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The Applicability of Self-Regulation Theories in Sport: Goal Adjustment Capacities, Stress

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Appraisals, Coping, and Well-Being among Athletes

1 Abstract

2 *Objectives:* We examined a model, informed by self-regulation theories, which included goal
3 adjustment capacities, appraisals of challenge and threat, coping, and well-being.

4 *Design:* Prospective.

5 *Methods:* Two hundred and twelve athletes from the United Kingdom ($n = 147$) or Australia
6 ($n = 65$), who played team ($n = 135$) or individual sports ($n = 77$), and competed at
7 international ($n = 7$), national ($n = 11$), county ($n = 67$), club ($n = 84$), or beginner ($n = 43$)
8 levels participated in this study. Participants completed measures of goal adjustment
9 capacities and stress appraisals two days before competing. Athletes also completed questions
10 on coping and well-being within three hours of their competition ending.

11 *Results:* The way an athlete responds to an unattainable goal is associated with his or her
12 well-being in the period leading up to and including the competition. Goal reengagement
13 positively predicted well-being, whereas goal disengagement negatively predicted well-being.
14 Further, goal reengagement was positively associated with challenge appraisals, which in turn
15 was linked to task-oriented coping, and task-oriented coping positively associated with well-
16 being.

17 *Conclusion:* When highly-valued goals become unattainable, consultants could encourage
18 athletes to seek out alternative approaches to achieve the same goal or help them develop a
19 completely new goal in order to promote well-being among athletes.

20 *Keywords:* Challenge; Disengagement; Reengagement; Threat

1 The Applicability of Self-Regulation Theories in Sport: Goal Adjustment Capacities, Stress
2 Appraisals, Coping, and Well-Being among Athletes

3 Goal setting is widely used in sport (i.e., Healy, Ntoumanis, Veldhuijzen van Zanten,
4 & Paine, 2014) and can be very helpful in aiding performance (Staufenbiel, Lobinger, &
5 Strauss, 2015). The effectiveness of goal setting interventions for goals that become
6 increasingly difficult or unattainable is unknown. On the whole, striving to achieve one's
7 goal is portrayed positively within society, but giving up is seen as a weakness (Ntoumanis,
8 Healy, Sedikides, Smith, & Duda, 2014a). Understanding more about athletes' responses to
9 unattainable goals may be useful in maximizing well-being during periods of difficulty, by
10 helping athletes deploy the most effective strategies. Indeed, the realization that one is unable
11 to achieve his or her goal is likely to be very stressful, as stress is caused when goals become
12 unattainable (Lazarus, 1999). Further, Smith, Ntoumanis, Duda, and Vansteenkiste (2011)
13 linked goal status to coping, via appraisals among athletes, whilst other researchers linked
14 goal adjustment capacities, coping, and indicators of well-being among caregivers (Wrosch,
15 Amir, & Miller, 2011). In particular, Wrosch et al. (2011) reported positive associations
16 between both goal disengagement and goal reengagement with well-being. It is noteworthy
17 that Wrosch et al. did not explore appraisal, given recent findings linked goal adjustment
18 capacities to appraisals (Smith et al., 2011). As such, we assessed how goal adjustment
19 capacities and stress appraisals predicted well-being in the lead up to and during a
20 competition. We also assessed how athletes coped during competition within a single model
21 to satisfy calls for more research to identify the psychological mechanisms that link goal
22 adjustment capacities with indicators of well-being (Wrosch et al).

23 Self-regulation theorists (i.e., Carver & Scheier, 1981, 1998; Emmons, 1986;
24 Heckhausen, Wrosch, & Schulz, 2010) argue that goals structure a person's life and facilitate
25 adaptive behaviors, which contribute to a person's well-being. Personal goals for an athlete's

1 next competition such as winning an event, achieving a personal best, or beating a specific
2 opponent, may, at some point, become unattainable. This can happen for a number of
3 reasons, such as injury, biological capabilities, or time constraints (Ntoumanis et al., 2014a).
4 In order to circumvent the negative consequences of failing to achieve one's goal, individuals
5 can deploy self-regulation strategies, such as disengaging from their goal and reengaging in
6 alternative goals (Wrosch, Scheier, Carver, & Schulz, 2003). Goal disengagement refers to
7 withdrawing effort and commitment from achieving an unattainable goal, whereas goal
8 reengagement involves identifying alternative approaches to achieve the same goal,
9 identifying different goals that relate to the overall goal, or developing a completely new goal
10 (Carver & Scheier, 2005). The key feature of goal reengagement is that the individual is
11 committed to his or her new goal pursuit (Wrosch et al., 2011).

12 Coping refers to all cognitive and behavioral efforts that are used to help an
13 individual manage external or internal demands that are appraised as taxing a person's
14 resources (Lazarus & Folkman, 1984). There are many different ways of classifying coping,
15 but a popular approach involves grouping coping strategies as task-, distraction-, or
16 disengagement-oriented dimensions (Gaudreau & Blondin, 2004). Task-oriented coping
17 includes attempts to master stressful situations, whereas distraction-oriented coping relates to
18 focusing on cues that are irrelevant to sport, and disengagement-oriented coping involves
19 athletes ceasing their efforts to strive for personal goals. It is worth noting that coping is
20 associated with sporting performance and goal attainment. With a sample of elite fencers,
21 Doron and Gaudreau (2014) reported that task-oriented coping predicted winning streaks,
22 whereas Schellenberg, Gaudreau, and Crocker (2013) reported a positive association between
23 task-oriented coping and goal attainment, but a negative association between disengagement-
24 oriented coping and goal attainment. At present, there does not appear to be an association
25 between distraction-oriented coping and actual performance (Gaudreau, Nicholls, & Levy,

1 2010). In addition to the association between coping and performance, health psychology
2 researchers reported a link between coping and well-being (Pérez-García, Oliván, & Bover,
3 2014).

