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**FINAL PROOF**

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

6 Appraisals, Coping, and Well-Being among Athletes

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11 applicability of self-regulation theories in sport: Goal adjustment capacities, stress appraisals,  
12 coping, and well-being among athletes. *Psychology of Sport and Exercise*.

## 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.

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 or positive mental health.

1 Personal goals for an athlete's next competition such as winning an event, achieving a  
2 personal best, or beating a specific opponent, may, at some point, become unattainable. This  
3 can happen for a number of reasons, such as injury, biological capabilities, or time constraints  
4 (Ntoumanis et al., 2014a). In order to circumvent the negative consequences of failing to  
5 achieve one's goal, individuals can deploy self-regulation strategies, such as disengaging  
6 from their goal and reengaging in alternative goals (Wrosch, Scheier, Carver, & Schulz,  
7 2003). Goal disengagement refers to withdrawing effort and commitment from achieving an  
8 unattainable goal, whereas goal reengagement involves identifying alternative approaches to  
9 achieve the same goal, identifying different goals that relate to the overall goal, or developing  
10 a completely new goal (Carver & Scheier, 2005). The key feature of goal reengagement is  
11 that the individual is 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 task-, distraction-, and  
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 provides a broad conceptualization of well-being, which is viewed as another term for  
18 positive mental health, with positive mental health and well-being often used interchangeably  
19 (Tennant et al.). As such, well-being or positive mental health are associated with people  
20 fulfilling their abilities, coping with stresses in life, and working productively or fruitfully  
21 (World Health Organization, 2004). Despite the association between coping and well-being,  
22 studies exploring these constructs among athletes are scant. One exception is the study by  
23 Smith et al. (2011), who did not report any significant associations between emotional well-  
24 being and coping. A possible explanation for this finding may be the scale employed by Smith  
25 and colleagues. These authors measured emotional well-being using 10 items from the

1 Positive and Negative Affect Schedule (Watson, Tellegen, & Clark, 1988). Unfortunately,  
2 this scale only captures the affective-emotional elements of well-being. It does not measure  
3 cognitive-evaluative or psychological functioning and thus fails to capture a wide conception  
4 of well-being (Tennant et al., 2007). In health domains, researchers reported a direct  
5 association between well-being and coping. With a sample of heart-failure patients, Pérez-  
6 García et al. (2014) reported a positive association between task-focused strategies and well-  
7 being, but a negative association between maladaptive coping (i.e., behavioral disengagement  
8 and self-blame) and well-being. There are a number of positive outcomes of well-being, so  
9 identifying mechanisms that may enhance well-being is important. Goal adjustment  
10 capacities may be one antecedent of psychological well-being.

11 In non-sport settings, researchers revealed the importance of goal adjustment  
12 capacities, in regards to well-being. Wrosch et al. (2003), for example, found goal  
13 disengagement predicted enhanced psychological well-being. Persisting in goal-directed  
14 behaviours for an unattainable goal may result in psychological distress (Carver & Scheier,  
15 1990). Disengaging from one's goals or withdrawing effort and commitment from  
16 unattainable goals (i.e., attempting to be fit for a particular competition when there is not  
17 enough time for the injured body part to heal) is an adaptive behaviour, because it prevents  
18 the individual experiencing an accumulation of failure experiences (Nesse, 2000). Indeed,  
19 disengaging from one's attempts to achieve a goal is associated with fewer depressive  
20 symptoms or negative affect (Wrosch et al., 2003). Conversely, goal reengagement strategies  
21 (e.g., identifying a new date to return to completion after an injury or to return to one's sport  
22 stronger) are associated with a greater purpose in life and positively toned emotions (e.g.,  
23 happiness, excitement, or joy). This is due to the awareness of future opportunities for  
24 success in achieving one's goals (Wrosch & Miller, 2009; Wrosch, Miller, Scheier, & Brun  
25 de Pontet, 2007). It is the reduction in negative affect, combined with feelings of

1 purposefulness and positive emotions as a consequence of goal adjustment strategies, which  
2 are thought to be the mechanisms by which psychological well-being is enhanced (Wrosch et  
3 al., 2007). Although Wrosch et al. suggested that goal reengagement strategies are the main  
4 source of enhanced psychological well-being, rather than goal disengagement.

