Week 3	0.10	1.18	0.38	2.63**	-0.02	-0.28	-0.01	-0.18	-0.01	-0.10	-0.00	-0.00
^c Week 4	0.04	0.53	0.29	2.06*	0.12	1.84	0.04	0.55	-0.06	-0.70	0.06	0.58
^c Week 5	0.09	1.08	0.31	2.15*	0.08	1.13	0.05	0.57	-0.02	-0.21	0.02	0.16
^c Monday	-0.39	-0.68	1.67	1.62	0.05	0.10	0.26	0.45	0.11	0.18	0.22	0.29
^c Tuesday	-0.51	-0.89	1.50	1.46	0.03	0.06	0.24	0.42	0.05	0.08	0.16	0.22

^c Wednesday	-0.53	-0.92	1.66	1.62	-0.00	-0.00	0.17	0.31	0.06	0.10	0.14	0.19
^c Thursday	-0.49	-0.85	1.59	1.54	0.01	0.03	0.20	0.35	-0.00	-0.01	0.17	0.24
^c Friday	-0.52	-0.89	1.51	1.47	0.06	0.12	0.32	0.56	0.04	0.07	0.28	0.38
^c Morning	0.01	0.10	0.01	0.09	-0.00	-0.07	0.07	1.47	0.05	0.92	0.03	0.49
^c Afternoon	-0.03	-0.50	0.12	1.24	0.05	1.01	0.00	0.05	0.15	2.62**	0.17	2.48**
Variance components intercept	0.03***		0.28***		0.14***		0.26***		0.14***		0.24***	
Threat appraisals	0.01**		0.05**		Fixed		Fixed		0.03***		0.03***	
Challenge appraisals	0.01***		0.04**		Fixed		0.01**		0.01***		Fixed	
Harm appraisals	0.04***		Fixed		0.02***		0.05***		Fixed		0.02*	
NA	-		-		0.05***		Fixed		0.03**		Fixed	
PA	-		-		Fixed		Fixed		Fixed		Fixed	

Note. $N = 28$, number of observations = 698. ^c = control variables. Averaged values are between-person participant variables. NA = negative affect; PA = positive affect; CHA-SP = executing control to solve problems; DIS-SP = eliciting support to solve problems; CHA-EA = executing control to express affect; TAL-EA = eliciting support to express affect. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.