

Organizational Stressors and Basic Psychological Needs:  
The Mediating Role of Athletes' Appraisal Mechanisms

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### Abstract

This article reports the first study to quantitatively examine the relationships between the demands encountered by athletes that are associated with the organization within which they are operating, cognitive appraisals, and basic psychological need experiences. Three hundred and fifteen high-level British athletes completed a multi-section questionnaire which assessed each of the aforementioned constructs. A series of path analyses provided valuable insight into the way in which the three dimensions (i.e., frequency, intensity and duration) of five organizational stressor categories were evaluated by athletes and, in turn, how such threat or challenge appraisals predicted feelings of need satisfaction and need frustration. Moreover, cognitive stress appraisals were found to mediate the relationship between organizational stressors and psychological need experiences. The role of secondary control appraisals was also explored and found to mediate the relationship between primary cognitive appraisals and basic psychological need experiences. Study limitations, proposed future research directions, and the implications of the findings for applied practitioners are discussed.

*Keywords:* basic psychological needs theory, cognitive, sport, transactional stress theory

### Organizational Stressors and Basic Psychological Needs:

#### The Mediating Role of Athletes' Appraisal Mechanisms

The environment that sport performers operate within places a wide range of demands on them that can have a number of psychosocial and performance-related effects (cf. Fletcher & Arnold, 2017; Arnold & Fletcher, 2012a). Specifically, over the past few decades, sport psychology research has pointed to the salience of athletes' organizational stress experiences (Fletcher et al., 2006), and the satisfaction of their basic psychological needs (Roberts & Treasure, 2012), as being central to their performance and well-being. However, somewhat surprisingly given their primacy in psychosocial processes, no research to date has examined the relationship between organizational stressors and basic psychological needs in sport performers. It is this gap in the literature that the present study sought to address by exploring how athletes evaluated the organizational-related stressors they encountered and how this predicted their basic psychological needs.

In a research synthesis of the organizational stressors that sport performers encounter, Arnold and Fletcher (2012a) reviewed the findings of 34 studies and identified 640 distinct demands. These demands were presented in a taxonomic classification which comprised four main categories: Leadership and Personnel issues, Cultural and Team issues, Logistical and Environmental issues, and Performance and Personal issues (Arnold & Fletcher, 2012a). This research provided the foundation for the development of a 23-item psychometric indicator that measured the organizational stressors encountered by sport performers, labelled the Organizational Stressor Indicator for Sport Performers (OSI-SP; Arnold et al., 2013; see also Arnold & Fletcher, 2012b). The OSI-SP measures the frequency, intensity, and duration of organizational demands and consists of five subscales: Goals and Development, Logistics and Operations, Team and Culture, Coaching, and Selection. The availability of this valid and

reliable measure now enables researchers to better understand the organizational environment in competitive sport (e.g., Arnold et al., 2016; in press).

In addition to investigating the organizational stressors that athletes encounter, sport psychology researchers have also begun to explore their reactions to these demands. Underpinning these responses, the cognitive process of appraisal is pivotal and relates to how a person evaluates his or her transactions with the environment (Lazarus, 1966). To elaborate, primary appraisal occurs when an individual evaluates and gives meaning to an encounter (Lazarus & Folkman, 1984). If something of significance is at stake, then this is described as a stressful encounter, for which there are three main meanings (also known as transactional alternatives): threat (possibility of future damage), challenge (an opportunity for growth, development, or mastery), or harm/loss (damage has already occurred) (Lazarus, 1966; Lazarus & Folkman, 1984). If meaning is ascribed to an encounter, then a secondary appraisal evaluates what can be done and which coping mechanisms are available to the individual (Lazarus & Folkman, 1984). Perceptions of control, such as controllability by self or others, are assumed to play an important role in secondary appraisal (Lazarus & Folkman, 1984).

A number of studies in sport psychology have investigated sport performers' appraisals (see, for a review, Fletcher et al., 2006). Some of these studies have highlighted that cognitive-evaluative mechanisms may play an important role when encountering organizational stressors in sport. Following Fletcher et al.'s (2006) review, Neil et al. (2011) indicated that athletes respond negatively to organizational stressors, although they have the potential to interpret their emotions in a positive way in relation to their performance. Hanton et al. (2012) extended these findings by showing that organizational-related demands are predominantly appraised as threatening or harmful, with little perceived control, and few coping resources available. Studies in this area have also incorporated the situational

properties underpinning the organizational stressor encountered (e.g., Lazarus & Folkman, 1984) and multidimensional and multifunctional families of coping (e.g., Skinner et al., 2003). For instance, Didymus and Fletcher (2012, 2014) have shown that the transactional alternatives experienced by athletes are related to the situational properties of the stressors encountered, and that appraisal-coping associations are an important aspect of the organizational stress process. Collectively, these qualitative studies have illustrated the pivotal role that appraisal plays in sport performers' experiences of their organizational environment (Fletcher & Arnold, 2017).

In his extensive writings on stress and emotion, Lazarus (1999) contested that the study of appraisal and coping should not be separated from motivation because of their close interrelationships (Ntoumanis et al., 2009). Within the sport psychology literature, the predominant approach to understanding motivation has been self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2002). Basic psychological needs theory (BPNT; Deci & Ryan, 2000), a sub-theory within SDT, postulates that to function optimally, three basic psychological needs for autonomy, competence, and relatedness must be satisfied (Standage, 2012). Autonomy reflects a need for individuals to feel volitional and responsible for their own behavior. Competence reflects feelings of effectance and confidence in achieving desired outcomes. Finally, relatedness concerns the degree to which individuals feel connected to and accepted by significant others (see Deci & Ryan, 2000).

However, people often experience non-optimal outcomes as a consequence of what Deci and Ryan (2000) describe as psychological need frustration (see Bartholomew et al. (2011a). Although much of the early SDT-based research attempted to infer experiences of need frustration via associations between low levels of need satisfaction and a range of negative outcomes, Bartholomew et al. (2011b) have shown that, when assessed

independently, need frustration is not only a better predictor of maladaptive outcomes but it also has its own unique antecedents (e.g., perceptions of controlling coach behavior).

In terms of the relationships between stress and psychological needs, various researchers have supported the notion that a person's basic needs can predict his or her cognitive appraisals of a situation (Skinner & Edge, 2002; Quested et al., 2011). However, this research has not focused on specific types of situations and events (e.g., organizational stressors) and, more importantly, it has also only examined this relationship in one direction. To move beyond this and extend understanding in the area, we contend that appraisals of organizational stressors may also predict need satisfaction and frustration rather than merely being a product of these constructs. The main rationale for this suggestion is that organizational stressors appear to possess many similar characteristics to the demands and constraints emanating from a person's social environment – factors which have been empirically demonstrated to predict basic psychological needs (Wang et al., 2009; Karjane & Hein, 2015). Furthermore, Deci and Ryan (2000) suggest that in addition to social factors, personal factors such as cognitive appraisals, may also satisfy or frustrate psychological needs. It is, therefore, important that research addresses both the social and personal antecedents of need experiences. Secondly, it has been suggested that stress-motivation relationships may be reciprocal in nature (Lazarus, 1991; Ntoumanis et al., 2009); therefore, it seems surprising that there has been minimal study of the direction from stress-related variables to motivation-related variables and a great deal of emphasis on the reverse relationship. Third, research in the sport domain has found that athletes often feel personally acted against (a key feature of need frustration) by people and events that are the result of the organization in which they operate (Lazarus, 2000; Arnold & Fletcher, 2012a; Fletcher, Hanton, & Wagstaff, 2012); thus, further justifying the need to examine the stress-need fulfilment relationship<sup>1</sup>.

The primary purpose of this study was to examine how athletes appraise the organizational stressors they encounter and how this relates to the satisfaction or frustration of their basic psychological needs. It was expected that: encountering organizational stressors would elicit challenge and threat appraisals and, in turn, predict experiences of need satisfaction and frustration (Hypothesis 1). Furthermore, the nature of an athlete's cognitive appraisal was expected to mediate the relationship between organizational stressors and his or her basic psychological needs (Hypothesis 2). In addition, primary challenge or threat appraisals were expected to predict the perceptions of control involved in the secondary appraisal process and, in turn, experiences of need satisfaction and frustration (Hypothesis 3). Moreover, perceptions of control were expected to mediate the relationship between primary stress appraisals and need experiences (Hypothesis 4). From a theoretical standpoint it was anticipated that, by examining the above hypotheses, this study would advance knowledge and understanding of the relationships *between* constructs within the transactional stress process (e.g., stressors, appraisals, outcomes) as opposed to examining them in isolation.