4 Well-being includes affective and psychological functioning, which relates to two
5 specific perspectives, the hedonic and the eudaimonic perspectives. The hedonic perspective
6 views psychological well-being as subjective experiences of happiness and defines well-
7 being in terms of pleasure attainment and pain avoidance. Conversely, the eudaimonic
8 perspective of well-being defines well-being in regards to the degree to which a person can
9 function fully (Ryan & Deci, 2001). These two conceptualizations of well-being resulted in
10 different strands of research and questionnaires that measured well-being from one
11 perspective, but not the other. However, examining well-being using a questionnaire, which
12 only captures either the hedonic or eudaimonic perspective, means that the entire well-being
13 construct is not captured. In order assess all components of well-being, without placing a
14 substantial time burden on participants, researchers such as Tennant et al. (2007) suggested
15 scholars should conceptualize and develop well-being scales that incorporate both the
16 hedonic and eudaimonic perspective. Combining the hedonic and eudaimonic perspectives,
17 **as Pérez-García et al. (2014) did in their study with heart-failure patients,** provides a
18 broad conceptualization of well-being (Tennant et al.). As such, well-being is associated with
19 people fulfilling their abilities, coping with stresses in life, and working productively or
20 fruitfully (World Health Organization, 2004). Despite the association between coping and
21 well-being, studies exploring these constructs among athletes are scant. One exception is the
22 study by Smith et al. (2011), who did not report any significant associations between
23 emotional well-being and **either task- or disengagement-oriented coping. A possible for**
24 **Smith et al. not finding a significant association between well-being and coping, could be**
25 **due to the scale they employed to assess well-being.** These authors measured emotional

1 well-being using 10 items from the Positive and Negative Affect Schedule (Watson,
2 Tellegen, & Clark, 1988). Unfortunately, this scale only captures the affective-emotional
3 elements of well-being. It does not measure cognitive-evaluative or psychological
4 functioning and thus fails to capture a wide conception of well-being (Tennant et al., 2007).
5 In health domains, researchers reported a direct association between well-being and coping.
6 With a sample of heart-failure patients, Pérez-García et al. (2014) reported a positive
7 association between task-focused strategies and well-being, but a negative association
8 between maladaptive coping (i.e., behavioral disengagement and self-blame) and well-being.

9 **Indicators of well-being (e.g., controlling anxiety, coping, and resilience) are**
10 **characteristics that successful athletes possess (Gould, Dieffenbach, & Moffett, 2002).**

11 Therefore, identifying mechanisms that may enhance well-being is important.

12 **Goal adjustment capacities may be one antecedent of psychological well-being.**

13 In non-sport settings, researchers revealed the importance of goal adjustment capacities, in
14 regards to well-being. Wrosch et al. (2003), for example, found goal disengagement predicted
15 enhanced psychological well-being. Persisting in goal-directed behaviours for an
16 unattainable goal may result in psychological distress (Carver & Scheier, 1990). Disengaging
17 from one's goals or withdrawing effort and commitment from unattainable goals (i.e.,
18 attempting to be fit for a particular competition when there is not enough time for the injured
19 body part to heal) is an adaptive behaviour, because it prevents the individual experiencing an
20 accumulation of failure experiences (Nesse, 2000). Indeed, disengaging from one's attempts
21 to achieve a goal is associated with fewer depressive symptoms or negative affect (Wrosch et
22 al., 2003). Conversely, goal reengagement strategies (e.g., identifying a new date to return to
23 completion after an injury or to return to one's sport stronger) are associated with a greater
24 purpose in life and positively toned emotions (e.g., happiness, excitement, or joy). This is due
25 to the awareness of future opportunities for success in achieving one's goals (Wrosch &

1 Miller, 2009; Wrosch, Miller, Scheier, & Brun de Pontet, 2007). **According to Wrosch et al.**
2 **(2007), goal adjustment strategies result in a reduction of negative affect, feelings of**
3 **purposefulness, and positive emotions. These consequences of goals adjustment**
4 **strategies are thought to lead to enhanced well-being.** Wrosch et al. suggested that goal
5 reengagement strategies are the main source of enhanced psychological well-being, rather
6 than goal disengagement.

7 Despite Wrosch et al. (2003) reporting that goal disengagement predicted enhanced
8 psychological well-being, their sample did not contain athletes. Existing theories and
9 empirical evidence indicates that goal disengagement might not be associated with such
10 positive outcomes within sporting domains (**Jones, Meijen, McCarthy, & Sheffield, 2009**).

11 A theoretical framework that predict a negative response to goal disengagement is **the**
12 **Theory of Challenge and Threat States in Athletes (TCTSA; Jones et al., 2009).**

13 According to this theory, threat occurs when personal resources are insufficient to meet the
14 demands of a situation, whereas challenge ensues when an individual perceives his or her
15 resources meet the demands of a situation. Thus, when athletes withdraw effort and
16 commitment (i.e., no longer trying to beat a particular opponent or win a race), they are
17 accepting that their resources are insignificant to meet the necessary demands. They may then
18 experience threat after disengaging from a goal. Alternatively, reengaging with an existing
19 goal, by developing a different approach or identifying a completely new goal, can empower
20 a person's belief to be successful. This is because identifying a new goal or alternative
21 strategy often involves the individual re-appraising a situation differently, which can result in
22 a sense of empowerment (Folkman & Moskowitz, 2000). Empowerment and feelings of
23 enhanced competence equates to athletes believing they can meet the demands of the
24 situation, and a challenge appraisal is likely to occur under such circumstances (Blascovich,
25 2008). Indeed, the **TCTSA (Jones et al.)** provides a theoretical link between resource

1 evaluations to meet the demands of a situation and challenge or threat states, which is
2 supported by empirical evidence (Tomaka, Blascovich, Kibler, & Ernst, 1997). Further, the
3 way an athlete appraises a situation (i.e., challenge vs. threat) influences coping (Lazarus &
4 Folkman, 1984). This is supported in recent research, whereby appraisals of challenges and
5 threat were significantly associated with task-oriented coping, whereas threat appraisals were
6 linked to distraction-, and disengagement-oriented coping responses among athletes
7 (Nicholls, Perry, & Calmeiro, 2014).