5         Despite Wrosch et al. (2003) reporting that goal disengagement predicted enhanced  
6 psychological well-being, their sample did not contain athletes. Existing theory and empirical  
7 evidence indicates that goal disengagement might not be associated with such positive  
8 outcomes within sporting domains. A theoretical framework that predicts a negative response  
9 to goal disengagement is the biopsychosocial model (BPSM) of challenge and threat  
10 (Blascovich, 2008). According to this model, threat occurs when personal resources are  
11 insufficient to meet the demands of a situation, whereas challenge ensues when an individual  
12 perceives his or her resources meet the demands of a situation. Thus, when athletes withdraw  
13 effort and commitment (e.g., no longer trying to beat a particular opponent or win a race),  
14 they are accepting that their resources are insignificant to meet the necessary demands. They  
15 may then experience threat after disengaging from a goal. Alternatively, reengaging with an  
16 existing goal, by developing a different approach or identifying a completely new goal, can  
17 empower a person's belief to be successful. This is because identifying a new goal or  
18 alternative strategy often involves the individual re-appraising a situation differently, which  
19 can result in a sense of empowerment (Folkman & Moskowitz, 2000). Empowerment and  
20 feelings of enhanced competence equates to athletes believing they can meet the demands of  
21 the situation, and a challenge appraisal is likely to occur under such circumstances  
22 (Blascovich, 2008). Indeed, the BPSM (Blascovich) provides a theoretical link between  
23 resource evaluations to meet the demands of a situation and challenge or threat states, which  
24 is supported by empirical evidence (Tomaka, Blascovich, Kibler, & Ernst, 1997). Further, the  
25 way an athlete appraises a situation (i.e., challenge vs. threat) influences coping (Lazarus &

1 Folkman, 1984). This is supported in recent research, whereby appraisals of challenges and  
2 threat were significantly associated with task-oriented coping, whereas threat appraisals were  
3 linked to distraction-, and disengagement-oriented coping responses among athletes  
4 (Nicholls, Perry, & Calmeiro, 2014).

### 5 **Summary and Hypotheses**

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

21 We also predicted positive paths between goal reengagement and challenge, along  
22 with goal disengagement and threat, but negative paths from goal reengagement to threat and  
23 goal disengagement to challenge. As goal reengagement is associated with people being  
24 aware of future opportunities for success in achieving one's goals (Wrosch & Miller, 2009;  
25 Wrosch et al., 2007), it is likely this would generate a challenge state given the belief in one's



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

21

## Method

### 22 Participants

23 Two-hundred and twelve athletes (male  $n = 107$ , female  $n = 105$ ), aged between 18  
24 and 25 years of age ( $M$  age = 18.96,  $SD = 5.74$ ), with a mean playing experience of 5.76  
25 years ( $SD = 4.38$ ), from the United Kingdom ( $n = 147$ ) or Australia ( $n = 65$ ), participated in

1 the study. Participants played team sports such soccer, rugby union, or rugby league ( $n =$   
2 135) or individual sports such as tennis, golf, martial arts ( $n = 77$ ). Our sample contained 114  
3 Caucasian, 40 African-Caribbean, 26 Asian, 27 Chinese, and five athletes from other ethnic  
4 groups. The athletes in our sample competed at international ( $n = 7$ ), national ( $n = 11$ ), county  
5 ( $n = 67$ ), club ( $n = 84$ ), and beginner ( $n = 43$ ) levels, who played their sport professionally ( $n$   
6  $= 11$ ), semi-professionally ( $n = 18$ ), or as an amateur ( $n = 183$ ).

