



Mindfulness and Nonattachment-To-Self in Athletes: Can Letting Go Build Well-being and Self-actualization?

Kelsey J. Lewis^{1,2} · Courtney C. Walton^{3,4} · Gavin R. Slemp² · Margaret S. Osborne^{1,5}

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Abstract

Objectives Many athletes seek to embody a mindful state when competing. However, amidst competitive pressures and demands to perform at their best, athletes report similar or even higher levels of psychological distress than community norms. Despite the widespread use of mindfulness as a sport performance strategy, few studies have examined the mechanisms behind mindfulness, and the role egoic fixation plays, in athlete well-being. The current study aimed to explore the role of mindfulness and nonattachment-to-self (NTS) in athlete well-being and self-actualization.

Methods An online survey was administered to 223 athletes (53.8% men), predominantly from Australia and New Zealand. Two-thirds of the sample were elite athletes. We used structural equation modeling to test a hypothesized model whereby NTS mediates the relationship between mindfulness and both well-being and self-actualization. We also tested an alternative model that positioned mindfulness as the mediator between NTS as the predictor, and well-being and self-actualisation as outcomes.

Results Both models exhibited similar fit to the data, although the alternative model displayed slightly better fit than the hypothesized model. Partial mediation was found for the hypothesized and alternative models, highlighting both as plausible pathways. Interestingly, NTS was found to exhibit a stronger effect on well-being and self-actualization than mindfulness, suggesting it may play a central role in athlete well-being.

Conclusion The findings highlight the need for researchers to consider mindfulness and NTS in tandem, acknowledging the role that egoic fixation plays in athlete mental health—especially when designing mindful-based interventions for athletes.

Keywords Mindfulness · Nonattachment · Well-being · Self-actualization · Sport

On the start line of the race, or in the last moments of the game, many athletes intend on greeting competitive pressure with unwavering focus. Yet, cultivating the optimal performance state is no easy feat. In competitive sport, there are multiple external

and internal stressors that can obstruct peak performance and well-being, including competitive and selection pressures, injuries, burnout, and maladaptive perfectionism (Reardon et al., 2019; Rice et al., 2016; Walton et al., 2021). Recent studies have found a considerable portion of elite athletes to be experiencing mental ill-health. For example, in a recent study, 17.7% of elite Australian athletes reported experiencing “high to very high” psychological distress, significantly higher than community norms of 9.5% (Purcell et al., 2020). With growing awareness on the critical importance of supporting athlete mental health (Vella et al., 2021), it is imperative for scientific research to provide evidence-based strategies for cultivating well-being (Reardon et al., 2019).

Amidst the popularization of mental training techniques for sporting performance and well-being, mindfulness has rapidly transitioned from an ancient Buddhist practice to a widely used intervention in sport (Gross, 2020). Sport-based mindfulness training commonly focuses on

✉ Margaret S. Osborne
mosborne@unimelb.edu.au

¹ Melbourne School of Psychological Sciences, The University of Melbourne, Melbourne, VIC, Australia

² Centre for Wellbeing Science, Melbourne Graduate School of Education, The University of Melbourne, 100 Leicester Street, Parkville, VIC, Australia

³ Elite Sports and Mental Health, 35 Poplar Road, Orygen, Melbourne, VIC, Australia

⁴ Centre for Youth Mental Health, The University of Melbourne, Melbourne, VIC, Australia

⁵ Melbourne Conservatorium of Music, The University of Melbourne, Melbourne, VIC, Australia

the ability to regulate present-moment attention during performance; cultivate awareness of the body, emotions, and thoughts; and retain acceptance of such experiences without judgment (Zhang et al., 2017). Several prominent sporting figures have endorsed mindful-based practices as key to their success, and there are now countless self-help books, meditation apps, and biofeedback devices that are advertised to boost athletic performance. This has prompted concerns around what is colloquially named “McMindfulness,” which refers to the self-centered focus on using mindfulness to gain an outcome (Purser, 2019).

Indeed, there are well-established benefits of mindful-based practices on well-being (van Agteren et al., 2021), and it is encouraging that athletes are being provided with opportunities to learn such practices. However, what Buddhists originally saw as a long-term practice for cultivating wisdom is, in some cases, being repackaged as a means of gaining a “competitive edge.” Some researchers have highlighted the denaturing of mindfulness from its Buddhist origins (e.g., Grossman & Van Dam, 2011), and others have argued that “competitive edge” approaches limit the potential of mindful practices (e.g., Gross, 2020).

It is interesting to consider what may be possible for athlete well-being and performance if mindfulness were to be seen as intertwined with other concepts like self-view, loving-kindness, and ethical action, as it is in Theravada Buddhism (the sect of Buddhism that we will refer to in this paper). A core tenet of Buddhism is impermanence, the recognition that our bodies, thoughts, and emotions are in constant flux (Sumedho, 1992). In this perspective, the desire to mentally hold onto something we like (*kama tanha*) or get rid of something that we do not like (*vibhava tanha*) or become something that we are not already (*bhava tanha*) are forms of attachment, which is deemed the root cause of suffering (Amaro, 2018). Sumedho (1992, p. 61) highlighted, “What you become, you can only become temporarily because becoming is a changing thing. It is not a permanent condition. So whatever you become, you will unbecome.”

From this perspective, using mindfulness to become the best athlete, or to feel ecstatic while performing, or to get rid of feelings of inadequacy, could eventually lead to suffering, given these experiences naturally come and go. In the Buddhist view, mindfulness cannot be related to gaining anything. It is rather a voluntary practice, free from ego-involvement, that guides one on their journey to realization of the “truth” (Sumedho, 2014). Unsurprisingly, it takes long-term commitment and dedicated practice to fully understand concepts like egoic attachment, perhaps explaining why mindfulness has been dissected as a singular concept in Western sport. The question remains as to whether a holistic approach towards mindfulness and Buddhist concepts, like attachment, could better integrate mindfulness in athletes’ lives.