## **Method**

### **Participants**

The participants were 315 (150 male, 165 female) high-level British athletes who ranged in age from 18 to 29 years ( $M_{\text{age}} = 20.76$ ,  $SD = 2.73$ ). The participants were either amateur ( $n = 101$ ) or professional ( $n = 214$ ), and competed at either national ( $n = 205$ ) or international ( $n = 110$ ) standard in the following sports: football ( $n = 86$ ), lacrosse ( $n = 62$ ), rugby league ( $n = 61$ ), cricket ( $n = 36$ ), gymnastics ( $n = 24$ ), triathlon ( $n = 22$ ), athletics ( $n = 18$ ), and rowing ( $n = 6$ ). Of the athletes who participated in this study, nine (2.86%) returned incomplete questionnaires and, therefore, had their responses excluded from the data analysis.

### **Design and Procedure**

A cross-sectional design was used to test the study hypotheses. Following institutional ethical clearance, permission to distribute questionnaires to athletes was sought from the principal coach of various sports clubs and from the prospective participants themselves. This involved explaining the nature of the study including its purpose, procedures, and the voluntary and confidential nature of participation. After receiving consent from the coaches and athletes, the questionnaire pack was distributed at a mutually agreed date and time.

### Measures

**Organizational stressors.** The Organizational Stressor Indicator for Sport Performers (OSI-SP; Arnold et al., 2013) was used to assess the organizational stressors the participants had encountered associated with their participation in competitive sport during the past month. The OSI-SP consists of 23 items which constitute five subscales: Goals and Development (six items), Logistics and Operations (nine items), Team and Culture (four items), Coaching (two items), and Selection (two items). Each item is responded to on three separate 6-point Likert rating scales: frequency (“how often did this pressure place a demand on you?”; 0 = *never*, 5 = *always*), intensity (“how demanding was this pressure?”; 0 = *no demand*, 5 = *very high*), and duration (“how long did this pressure place a demand on you for?”; 0 = *no time*, 5 = *a very long time*). Over a series of studies, Arnold et al. (2013; 2017) validated the OSI-SP, providing evidence for its content, concurrent, discriminant, and factorial validity. Support was also provided for the internal consistency of the indicator.

**Appraisal.** The Stress Appraisal Measure (SAM; Peacock & Wong, 1990) was used to assess the participants’ primary and secondary appraisals of organizational stressors. The SAM consists of 28 items which are equally distributed to measure the three meanings of primary appraisals (threat, challenge, harm/loss; example item: “To what extent can I become a stronger person because of this problem?”), three secondary appraisals (controllable by self, controllable by others, uncontrollable by anyone; example item: “Is the outcome of this



situation uncontrollable by anyone?”), and overall perceived stressfulness (example item: “To what extent do I perceive this situation as stressful?”) (four items for each). Each item is responded to on a 5-point Likert rating scale with the numerical anchors (ranging from 0 = *not at all* to 5 = *a great amount*). Peacock and Wong (1990) conducted a confirmatory factor analysis that confirmed the factorial structure of the measure and also reported satisfactory internal consistency values.

**Need satisfaction.** Participants’ psychological need satisfaction was assessed using five items developed by Standage et al. (2003) to measure autonomy (example item: “I have some choice in what I want to do in my sport”), five items from the Perceived Competence subscale of the Intrinsic Motivation Inventory (IMI; McAuley et al. 1989; example item: “I think I am pretty good at my sport”) and the five-item Acceptance subscale of the Need for Relatedness Scale (NRS-10; Richer & Vallerand, 1998; example item: “when participating in my sport I feel supported”). Each item is responded to on a 7-point Likert rating scale (with the numerical anchors ranging from 1 = *strongly agree* to 7 = *strongly disagree*). The subscales have demonstrated satisfactory levels of internal consistency in previous research conducted with sport performers (Standage et al., 2003; Bartholomew et al., 2011b).

**Need frustration.** The Psychological Need Thwarting Scale (PNTS; Bartholomew et al., 2011a) was used to assess the participants’ sense of need frustration. The PNTS consists of 12 items which constitute three subscales: autonomy (four items; example item: “I feel prevented from making choices with regard to the way I train”), competence (four items; example item: “There are times when I am told things that make me feel incompetent”), and relatedness (four items; example item: “I feel that I am rejected by those around me”). Each item is responded to on a 7-point Likert rating scale (with the numerical anchors ranging from 1 = *strongly disagree* to 7 = *strongly agree*). Bartholomew et al. (2011a; 2011b) have

provided support for the content, factorial, and predictive validity of the measure as well as evidence to support the reliability of each subscale.

### **Data Analysis**

Data were tested for parametric assumptions and was found to be free from violations. Subsequently, path analyses using EQS 6.1 (Bentler & Wu, 2002) were conducted to test the hypothesized models outlined in Hypothesis 1 (i.e., relations between organizational stressors, cognitive appraisals, and psychological need experiences – Models 1-3); and Hypothesis 3 (i.e., relations between cognitive appraisals, perceptions of control, and psychological need experiences – Model 4). The mean subscale scores were used as the observed variables in each model. In line with previous research in sport (Bartholomew et al., 2011a), composite need satisfaction and need frustration scores were used. The degree of model fit was evaluated using multiple fit indices, including the chi-square statistic, the comparative fit index (CFI), and the standardized root mean residual (SRMR). Although values indicative of acceptable model fit remain controversial (Marsh, Hau & Wen, 2004), it is typically accepted that CFI values exceeding .90 and SRMR values of <.08 are indicative of adequate fit (Hu & Bentler, 1999).

Following the recommendations of MacKinnon et al. (2002) and Preacher and Hayes (2008), the indirect effects of the frequency, intensity, and duration dimensions of the organizational stressors on the outcome variables (i.e., need satisfaction and need frustration), via challenge or threat appraisals, were examined to test for mediation in relation to Hypothesis 2. For simplicity purposes, the five organizational stressors were collapsed into one composite variable for each dimension. Similarly, to test Hypothesis 4, the indirect effects of cognitive appraisals on need satisfaction and frustration via perceptions of control were examined. Indirect effects and bias-corrected 95% confidence intervals were estimated

using a bootstrapping approach so that inferences could be made about their significance in the population sample (see Preacher & Hayes, 2008).

## Results

### Descriptive Statistics

Table 1 contains the mean ( $M$ ), standard deviation ( $SD$ ), and internal consistency ( $\alpha$ ) values of the variables examined. On average, participants perceived moderate levels of organizational stressors, and higher levels of challenge appraisals and need satisfaction compared to threat appraisals and need frustration. All factors were found to have alpha values above the generally assumed acceptable standard of .70 (i.e., Tabachnick & Fidell, 2001), except for the intensity dimension of the goals and development subscale ( $\alpha = .62$ ). However, as this value is only marginally beneath the guideline, it was decided to retain the construct in the investigation. Despite this, results pertaining to this factor should be interpreted with slight caution. Table 2 contains the bivariate correlations between the variables. Significant relationships supported the direct and indirect associations outlined in the hypothesized models.

### Hypothesis 1: Organizational Stressor Frequency (Model 1)

The path model demonstrated an adequate fit to the data:  $\chi^2(11) = 81.94, p < .001$ , CFI = .93, SRMR = .08. The standardized path coefficients are presented in Figure 1. As illustrated in Figure 1, the Goals and Development, Logistics and Operations, and Team and Culture organizational stressor subscales were all found to significantly predict challenge appraisals; however, Coaching ( $\beta = -.08, p > .05$ ) and Selection ( $\beta = .01, p > .05$ ) subscales were not found to have a significant effect. In relation to threat appraisals, the standardized beta coefficients showed that both Team and Culture and Coaching organizational stressor subscales were significant predictors of threat appraisals, with Team and Culture having the greatest predictive quality. Goals and Development ( $\beta = -.08, p > .05$ ), Logistics and

Operations ( $\beta = -.05, p > .05$ ), and Selection ( $\beta = -.05, p > .05$ ) did not significantly predict threat appraisals. Challenge appraisals better predicted experiences of need satisfaction and threat appraisals were more strongly associated with experiences of need frustration.

### **Hypothesis 1: Organizational Stressor Intensity (Model 2)**

The path model demonstrated an adequate fit to the data:  $\chi^2 (11) = 70.52, p < .001$ , CFI = .93, SRMR = .06. As illustrated in Figure 2, the Goals and Development and Selection organizational stressor subscales were found to be the only significant predictors of athletes' challenge appraisals. Logistics and Operations ( $\beta = -.11, p > .05$ ), Team and Culture ( $\beta = -.10, p > .05$ ), and Coaching ( $\beta = -.11, p > .05$ ) did not significantly predict challenge appraisals. In relation to threat appraisals, the Selection organizational stressor subscale was found to be the strongest unique predictor with Coaching and Goals and Development also having significant effects. Logistics and Operations ( $\beta = -.01, p > .05$ ) and Team and Culture ( $\beta = -.06, p > .05$ ) did not significantly predict threat appraisals. Pathways between cognitive appraisals and psychological needs remained the same as those observed in Model 1.