## 7 **Measures**

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

19       **Challenge and Threat Appraisals.** Participants completed challenge and threat  
20 questions from the Stress Appraisal Measure (SAM; Peacock & Wong, 1990) and responded  
21 to the stem “This questionnaire is concerned with your thoughts about your next competition  
22 in two days time. Please rate the degree to which the following statements apply to you.”  
23 There were six challenge questions (i.e., “I am excited about playing in my next competition”  
24 and “I am keen to play my next competition” and six threat questions (i.e., “I think the  
25 outcome of my next competition will be negative” and “my next competition could have

1 negative consequences for me.”) Questions were answered on a Likert-type scale, ranging  
2 from 1 = *not at all* to 5 = *extremely*. Internal consistencies ranged from .65 to .90 with a  
3 sample of 100 participants. Peacock and Wong report three Cronbach alpha scores for threat  
4 (i.e., .65, .75, and .73) among their samples of undergraduate students.

5       **Coping.** The Coping Inventory for Competitive Sport (CICS; Gaudreau & Blondin,  
6 2002) measured how the athletes coped during competitive sport. The CICS is a 39-item  
7 questionnaire, which assesses three second-order dimensions, from 10 coping subscales.  
8 These are task-oriented coping (i.e., thought control, mental imagery, relaxation, effort  
9 expenditure, logical analysis, and seeking support), distraction-oriented coping (i.e.,  
10 distancing and mental distraction), and disengagement-oriented coping (i.e.,  
11 disengagement/resignation and venting of unpleasant emotions). Participants responded to the  
12 stem “Each question represents things that athletes can do or think during sport. For each  
13 question you must indicate the extent to which it corresponds to what you did during your  
14 sport today. We are interested in what you actually did or thought during your sport.” “I  
15 visualized that I was in total control of the situation” and “I lost all hope of attaining my  
16 goal” are examples of questions within the CICS (Gaudreau & Blondin, 2002). Participants  
17 answered these questions on a 5-point Likert-type scale, anchored at 1 = *not at all* and 5 =  
18 *very strongly*. Gaudreau and Blondin (2002) reported Cronbach alpha coefficients for  
19 individual coping strategies ranging from .67 to .87 among their sample of 314 athletes.

20       **Well-being.** The Short Warwick Edinburgh Mental Well-Being Scale (SWEMWBS;  
21 Tennant et al., 2007) examined well-being among the participants. Participants responded to  
22 the stem “Below are some statements about feelings and thoughts. Please circle the number  
23 that best describes your experience of each over the last couple of days.” The SWEMWBS  
24 (Tennant et al.) contains seven questions (i.e., “I’ve been able to make up my own mind  
25 about things” and “I’ve been feeling optimistic about the future”) that are answered on a 5-

1 point Likert-type scale ranging from 1 = *none of the time* to 5 = *all of the time*. Tennant et al.  
2 reported Cronbach's alphas of .89 for their student sample of 354 students and .91 for 2075  
3 participants who were classified as a general population sample.

#### 4 **Procedure**

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

#### 15 **Data Analysis**

16 We used descriptive statistics to examine missing data, outliers, and univariate  
17 normality. Omega point estimates and bootstrapped confidence intervals assessed internal  
18 consistency (i.e., Dunn, Baguley, & Brunnsden, 2013). Owing to our sample size, a full  
19 structural equation model, including a measurement model, was not possible. Therefore, we  
20 explored the factor structure of each measure by employing exploratory structural equation  
21 modelling (ESEM; Asparouhov & Muthén, 2009), with a subjective view of fit indices  
22 (Marsh, Hau, & Wen, 2004; Perry, Nicholls, Clough, & Crust, 2015).

23 For the main analysis, we tested a structural equation model, employing the robust  
24 maximum likelihood (MLR) estimator to guard against departure from multivariate  
25 normality. Standardized parameter estimates, bootstrapped to provide 95% confidence

1 intervals, examined model fit. Specifically, the comparative fit index (CFI) and Tucker-Lewis  
2 Index (TLI) were examined as normed and non-normed indices. The standardized root-mean-  
3 square residual (SRMR) and the root mean square error approximation (RMSEA) presented  
4 absolute fit indices. We tested our hypotheses in two stages. First, we tested a model whereby  
5 well-being was predicted directly by goal disengagement and goal reengagement. Next, we  
6 examined the hypothesized mediator model, where the direct path between goal adjustment  
7 and well-being was mediated by stress appraisal and coping.

