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# Religious Belief vs. Religious Practice. What is More Beneficial to Elite Athletes? An Investigation of Religious/Spiritual Belief, and its Relationship to Challenge & Threat Appraisal

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**Abstract**

Religiosity/spirituality has been linked with reduced anxiety in athlete populations. This study set out to assess the impact of religious/spiritual belief, opposed to practice, to see whether it too would predict anxiety, as well as feelings of control and cognitive appraisal in elite athletes (N = 115). Self-reported self-efficacy, control, achievement goals, life satisfaction, trait anxiety and strength of belief in a higher power (SBHP) were measured and analysed with simple linear regressions and multiple regressions (with challenge and threat appraisals as the dependent variables). The models predicting both challenge and threat appraisal were found to be significant, although SBHP was not a significant predictor, nor was it significantly predicative of any of the variables, or significantly correlated with them. The contribution of religious/spiritual belief to psychological benefits is compared to religious/spiritual practice and discussed alongside implications for future research and applied practice.

**Keywords**: sport, psychology, religion, spirituality, belief, anxiety, challenge, threat, appraisal

## Introduction

### Religion and Sport

There is very little international agreement on how to define the terms 'religiosity', 'spirituality' and 'supernatural belief' (Snider & McPhedran, 2014) and where the boundaries lie between them. The focus of this paper is on the concepts of religiosity and spirituality, and if one is to fully study these it is essential to ascertain working definitions. Schofield, Baker, Staples, and Sheffield (2016) for example, recently proposed that paranormal belief, spirituality and religiosity are three distinct typologies, whereas Snider and McPhedran (2014) use the operational term 'religiosity/spirituality' to encompass the institutional beliefs and practices of the traditionally religious, combined with spirituality, which the authors class as a "less structured, personal and self-defined branch" of religiosity (p. 570). Schofield et al. (2016) also cite that spirituality has been defined as a more personal notion (Zinnbauer et al., 1997) that revolves around individual values, rather than the institutional ideas characterised by formal religiosity (Hood, Hill, & Spilka, 2009). Others see religiosity and spirituality as being two branches of the all-encompassing category of paranormal belief (Benson, Roehlkepartain, & Rude, 2003), whilst some use the terms religiosity and spirituality interchangeably (Williams & Sternthal, 2007, cited in Snider & McPhedran, 2014). Given that the forthcoming literature generally splits out religiosity and spirituality, the present study will refer to religiosity and spirituality as separate entities but referred to as one all-encompassing category, 'religiosity/spirituality', in line with Snider and McPhedran (2014). Whilst this conciseness in definition will be used for the present paper, it is worth caveating that there is little universal agreement in defining these terms in the literature on supernatural belief, with Schofield et al. (2016) citing that "when concepts such as religion are defined, the only person likely to agree with a given definition is its author" (p. 419).

The link between religiosity/spirituality and sport has been researched from many different angles. Some have contended that sport itself is a religion (e.g., Reid, 2016; Chidester, 1996; Prebish, 1992), whereas others have argued that sport fills a spiritual void for athletes (e.g., Lawrence, 2005), and some opine that fans that follow sport also have a religious or spiritual relationship with it (Wann, Melznick, Russell, & Pease, 2001; Wann, 2001; Serazio, 2013). There has also been research into the conflicting role identities of religion and athlete (Stevenson, 1991), a growing body of literature that has investigated the best ways coaches can deal with or consult with religious athletes (Mosley, Frierson, Cheng, & Aoyagi, 2015; Watson & Czech, 2005; Watson & Nesti, 2005) studies purporting religiosity as a protective factor against substance abuse (Rodek, Sekulic, & Pasalic, 2009; Storch, Storch, Kovacs, Okun, & Welsh, 2003), as well studies assessing the prevalence of religiosity or spirituality in athletic populations (Storch, Kolsky, Silvestri, & Storch, 2001; Bell, Johnson, & Petersen, 2009). Given the array of literature on the subject, one might think there would be a healthy body of research on the potential sport psychology benefits derived from religiosity/spirituality. This supposition would be strengthened even more so by the wealth of literature in the clinical domain. For example, in a recent meta-analysis of 23 random control trials, Gonçalves, Lucchetti, Menezes, and Vallada (2015) found significant effects of religious or spiritual interventions on anxiety general symptoms ($p < .001$). In another meta-analysis, Hackney and Sanders (2003) went further and argued that the type of religiosity definition produces different effect sizes. They grouped definitions into three types: institutional religiosity (attendance, participation, and prayer), ideological religiosity (attitudes, belief and belief salience) and personal devotion (emotional attachment to God). In their analysis of 34 studies, they found significant increases in mean effect size (for

psychological health) as one proceeds from institutional religiosity (.06) to ideology (.08), to personal devotion (.15).

However, despite the wealth of literature on the link between religion or spirituality and sport, as well as the weight of research in the clinical domain looking at psychological benefits derived from religiosity/spirituality, there are a limited number of studies that have researched the potential psychological benefits that might be derived from religious/spiritual practice or belief, in the context of competitive sport. Sarkar, Hill, and Parker (2015) have remarked that "given religion and spirituality are important for the welfare of numerous individuals, it is somewhat surprising that relatively few studies within the sport psychology literature have directly examined the association between religion, spirituality, and well-being in sport performers" (p. 49). Some authors have attempted to relate religiosity/spiritually to the experience of flow or being in the zone. Athletes and performers who describe the experience of being in the zone has been conceptualised as 'flow' and coined in the psychological literature by Csíkszentmihályi (2008). The author describes it as an optimal experience whereby the subject feels complete, undistracted concentration with the task at hand. Csíkszentmihályi (2008) lists eight characteristics of flow, including 'clarity of goals', 'intrinsically rewarding experience', 'effortlessness' and 'feelings of complete control'. Dillon and Tait (2000) found a correlation between those who scored high on their Spirituality in Sports Test (SIST) with the Zone Test, which they used as a proxy for measuring flow. Criticisms of this study include the non-elite level of the sample population, given they completed at National Collegiate Athletic Association (NCAA) Division III level, and the small sample size (62). In fact, a closer look at the study design reveals that only 42 of the participants were collegiate athletes, with the remaining 32% of the participants self-reporting that they had been on teams in high school. With such a low sample of athletes, the correlational nature of the data may be considered low in reliability, give the very small sample size (e.g., Button et al., 2013). Spittle and Dillon (2014) aimed to repeat their findings with 92 competitive golfers, but this time found no correlation between scores on the SIST and the Zone Test, however, they did find significant correlation between spirituality and 'sense of control', a subscale of another measure of flow, the Dispositional Flow Scale (DFS). Whilst this study has a larger sample size than the pioneering Dillon and Tait (2000) paper, the label of the golfers as 'competitive' could be argued to be somewhat generous. A closer look at the participants reveals that 67% of them had not played higher than club level standard, with professional golfers making up 2.2% of the sample. Both of these studies intended to study relationships with spirituality and being in the zone and used quantitative scales to attempt to capture the concept of flow. However, in a systematic review of literature on flow states in elite sport, Swann, Keegan, Piggott, and Crust (2012) argue that quantitative measures are not as effective at investigating flow as qualitative means, "especially as they attempt to explore an intensely subjective experience by using objective measures" (p. 810).