### **Hypothesis 1: Organizational Stressor Duration (Model 3)**

The path model demonstrated an adequate fit to the data:  $\chi^2 (11) = 87.77, p < .001$ , CFI = .91, SRMR = .07. As illustrated in Figure 3, the Goals and Development, Logistics and Operations, and Team and Culture organizational stressor subscales were all significant predictors of challenge appraisals. Pathways between Coaching ( $\beta = -.08, p > .05$ ) and Selection ( $\beta = .09, p > .05$ ) and challenge appraisals were not significant. Furthermore, only a significant effect was found for the Team and Culture organizational stressor subscale in relation to threat appraisals. Goals and Development ( $\beta = -.08, p > .05$ ), Logistics and Operations ( $\beta = .02, p > .05$ ), Coaching ( $\beta = .03, p > .05$ ), and Selection ( $\beta = -.07, p > .05$ ) were not significant predictors. Again, pathways between cognitive appraisals and need satisfaction and need frustration remained similar to those previously outlined.

**Hypothesis 2: The Mediating Effect of Cognitive Appraisals**

The indirect effects of organizational stressors on need satisfaction and frustration via challenge and threat appraisals are presented, separately for frequency, intensity and duration, in Table 3. An examination of the specific indirect effects revealed that threat appraisals significantly mediated the relationship between the frequency and intensity of organizational stressors and experiences of psychological need frustration. Moreover, challenge appraisals significantly mediated the relationship between the duration of organizational stressors and feelings of need satisfaction.

**Hypothesis 3: Primary and Secondary Stress Appraisals (Model 4)**

The path model demonstrated an adequate fit to the data:  $\chi^2 (7) = 47.36, p < .05$ , CFI = .95, SRMR = .07. As illustrated in Figure 4, challenge appraisals were a strong predictor of the Controllable by Self and Controllable by Others subscales. They were also a significant and negative predictor of the Uncontrollable by Anyone subscale. Threat appraisals only predicted situations which were perceived to be uncontrollable by anyone. In turn, the Controllable by Self and Controllable by Others subscales positively predicted need satisfaction and negatively predicted need frustration. Moreover, the Uncontrollable by Anyone subscale was also a significant and positive predictor of need frustration. Threat appraisals were not significantly associated with the Controllable by Self ( $\beta = -.03, p > .05$ ) or Controllable by Others ( $\beta = .08, p > .05$ ) subscales. In addition, the Uncontrollable by Anyone subscale did not predict need satisfaction ( $\beta = -.03, p > .05$ ).

**Hypothesis 4: The Mediating Effect of Perceptions of Control**

The indirect effects of cognitive appraisals on need experiences via perceptions of control are presented in Table 4. An examination of the specific indirect effects revealed that perceptions of control by the self and others significantly mediated the relationship between challenge appraisals and need satisfaction. Moreover, all three types of control mediated the

relationship between challenge appraisals and need frustration. No significant indirect effects were found between threat appraisals and need satisfaction via perceptions of control. In contrast, perceptions of the stressor being uncontrollable by anyone significantly mediated the relationship between threat appraisals and experiences of psychological need frustration.

### **Discussion**

The ongoing transaction between an athlete and their surrounding environment and the satisfaction or frustration of their basic psychological needs have both been identified in the sport psychology literature as critical determinants of performance and well-being (cf. Fletcher & Arnold, 2017; Roberts & Treasure, 2012). Despite this recognized importance, no research to date has examined the relationship between prevalent environmental demands, the appraisal of such encounters, and basic psychological needs in a sample of sport performers. The purpose of this study, therefore, was to examine how athletes appraise the organizational stressors they encounter and the effects that these evaluations have on their feelings of psychological need satisfaction or frustration.

In support of the first hypothesis, the findings illustrate that encountering organizational stressors is associated with stressful appraisals from sport performers which, in turn, impact upon feelings of need satisfaction and frustration. Specifically, the frequency, intensity, and duration of organizational demands are significantly related to both challenge and threat appraisals. Although extant literature has identified that transactional alternatives are related to the situational properties of stressors encountered (i.e., Didymus & Fletcher, 2012; Lazarus & Folkman, 1984), the frequency and intensity assessment dimensions have not been previously considered. To delve deeper into the findings relating to this first hypothesis, it is evident that each type of organizational stressor produces a stressful appraisal (challenge or threat) on at least one of the three dimension response scales; however, only goals and development produces a stressful (challenge) appraisal for all three. This finding

further underscores the importance of examining the dimensionality of stressors, in addition to the type of the demand, to truly understand the complexities of the performer-environment transaction. With regards to the type of demand, challenge appraisals are predicted by all dimensions of goals and development stressors, though threat appraisals are only predicted by the intensity.

The findings also indicate that the frequency and duration dimensions of logistics and operations stressors negatively predict challenge appraisals; however these demands do not predict threat appraisals (on any dimension). As logistics and operations stressors (e.g., travel, accommodation, training venue) typically relate to environmental factors often controlled and managed by personnel other than athletes (e.g., coach, team manager), it is likely that athletes feel unable to control and master such events. Whilst athletes may be enthusiastic about addressing a short lived or infrequent logistical or operational stressor (e.g., poorly designed training schedule), it is likely that as the frequency and duration of such demands heighten, the athlete is less likely to appraise the stressor as an opportunity for growth, development, and mastery and instead perhaps view the stressor as being fixed and unchangeable as part of structural inertia (cf. Hannan & Freeman, 1984). Organizations, however, should acknowledge the role they can play in modifying logistical and operational processes. Indeed, Thaler and Sunstein (2009) advise managers and governments to become ‘choice architects’ who can design and modify environments in certain ways to nudge individuals’ behaviors in a desired manner.

Turning to team and culture stressors, the frequency and duration dimensions predict both challenge (negatively) and threat (positively) appraisals; however, their intensity does not predict either. When performers experience frequent and prolonged stressors associated with their team and culture, evidence suggests that this can create disharmony, a loss of focus, and overall devastating effects (Neil et al., 2011). The possibility for these undesirable

outcomes can explain why individuals are more likely to recognize the potential for future damage and, thus, view these demands as threatening when their dimensions heighten.

Turning to the intensity finding, given the amount of time that team sport athletes spend together, it is likely that if this stressor becomes too intense then damage will occur and a harm/loss rather than challenge/threat appraisal will be made.

No dimensions of coaching stressors significantly predict challenge appraisals, though the frequency and intensity of these demands are significant predictors of threat appraisals. One potential explanation for the link to threat appraisals might be the typical coach/athlete hierarchy or dictatorial leadership methods. Such coaching can create a lack of athlete enthusiasm or belief about being able to master or modify frequent or intense coaching related stressors (challenge appraisal) and instead a realization of potential future damage (threat appraisal) given the importance of coach-athlete relationships (Jowett & Poczwardowski, 2007).

For selection related organizational stressors, the findings show that the intensity of these demands significantly predict both challenge (positively) and threat (negatively) appraisals; however, the frequency and duration dimensions do not. As illustrated in the adversity literature (e.g., Sarkar et al., 2015), selection-related stressors might be perceived by sport performers as an opportunity for human growth and development (challenge appraisal). To explain the negative relationship with threat appraisals, however, it is likely that if a selection stressor becomes too intense then rather than perceiving the potential for future damage (i.e., a threat appraisal), the stressor will have placed such a demand on the performer that damage will have already occurred (e.g., impacted self-confidence; Barker et al., 2014) and, thus, a harm/loss appraisal will likely be made instead.

The pathways between challenge and threat appraisals and athletes' experiences of need satisfaction and need frustration remained stable across all three dimensions of the



organizational stressors. To date, scholars have theorized that basic psychological need satisfaction impacts upon the appraisal of psychologically demanding situations (Skinner & Edge, 2002; Ntoumanis et al., 2009). Although a reciprocal and bidirectional relationship has been suggested in previous papers (i.e., appraisals impacting basic psychological needs; Lazarus, 1991; Ntoumanis et al., 2009), this is the first study to provide evidence for this relationship in response to organizational stressors. To explain how appraisals might relate to basic psychological needs, it is suggested that if a performer views a stressor as an opportunity for growth and development (i.e., challenge appraisal) they will typically implement problem-focused coping strategies to manage the demand (cf. Ntoumanis et al., 2009). These strategies require control over the stressor; thus, effective implementation can lead to better autonomous functioning and satisfy ones needs for relatedness (i.e., problem solving with others) and competence (Weinstein & Ryan, 2011). Making a threat appraisal, however, implies that future danger is recognized; therefore, emotion or avoidance coping strategies are typically adopted (Ntoumanis et al., 2009), since they require less, if any, control over the demand. Since these strategies do not directly address the demand itself and can produce undesirable outcomes (Carver & Connor-Smith, 2010), an individual's basic psychological needs can potentially be thwarted. This appraisal-basic psychological needs ordering is also in accordance with the transactional theory of stress which suggests that only following primary appraisals (i.e., "What does this stressor mean to me?") do individuals evaluate through secondary appraisal their behavioral choices, capacity to produce desired outcomes, and supportive connections in addressing a stressor (i.e., autonomy, competence, relatedness).