### 8 **Results**

9 Preliminary analyses found no missing data or issues with outliers. Table 1 contains  
10 descriptive statistics and omega point estimates. There were no issues with univariate  
11 skewness ( $< 2$ ) or kurtosis ( $< 2$ ). We calculated Omega point estimates and confidence  
12 intervals using the MBESS package (Kelley & Lai, 2012), in R (R Development Core Team,  
13 2012), with 1,000 bootstrap samples. All demonstrated acceptable internal consistency. Table  
14 2 includes Pearson's bivariate correlations between all variables.

15 It was not possible to conduct a full structural equation model including requisite  
16 measurement models, as the ratio of participants to free parameters was insufficient (Bentler  
17 & Chou, 1987). To explore factor structure was appropriate, we conducted ESEM on each  
18 scale before proceeding to the main analysis. We scrutinized model fit and standardized  
19 parameter estimates to ensure theoretically sensible loadings and that cross-loadings were not  
20 substantive. The GDGRS presented a reasonable model fit;  $\chi^2(26) = 86.42, p < .001, CFI =$   
21  $.913, TLI = .836, SRMR = .051, RMSEA = .111$  (90% CI = .086, .137). All items loaded  
22 significantly onto their intended factor with two significant cross-loadings. Specifically, two  
23 disengagement items loaded onto the reengagement factor, though these were lower than  
24 their intended factor loading. Consequently, the GDGRS (Wrosch et al., 2003) demonstrated  
25 appropriate measurement of goal adjustment capacities in the sample. The SAM (Peacock &

1 Wong, 1990) presented good ESEM model fit;  $\chi^2(13) = 26.23, p = .001, CFI = .971, TLI =$   
2  $.932, SRMR = .030, RMSEA = .075$  (90% CI = .035, .114). All items loaded significantly  
3 onto their intended factors and there were no substantive cross-loadings.

4 The sample size was not sufficient to conduct a full item-level analysis on the CICS  
5 (Gaudreau & Blondin, 2002). Consequently, we tested an ESEM measurement model in  
6 which three latent variables, task- distraction-, and disengagement-oriented coping were  
7 indicated by the 10 subscales from the CICS. This presented good model fit;  $\chi^2(18) = 24.65, p$   
8  $= .103, CFI = .973, TLI = .930, SRMR = .031, RMSEA = .065$  (90% CI = .000, .118). The  
9 final factor structure examined was the unidimensional, 7-item WEMWBS. Model fit was  
10 good;  $\chi^2(14) = 19.16, p = .118, CFI = .983, TLI = .972, SRMR = .035, RMSEA = .045$  (90%  
11 CI = .000, .086) and all items loaded substantively onto the single factor. Overall, the  
12 preliminary analyses supported the use of published measurement models in the current  
13 sample without the need for modification.

#### 14 **Structural Equation Modeling**

15 We tested the hypothesized model using SEM in Mplus 7 (Muthén & Muthén, 2012).  
16 Due to the sample size, each latent variable was indicated by one observed variable, which  
17 represented the mean score of all items representing the factor, as performed by Ntoumanis et  
18 al. (2014). Before testing the hypothesized model, we examined a model whereby well-being  
19 in the lead up to, and during the competition was predicted by goal disengagement and goal  
20 reengagement. This model fitted the data reasonably well;  $\chi^2(1) = 1.72, p = .189, CFI = .969,$   
21  $TLI = .907, SRMR = .051, RMSEA = .059$  (90% CI = .000, .104). More meaningfully, well-  
22 being was significantly and positively predicted by goal reengagement ( $\beta = .33, p < .001$ ) and  
23 negatively predicted by goal disengagement ( $\beta = -.26, p < .001$ ). We then tested the  
24 hypothesized model to examine the extent to which the effects between goal adjustment  
25 capacities and well-being were mediated by stress appraisal and coping. Model fit was