The focus of this review will now switch to a body of research, which has repeatedly inferred a relationship between religiosity/spirituality and lowered anxiety, in both clinical populations and athlete populations. The reason why this particular area of the literature is of such interest is because researchers have found that high-anxiety conditions inhibit sports performance, including anticipation judgments and visual search behaviors (Alder, Ford, Causer, & Williams, 2016). As such, any insight into lowering athletes' anxiety is of great value to the domain of sport psychology.

**Stress and Anxiety**

The majority of studies attempting to ascertain a competitive benefit from being religious or spiritual have focused on coping skills and reducing anxiety. One of the most cited papers is Czech, Wrisberg, Fisher, Thomson, and Hayes (2004) and their investigation of Christian athletes' prayer experiences. In a semi-structured interview with nine former NCAA Division I collegiate athletes, they uncovered four key themes following inductive and deductive analysis. Two themes were most prominent. The first was using prayer for performance purposes such as reducing anxiety, whilst the second theme was about prayer routine, and the control that athletes derive from a regular pre-competition routine. Whilst hard to extrapolate these results to a general population, the results of this study suggest that prayer could be used by athletes to reduce anxiety and increase the perception of control. One might note that reductions in anxiety often came from prayers that utilised secondary tools such as breathing exercises, for example, "I would use a kind of praying/relaxation breathing technique" (Czech et al., 2004, p.7). This suggests that it may not be just prayer that is leading to reduced anxiety, but the accompanying breathing exercise as well. In the second theme, the authors note that it might not be prayer routine that gives athletes competitive advantage, but the control that they derive from a ritualistic routine. The authors note Womack's (1992) characteristics of rituals that give athletes a feeling of control over their environment, namely 'stylized', 'repetitive', 'sequential', and 'potent', all of which the authors argue are reflective of the prayer routines described by their participants. There are a number of potential critiques of this study. First of all, the use of former athletes is questionable, given that the heated experience of competition might have dissipated since retiring from competitive sport. It arguably creates a methodology closer to biographical accounts of competitive sport, as opposed to a study of current athletes. The lead author also admits a personal bias given that he himself is a Christian and a former athlete. Whilst they have mitigated for this by employing an interpretive group to give unbiased perspectives on coding and categories, the lead author ultimately pulls together the analysis, and hence this may still cast doubt over the impartiality of the findings. Furthermore, one might question how homogenous this population is. A sample size of nine athletes is difficult to generalise from, plus anxiety in athlete populations has been related to multiple predictive factors including, but not exclusive to, serotonin transporter promoter polymorphism and personality traits (Petito et al., 2016), the anxiety of coaches (Mottaghi, Atarodi, and Rohani, 2013) and parental pressure (O'Rourke, Smith, Smoll, & Cumming, 2011), yet it is not clear whether the authors have attempted to reveal, nor control for such additional factors within the study design.

In a very recent paper, Najah, Farooq, and Rejeb (2017) used a quantitative approach to studying the effects of religiosity/spirituality practice on psychological outcomes. They assessed 50 professional athletes that had suffered anterior cruciate ligament (ACL) injuries prior to their surgery. They classified them as either high or low in religiosity or spirituality (RSH or RSL) and either high or low in the extent to which they prayed or meditated (PMH or PML) before distributing the Brief Cope Inventory (BCI) and Depression and Anxiety Stress Scale (DASS 21). Their results showed that belief scores were negatively correlated with depression ($r$ = -.41, $p$ < .01) and anxiety ($r$ = -.42, $p$ < .01). They also found that praying and mediation were negatively correlated to depression ($r$ = -.31, $p$ < .05) and anxiety (r = -.30, p < .05) but to a less significant degree. Furthermore, when they compared the groups they had created, they found that those with higher religious and spiritual belief displayed higher coping, whilst those with less belief had higher depression and anxiety scores. Similarly, those who were found to pray or meditate more were also higher on coping scores, however, no significant differences were found for depression and anxiety. These results

suggest that religiosity/spirituality does have a relationship with anxiety, however, it must be noted that the context of the study is restricted to dealing with injury, and findings might not be generalisable to athletes in competition scenarios. The authors also concede that the way they defined high and low religious/spiritual groups was based on only two questions in the BCI, admitting, "…it is not possible to distinguish or quantify the levels of religious belief and practice based on these items" (p. 188). Similarly to the Czech et al. (2014) study, it is also not clear whether other personal factors that may predispose anxiety have been measured or controlled for. Added to the low sample size, they stress that the findings should be regarded as promising insight for future research, rather than robust findings.

Elsewhere, a number of researchers have found a relationship between religiosity/spirituality and anxiety in elite athlete populations. A much-referenced study by Vernacchia, McGuire, Reardon, and Templin (2000) for example found that 6 Olympic athletes in their sample of 15 Olympians identified the importance of religion/spirituality in coping with injuries as well as personal and athletic set backs. Whilst this study might be heralded for its high quality sample of elite athletes, the self-reported qualitative findings from six athletes is hard to generalise to all religious athletes. Kim and Duda (2003) also found that religion is used as a coping strategy. In their cross-cultural study of 318 NCAA Division I collegiate athletes and 404 Korean athletes playing at equivalent level in South Korea, they found that subjects used religion as a coping strategy when undergoing psychological stress. Finally, Park (2000) also found that Korean athletes utilised prayer as a coping mechanism for stress, with 22% of the study's 148 international athletes identifying with this strategy of coping. This study may point to evidence of a relationship between religious/spiritual practice and anxiety that applies across countries and cultures. Despite its large sample of elite, international athletes, the finding is a descriptive statistic. One might equally point out that 78% of the sample did not utilise religion as a coping strategy. When inspecting the findings further, one also discovers that there were five other coping strategies that were more popular than utilising religion (mental training, training strategies, somatic relaxation, hobbies, and social support). The Park (2000) study is widely cited in the literature, which is perhaps slightly reflective of the paucity of the literature on religiosity/spirituality and sport psychology benefits. None of these five studies meet the highest standard of reliability in terms of randomly controlled trials, and are all single measures in time without the benefit of longitudinal evidence. However, the cumulative weight of these findings, in addition to meta-analyses in clinical populations might suggest that religiosity/spirituality is related to anxiety within athlete populations.