In terms of further theoretical contributions, this study has added to the literature which empirically distinguishes between low levels of psychological need satisfaction and need frustration. To elaborate, the findings show that the manifestation of need frustration in

high-level athletes appears more related to the occurrence of threat, as opposed to the absence of challenge appraisals. In contrast, need satisfaction was better predicted by challenge appraisals than by reduced threat evaluations. That these two psychological outcomes appear to be differentially predicted by contrasting appraisals adds further conceptual weight to the distinction between needs satisfaction and frustration (Bartholomew et al., 2011a) and can contribute to the advancement of SDT in sport.

Moreover, the present findings can help explain previous research which has suggested links between organizational pressures and individuals feeling personally acted against (i.e., having their needs frustrated; Neil et al., 2011; Stebbings et al., 2012). Specifically, the mediation analyses carried out to examine Hypothesis 2, suggest that athletes will feel frustrated and acted against when organizational stressors are frequent and intense and, most importantly, perceived to represent a threat. However, it appears that the athletes in the present sample were able to maintain feelings of autonomy, competence, and relatedness when prolonged stressors are perceived as a challenge. It may be, therefore, that athletes view on-going stressors as a challenge but become threatened when these stressors become more frequent or intense and this results in the frustration of their psychological needs. Overall, these findings advance our understanding of the transactional stress process and suggest that cognitive appraisals may represent an underlying process via which perceived organizational stressors can be linked to either positive or negative motivational outcomes (Fletcher et al., 2006).

The third hypothesis was also supported due to athletes' stressful appraisals predicting perceptions of control and subsequent need satisfaction and need frustration. Previous research in this area has suggested that organizational stressors are typically appraised by sport performers as threatening or harmful (Neil et al., 2011). In contrast, the findings from the larger sample of sport performers recruited in the present study demonstrated a higher

mean value for challenge appraisals made in relation to organizational stressors ( $M = 3.48$ ) than threat appraisals ( $M = 2.30$ ). Extant research has also found that stressors appraised as a threat are associated with little perceived control and those appraised as a challenge are associated with greater perceptions of control (Lazarus & Folkman, 1984; Troup & Dewe, 2002; Neil et al., 2011). In support of these associations, the path analysis demonstrates that threat appraisals were significantly, positively, and only associated with perceptions of a situation being uncontrollable. In contrast, challenge appraisals were strongly and positively associated with situations which were perceived to be within ones control. To advance existing knowledge and understanding, however, the results also illustrate that the perceptions of control associated with challenge appraisals could emanate not only from an individuals' perceptions of their own control but also from others around them. Such findings can make an important contribution to theory, adding weight and detail to the initial suggestions that to accurately predict the precise nature of any appraisal, one must consider an individual's control beliefs (cf. Dewe, 1992; Fletcher et al., 2006). For practice, the findings indicate that organizational demands do not always have to lead to negative connotations; instead, if sport performers' perceptions of their or others' control can be enhanced, then a challenge appraisal and positive outcomes can ensue (cf. Lazarus & Folkman, 1984). In line with SDT and providing further support for disentangling need experiences, situations deemed to be controllable either by the self or by others positively predicted feelings of need satisfaction and negatively predicted feelings of need frustration. In contrast, the findings suggest that when athletes perceive the situation to be completely uncontrollable they feel helpless, incompetent, and isolated.

In relation to the final hypothesis, the negative specific indirect effects suggest that perceptions of control by self and others may buffer the effects of organizational stressors which are seen as challenging on experiences of need frustration. Again, these findings

highlight the importance of perceived control in challenge appraisals and positive motivational responses (Deci & Ryan, 2000; Neil et al., 2011). However, a perceived lack of control by anyone also significantly mediated the relationship between challenge appraisals and need frustration. This finding may suggest that athletes are less likely to experience need frustration when stressors are seen as uncontrollable because, whilst athletes view the stressor as an opportunity for mastery and development, they do not feel pressured as external attributions can be made if an unsuccessful outcome occurs. On the other hand, when threat appraisals are made a lack of control by anyone is a positive predictor of need frustration. This is not surprising given the feelings of helplessness, incompetence, and isolation which characterize this maladaptive motivational state (Bartholomew et al., 2011b). Perceptions of control by the self and others also played a key role in experiences of need satisfaction when stressors are appraised as a challenge. However, perceptions of control did not mediate the relationship between threat appraisals and need satisfaction. Thus, when stressors are perceived to be a threat, secondary appraisals of control do not buffer their influence and protect athletes' feelings of autonomy, competence, and relatedness. In sum, the mediation findings outlined in this paper are believed to be the first to demonstrate how athletes' primary and secondary appraisals of organizational stressors relate to, and can help explain, why some athletes experience need satisfaction in their sports whilst others perceive their needs to be frustrated.

One limitation of this study is the cross-sectional design, which restricts causality conclusions between the key variables measured. Future research should aim to conduct studies which collect prospective longitudinal data on organizational stressors, appraisals, and basic psychological needs so that causality (and their temporal nature) can be established. To further explain the relationship between appraisals and basic psychological needs, it will also be beneficial to incorporate measures of other variables in the transactional stress process,

such as coping and coping effectiveness (cf. Ntoumanis et al., 2009). Moreover, this study used observed variables and composite need satisfaction and need frustration scores. It would be interesting for future research, using latent variable modeling, to examine whether specific organizational stress appraisals differentially predict individual needs. For example, stressors associated with team and culture may have particular repercussions for feelings of relatedness. Furthermore, given that the organizational stressors were collapsed into their frequency, intensity, and duration dimensions in the mediation analysis, a more detailed exploration of these relations is necessary to further our understanding of the links between organizational stressors, athletes' appraisals, and experiences of need satisfaction and frustration. On a related note, the present research only examined the constructs within one sub-theory of SDT, an intriguing direction for research would be to examine the interplay between the aforementioned constructs and other key variables in the meta-theory (e.g., behavioral regulations; Standage, 2012).

From an applied perspective, sport organizations and the personnel operating within them have a vested interest in better understanding how high quality motivation can be supported rather than frustrated (Roberts & Treasure, 2012). The findings of the present study identify that organizational stressors and the way in which they are appraised can act as an affordance or a barrier to the need satisfaction that an athlete experiences. It is, therefore, suggested that those personnel working with sport performers help to address these issues. First, the findings suggest that dimensions of certain organizational stressors can trigger threat appraisals and subsequent need frustration. One option is to work with sport organizations in a proactive and preventative primary stress management intervention (PSMI; Cox et al., 2010) to reduce or eliminate the dimensions of such stressors. For instance, changes might be made to the macro environment to address team and culture stressors (e.g., making the team culture more inclusive and connected) or the micro environment to address

coaching stressors and the performer's perceptions of control (e.g., working with the coach to maximize opportunities for athlete choice) (cf. Standage, 2012).

For those stressors which are unavoidable or for situations where benefits can be reaped from learning to cope with stressors, secondary stress management interventions (SSMI) may be more appropriate to modify sport performers' responses to stressors. With reference to the present findings, it is suggested that such interventions look to promote challenge appraisals of organizational stressors so that needs are satisfied rather than frustrated. For example, a cognitive behavioral intervention might be implemented to assist athletes in responding to the intensity of goals and development and selection stressors in a more positive and functional way (Neil et al., 2013). A further suggestion for a SSMI would be mindfulness training. Specifically, helping athletes to cultivate non-judgmental, moment-to-moment awareness of the environment they are in can assist them in volitionally, rather than automatically, responding to the organizational stressors they encounter to, ultimately, facilitate a reduction in stress and support their need satisfaction (Weinstein et al., 2009).