1 reasonable;  $\chi^2(12) = 22.43, p = .021, CFI = .967, TLI = .916, SRMR = .054, RMSEA = .070$   
2 (90% CI = .026, .112), but indicated some misspecification. Inspection of the modification  
3 indices signaled that the addition of a direct path from threat to well-being would  
4 significantly improve model fit. This conceptually viable path (i.e., Blascovich, 2008, Schmid  
5 & Muldoon, 2015) created the final model shown in Figure 2. Model fit improved, including  
6 achieving a non-significant chi-square statistic;  $\chi^2(11) = 18.01, p = .081, CFI = .980, TLI =$   
7  $.949, SRMR = .041, RMSEA = .055$  (90% CI = .000, .099). All paths in the model were  
8 statistically significant with the exception of threat appraisal to disengagement-oriented  
9 coping. With the exception of the path between distraction-oriented coping and  
10 psychological well-being ( $\beta = .27, p < .001$ ), the direction of the other parameter estimates  
11 were as expected. Overall, the direct effects indicated that goal disengagement predicted  
12 threat stress appraisal, which predicted lower psychological well-being. Conversely, goal  
13 reengagement predicted challenge stress appraisal, which predicted task-oriented coping,  
14 which predicted higher psychological well-being. The negative paths opposing these positive  
15 ones were also significant.

16 To determine indirect effects from goal adjustment capacities to psychological well-  
17 being, 95% confidence intervals were obtained from 5000 bootstrapped samples. Significant  
18 indirect effects were evident from goal disengagement to well-being via challenge and task-  
19 oriented coping ( $\beta = -.08, p < .001, 95\% CI = -.13, -.02$ ), and challenge and distraction-  
20 oriented coping ( $\beta = .05, p < .01, 95\% CI = .01, .10$ ). Total indirect effects from goal  
21 disengagement to psychological well-being were negative ( $\beta = -.16, p < .05, 95\% CI = -.32,$   
22  $.01$ ). Significant indirect effects from goal reengagement to well-being were observed via  
23 challenge and task-oriented coping ( $\beta = .09, p < .001, 95\% CI = .03, .15$ ), challenge and  
24 distraction-oriented coping ( $\beta = -.06, p < .001, 95\% CI = -.11, -.01$ ), and threat ( $\beta = .11, p <$

1 .05, 95% CI = .00, .23). Total indirect effects from goal reengagement to psychological well-  
2 being were positive ( $\beta = .18, p < .001, 95\% \text{ CI} = .04, .32$ ).

### 3 **Discussion**

4 Informed by self-regulation theories (i.e., Carver & Scheier, 1981, 1998; Emmons,  
5 1986; Heckhausen et al., 2010), we tested a model that included goal adjustment capacities,  
6 appraisals, coping, and well-being. As such, the objective of this study was to shed light on  
7 the relationship between goal adjustment capacities and well-being among athletes, and  
8 examine the psychological constructs that may link these two variables (i.e., appraisal and  
9 coping). Overall, we found support for our model and many of the hypothesized paths were  
10 significant, inferring the way in which an athlete responds to an unattainable goal is  
11 associated with his or her well-being. In particular, well-being during the two days leading up  
12 to, and including the competition was negatively predicted by goal disengagement, but  
13 positively predicted by goal reengagement. This is in partial agreement with research from  
14 the health psychology literature, where both goal reengagement and disengagement positively  
15 predicted well-being (Wrosch et al., 2003, 2011). We offer two explanations for our  
16 contrasting findings. These differences may be due to the different contexts in which the data  
17 was collected and therefore the nature of the stress experienced. The participants in the  
18 Wrosch et al. (2011) study faced a chronic stressor (i.e., being a caregiver for a family  
19 member with a mental illness), whereas we examined an acute stressor (i.e., the stress  
20 encountered during sport). As such, goal adjustment capacity strategies that involve  
21 disengagement may be effective for chronic stress. Alternatively, goal disengagement may  
22 have been negatively linked to poorer well-being, because the athletes performed poorer, and  
23 thus reported poorer well-being scores. We did not assess sporting performance, but previous  
24 scholarly activity found a negative association between disengagement-oriented coping and  
25 goal attainment (Schellenberg et al., 2013). Future research is required to explore factors that