**Models of Stress and Emotion**

Whilst there has been a modest amount of research looking at the relationship between religiosity/spirituality and anxiety in athlete populations, so far this has been assessed in absence of an overarching model of how stress and emotion affects athletic performance. One might look to the Multidimensional Anxiety Theory (MAT), which was developed by Martens, Burton, Vealey, Bump, and Smith (1990). It is a theory that broadens the construct, as it regards anxiety as comprised of two distinct components: cognitive anxiety and somatic anxiety. Whilst the theory looks to dig deeper in to the concept of anxiety, some researchers have criticised it, noting evidence that suggests somatic and cognitive anxiety are not mutually exclusive phenomena (e.g., Krane, 1992). But the critical reason why this theory has not been used within the present study is its lack of consistency in predicting how these two types of anxiety predict performance (McNally, 2002). Another prominent theory of anxiety is the Catastrophe Model (Hardy & Fazey, 1987, cited in Hardy & Parfitt, 1991), which also utilises a dichotomous view of anxiety, but unlike MAT uses the construct of physiological arousal instead of somatic anxiety. Catastrophe Model predicts that performance will only

become severely impaired when an individual exhibits high cognitive anxiety, whereby accompanying physiological arousal is tolerated up until a crucial threshold after which a rapid deterioration in performance (i.e. a catastrophe) is predicted. Whilst this theory makes strong claims about when anxiety will determine a drop in performance, researchers have noted that evidence hasn't consistently mirrored the theory's predictions (e.g., Hardy, Parfitt, & Pates, 1992, cited in McNally, 2002), and it also fails to explain exactly how the effects of cognitive anxiety and physiological arousal on performance occur (McNally, 2002). The Theory of Challenge and Threat States in Athletes (TCTSA) proposed by Jones, Meijen, McCarthy, and Sheffield (2009) is the most recent theoretical addition to the anxiety and arousal literature within athlete populations. It aims to further the position of Lazarus (1999) who argued that factors such as anxiety and control affect athletic performance, via their impact on whether an athlete appraises his or her arousal as a challenging or threatening experience (see the full model in Figure 1).