8 **Summary and Hypotheses**

9 Firstly, we tested whether goal adjustment capacities, in relation to important goals in
10 the athletes' next competition, predicted well-being in the lead up to, and during a sports
11 competition, and then developed the hypothesized mediator model (see Figure 1) to explain
12 the process via appraisals and coping. We predicted that goal adjustment capacities would be
13 associated with well-being, based on previous research in non-sport domains (Wrosch et al.,
14 2003, 2009), which linked both types of goal adjustment capacities to well-being. In
15 accordance with findings from the health psychology literature, we predicted a positive
16 relationship between goal reengagement strategies and well-being in the two days leading up
17 to, and during a sports competition. However, unlike the findings of Wrosch and colleagues,
18 we predicted a negative relationship between goal disengagement and well-being. Although
19 disengaging from one's goals may be effective in promoting well-being outside of sporting
20 contexts, disengagement is associated with negative outcomes in sport such as burnout
21 (Schellenberg et al., 2013). Burnout is considered as marker of psychological ill-being
22 (DeFreese & Smith, 2015). As such, we believed this goal adjustment capacity would predict
23 poorer well-being scores in the two days leading up to and during the competition.

24 We also predicted positive paths between goal reengagement and challenge, along
25 with goal disengagement and threat, but negative paths from goal reengagement to threat and

1 goal disengagement to challenge. As goal reengagement is associated with people being
2 aware of future opportunities for success in achieving one's goals (Wrosch & Miller, 2009;
3 Wrosch et al., 2007), it is likely this would generate a challenge state given the belief in one's
4 ability to achieve a goal is an antecedent of challenge states (Blascovich, 2008; Tomaka et al.,
5 1997). We predicted a negative path from goal disengagement to threat, because scholars
6 reported an association between disengagement strategies and threat appraisals (Nicholls et
7 al., 2014). We also hypothesized a positive path from challenge, but a negative path from
8 threat to well-being. All of these predictions were based on the notion that a challenge state
9 occurs when people perceive their resources are sufficient to cope, whereas threat ensues
10 when resources are insufficient and the emotional responses associated with each appraisal
11 (Blascovich). A key component of well-being relates to emotional well-being and
12 functioning. Pleasant emotions and superior functioning are associated with challenge states,
13 whereas unpleasant emotions and impaired functioning are a consequence of threat states
14 (Blascovich). Further, empirical evidence also underpins these hypotheses. Schmidt and
15 Muldoon (2015) reported an association between enhanced threat levels and poorer well-
16 being. We also predicted a positive path from challenge to task-oriented coping, but negative
17 paths from challenge to distraction- and disengagement-oriented coping. Positive paths from
18 threat to disengagement- and distraction-oriented coping, along with a negative path from
19 threat to task-oriented coping were predicted. The directions of these paths are based upon
20 previous research (i.e., Nicholls et al., 2014; Ntoumanis, Healy, Sedikides, Duda, Stewart,
21 Smith, & Bond, 2014b). Finally, we predicted a positive path from task-oriented coping to
22 well-being, but negative paths from distraction- and disengagement-oriented coping to
23 psychological well-being, based upon the finding of Pérez-García et al. (2014).

24

Method

1 **Participants**

2 Two-hundred and twelve athletes (male $n = 107$, female $n = 105$), aged between 18
3 and 25 years of age (M age = 18.96, $SD = 5.74$), with a mean playing experience of 5.76
4 years ($SD = 4.38$), from the United Kingdom ($n = 147$) or Australia ($n = 65$), participated in
5 the study. Participants played team sports such soccer, rugby union, or rugby league ($n =$
6 135) or individual sports such as tennis, golf, martial arts ($n = 77$). Our sample contained 114
7 Caucasian, 40 African-Caribbean, 26 Asian, 27 Chinese, and five athletes from other ethnic
8 groups. The athletes in our sample competed at international ($n = 7$), national ($n = 11$), county
9 ($n = 67$), club ($n = 84$), and beginner ($n = 43$) levels, who played their sport professionally (n
10 = 11), semi-professionally ($n = 18$), or as an amateur ($n = 183$).

11 **Measures**

12 **Goal Adjustment Capacities.** The Goal Disengagement and Goal Reengagement
13 Scale (GDGRS; Wrosch et al. 2003) assessed the extent to which participants could reduce
14 effort and commitment to unattainable goals, along with pursuing alternative goals. The
15 GDGRS (Wrosch et al.) contains 10 items that are answered on a 5-point Likert-type scale,
16 anchored at 1 = *strongly disagree* and 5 = *strongly agree*. Participants responded to the stem
17 “If it becomes likely that I am not going to succeed in achieving an important goal or goals in
18 my next competition, in two days time.” Four items of the GDGRS (i.e., “It’s easy for me to
19 reduce my effort toward the goal”) measured goal disengagement and six items (i.e., “I think
20 about other new goals to pursue”) measured goal reengagement. With a sample of 115
21 participants, Wrosch et al. reported a Cronbach’s alpha of .84 for goal disengagement and .86
22 for goal **reengagement** among 115 undergraduate students.

23 **Challenge and Threat Appraisals.** Participants completed challenge and threat
24 questions from the Stress Appraisal Measure (SAM; Peacock & Wong, 1990) and responded
25 to the stem “This questionnaire is concerned with your thoughts about your next competition

1 in two days time. Please rate the degree to which the following statements apply to you.”
2 There were six challenge questions (i.e., “I am excited about playing in my next competition”
3 and “I am keen to play my next competition”) and six threat questions (i.e., “I think the
4 outcome of my next competition will be negative” and “my next competition could have
5 negative consequences for me.”) Questions were answered on a Likert-type scale, ranging
6 from 1 = *not at all* to 5 = *extremely*. Internal consistencies ranged from .65 to .90 with a
7 sample of 100 participants. Peacock and Wong report three Cronbach alpha scores for threat
8 (i.e., .65, .75, and .73) among their samples of undergraduate students.