1 may shape the relationship between goal disengagement and well-being to inform both theory  
2 and applied practice. This study therefore highlights the nuances of conducting sport specific  
3 research and illustrates within the context of sport, findings may be different from other  
4 populations.

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

1 because of the athlete's new plan, whereas disengaging in a goal would be associated with an  
2 unpleasant emotion such dejection, anger, or anxiety, due to feelings of hopelessness.  
3 Previous scholarly activity linked pleasant emotions with challenge appraisals and unpleasant  
4 emotions with threat appraisals (Nicholls et al., 2014; Nicholls, Polman, & Levy 2012).  
5 Future research could explore emotional responses in relation to goal adjustment capacities in  
6 order to shed more light on this relationship. Further, in the present model, goal adjustment  
7 capacities preceded appraisals of challenge and threat. Given that these constructs were  
8 assessed at the same point in time, it is plausible that appraisals of challenge or threat may  
9 influence the type of goal adjustment capacity deployed. In order to assess causality, and thus  
10 whether goal adjustment capacities cause different appraisals or whether appraisals cause  
11 different goal adjustment capacities, experimental research is required.

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

1 within his Cognitive-Motivational-Relational theory of emotions. Our finding also suggests  
2 that practitioners may be able to manipulate coping by providing appraisal training in the  
3 build up to competitions, and thus enhance performance if athletes use task-oriented  
4 strategies when competing (e.g., Doron & Gaudreau, 2014; Gaudreau et al., 2010;  
5 Schellenberg et al., 2013).

6 Appraisal training may also influence well-being. We found a negative and significant  
7 path between threat and well-being. It is unsurprising that this path was negative.

8 Conceptually, threat states are associated with athletes being concerned about future losses  
9 due to deficiencies in coping (Lazarus, 1999), whereas well-being is related to people being  
10 able to cope with stresses (World Health Organization, 2004). As such, decreasing threat  
11 levels may be more effective in improving well-being than increasing challenge states.

12 Research is required to assess the impact of appraisal training interventions on well-being.

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

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

23 A possible limitation of this study is that participants responded to their general well-  
24 being over the course of the assessment period (i.e., two days), which is in accordance with  
25 previous research (Wrosch et al., 2011). This meant we did not measure how the participants

1 were feeling throughout specific phases (i.e., immediately pre- or post-competition). Future  
2 research could explore temporal indicators of well-being across stages of a competition.  
3 Further, to our knowledge, the only other sport study to employ the GDGRS (Wrosch et al.,  
4 2003), was by Ntoumanis et al. (2014a). It could be argued that more studies are required to  
5 validate this scale among athletic populations. Although we examined the factor structure of  
6 each scale, the sample size was not sufficient to permit a full SEM, which incorporated  
7 measurement error. Consequently, a limitation of the study is that latent variables were not  
8 directly examined in the main analyses. Another limitation of this study is that we did not  
9 assess the perceived importance of the competition, stress levels during the competition,  
10 number or hours spent training, nor the outcome of the competition. These are all variables  
11 that could potentially influence all of the constructs we assessed. Indeed, future research  
12 could examine these variables in relation to the constructs we examined, as these may impact  
13 upon our model.

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

- 1 adjustment capacities and well-being relationship, with a view to developing theory and
- 2 creating well-being interventions.