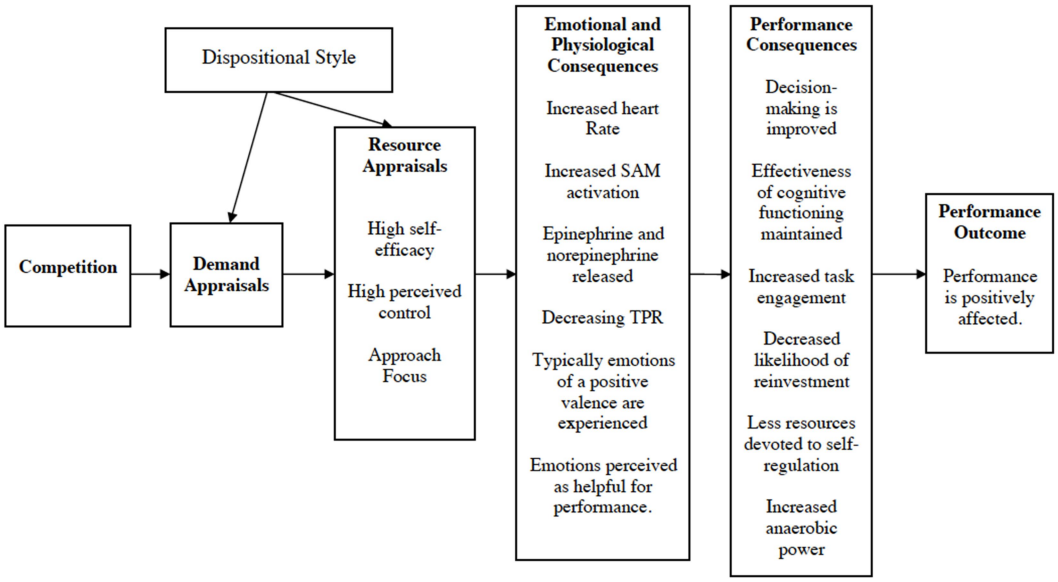


**Figure 1a.** Theory of Challenge and Threat States in Athletes (TCTSA) – The Challenge State

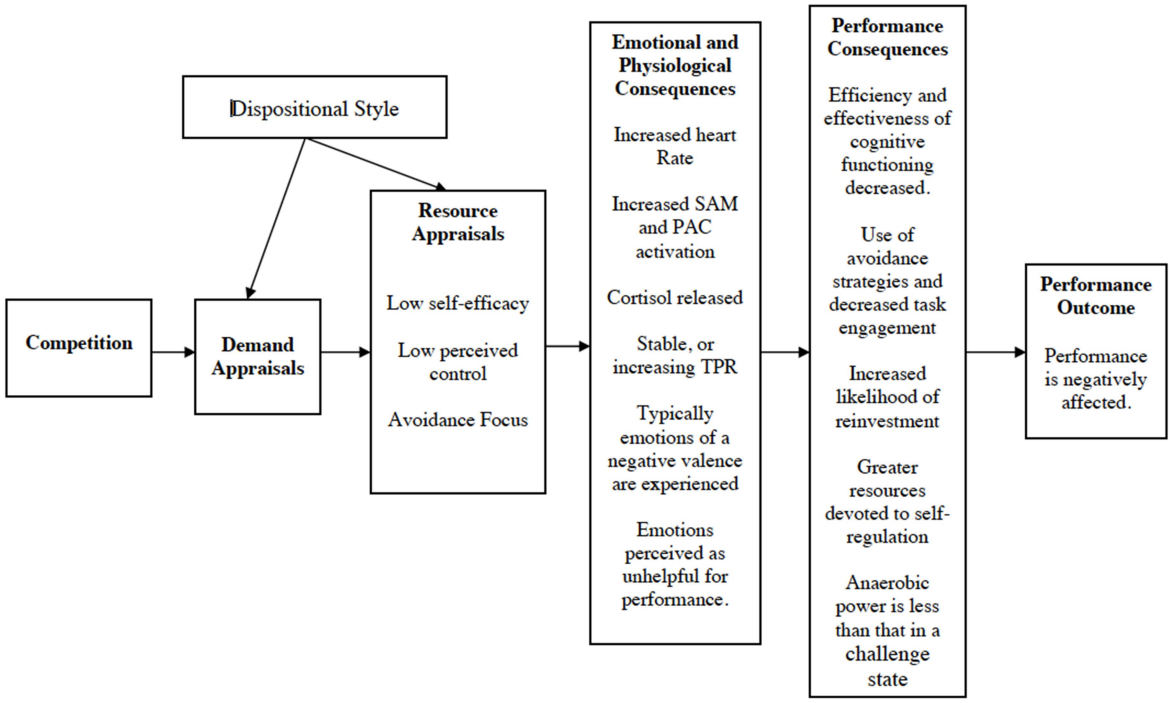


**Figure 1b.** Theory of Challenge and Threat States in Athletes (TCTSA) – The Threat State

It also aims to integrate biopsychosocial (BPS) models of challenge and threat (Blascovich & Tomaka, 1996; Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004), by making predictions about challenge or threat states through demand appraisals (e.g., perception of danger, uncertainty and required effort) as well as resource appraisals (e.g., skills, knowledge and ability). A key aspect of BPS theories that the TCTSA has integrated, concerns athletes' physiological responses to arousal and posits that specific patterns of neuroendocrine and cardiovascular response are indicative of a challenge or threat state. The TCTSA is a sport-specific model and integrates other commonly proposed factors that influence athletic performance, namely, self-efficacy, perceived control and motivational goals. The TCTSA's assertion that challenge and threat states are the result of how athletes perceive and process stress, anxiety and arousal has been supported by a number of studies (e.g., Turner et al., 2013; Meijen, Jones, McCarthy, Sheffield, & Allen, 2013; Moore, Vine, Wilson, & Freeman, 2012; Turner, Jones, Sheffield, & Cross, 2012; Vine, Freeman, Moore, Chandra-Ramanan, & Wilson, 2013). Given the growing body of research supporting it, and given it has been developed specifically for athletes and aims to predict athletic performance, the TCTSA has been chosen as the model to underpin the present investigation of SBHP, and its potential psychological benefits for elite athletes.

## Aims and Hypotheses

In order to add value to this research area, one might look at three key elements: strength of belief, the definition of elite athlete, and a framework for anxiety in competition environments. Firstly, the majority of the studies in the literature only concern religious/spiritual *practice*. Just one paper (Najah et al., 2017) addresses the *belief* aspect of religiosity/spirituality as a potential determinant. Secondly, aside from Vernacchia et al. (2000) and their study of Olympic athletes, the majority of the literature base is derived from findings with student-athletes, despite the fact that many practicing sport psychologists are

looking for research that they can utilise for elite populations. Finally, all the studies tend to look at the relationship between religiosity/spirituality and psychological benefits in isolation, despite the fact, there are existing frameworks that consider anxiety and control as part of an interlinking chain of factors that impact on performance through challenge and threat appraisal. As such, the present study has three aims: i) to investigate whether SBHP is related to psychological benefits, ii) to study this relationship with a large sample of elite athletes, and iii) to assess whether SBHP impacts on cognitive appraisal and all the factors that comprise the TCTSA (self-efficacy, motivational focus, control, and anxiety). Given the wealth of research in the clinical domain, the primary hypothesis was that SBHP would predict anxiety in the elite athlete sample. The secondary hypothesis was that SBHP would contribute to the TCTSA model, helping to predict control, and both challenge and threat appraisals by acting as a protective factor against anxiety.

## Method

### Participants

The sample comprised 115 elite athlete participants (male = 85; female = 20; $M_{age}$ = 22.16; *SD* = 5.83) who were recruited from a variety of sports (Athletics, *n* = 10; Basketball, *n* = 2; Cricket, *n* = 2; Football, *n* = 10; Lacrosse, *n* = 2; Motor Racing, *n* = 4; Rugby, *n* = 36; Tennis, *n* = 42). The 'elite' parameter was classified following recommendations by Swann, Moran, & Piggott (2015), who carried out a systematic analysis of 91 empirical studies that used the term 'elite athlete'. As such, athletes were deemed elite if they i) were above the age of 15, and ii) played their sport at county, national, or international level, or were part of an elite academy pathway (county, *n* = 9; national, *n* = 56; international, *n* = 41; youth academy, *n* = 9). Athletes were recruited from professional rugby and cricket clubs, elite tennis academy programs, a premier league football under 18 academy team, as well as professional footballers playing at Championship level, National League 1 and National League 2. Participants came from 13 countries (Austria, Australia, Belgium, Denmark, India, Ireland, Mexico, New Zealand, Romania, South Africa, Spain, UK, USA) and all participants were fluent in English. Finally, athletes came from a variety of religious and spiritual backgrounds (organised religion, *n* = 19; spiritual but not religious, *n* = 32; agnostic, *n* = 31; atheist, *n* = 29; undefined, *n* = 4).

### Design

Considering the brevity of research that has studied SBHP in relation to sport psychology, a cross-sectional design was deemed appropriate. Cross-sectional research is deemed appropriate for making initial enquiries into an area of interest (Thomas, 2011), and the results that emerge from such studies may enlighten the hypotheses for future, more complex investigations (Sedgwick, 2014).

### Measures

**The Cognitive Appraisal Scale (CAS).** The CAS (Skinner & Brewer, 2002) is an 18-item measure used to assess participants' trait style of cognitive appraisal. It is an evaluative scale that investigates whether athletes appraise situations as a challenge (e.g., *I believe that most stressful situations contain the potential for positive benefits*) or threat (e.g., *I worry that I will say or do the wrong things*). Participants reported the extent to which they agreed or disagreed with each statement along a six-point Likert-type scale that ranged from 1 (*strongly disagree*) to 6 (*strongly agree*). Following its application in a recent study of cognitive appraisal with athlete populations, participants were asked to answer the questions specific to their sport

(Williams & Cumming, 2012). This same study also found reliability of the scale with both the challenge (CR = 0.89, AVE = 0.50) and threat (CR = 0.94, AVE = 0.60) subscales. In the present study, Cronbach's alpha coefficient for threat appraisal was found to exceed Nunnally's (1967) minimum level of .7 (α = .92) however the challenge appraisal subscale was just below this threshold (α = .66). This latter result was deemed acceptable given that Hair et al. (2006) have suggested the acceptable limit can decrease to .6, particularly for exploratory research and in studies in the social sciences.