9 **Coping.** The Coping Inventory for Competitive Sport (CICS; Gaudreau & Blondin,
10 2002) measured how the athletes coped during competitive sport. The CICS is a 39-item
11 questionnaire, which assesses three second-order dimensions, from 10 coping subscales.
12 These are task-oriented coping (i.e., thought control, mental imagery, relaxation, effort
13 expenditure, logical analysis, and seeking support), distraction-oriented coping (i.e.,
14 distancing and mental distraction), and disengagement-oriented coping (i.e.,
15 disengagement/resignation and venting of unpleasant emotions). Participants responded to the
16 stem “Each question represents things that athletes can do or think during sport. For each
17 question **you** must indicate the extent to which it corresponds to what you did during your
18 sport today. We are interested in what you actually did or thought during your sport.” “I
19 visualized that I was in total control of the situation” and “I lost all hope of attaining my
20 goal” are examples of questions within the CICS (Gaudreau & Blondin, 2002). Participants
21 answered these questions on a 5-point Likert-type scale, anchored at 1 = *not at all* and 5 =
22 *very strongly*. Gaudreau and Blondin (2002) reported Cronbach alpha coefficients for
23 individual coping strategies ranging from .67 to .87 among their sample of 314 athletes.

24 **Well-being.** The Short Warwick Edinburgh Mental Well-Being Scale (SWEMWBS;
25 Tennant et al., 2007) examined well-being among the participants. Participants responded to

1 the stem “Below are some statements about feelings and thoughts. Please circle the number
2 that best describes your experience of each over the last couple of days.” The SWEMWBS
3 (Tennant et al.) contains seven questions (i.e., “I’ve been able to make up my own mind
4 about things” and “I’ve been feeling optimistic about the future”) that are answered on a 5-
5 point Likert-type scale ranging from 1 = *none of the time* to 5 = *all of the time*. Tennant et al.
6 reported Cronbach's alphas of .89 for their student sample of 354 students and .91 for 2075
7 participants who were classified as a general population sample.

8 **Procedure**

9 Following ethical approval from a University Ethics Committee, letters detailing the
10 nature of the study were sent to sports teams. Those athletes interested in participating in the
11 study signed a consent form. The participants filled out the GDGRS (Wrosch et al., 2003) and
12 then the challenge and threat items of the SAM (Peacock & Wong, 1990) two days before,
13 and in relation to the athletes’ next sporting competition (T1). Participants then completed the
14 CICS (Gaudreau & Blondin, 2002) in relation to their coping during the competition,
15 followed by the SWEMWBS (Tennant et al., 2007), in the presence of a research assistant, to
16 assess well-being throughout the duration of the study, which included the two days leading
17 up to the competition and the competition itself. The CICS and the SWEMWBS were
18 completed within three hours of their competition finishing (T2).

19 **Data Analysis**

20 We used descriptive statistics to examine missing data, outliers, and univariate
21 normality. Omega point estimates and bootstrapped confidence intervals assessed internal
22 consistency (i.e., Dunn, Baguley, & Brunsten, 2013). Owing to our sample size, a full
23 structural equation model, including a measurement model, was not possible. Therefore, we
24 explored the factor structure of each measure by employing exploratory structural equation

1 modelling (ESEM; Asparouhov & Muthén, 2009), with a subjective view of fit indices
2 (Marsh, Hau, & Wen, 2004; Perry, Nicholls, Clough, & Crust, 2015).

3 For the main analysis, we tested a structural equation model, employing the robust
4 maximum likelihood (MLR) estimator to guard against departure from multivariate
5 normality. Standardized parameter estimates, bootstrapped to provide 95% confidence
6 intervals, examined model fit. Specifically, the comparative fit index (CFI) and Tucker-Lewis
7 Index (TLI) were examined as normed and non-normed indices. The standardized root-mean-
8 square residual (SRMR) and the root mean square error approximation (RMSEA) presented
9 absolute fit indices. We tested our hypotheses in two stages. First, we tested a model whereby
10 well-being was predicted directly by goal disengagement and goal reengagement. Next, we
11 examined the hypothesized mediator model, where the direct path between goal adjustment
12 and well-being was mediated by stress appraisal and coping.

13 **Results**

14 Preliminary analyses found no missing data or issues with outliers. Table 1 contains
15 descriptive statistics and omega point estimates. There were no issues with univariate
16 skewness (< 2) or kurtosis (< 2). We calculated Omega point estimates and confidence
17 intervals using the MBESS package (Kelley & Lai, 2012), in R (R Development Core Team,
18 2012), with 1,000 bootstrap samples. All demonstrated acceptable internal consistency. Table
19 2 includes Pearson's bivariate correlations between all variables.

20 To determine if skill level impacted on goal adjustment, stress appraisal, coping, and
21 well-being, we conducted a one-way ANOVA with Tukey's post-hoc tests and 1000
22 bootstrapped samples. The results indicated significant skill level effects on all variables with
23 the exception of well-being (Table 3). Specifically, national-level athletes reported less goal
24 disengagement, greater challenge appraisals, more task-oriented coping, and less distraction-

1 and disengagement-oriented coping. To account for these effects, subsequent SEM analyses
2 controlled for skill level on all variables with the exception of well-being.

3 It was not possible to conduct a full structural equation model including requisite
4 measurement models, as the ratio of participants to free parameters was insufficient (Bentler
5 & Chou, 1987). To explore factor structure was appropriate, we conducted ESEM on each
6 scale before proceeding to the main analysis. We scrutinized model fit and standardized
7 parameter estimates to ensure theoretically sensible loadings and that cross-loadings were not
8 substantive. The GDGRS presented a reasonable model fit; $\chi^2(26) = 86.42, p < .001, CFI =$
9 $.913, TLI = .836, SRMR = .051, RMSEA = .111$ (90% CI = .086, .137). All items loaded
10 significantly onto their intended factor with two significant cross-loadings. Specifically, two
11 disengagement items loaded onto the reengagement factor, though these were lower than
12 their intended factor loading. Consequently, the GDGRS (Wrosch et al., 2003) demonstrated
13 appropriate measurement of goal adjustment capacities in the sample. The SAM (Peacock &
14 Wong, 1990) presented good ESEM model fit; $\chi^2(13) = 26.23, p = .001, CFI = .971, TLI =$
15 $.932, SRMR = .030, RMSEA = .075$ (90% CI = .035, .114). All items loaded significantly
16 onto their intended factors and there were no substantive cross-loadings.