To conclude, this is the first study to quantitatively examine the relationships between organizational stressors, cognitive appraisals, and basic psychological need experiences. In support of the hypotheses, the results illustrate that: (a) encountering organizational stressors is associated with stressful appraisals; (b) the nature of an athlete's appraisal mediates the relationship between organizational stressors and whether his or her basic psychological needs are satisfied or frustrated; (c) challenge or threat appraisal are associated with the extent to which an athlete perceives him or herself to be in control of a situation; and (d) perceptions of control mediate the relationship between cognitive appraisals and psychological need satisfaction and frustration. These findings can further theoretical knowledge and understanding relating to the transactional theory of stress (Lazarus & Folkman, 1984) and SDT (Deci & Ryan, 1985; Ryan & Deci, 2002). For practice, it is

suggested that the findings are incorporated into the planning of stress management interventions to both optimize the stress experience and support need satisfaction and high quality motivation.

### **Perspectives**

To provide perspective, this study has recruited a large and diverse sample of high level sport performers to investigate the relationships between the stressors faced by athletes associated with the organization within which they are operating, their cognitive appraisals of these factors, and basic psychological need experiences. In so doing, it is the first study to quantitatively investigate the relationships between the three constructs. The paper's results illustrate that the encountering of stressors within the organizational system that an athlete operates within does elicit stressful appraisals. The nature of this appraisal then mediates the relationship between the organizational demands and whether his or her basic psychological needs are perceived to be satisfied or frustrated. Furthermore, secondary appraisals of control are also important in mediating the effect of challenge and threat appraisals on experiences of need satisfaction and need frustration. The findings provide important implications for practitioners and organizations who, together, can use them to plan both cultural- and individual-level stress management interventions to minimize the negative consequences of stress and further optimize individuals' motivation, psychological well-being and, hopefully, sporting performances.

### **Footnotes**

<sup>1</sup>In view of this evidence-based rationale (cf. Karjane & Hein, 2015; Wang et al., 2009), the focus of this study will be to examine the directional relationship between cognitive appraisals of organizational stressors and psychological needs. Since the relationship between a person's basic needs and his or her cognitive appraisal has been tested previously (e.g., Quested et al., 2011), this direction is not the focus of the current study. Following this study,

however, future research could examine the relationship between psychological needs and the appraisal of organizational stressors specifically to test the temporal ordering of such variables.



## References

- Arnold R, & Fletcher D. Psychometric issues in organizational stressor research: A review and implications for sport psychology. *Meas Phys Educ Exerc Sci* 2012a: 16: 81-100.
- Arnold R, & Fletcher D. A research synthesis and taxonomic classification of the organizational stressors encountered by sport performers. *J Sport Exerc Psychol* 2012b: 34: 397-429.
- Arnold R, Fletcher D, & Daniels K. Development and validation of the Organizational Stressor Indicator for Sport Performers. *J Sport Exerc Psychol* 2013: 35: 180-196.
- Arnold R, Fletcher D, & Daniels K. Demographic differences in sport performers' experiences of organizational stressors. *Scand J Med Sci Sports* 2016: 26: 348-358.
- Arnold R, Fletcher D, & Daniels K. Organizational stressors, coping, and outcomes in competitive sport. *J Sports Sci* 2017: 39: 694-703.
- Arnold R, Ponnusamy V, Zhang C.-Q, & Gucciardi DF. Cross cultural validity and measurement invariance of the Organizational Stressor Indicator for Sport Performers (OSI-SP) across three countries. *Scand J Med Sci Sports* in press: Advance online publication.
- Barker D, Barker-Ruchti N, Wals A, & Tinning R. High performance sport and sustainability: A contradiction of terms. *Reflective Practice* 2014: 15: 1-11.
- Bartholomew KJ, Ntoumanis N, Ryan RM, Bosch JA, & Thøgersen-Ntoumani C. Self-determination theory and diminished functioning: The role of interpersonal control and psychological need thwarting. *Pers Soc Psychol Bull* 2011b: 37: 1459-1473.
- Bartholomew KJ, Ntoumanis N, Ryan RM, & Thøgersen-Ntoumani C. Psychological need thwarting in the sport context: Development and initial validation of a psychometric scale. *J Sport Exerc Psychol* 2011a: 33: 124-145.

Bentler PM, & Wu EJC. (2002). *EQS 6 for Windows user's guide*. Encino, CA: Multivariate Software.

Carver CS, & Connor-Smith J. Personality and coping. *Ann Rev Psychol* 2010; 61: 679-704.

Cox T, Taris TW, & Nielson K. (Eds.). *Organizational interventions: Issues and challenges* [Special issue]. *Work Stress* 2010; 24(3).

Deci EL, & Ryan RM. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum.

Deci EL, & Ryan RM. The “what” and “why” of Goal Pursuits: Human needs and the self-determination of behaviour. *Psychol Inq* 2000; 11: 227-268.

Dewe PJ. The appraisal process: Exploring the role of meaning, importance, control and coping in work stress. *Anxiety, Stress and Coping: An International Journal* 1992; 5: 95-109.

Didymus FF, & Fletcher D. Getting to the heart of the matter: A diary study of swimmers' appraisals of organizational stressors. *J Sports Sci* 2012; 30: 1375-1385.

Didymus FF, & Fletcher D. Swimmers' experiences of organizational stress: Exploring the role of cognitive appraisal and coping behaviors. *J Clin Sport Psychol* 2014; 8: 159-183.

Fletcher D, & Arnold R. (2017). *Stress in sport: The role of the organizational environment*. In C. R. D. Wagstaff (Ed.), *An organizational psychology of sport: Key issues and practical applications* (pp. 83-100). Abingdon, UK: Routledge.

Fletcher D, Hanton S, & Mellalieu SD. (2006). An organizational stress review: Conceptual and theoretical issues in competitive sport. In S. Hanton & S. D. Mellalieu (Eds.), *Literature reviews in sport psychology* (pp. 321-373). Hauppauge, NY: Nova Science Publishers.

- Fletcher D, Hanton, S, & Wagstaff, CRD. Performers' responses to stressors encountered in sport organizations. *J of Sports Sci* 2012: 30: 349-358.
- Hannan MT, & Freeman J. Structural inertia and organizational change. *American Sociological Review* 1984: 49: 149-164.
- Hanton S, Wagstaff CRD, & Fletcher D. Cognitive appraisals of stressors encountered in sport organizations. *Int J Sport Exerc Psychol* 2012: 10: 276-289.
- Hu L, & Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Modeling* 1999: 6: 1-55.
- Jowett S, & Poczwardowski A. (2007). Understanding the coach-athlete relationship. In S. Jowett & D. Lavallee (Eds.), *Social psychology in sport* (pp. 3-14). Champaign, IL: Human Kinetics.
- Karjane K, & Hein V. Controlling coaches' behavior, psychological need thwarting, motivation and the results of the volleyball competitions. *Acta Kinesiologiae Universitatis Tartuensis* 2015: 21: 51-60.
- Lazarus RS. (1966). *Psychological stress and the coping process*. New York, NY: McGraw-Hill.
- Lazarus RS. Psychological stress in the workplace. *J Soc Behav Pers* 1991: 6: 1-13.
- Lazarus RS. (1999). *Stress and emotion: A new synthesis*. London, UK: Free Association.
- Lazarus RS. How emotions influence performance in competitive sports. *Sport Psychol* 2000: 14: 229-252.
- Lazarus RS, & Folkman S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.
- Mackinnon DP, Fairchild AJ, & Fritz MS. Mediation analysis. *Ann Rev Psychol* 2007: 58: 593-614.

- Marsh HW, Hau KT, & Wen Z. In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in over-generalizing Hu and Bentler's (1999) findings. *Struct Equ Modeling* 2004; 11: 391-410.
- McAuley E, Duncan T, & Tammen VV. Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Res Q Exerc Sport* 1989; 60: 48-58.
- Neil R, Hanton S, & Mellalieu SD. Seeing things in a different light: Assessing the effects of a cognitive behavioral intervention upon the further appraisals of golfers. *J Applied Sport Psychol* 2013; 25: 106-130.
- Neil R, Hanton S, Mellalieu SD, & Fletcher D. Competition stress and emotions in sport performers: The role of further appraisals. *Psychol Sport Exerc* 2011; 12: 460-470.
- Ntoumanis N, Edmunds J, & Duda JL. Understanding the coping process from a self-determination theory perspective. *Br J Health Psychol* 2009; 14: 249-260. Peacock EJ, & Wong PTP. The Stress Appraisal Measure (SAM): A multidimensional approach to cognitive appraisal. *Stress Med* 1990; 6: 227-236.
- Preacher KJ, & Hayes, AF. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav Res Methods* 2008; 40: 879-891.
- Quested E, Bosch JA, Burns VE, Cumming J, Ntoumanis N, & Duda JL. Basic psychological need satisfaction, stress-related appraisals, and dancers' cortisol and anxiety responses. *J Sport Exerc Psychol* 2011; 33: 828-846.
- Richer SF, & Vallerand R. Construction et validation de L'échelle du Sentiment d'Appartenance Sociale [Construction and validation of the Perceived Relatedness Scale]. *Revue Européenne de Psychologie Appliquée* 1998; 48: 129-137.