**The Character Strength Inventory-Spirit scale (CSI-Spirit).** The CSI-Spirit (Isaacowitz, Seligman, & Valiant, 2003) is a seven-item measure used to assess SBHP. It is an evaluative scale that investigates the extent to which athletes believe in the existence of extraordinary, supernatural or unseen entities (e.g., *I believe in a universal power, a god* and *I have had dreams that foretold what was going to happen*). Each statement was responded to along a five-point Likert scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Following two studies of validity by Schuurmans-Stekhoven (2014) a modified six-item version of the scale was used. The authors found the scale to be internally reliable, with a Cronbach alpha coefficient of .77, and noted that this six-item scale is useful for isolating supernatural/spiritual beliefs from related constructs (such as pure religiosity and prosociality). This is an important characteristic given the afore-mentioned surge in people who identify with being spiritual but not religious (Pew Research Centre, 2012). The coefficient for the present study was found to be above Nunally's (1967) minimum limit (α = .84).

**The Academic Control Scale (ACS).** A one-item measure was used to assess control, adapted from the Academic Control Scale (Perry, Hladkyj, Pekrun, & Pelletier, 2001) following its use in a recent study with athletes, which used this item as a measure for control (Turner et al., 2013). Participants responded to the statement 'The more effort I put in, the better I will do' on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

**The Achievement Goals Questionnaire (AGQ).** The AGQ (Conroy, Elliott, & Hofer, 2003) is a 12-item scale used to measure whether one's approach to mastery and performance is characterised by 'approach' (e.g., *It is important for me to master all aspects of my performance*) or 'avoidance' (e.g., *I just want to avoid performing worse than others*) whereby respondents are asked to rate each statement along a seven-point Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). Participants were asked to complete the scale with reference to their sport, following a recent study of elite athletes by Turner et al. (2013). Stoeber and Stoeber (2009) found good reliability for each of the subscales in an adult sports population (mastery approach, α = .73; mastery avoidance, α = .82; performance approach, α = .81; performance avoidance α = .85) whilst Stoeber, Stoll, Salmi, and Tiikkaja (2009) found acceptable validity for the subscales with under-18 athletes (mastery approach, α = .51; mastery avoidance, α = .71; performance approach, α = .79; performance avoidance α = .67). The Cronbach's alpha coefficient for the present study was found to be above Nunally's (1967) minimum limit for all sub-scales (mastery approach, α = .73; mastery avoidance, α = .93; performance approach, α = .87; performance avoidance, α = .90).

**Self-efficacy**. As recommended by Bandura (2006), a self-efficacy measure will ideally be bespoke to the specific domain of expertise in question. As such, a generalisable sports related measure of self-efficacy was used, taken from Coffee & Rees (2008) and utilised in a recent study of challenge and threat states in elite athletes (Meijen, Jones, Sheffield, McCarthy, & Allen, 2013). This six-item scale was adapted using the prefix 'With reference to your next

performance…', where subjects responded to statements such as *"I am confident I can perform well, even if things get tough*" along a five-point Likert scale ranging from 1 (*not at all*) to 5 (*completely*). Meijen et al. (2013) found good reliability for this scale with their elite athletes (α = .75). The Cronbach's alpha coefficient for the present study was found to be above Nunally's (1967) minimum limit (α = .71).

**The Satisfaction with Life Scale (SWLS).** The SWLS (Diener, Emmons, Larsen, & Griffin, 1985) is a five-item scale whereby participants indicate their agreement with statements pertaining to life satisfaction (e.g., *If I could live my life over, I would change almost nothing*) along a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale has been validated with athlete samples in a recent study by Cronin and Allen (2015). This scale has previously displayed adequate reliability with adults and under-18s. For example, Stoeber and Stoeber (2008) found reliability with adults, reporting a Cronbach's alpha coefficient of .85, whilst Cronin and Allen (2015) also found reliability with 10-19 year old adolescents, reporting a Cronbach's alpha coefficient of .88. The Cronbach's alpha coefficient for the present study was found to be above Nunally's (1967) minimum limit (α = .79).

**The State Trait Anxiety Inventory-Trait (STAI-T)**. The STAI-T (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) is a 20-item trait scale of anxiety. Participants responded to statements such as *"I make decisions easily"* and *"I take disappointments so keenly that I can't put them out of my mind"* along a four-point Likert scale ranging from 1 (*almost never*) to 4 (*almost always*). Covassin et al. (2014) found reliability for this scale with collegiate athletes, finding a Cronbach's alpha coefficient of .86, whilst Fernandez-Berrocal, Alcaide, Extremera, and Pizarro (2006) found reliability in an under 18 population, with a Cronbach's alpha coefficient of .75. The Cronbach's alpha coefficient for the present study was found to be above Nunally's (1967) minimum limit (α = .90).

**Pilot study for under-18 athletes.** As three of the scales had not previously been validated with youth athletes (CSI-Spirit; Self-Efficacy Scale; CAS), a separate pilot study with ten athletes under the age of 18 was carried out to ensure comprehension and understanding of the scales. These participants received the same questionnaire as the other athletes but were also asked to rate three statements (e.g., *"I found the questions easy to comprehend and understand"*) along a five-point Likert scale ranging from 1 (*definitely true*) to 5 (*definitely false*). The results generally indicated comprehension of the measures for the under-18 subjects, with 11 out of 13 subjects (85%) agreeing that they understood the wording for the measures across the three scales, and two subjects (15%) agreeing that they found the wording difficult.

## Procedure

After the study received institutional ethics approval, participants were recruited via contacts at various elite sports institutions. Under-18 athletes were recruited via their parents who received the information sheet and a parental consent form. Athletes were sent the survey by email and asked to visit a secure web link to complete the survey online using Qualtrics online survey software (Qualtrics, Provo, UT), whereby full information about the study was conveyed and informed consent was given as part of the webpage. If they chose to consent and continue, participants were asked to provide demographic information before completing the battery of questionnaires. The user experience took between five and ten minutes depending on reading speed. To ensure anonymity and honest answers, subjects were not asked for their name and were reassured at the outset that all responses would be anonymised.