17 The sample size was not sufficient to conduct a full item-level analysis on the CICS
18 (Gaudreau & Blondin, 2002). Consequently, we tested an ESEM measurement model in
19 which three latent variables, task- distraction-, and disengagement-oriented coping were
20 indicated by the 10 subscales from the CICS. This presented good model fit; $\chi^2(18) = 24.65, p$
21 $= .103, CFI = .973, TLI = .930, SRMR = .031, RMSEA = .065$ (90% CI = .000, .118). The
22 final factor structure examined was the unidimensional, 7-item WEMWBS. Model fit was
23 good; $\chi^2(14) = 19.16, p = .118, CFI = .983, TLI = .972, SRMR = .035, RMSEA = .045$ (90%
24 CI = .000, .086) and all items loaded substantively onto the single factor. Overall, the

1 preliminary analyses supported the use of published measurement models in the current
2 sample without the need for modification.

3 **Structural Equation Modeling**

4 We tested the hypothesized model using SEM in Mplus 7 (Muthén & Muthén, 2012).
5 Due to the sample size, each latent variable was indicated by one observed variable, which
6 represented the mean score of all items representing the factor, as performed by Ntoumanis et
7 al. (2014). Before testing the hypothesized model, we examined a model whereby well-being
8 in the lead up to, and during the competition was predicted by goal disengagement and goal
9 reengagement. This model fitted the data reasonably well; $\chi^2(1) = 1.72, p = .189, CFI = .969,$
10 $TLI = .907, SRMR = .051, RMSEA = .059$ (90% CI = .000, .104). More meaningfully, well-
11 being was significantly and positively predicted by goal reengagement ($\beta = .33, p < .001$) and
12 negatively predicted by goal disengagement ($\beta = -.26, p < .001$). We then tested the
13 hypothesized model to examine the extent to which the effects between goal adjustment
14 capacities and well-being were mediated by stress appraisal and coping. Model fit was
15 reasonable; $\chi^2(12) = 23.67, p = .023, CFI = .969, TLI = .907, SRMR = .050, RMSEA = .068$
16 (90% CI = .025, .108), but indicated some misspecification. Inspection of the modification
17 indices signaled that the addition of a direct path from threat to well-being would
18 significantly improve model fit. This conceptually viable path (i.e., Blascovich, 2008, Schmid
19 & Muldoon, 2015) created the final model shown in Figure 2. Model fit improved, including
20 achieving a non-significant chi-square statistic; $\chi^2(11) = 19.32, p = .081, CFI = .981, TLI =$
21 $.942, SRMR = .038, RMSEA = .054$ (90% CI = .000, .096). All paths in the model were
22 statistically significant with the exception of threat appraisal to disengagement-oriented
23 coping. With the exception of the path between distraction-oriented coping and
24 psychological well-being ($\beta = .27, p < .001$), the direction of the other parameter estimates
25 were as expected. Overall, the direct effects indicated that goal disengagement predicted

1 threat stress appraisal, which predicted lower psychological well-being. Conversely, goal
2 reengagement predicted challenge stress appraisal, which predicted task-oriented coping,
3 which predicted higher psychological well-being. The negative paths opposing these positive
4 ones were also significant.

5 To determine indirect effects from goal adjustment capacities to psychological well-
6 being, 95% confidence intervals were obtained from 5000 bootstrapped samples. Significant
7 indirect effects were evident from goal disengagement to well-being via challenge and task-
8 oriented coping ($\beta = -.08, p < .001, 95\% \text{ CI} = -.13, -.02$), and challenge and distraction-
9 oriented coping ($\beta = .05, p < .01, 95\% \text{ CI} = .01, .10$). Total indirect effects from goal
10 disengagement to psychological well-being were negative ($\beta = -.16, p < .05, 95\% \text{ CI} = -.32,$
11 $.01$). Significant indirect effects from goal reengagement to well-being were observed via
12 challenge and task-oriented coping ($\beta = .09, p < .001, 95\% \text{ CI} = .03, .15$), challenge and
13 distraction-oriented coping ($\beta = -.06, p < .001, 95\% \text{ CI} = -.11, -.01$), and threat ($\beta = .11, p <$
14 $.05, 95\% \text{ CI} = .00, .22$). Total indirect effects from goal reengagement to psychological well-
15 being were positive ($\beta = .18, p < .001, 95\% \text{ CI} = .04, .32$).

16 Discussion

17 Informed by self-regulation theories (i.e., Carver & Scheier, 1981, 1998; Emmons,
18 1986; Heckhausen et al., 2010), we tested a model that included goal adjustment capacities,
19 appraisals, coping, and well-being. As such, the objective of this study was to shed light on
20 the relationship between goal adjustment capacities and well-being among athletes, and
21 examine the psychological constructs that may link these two variables (i.e., appraisal and
22 coping). Overall, we found support for our model and many of the hypothesized paths were
23 significant, inferring the way in which an athlete responds to an unattainable goal is
24 associated with his or her well-being. In particular, well-being during the two days leading up
25 to, and including the competition was negatively predicted by goal disengagement, but