- Roberts GC, & Treasure DC. (2012). *Advances in motivation in sport and exercise*. Champaign, IL: Human Kinetics.
- Ryan RM, & Deci EL. (2002). Self-determination research: Reflections and future directions. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 431-441). Rochester, NY: University of Rochester Press.
- Sarkar M, Fletcher D, & Brown DJ. What doesn't kill me...: Adversity-related experiences in the development of superior Olympic performance. *J Sci Med Sport* 2015; 18: 475-479.
- Skinner E, & Edge K. (2002). Self-determination, coping, and development. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 297-337). Rochester, NY: University of Rochester Press.
- Skinner E, Edge K, Altman J, & Sherwood H. Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychol Bull* 2003; 129: 216-269.
- Standage M. (2012). Motivation: Self-determination theory and performance in sport. In S. M. Murphy (Ed.), *The Oxford handbook of sport and performance psychology* (pp. 233-249). New York, NY: Oxford University Press.
- Standage M, Duda JL, & Ntoumanis N. A model of contextual motivation in physical education: Using constructs and tenets from self-determination and goal perspective theories to predict leisure-time exercise intentions. *J Educ Psychol* 2003; 95: 97-110.
- Stebbing J, Taylor IM, Spray CM, & Ntoumanis N. Antecedents of perceived coach interpersonal behaviors: The coaching environment and coach psychological well-being. *J Sport Exerc Psychol* 2012; 34: 481-502.
- Tabachnick BG, & Fidell LS. (2001). *Using multivariate statistics*. London, UK: Allyn and Bacon.

Thaler RH, & Sunstein CR. (2009). *Nudge*. Camberwell, Australia: Penguin.

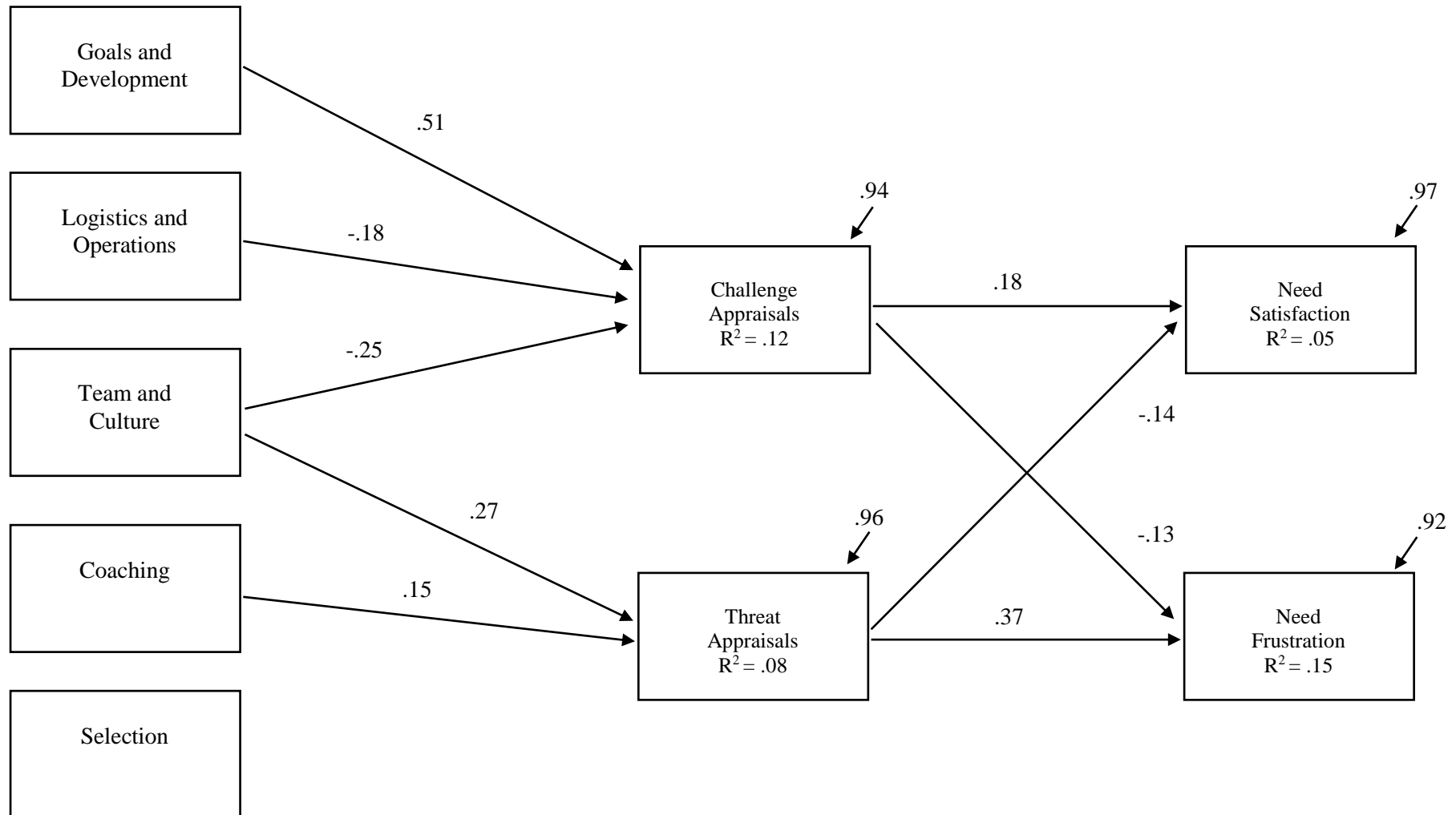
Troup C, & Dewe P. Exploring the nature of control and its role in the appraisal of workplace stress. *Work Stress* 2002; 16: 335-355.

Wang JCK, Koh KT, & Chatzisarantis N. An intra-individual analysis of players' perceived coaching behaviours, psychological needs and achievement goals. *Int J Sports Sci Coaching* 2009; 4: 177-192.

Weinstein N, & Ryan RM. Conceptual review: A self-determination theory approach to understanding stress incursion and responses. *Stress Health* 2011; 27: 4-17.

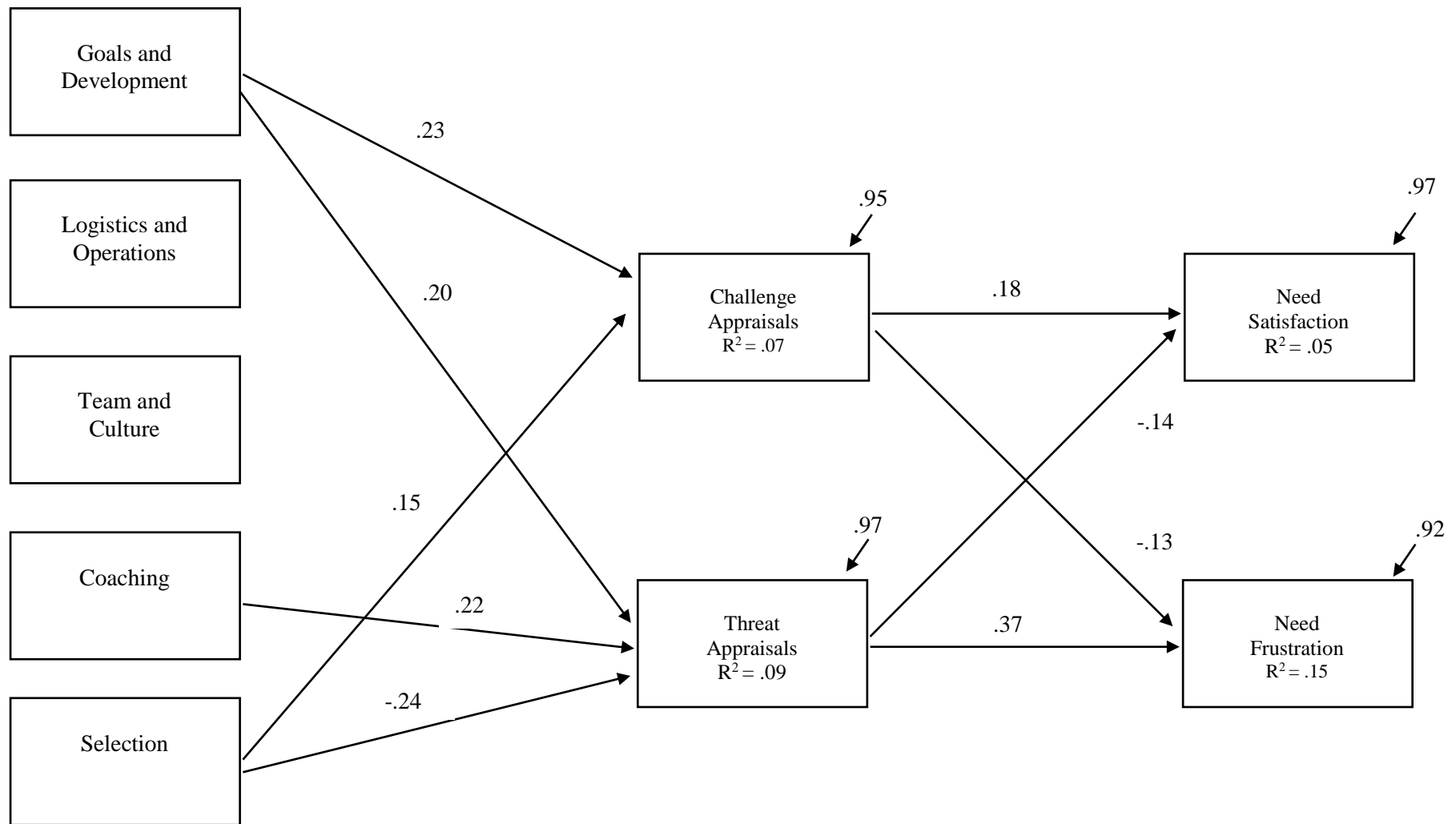
Weinstein N, Brown KW, & Ryan RM. A multi-method examination of the effects of mindfulness on stress attribution, coping, and emotional well-being. *J Res Pers* 2009; 43: 374-385.