3

4

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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	$\omega$ (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)

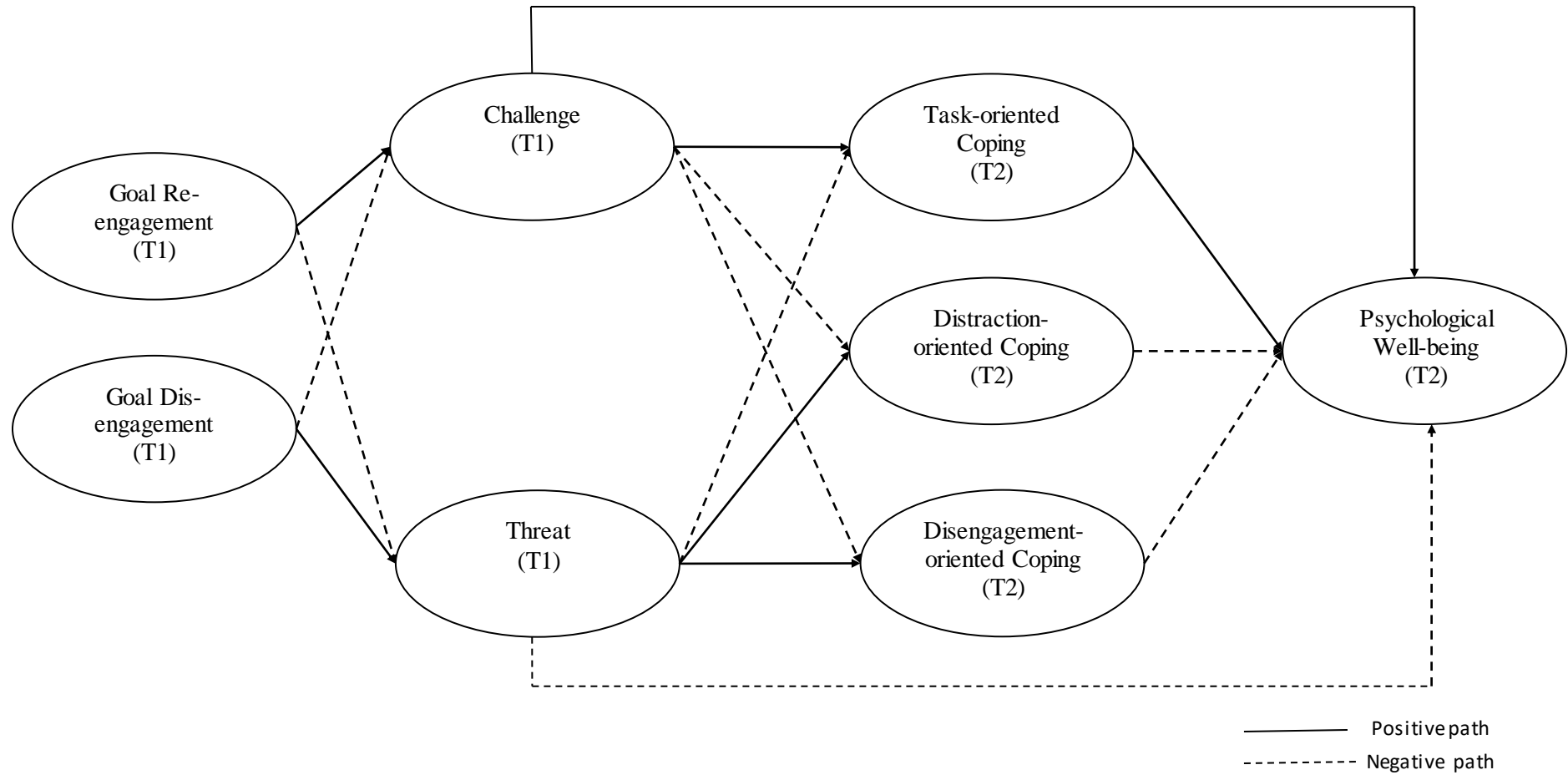
Table 2. *Bivariate correlations between variables*