1 positively predicted by goal reengagement. This is in partial agreement with research from
2 the health psychology literature, where both goal reengagement and disengagement positively
3 predicted well-being (Wrosch et al., 2003, 2011). We offer two explanations for our
4 contrasting findings. These differences may be due to the different contexts in which the data
5 was collected and therefore the nature of the stress experienced. The participants in the
6 Wrosch et al. (2011) study faced a chronic stressor (i.e., being a caregiver for a family
7 member with a mental illness), whereas we examined an acute stressor (i.e., the stress
8 encountered during sport). As such, goal adjustment capacity strategies that involve
9 disengagement may be effective for chronic stress. Alternatively, **our findings may be due to**
10 **differing levels of control among athletes in comparison to non-athletic populations.**
11 **Individuals who play sport decide whether or not they want to participate in sport, and any**
12 **undesirable consequences of playing sport can be stopped if a person ceases sports**
13 **participation. As such, people who play sport can control any negative feelings by ceasing**
14 **their sports participation. However, in other circumstances, such as the Wrosch et al. (2011)**
15 **study where individuals have little choice, but to provide care to a family member,**
16 **individuals have no control over the stressor, in that there is no way to suddenly alleviate the**
17 **stressor. According to Bandura (2001) the concept of control is vital and has implications for**
18 **well-being. Indeed, Bandura stated that “among the mechanisms of personal agency, none is**
19 **more central or pervasive than people’s beliefs in their capability to exercise some measure of**
20 **control over their own functioning and over environmental events” (p. 10). Frazier et al.**
21 **(2011) stated that is widely accepted that high levels of control are positively associated with**
22 **higher levels of well-being.** This study therefore highlights the nuances of conducting sport
23 specific research and illustrates within the context of sport, findings may be different from
24 other populations.

1 The paths between goal adjustment capacities and stress appraisals supported our
2 hypotheses, with positive paths from goal disengagement to threat and from goal
3 reengagement to challenge. Further, the paths from goal disengagement to challenge and goal
4 reengagement to threat were negative. Folkman and Moskowitz (2000) suggested that
5 developing a new goal may involve an element of re-appraisal, which allows the person to
6 identify new solutions to a problem (i.e., no longer being able to achieve one's goal). Some
7 goals become unattainable due to personal reasons such as an athlete not dedicating enough
8 time to their conditioning program, technical skills, or tactics (Ntoumanis et al., 2014a).
9 These reasons could be resolved by the athlete re-appraising the situation and setting a goal to
10 work on these individual aspects. Under these circumstances, athletes may then view their
11 situation as challenging, because of their new strategy (Blascovich, 2008). Alternatively, if
12 goal failure is down to factors that go beyond the control of the athlete (i.e., selectors not
13 picking an athlete, injury, or illness) then the relationship between goal reengagement and
14 challenge appraisals may be different, because no amount of reappraisal strategies can solve
15 the problem. In this study, we did not examine the controllability of goal failure. Exploring
16 control in relation to goal attainment may be an interesting avenue for future research, as it
17 may influence the effectiveness of goal reengagement strategies. An alternative explanation
18 for the relationship between goal adjustment capacities and appraisals may be due the
19 athletes' emotional responses. We did not explore emotions within our model, and thus the
20 emotional responses to different goal adjustment capacities. It is plausible, however, that
21 reengaging in a new goal would result in a pleasant emotion such as hope, relief, or happiness
22 because of the athlete's new plan, whereas disengaging in a goal would be associated with an
23 unpleasant emotion such as **as** dejection, anger, or anxiety, due to feelings of hopelessness.
24 Previous scholarly activity linked pleasant emotions with challenge appraisals and unpleasant
25 emotions with threat appraisals (Nicholls et al., 2014; Nicholls, Polman, & Levy 2012).

1 Future research could explore emotional responses in relation to goal adjustment capacities in
2 order to shed more light on this relationship. Further, in the present model, goal adjustment
3 capacities preceded appraisals of challenge and threat. Given that these constructs were
4 assessed at the same point in time, it is plausible that appraisals of challenge or threat may
5 influence the type of goal adjustment capacity deployed. In order to assess causality, and thus
6 whether goal adjustment capacities cause different appraisals or whether appraisals cause
7 different goal adjustment capacities, experimental research is required.

8 The paths from stress appraisals of challenge and threat to coping provide some
9 support for our hypotheses and existing literature (e.g., Nicholls et al., 2014; Ntoumanis et al.
10 2014b). We found a positive path from challenge to task-oriented coping, but a negative path
11 from challenge to disengagement-oriented coping. Further, path from threat to distraction-
12 oriented coping was positive and there was a negative path from threat to task-oriented
13 coping. These results were obtained despite our measurement period not being as close to
14 competition as other studies (i.e., Nicholls et al. 2012). For example, Nicholls et al. (2012)
15 examined appraisals within one hour of a competition starting and coping within an hour of
16 the competition finishing, whereas Nicholls et al. (2014) assessed appraisals and coping
17 together, before a competition started. Ntoumanis et al. examined these constructs after
18 participants completed a laboratory task. In the present study, we assessed appraisals two
19 days before a competition and coping within three hours of the competition ending. This
20 finding indicates the strength of appraisals in predicting coping several days later and
21 provides support for Lazarus' (1999) assertion that appraisal is the most important construct
22 within his Cognitive-Motivational-Relational theory of emotions. Our finding also suggests
23 that practitioners may be able to manipulate coping by providing appraisal training in the
24 build up to competitions, and thus enhance performance if athletes use task-oriented

1 strategies when competing (e.g., Doron & Gaudreau, 2014; Gaudreau et al., 2010;
2 Schellenberg et al., 2013).

3 Appraisal training may also influence well-being. We found a negative and significant
4 path between threat and well-being. It is unsurprising that this path was negative.
5 Conceptually, threat states are associated with athletes being concerned about future losses
6 due to deficiencies in coping (Lazarus, 1999), whereas well-being is related to people being
7 able to cope with stresses (World Health Organization, 2004). As such, decreasing threat
8 levels may be more effective in improving well-being than increasing challenge states.
9 Research is required to assess the impact of appraisal training interventions on well-being.