Figure 1. Path analysis of associations between organizational stressors, cognitive appraisals, and psychological needs (Hypothesis 1: Frequency).



Note: Only significant pathways are presented for simplicity purposes ( $p < .05$ ). Standardized betas are reported. Organizational stressors were allowed to covary. Error terms between the need satisfaction and need thwarting were also correlated (-.60).

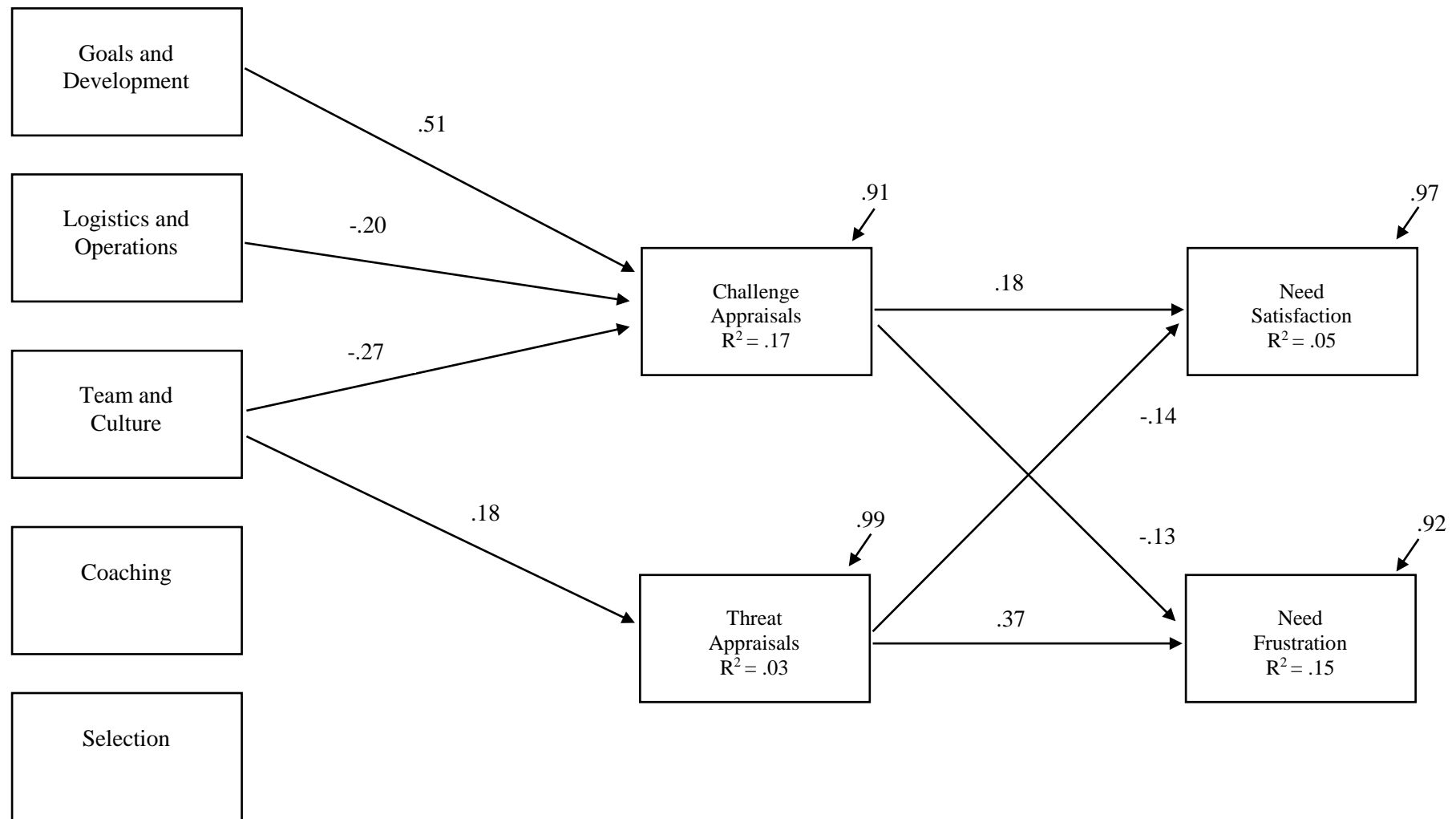
Figure 2. Path analysis of associations between organizational stressors, cognitive appraisals, and psychological needs (Hypothesis 1: Intensity).



Note: Only significant pathways are presented for simplicity purposes ( $p < .05$ ). Standardized betas are reported. Organizational stressors were allowed to covary. Need satisfaction and need thwarting were also correlated ( $-.60$ ).