### Data analysis

After collecting the responses, the dataset was cleaned and screened, and missing data was identified and removed from the study. The data was then assessed against parametric assumptions for multiple linear regression before the main analysis. The main analysis consisted of a correlation matrix, two hierarchical multiple regressions and simple linear regressions using SBHP as the independent variable. The two hierarchical multiple linear regressions were conducted with threat appraisal and challenge appraisal as the dependent variables. Following the theoretical links established in previous research (Jones et al., 2009; Meijen et al., 2013; Turner et al., 2013; Turner et al., 2012 ), self-efficacy, control and the four subscales of the GAQ were entered at step 1, with trait anxiety, life satisfaction and SBHP entered at step 2. This was replicated for both hierarchical regressions.

## Results

### Preliminary Analyses

Multiple regression assumptions were checked. Firstly, outliers were identified via inspection of box plots and z-scores. Eight outliers were found outside of +/-3 standard deviations and were addressed using the winsorizing technique (Shorack, 1996). Following winsorizing, normality of the residuals was found, judging by the histograms and P-P plots for both regressions (see Appendix 1.0.) The sample size of 115 satisfies Field's (2013) directive that one "should have ten cases per predictor in the model" (p.313) and also a G-Power analysis (Faul, Erdfelder, Buchner, & Lang, 2009) at the outset which found that a F-test (two-tailed) for a medium effect, with $\alpha = .5$ and $\beta\text{-}1 = .8$ and nine predictor variables, gives a minimum sample size of 114 (see G-Power analysis in Appendix 2.0.) The next assumption was that of homoscedasticity. The scatterplots (Appendix 3.0) of standardised residuals showed that the data meets the assumption of homoscedasticity and linearity for both multiple regressions (each of the partial plots also showed a linear relationship between the individual predictors and both dependent variables, and can be viewed in Appendix 5.0.) Next, multicollinearity was checked by running collinearity diagnostics tests. These tests indicated that multicollinearity was not a concern given that none of the independent variables correlated above .8, no single item scored more than VIF > 10 (see Appendix 5.0) and the average VIF score was more than one (Field, 2013). Finally, the data met the assumption of independent errors for both regressions (Threat, Durbin-Watson value = 1.98; Challenge, Durbin-Watson value = 1.64).

### Main Analyses

**Primary hypothesis.** Descriptive statistics and correlation coefficients for the two dependent variables and nine independent variables can be seen in Table 2. The data shows that threat appraisal was positively correlated with trait anxiety, mastery avoidance, performance avoidance, and performance approach, and negatively correlated with self-efficacy. Challenge appraisal was positively correlated with self-efficacy, control and mastery approach, and negatively correlated with trait anxiety. SBHP was not significantly correlated with any of the variables under investigation.

SBHP was analysed as a predictor variable in ten simple linear regressions with the other variables in the study used as dependent variables. None of these regressions provided a significant result, nor approached significance, and can be viewed in Table 1 below.

**Table 1.** *Summary of simple linear regression analyses with SBHP as the predictor variable (N = 115)*

| | F | *p* | $R^2$ |
|---|---|---|---|
| Self-efficacy | (1,112) = 1.50 | .22 | .01 |
| Control | (1,113) = .21 | .65 | .002 |
| MAp | (1,113) = .03 | .86 | .0003 |
| MAv | (1,113) = .03 | .86 | .0003 |
| PAp | (1,113) = 2.57 | .11 | .02 |
| PAv | (1,113) = 1.67 | .20 | .02 |
| Trait anxiety | (1,113) = .88 | .35 | .008 |
| Life Satisfaction | (1,113) = .80 | .37 | .007 |
| Challenge Appraisal | (1,113) = .76 | .39 | .007 |
| Threat Appraisal | (1,113) = .67 | .42 | .006 |

MAp = mastery-approach goals, MAv = mastery-avoidance goals, PAp = performance-approach goals, PAv = performance-avoidance goals, SBHP = strength of belief in a higher power.

**Table 2**. Summary of means, standard deviations, and correlations for scores on mastery approach, mastery avoidance, performance approach, performance avoidance, anxiety, life satisfaction, control, self-efficacy, SBHP, and challenge and threat appraisals.

| | M & SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Threat appraisal | 3.18 / 1.00 | – | | | | | | | | | | |
| 2 Challenge Appraisal | 4.75 / .50 | -.16 | – | | | | | | | | | |
| 3 Trait anxiety | 1.96 / .44 | .65*** | -.22* | – | | | | | | | | |
| 4 Self-efficacy | 3.86 / .46 | -.30** | .35*** | -.15 | – | | | | | | | |
| 5 Control | 5.36 / .80 | -.05 | .26** | .08 | .30** | – | | | | | | |
| 6 MAp | 6.44 / .60 | .001 | .25** | .01 | .31** | .45*** | – | | | | | |
| 7 MAv | 4.83 / 1.49 | .69*** | -.18 | .57*** | -.28** | .08 | .07 | – | | | | |
| 8 PAp | 5.12 / 1.45 | .28** | .14 | .16 | .16 | .06 | .40*** | .17 | – | | | |
| 9 PAv | 3.31 / 1.74 | .39*** | .03 | .21* | -.002 | .13 | .13 | .29** | .47*** | – | | |
| 10 Life satisfaction | 5.02 / 1.01 | -.08 | .11 | -.31** | .05 | -.18 | -.06 | -.09 | -.03 | -.01 | – | |
| 11 SBHP | 2.71 / .90 | .08 | .08 | .09 | -.12 | -.04 | .02 | .02 | .15 | .12 | .08 | – |

*Note:* *$P < .05$, **$P < .01$, ***$P < .001$. MAp = mastery-approach goals, MAv = mastery-avoidance goals, PAp = performance-approach goals, PAv = performance-avoidance goals, SBHP = strength of belief in a higher power.

**Secondary hypothesis**. With threat appraisal as the dependent variable, multiple regression results showed a significant effect at Step 1 ($R^2$ = .56, $P$ < .001) with mastery avoidance ($\beta$ = .60, $P$ < .001) and performance avoidance ($\beta$ = .17, $P$ < .05) as significant predictor variables. The entry of trait anxiety, life satisfaction and SBHP at Step 2 improved the model fit, $\Delta R$ = .65, $P$ < .001 with trait anxiety ($\beta$ = .40, $P$ < .001) the only additional significant predictor variable. The contribution of SBHP to the model was non-significant ($\beta$ = .-.04, $P$ = .52). Both steps of the model are shown in Table 3.