10 The three paths between coping and well-being were significant, although not all in
11 the anticipated direction. The positive path between task-oriented and well-being and the
12 negative path between disengagement-oriented are in agreement with Pérez-García et al.'s
13 (2014) findings among patients with heart-failure and our hypotheses. As such, the Pérez-
14 García results transfer to a sport setting and appear that they are not context specific. The
15 notion that coping and well-being are associated provides conceptual support for Lazarus
16 (1999) who stated that when a person copes well, stress will be low, and therefore well-being
17 will be enhanced. The path between distraction-oriented coping and well-being was
18 somewhat unexpected in the present sample. We predicted a negative path between the
19 constructs, but the path was positive. Our prediction was based on previous studies that
20 identified a negative path between distraction-oriented coping and coping effectiveness (i.e.,
21 Nicholls, Levy, & Perry, 2015; Nicholls, Perry, Jones, Morley, & Carson, 2013). As
22 distraction-oriented coping was deemed to be an ineffective coping in the aforementioned
23 studies, we believed it would be associated with higher stress levels and thus poorer well-
24 being. We offer two explanations for the present findings. The use of distraction-oriented
25 coping involves athletes thinking about things other than the competition, to distract

1 themselves from the stressful competition. Similar to the conceived benefits of goal
2 disengagement, this form of coping may reduce distress and by taking the athlete's mind off
3 what is causing him or her stress, and thus enhance well-being (Wrosch et al., 2007).
4 Alternatively, the positive relationship between distraction-oriented coping and well-being
5 might be due to some athletes using high levels of distraction-oriented coping in combination
6 with high-levels of task-oriented coping. Shimazu and Schaufeli (2007) reported that workers
7 using high levels of task and distraction based coping strategies experienced lower stress
8 levels, in comparison to high task and low distraction. We did not specifically examine the
9 interplay between these coping strategies, and examining clusters in coping patterns is not a
10 new line of research (i.e., Gaudreau & Blondin, 2004), but has the potential to reveal the
11 antecedents of well-being. Generally, researchers tend to examine the associations between
12 certain strategies or coping dimensions and other constructs such as performance (i.e., Doron
13 & Gaudreau, 2014; Gaudreau et al., 2010), goal attainment (Schellenberg et al., 2013) or
14 coping effectiveness (e.g., Nicholls et al., 2013), without assessing combinations of different
15 coping strategies in relation to different outcomes. Adopting this approach may help scholars
16 develop more effective coping interventions by identifying the most efficient ways to cope.
17 At the present time, there appears to be no association between performance and distraction-
18 oriented coping (e.g., Gaudreau et al., 2010), so although encouraging athletes to use more
19 distraction coping strategies may not affect performance, it may enhance well-being.

20 A possible limitation of this study is that participants responded to their general well-
21 being over the course of the assessment period (i.e., two days), which is in accordance with
22 previous research (Wrosch et al., 2011). This meant we did not measure how the participants
23 were feeling throughout specific phases (i.e., immediately pre- or post-competition). Future
24 research could explore temporal indicators of well-being across stages of a competition.
25 Further, to our knowledge, the only other sport study to employ the GDGRS (Wrosch et al.,

1 2003), was by Ntoumanis et al. (2014a). It could be argued that more studies are required **that**
2 **examine the validity of using this scale with** athletic populations. Although we examined the
3 factor structure of each scale **in our sample**, the sample size was not sufficient to permit a full
4 SEM, which incorporated measurement error. Consequently, a limitation of the study is that
5 latent variables were not directly examined in the main analyses. Another limitation of this
6 study is that we did not assess the perceived importance of the competition, stress levels
7 during the competition, number or hours spent training, nor the outcome of the competition.
8 These are all variables that could potentially influence all of the constructs we assessed.
9 Indeed, future research could examine these variables in relation to the constructs we
10 examined, as these may impact upon our model.

11 In summary, we found support for our model that was inspired by theories of self-
12 regulation (i.e., Carver & Scheier, 1981, 1998; Emmons, 1986; Heckhausen et al., 2010).
13 Based on our findings, we suggest that applied practitioners continue encouraging athletes to
14 set challenging goals, but carefully monitor such goals and help athletes recognize the
15 difference between a goal that requires effort and an unattainable goal. If goals become
16 unattainable, applied consultants could encourage athletes to develop alternative approaches
17 to achieve the same goal, set smaller goals that would ultimately lead to success in their
18 overall personal goal, or develop a completely new goal (Carver & Scheier, 2005), rather
19 than persisting or simply disengaging from their goal. This is likely to foster challenge
20 appraisals, task-oriented coping, and enhanced well-being. It appears that coping and
21 appraisals are mechanisms that link goal adjustment capacities and well-being, although
22 future scholarly activity could identify other psychological constructs that underpin the goal
23 adjustment capacities and well-being relationship, with a view to developing theory and
24 creating well-being interventions.

25

26

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Table 1. *Descriptive statistics, univariate normality estimates, and omega point estimates with confidence intervals*

Variable	Mean	SD	Min	Max	Skew	Kurt	ω (95% CI)
Goal disengagement	3.24	.99	1.00	5.00	-.67	.05	.85 (.80, .89)
Goal re-engagement	3.42	.68	1.00	5.00	.11	.50	.69 (.58, .79)
Threat	2.43	.95	1.00	5.00	.43	-.38	.79 (.73, .83)
Challenge	3.77	.90	1.75	5.00	-.15	-1.14	.77 (.70, .81)
Task coping	3.02	.64	1.30	4.52	.08	-.20	.84 (.75, .88)
Distraction coping	3.04	1.01	1.00	4.88	-.13	-1.01	.89 (.87, .91)
Disengagement coping	2.43	.75	1.00	4.50	.01	-.55	.70 (.60, .76)
Well-being	3.65	.75	1.86	5.00	-.04	-.35	.85 (.81, .88)