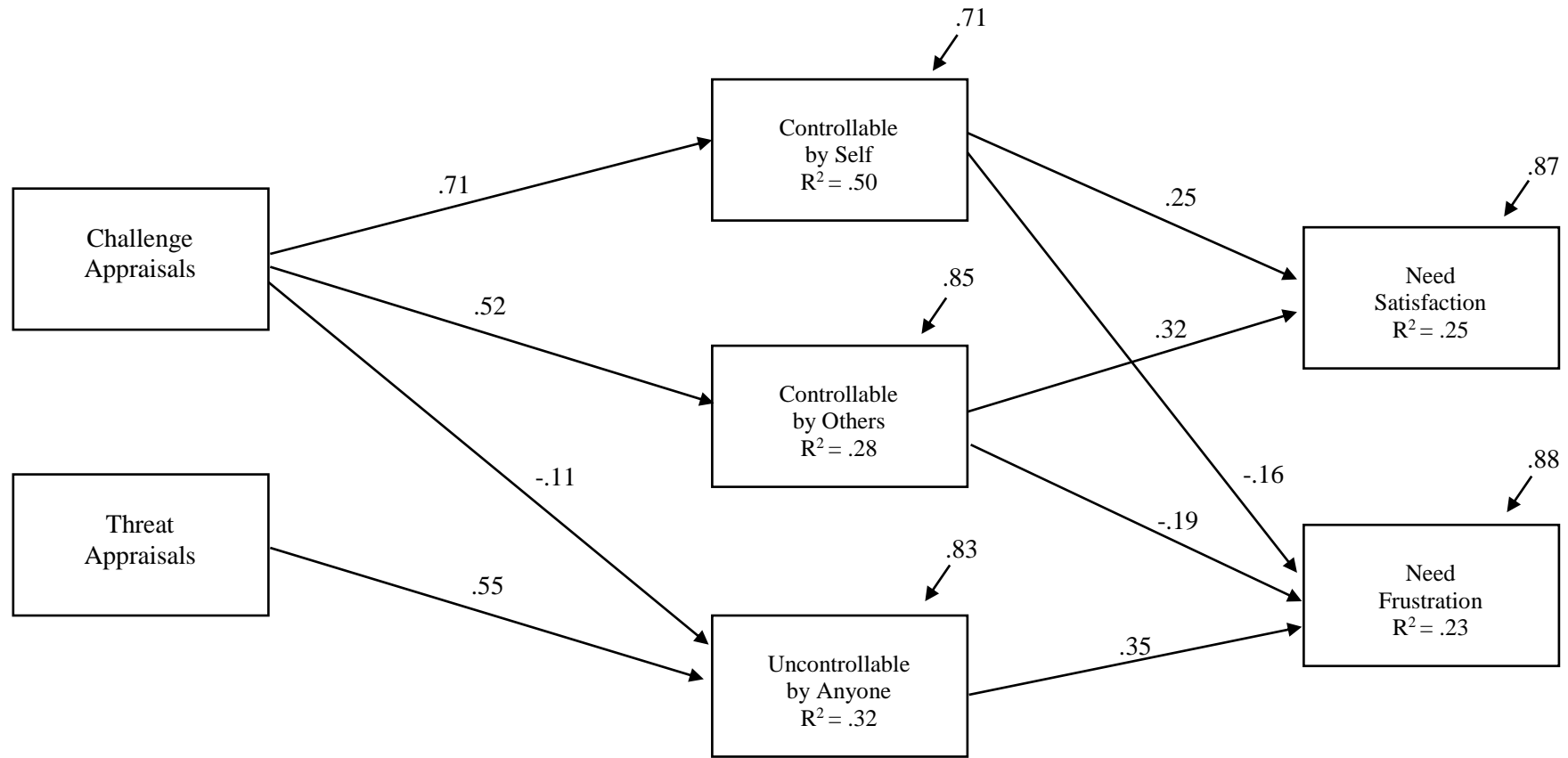


Figure 3. Path analysis of associations between organizational stressors, cognitive appraisals, and psychological needs (Hypothesis 1: Duration).



Note: Only significant pathways are presented for simplicity purposes ( $p < .05$ ). Standardized betas are reported. Organizational stressors were allowed to covary. Need satisfaction and need thwarting were also correlated (-.60).

Figure 4. Path analysis of associations between perceptions of control and cognitive appraisals (Hypothesis 3).



Note: Only significant pathways are presented for simplicity purposes ( $p < .05$ ). Standardized betas are reported. Perceptions of controllable by self and controllable by others were correlated at .26. Need satisfaction and need frustration were also correlated (-.58).

Table 1

*Means, Standard Deviations and Alphas of the Variables Measured in this Study*

Construct	<i>M</i>	<i>SD</i>	$\alpha$
Goals and Development Frequency	2.34	.94	.78
Goals and Development Intensity	2.60	.98	.62
Goals and Development Duration	2.41	.91	.73
Logistics and Operations Frequency	1.61	.99	.88
Logistics and Operations Intensity	1.71	.92	.84
Logistics and Operations Duration	1.50	.83	.82
Team and Culture Frequency	2.13	.95	.79
Team and Culture Intensity	2.31	.90	.73
Team and Culture Duration	2.03	.80	.72
Coaching Frequency	1.76	1.19	.79
Coaching Intensity	2.05	1.32	.87
Coaching Duration	1.80	1.13	.80
Selection Frequency	2.17	1.12	.80
Selection Intensity	2.45	1.27	.80
Selection Duration	2.06	1.09	.76
Challenge Appraisals	3.48	.70	.76
Threat Appraisals	2.30	.81	.78
Controllable by Self	3.49	.79	.77
Controllable by Others	3.02	.76	.70
Uncontrollable	1.96	.73	.75
Need Satisfaction	4.95	.92	.92
Need Frustration	3.26	1.04	.88

*Note.* Scores for organizational stressor dimensions and stress appraisals are from a possible scale range of 1-5. Scores for need satisfaction and need frustration are from a possible scale range of 1-7.

Table 2

*Correlations between the Variables in this Study*

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1) LO (F)	--	.94**	.91**	.60**	.44**	.48**	.49**	.36**	.41**	.50**	.47**	.51**	.55**	.48**	.33**	-.03	.08	-.06	-.05	.37**	.05	.31**
2) LO (I)		--	.90**	.57**	.46**	.47**	.49**	.42**	.42**	.53**	.54**	.49*	.55**	.53**	.42**	-.03	.11*	-.10	-.04	.38**	-.01	.29**
3) LO (D)			--	.58**	.43**	.51**	.46**	.35**	.42**	.41**	.43**	.50**	.52**	.48**	.39**	.02	.05	-.05	-.06	.29**	.10	.25**
4) GD (F)				--	.76**	.88**	.70**	.59**	.67**	.37**	.30**	.43**	.58**	.46**	.44**	.21**	.11	.18**	.05	.12*	.02	.22**
5) GD (I)					--	.83**	.55**	.59**	.60**	.23**	.26**	.28**	.54**	.51**	.47**	.17**	.17**	.20**	.04	.08	.01	.13*
6) GD (D)						--	.55**	.54**	.61**	.23**	.22**	.32**	.53**	.50**	.47**	.31**	.02	.28**	.12*	-.02	.04	.09
7) TC (F)							--	.85**	.86**	.44**	.43**	.44**	.50**	.39**	.36**	-.01	.23**	.03	-.02	.25**	.01	.25**
8) TC (I)								--	.86**	.40**	.46**	.37**	.53**	.51**	.45**	.01	.16**	.16**	.02	.16**	.10	.08
9) TC (D)									--	.43**	.44**	.50**	.51**	.40**	.45**	.03	.13*	.16**	-.01	.14*	.04	.16**
10) C (F)										--	.84**	.78**	.37**	.28**	.32**	-.09	.20**	.01	-.08	.39**	-.18**	.31**
11) C (I)											--	.82**	.46**	.39**	.39**	-.10	.21**	-.05	-.17**	.35**	-.19**	.28**
12) C (D)												--	.43**	.34**	.35**	.04	.08	.09	-.09	.35**	-.11*	.28**
13) S (F)													--	.84**	.76**	.06	.06	.03	-.08	.21**	.02	.21**
14) S (I)														--	.80**	.16**	-.02	.09	-.01	.10	.05	.14*
15) S (D)															--	.16**	-.03	.15**	.01	.01	-.06	.11*
16) Challenge																--	-.10	.71**	.52**	-.16**	.20**	-.16**
17) Threat																	--	-.10	.03	.56**	-.16**	.38**
18) Self-control																		--	.52**	-.18**	.42**	-.32**
19) Others control																			--	-.02	.45**	-.28**
20) Uncontrollable																				--	-.08	.38**
21) Need satisfaction																					--	-.61**
22) Need frustration																						--

\* $p < .05$ , \*\* $p < .01$

Note. (F) = Frequency, (I) = Intensity, (D) = Duration. GD = Goals and Development, LO = Logistics and Operations, TC = Team and Culture, C = Coaching, S = Selection.

Table 3

*Indirect Effects of Organizational Stressors on Psychological Need Experiences via Cognitive Appraisals (Hypothesis 2)*

Predictor Variable	Criterion Variable	Total Indirect Effect (95% CI)	Specific Indirect Effect	
			Challenge Appraisals (95% CI)	Threat Appraisals (95% CI)
Frequency of Organizational Stressors	Need Satisfaction	-.02 (-.06 to .01)	.01 (-.01 to .04)	-.02 (-.06 to -.01)
	Need Frustration	.06* (.02 to .12)	.00 (-.02 to .01)	.07* (.03 to .12)
Intensity of Organizational Stressors	Need Satisfaction	-.02 (-.06 to .02)	.01 (-.01 to .04)	-.02 (-.05 to .00)
	Need Frustration	.06* (.01 to .11)	-.01 (-.02 to .01)	.06* (.02 to .11)
Duration of Organizational Stressors	Need Satisfaction	.02 (-.02 to .05)	.03* (.01 to .06)	-.01 (-.04 to .00)
	Need Frustration	.01 (.03 to .06)	-.02 (-.04 to -.01)	.03 (-.01 to .07)

*Note:* \*  $p < 0.05$ . Standardized beta coefficients are presented with bias-corrected 95% confidence intervals.

Table 4

*Indirect Effects of Cognitive Appraisals on Psychological Need Experiences via Perceptions of Control (Hypothesis 4)*

Predictor Variable	Criterion Variable	Total Indirect Effect (95% CI)	Specific Indirect Effect		
			Controllable by Self (95% CI)	Controllable by Others (95% CI)	Uncontrollable (95% CI)
Challenge	Need Satisfaction	.35* (.27 to .42)	.18* (.06 to .28)	.17* (.09 to .25)	.00 (-.01 to .02)
	Frustration	-.25* (-.32 to -.19)	-.11* (-.18 to -.04)	-.10* (-.16 to -.05)	-.04* (-.07 to -.01)
Threat	Need Satisfaction	.00 (-.07 to .07)	-.01 (-.04 to .01)	.03 (.00 to .08)	-.02 (-.07 to .03)
	Frustration	.18* (.12 to .25)	.01 (-.01 to .03)	-.02 (-.05 to .00)	.19* (.13 to .26)

*Note:* \*  $p < 0.05$ . Standardized beta coefficients are presented with bias-corrected 95% confidence intervals.