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**

1 Figure 1. Hypothesized Model

2

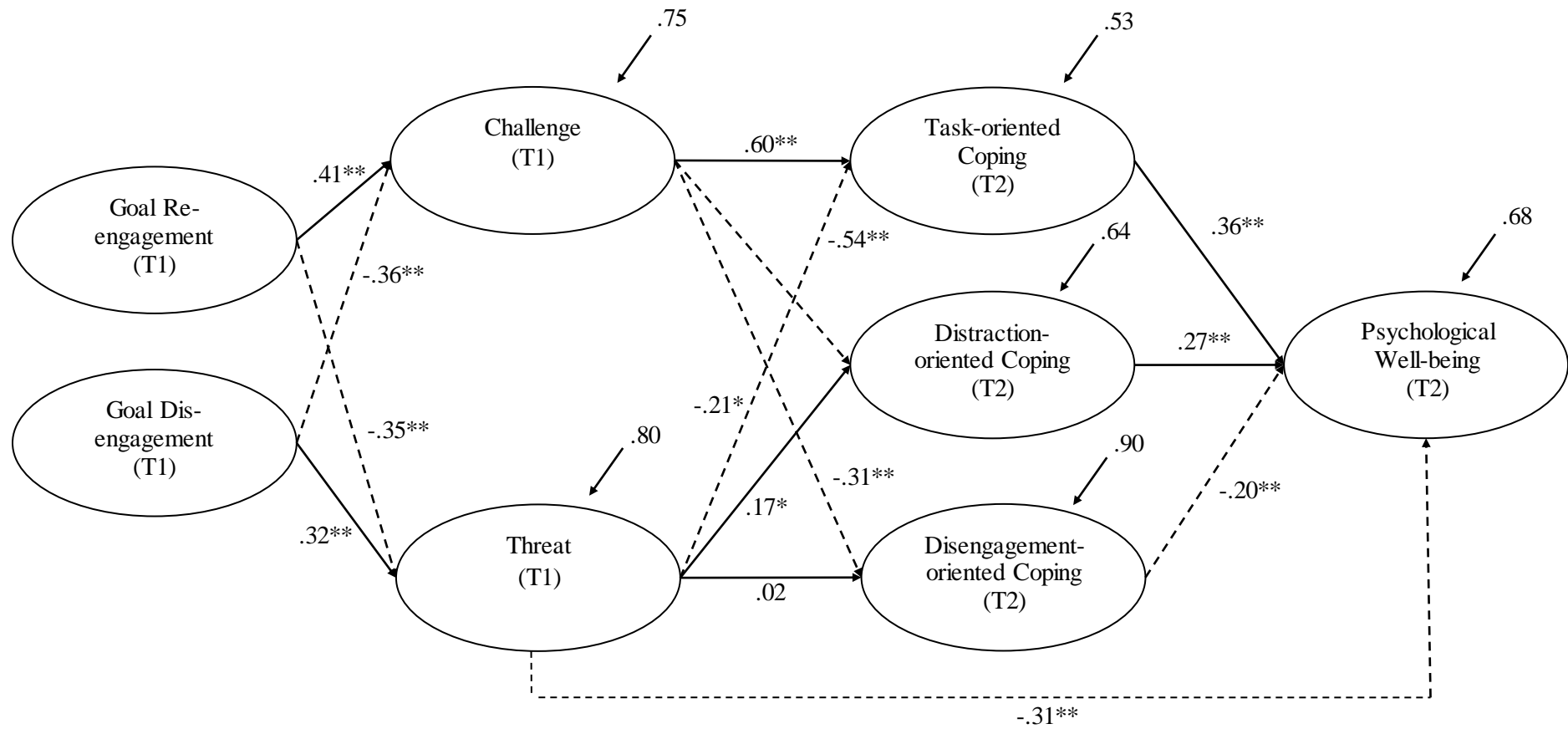
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1 Figure 2. *Structural Equation Model with Parameter Estimates from Goal Adjustment, Stress Appraisal, Coping, and Psychological Well-being.*  
 2 \* $p < .05$ , \*\* $p < .01$ .



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