**Table 3.** Summary of hierarchical regression analysis for variables predicting threat appraisal (N = 115)

| | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| | *B* | *SE B* | *β* | *b* | *SE B* | *β* |
| Self-efficacy | -.23 | .16 | -.11 | -.26 | .15 | -.12 |
| Control | -.10 | .10 | -.08 | -.12 | .09 | -.09 |
| MAp | -.09 | .14 | -.05 | -.03 | .12 | -.02 |
| MAv | .41 | .05 | .60** | .27 | .05 | .39** |
| PAp | .11 | .06 | .15 | .09 | .05 | .12 |
| PAv | .10 | .04 | .17* | .10 | .04 | .16* |
| Trait anxiety | | | | .92 | .17 | .40** |
| Life Satisfaction | | | | .08 | .06 | .08 |
| SBHP | | | | -.04 | .07 | -.04 |
| *R* | | .75 | | | .81 | |
| $R^2$ | | .56 | | | .65 | |
| $R^2$ Adjusted | | .53 | | | .62 | |
| $R^2$ change | | .56 | | | .10 | |
| *F* for change in $R^2$ | | 22.56 | | | 9.51 | |
| *Sig. F Change* | | $4.89 \times 10^{-17}$ | | | .000013 | |

*$p$ < .05 **$p$ < .01. . MAp = mastery-approach goals, MAv = mastery-avoidance goals, PAp = performance-approach goals, PAv = performance-avoidance goals, SBHP = strength of belief in a higher power.

With challenge appraisal as the dependent variable, multiple regression results showed a significant effect at Step 1 ($R^2$ = .18, $P$ < .01) with self-efficacy ($\beta$ = .22, $P$ < .05) the only significant predictor variable. The entry of trait anxiety, life satisfaction and SBHP at Step 2 marginally improved the model fit but not significantly, $\Delta R$ = .22, $P$ = .17 with no additional significant predictor variables. The contribution of SBHP to the model was non-significant ($\beta$ = .-.08, $P$ = .37). Both steps in the model are shown in Table 4.

**Table 4**. Summary of hierarchical regression analysis for variables predicting challenge appraisal (N = 115)

| | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| | *B* | *SE B* | *β* | *b* | *SE B* | *β* |
| Self-efficacy | .24 | .11 | .22* | .24 | .11 | .23* |
| Control | .09 | .07 | .15 | .11 | .07 | .18 |
| MAp | .07 | .09 | .08 | .05 | .09 | .06 |
| MAv | -.05 | .03 | -.14 | -.01 | .04 | -.04 |
| PAp | .04 | .04 | .12 | .04 | .04 | .12 |
| PAv | .000492 | .03 | .002 | -.002 | .03 | -.007 |
| Trait anxiety | | | | -.19 | .13 | -.17 |
| Life Satisfaction | | | | .04 | .05 | .09 |
| SBHP | | | | .05 | .05 | .08 |
| *R* | | .42 | | | .47 | |
| $R^2$ | | .18 | | | .22 | |
| $R^2$ Adjusted | | .13 | | | .15 | |
| $R^2$ change | | .18 | | | .04 | |
| *F* for change in $R^2$ | | 3.88 | | | 1.73 | |
| *Sig. F Change* | | .002 | | | .17 | |

*$p < .05$ **$p < .01$. . MAp = mastery-approach goals, MAv = mastery-avoidance goals, PAp = performance-approach goals, PAv = performance-avoidance goals, SBHP = strength of belief in a higher power.

## Discussion

### Results Summary

Despite research in both the sport psychology and clinical domains suggesting a potential relationship between religiosity/spirituality and anxiety, the results of this study do not strengthen this literature base. The findings of this study did not support the primary hypothesis that SBHP would predict anxiety. It also did not support the secondary hypothesis that is would predict control, and play a significant role in predicting cognitive appraisal. As such, these outcomes are at odds with Najah et al., (2017) and their argument that "belief in an omnipotent God…can be mentally beneficial" (p.187). It also challenges the findings of Czech et al. (2004) and their assertion that religion/spirituality allows athletes to "feel as if

they have some control over what happens to them on the playing field" (p.9). These results are particularly in opposition to the suggestion by Bell et al. (2009) that religion provides a framework that "allows relief from fear and anxiety on the basis of the athletes understanding (i.e., belief) that a supreme being is in complete control of the situation" (p.1). The implications of these results for both hypotheses will now be discussed, as well as a reflection on methodological issues.

**Primary Hypothesis**

SBHP did not predict anxiety, and neither was it correlated to these variables. One of the implications is it that religious/spiritual belief and religious/spiritual practice may result in different outcomes. With the exception of Najah et al. (2017) who made initial steps toward measuring supernatural belief, all the studies in the literature have primarily investigated the practice of religiosity/spirituality, such as prayer or mediation. Given the consistency of findings within both the sport psychology and clinical domains regarding a relationship with anxiety, these results may point toward the possibility that strength of belief in itself is unrelated to psychological benefits, and it is, in fact, other elements of religiosity/spirituality (such as religious practice, or the religious community) that determine psychological benefits. Czech et al's (2004) study, for example, suggests that prayer is accompanied by potential mechanisms (such as breathing exercises, ritualistic adherence to routine) that might help to explain any potential determinant of reduced anxiety or increased control, whilst Czech and Bullet (2007) have also found in their study of NCAA collegiate athletes, that prayer intensity and frequency increases with the importance of performance. Finally, Coakley (2003) suggests six possible reasons athletes utilize religious prayer, with reason number one being using it as a coping mechanism for stressful situations. The community aspect of religion has also been identified as a factor in reduced stress and anxiety in non-athlete populations, through increased acceptance and social support (Ellison, Boardman, William, & Jackson, 2001).

Another implication of this finding is that religiosity/spirituality does not result in beneficial psychological outcomes for athletes, regardless of whether it is derived through belief, practice or community. With the exception of Najah et al. (2017), every study in the literature base has been a qualitative exploration of religion. In an epistemological critique of the spirituality in sport literature, Crust (2006) points out that there is a danger that an overreliance on qualitative enquiry undermines a quantitative attempt at exploring whether these recurring themes are generalisable. There is a danger that the recurrent themes mined in qualitative research produces an availability bias (Kahneman, 1982), which shines a light on successful athletes that have derived a benefit from religiosity/spirituality, whilst an unstudied majority that has not derived these same benefits, are not equally represented in the literature. It could be argued that this second implication is less convincing, given the wealth of research in the clinical domain that has found a relationship between religiosity/spirituality and reduced anxiety, in meta-analyses (Gonçalves et al., 2015; Hackney & Sanders, 2003), Christian populations (e.g., Leondari & Gialamas, 2009), Muslim populations (e.g., Vasegh & Mohammadi, 2007), Jewish populations (e.g., Rosmarin, Pargament, & Mahoney, 2009) and in multiple countries (e.g., Lavrič & Flere, 2010).