Table 2. *Bivariate correlations between variables*

Variable	1	2	3	4	5	6	7
1. Goal disengagement	-						
2. Goal re-engagement	.17*	-					
3. Threat	.13	-.26**	-				
4. Challenge	-.30**	.36**	-.33**	-			
5. Task-oriented coping	-.13	.35**	-.26**	.66**	-		
6. Distraction-oriented coping	.30**	-.28**	.48**	-.59**	-.33**	-	
7. Disengagement-oriented coping	.11	-.29**	.43**	-.34**	-.21**	.52**	-
8. Well-being	-.16*	.25**	.31**	.28**	.40**	-.10	.24**

Table 3. Skill level effect on mean (SD) for goal adjustment, stress appraisal, coping, and well-being

Variable	Beginner (n = 43)	Club/Uni (n = 84)	County (n = 67)	National/International (n = 18)
Goal disengagement	12.20 (2.54)	12.15 (2.08)	11.06 (2.27) ^{1,2}	7.00 (3.35) ^{1,2,3}
Goal re-engagement	20.67 (3.44)	20.90 (4.07)	19.30 (4.02) ²	21.29 (4.01)
Threat	9.17 (3.28)	9.43 (4.15)	10.94 (3.22) ²	8.82 (3.56)
Challenge	14.44 (3.63)	15.35 (3.53)	13.27 (3.24) ^{2,3}	18.47 (3.30) ^{1,2,3}
Task coping	67.90 (16.27)	69.53 (15.40)	65.70 (11.43)	80.41 (12.56) ^{1,2,3}
Distraction coping	24.59 (7.99)	25.08 (8.19)	26.75 (7.71)	18.18 (5.99) ^{1,2,3}
Disengagement coping	20.09 (5.63)	18.90 (5.80)	21.49 (5.48) ²	15.53 (6.97) ^{1,3}
Well-being	25.65 (5.03)	25.05 (6.01)	25.57 (3.80)	27.94 (5.38)

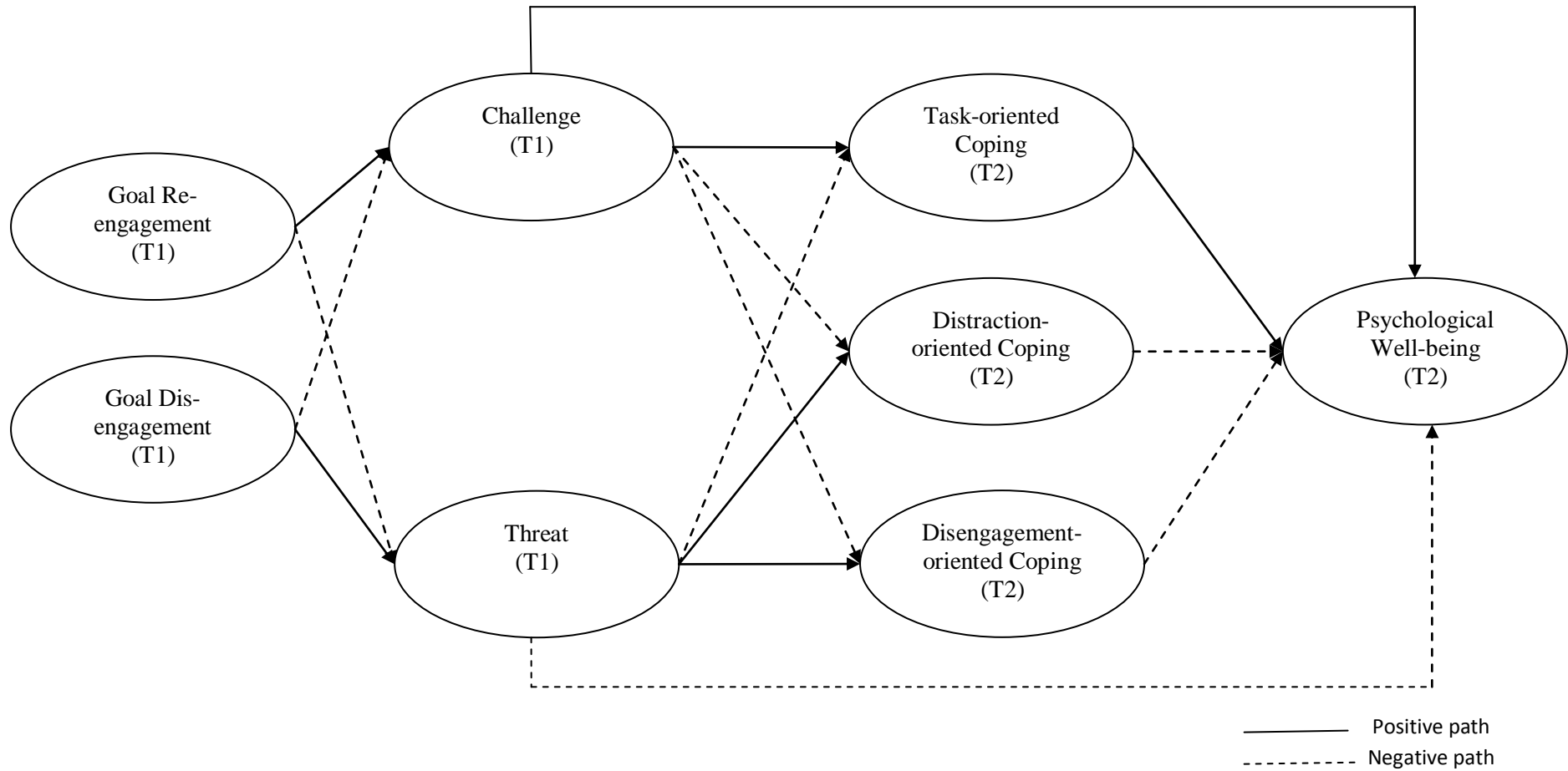
¹Significantly different ($p < .05$) from beginner level

²Significantly different ($p < .05$) from club/university level

³Significantly different ($p < .05$) from county level

1 Figure 1. Hypothesized Model

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1 Figure 2. *Structural Equation Model with Parameter Estimates from Goal Adjustment, Stress Appraisal, Coping, and Psychological Well-being.*
 2 * $p < .05$, ** $p < .01$.