**Secondary Hypothesis**

SBHP did not predict either challenge or threat appraisal, and nor did it predict the other variables in the TCTSA (self-efficacy, control, and achievement goals). As mentioned previously, this challenges previous research such as Czech et al. (2004) who found that athletes reported a greater sense of control over their performance as a result of

religiosity/spirituality. The relationship between religiosity/spirituality and control, cognitive appraisal, self-efficacy, and achievement goals has not been studied to the same degree as anxiety, given its central role in clinical research. As such, it is difficult to conceive any further conclusions. However, as with anxiety, it also a possibility that these factors do have a relationship with religiosity/spirituality but it is not with religious/spiritual belief, but rather with religious/spiritual practice and community. Future research is needed in order to reveal any potential relationships.

**Methodological Issues**

**Self-report measures**. In a very recent review of self-report measures with elite athletes, Saw, Kellmann, Main, and Gastin (2017) note that whilst many athletes habitually report within a narrow range of values, many others will fluctuate wildly. As such, because data was only collected at a single point in time, the results of this study may have been likely to change if more data points had been taken over a competitive season. Furthermore, given that the season had ended for many athletes (data was taken between April and June), the intensity of emotions being measured may have dissipated as they started to switch into 'holiday mode'. It must also be noted that many of the subjects were in elite academy programs where researchers have previously found a competitive environment for professional contracts can sometimes affect the accuracy of self-reported data (Turner et al., 2013).

**Measurement of challenge, threat, and anxiety.** Because of constraints in getting access to the athletes in this study, it was not possible to measure anxiety or arousal using physiological data, as is now common in contemporary challenge and threat studies (e.g., Turner et al., 2013; Moore et al., 2012; Vine et al., 2013) where measuring cortisol levels, cardiac output and stroke volume is now common practice. This added level of detail would have been optimal for assessing not only anxiety but also whether self-reported arousal was characteristic of challenge or threat states. In a very recent study, Cumming, Turner, and Jones (2017) have broken new ground by measuring self-reported challenge and threat appraisal with elite rowers over an entire season, and have called on researchers to measure longitudinally but with the physiological measures as well. Taking state anxiety measurements over multiple time periods would have built a more accurate picture of the athletes in this study, compared to the single measure of trait anxiety.

**Measurement of SBHP.** This is the first study to act on recommendations from Schuurmans-Stekhoven (2014) regarding the use of the CSI-Spirit (Isaacowitz et al., 2003) as a measure for religious/spiritual belief. Whilst the scale was found to have good internal reliability, it is also possible that new or bespoke measures of SBHP may produce a different set of results. This is also the first study in the area that has attempted to study the belief salience of both overtly religious, and non-religious but spiritual athletes, given the huge rise in non-religious but spiritual individuals reported in government censuses in recent years (Pew Research Centre, 2012; Pew Research Centre, 2014; Pew Research Centre, 2015). It is again possible that results may have differed if only overtly religious *or* spiritual athletes were studied.

**Measurement of performance**. The TCTSA was selected as the model of anxiety and arousal to underpin this study, and yet one of the key elements of the theory is its ambition to predict performance. However, due to the aforementioned constraints with access to the athletes, performance data was not obtained.

**The participant sample**. Differences in participant samples may have played a role in arriving at different results. This is the first study in the literature to restrict its targeting of athletes based on recommendations by Swann et al. (2015) and their category definitions of

elite athletes. It must be noted that the majority of studies in the literature have used collegiate athletes, whilst 84% of the sample in the present study played at a national standard or above, and 36% played at international level, with many of the subjects being professional athletes participating at the highest echelons of their sport, or in elite training academies. It could be argued that this sample, the majority of whom dedicate every waking hour to being an athlete, may differ somewhat from athletes recruited from student populations where participation is non-professional and balanced with full-time academic study.

After considering these methodological issues, it might be reasonable to argue that tweaks to the study design might result in findings that support the extant literature, as opposed to challenging it. As such, more research is needed to clarify the reasons behind the discrepancy.

**Summary**

In summary, the present study has found no correlations or predictive relationships between the strength of religious/spiritual belief, and a range of psychological factors including trait anxiety, control, and cognitive appraisal. Given the results are inconsistent with previous research, and the myriad of potential methodological issues, this study may contribute more questions than answers to the literature base. The foremost question might be whether the multitude of previous studies linking religiosity/spirituality to decreased anxiety, might highlight the benefits of religious/spiritual prayer, meditation or community support, opposed to religious/spiritual belief.

This area of sport psychology is in need of new research to add to the literature. In the last available review of the area, Maranise (2013) points out "little academic attention has been given to this rapidly-increasing popular culture phenomenon [sport and spirituality]" (p.83). Within this context, it must also be noted that following on from Crust's (2006) critique of the abundance of qualitative study in the area, the present research does contribute valuable initial quantitative evidence with a larger sample size. It is also the first study to contribute to the literature with a large-scale sample of elite athletes using recommendations by Swann et al. (2015) to define 'elite'. Another distinctive feature of the present study was its attempt to underpin the investigation of anxiety and control within the context of a contemporary model of stress and arousal, in the TCTSA. Furthermore, it is the first study in the literature to follow recommendations by Schuurmans-Stekhoven (2014) in using the CSI-Spirit (Isaacowitz et al., 2003) to isolate the measurement of SBHP. The literature is now in need of longitudinal studies and random control trials to push the reliability and credibility of the evidence further. Future studies might look to study religious/spiritual belief *and* practice, utilise physiological measurements to augment self-report data and measure multiple data points over the course of a competitive season. There might also be variation across different sports, religions, cultures, ages, and genders. Studies that isolate or investigate the contribution of these variables may also be valuable to the literature. Finally, as athletic performance is often an important interest to practitioners in sport psychology, future studies might want to replicate the present study in underpinning research with the TCTSA, and go a step further by measuring performance as well.

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**Conflict of Interest**

The author has not declared any conflicts of interest.

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