Attachment, in the Buddhist sense, refers to clinging to thoughts, experiences, and concepts that are desirable, as well as avoiding the undesirable (Sahdra et al., 2010). Nonattachment therefore refers to the ability to engage with experience without fixating on things needing to be a certain way (Sahdra et al., 2010). A recently introduced subset of the nonattachment literature is “nonattachment-to-self” (NTS), referring to the ability to engage with self-related thoughts, concepts, and experiences without clinging to or avoiding them (Whitehead et al., 2018). Henceforth, we use the term “general nonattachment” when referring to the literature that measures nonattachment in relation to one’s life in general and “NTS” when referring to that which specifically addresses one’s self-concept.

NTS is based on the premise that the self is a concept. Hence, it is considered an illusion to believe in the self as a fixed entity (Whitehead et al., 2018). From this perspective, the notions of “I want” or “me progressing” are desires that arise from attachment to the fixed self (Amaro, 2018). NTS enables one to engage with self-related experiences without egoic fixation and importantly, “without a need for the self to be different than it is” (Whitehead et al., 2018, p. 2). When one is nonattached, the mental state that occurs is referred to as equanimity, an even-minded experience towards all of life’s happenings, desirable or undesirable (Desbordes et al., 2015). An athlete who competes with equanimity may have negative experiences without trying to suppress them, as well as positive experiences without getting over-excited (Desbordes et al., 2015). By remaining nonattached, an athlete may avoid over-arousal and subsequent performance deficits (Arent & Landers, 2003).

Zhang et al. (2021) are among the few scholars to have explored general nonattachment in athletes. They found it to be associated with increased well-being and decreased burnout. To our knowledge, NTS is yet to be studied in athletes, despite being an important topic to investigate. The requirement for athletes to consistently perform at their best may lead some athletes to rigidly define themselves by their sporting achievements, such that the idea of being an “athlete” makes up a significant portion of their identity (Coakley, 1992). It is thus unsurprising that self-related issues which may contribute to poorer mental health, including performance-based self-esteem (Gustafsson et al., 2018) and maladaptive perfectionism (Jowett et al., 2013; Koivula et al., 2002), are prevalent in sport. Hence, self-regulatory strategies that minimize egoic fixation, such as NTS, warrant attention in athletes.

Importantly, NTS does not mean an athlete must suppress their emotions or identity, nor must they adopt indifference towards their training. Much the opposite, NTS means an athlete can understand the self, forming an intricate awareness of their habitual patterns, quirks, and triggers, without getting caught up in egoic desire (Sumedho, 2014).

Detaching from egoic desire does not mean an athlete cannot work towards mastery of their sport. In Buddhism, intention (*chanda*), persistence (*viriyā*), planning (*citta*), and reflection (*vimamsa*) are all fundamental qualities to be developed for enlightenment, which represents the end of suffering and the ultimate goal (Amaro, 2018). Moreover, in the suttas of the Pali Canon (Bodhi, 2005, p.1376), the description of one pursuing the path to enlightenment “he makes an effort, arouses energy, applies his mind and strives” bears many similarities to the athlete. For those in the sporting world, the key point is that one’s intentions stem from an intrinsic drive to play one’s sport, rather than egoic attempts to cling, avoid, or control.

When considering the integration of NTS in athletes’ lives, it is important to clarify that NTS is a distinct skill to mindfulness. NTS refers to detaching from mental fixations, while mindfulness typically refers to the awareness of mental fixations (Elphinstone et al., 2021). Using confirmatory factor analyses (CFAs), studies have shown general nonattachment to belong to the same family of constructs as mindfulness, while being empirically distinct from mindfulness (Sahdra et al., 2016). In line with Desbordes et al.’s (2015) rationale, it is possible for an athlete to begin practicing mindfulness, and in doing so, they become more aware of their disruptive thought patterns and self-concepts. While they attempt to accept these, they may become increasingly frustrated because they have not developed the capacity to let go of these fixations, as they have not yet addressed the root cause from which these fixations are stemming—attachment. Long term, regular mindfulness practice may enable the athlete to see their mental fixations with greater clarity and wisdom, laying the foundation for NTS to evolve (Desbordes et al., 2015; Ho et al., 2022).

This relationship is also represented by the well-established mediational model of mindfulness leading to general nonattachment, which, in turn, leads to well-being-related outcomes (Ho et al., 2022). These findings concur with Vago and Silbersweig’s (2012) self-awareness, self-regulation, and self-transcendence (S-ART) framework, in which self-awareness (i.e., mindfulness) precedes self-regulation and self-transcendence (i.e., NTS). Following the S-ART framework, Verhaeghen (2019) found awareness predicted regulation and transcendence, which, in turn, predicted well-being.

To date, the mindfulness literature in sport has typically addressed performance outcomes, with less emphasis on well-being (Noetel et al., 2019). Well-being comprises the emotional, psychological, and social well-being of an individual, including the experience of positive emotions, purpose, and connection with others (Lamers et al., 2010). In sporting populations, mindfulness has been associated with increased well-being (Shannon et al., 2020; Zhang et al., 2017, 2021) and decreased stress (Vidic et al., 2017). In general populations, mindfulness (Mesmer-Magnus et al., 2017)

and mindful-based interventions (van Agteren et al., 2021) have been robustly associated with increased well-being.

Similarly, general nonattachment has been associated with increased subjective well-being and flourishing in athletes (Zhang et al., 2021). In broader populations, NTS has been associated with increased psychological well-being (Whitehead et al., 2018, 2021), and general nonattachment has been associated with increased life satisfaction, positive affect, and psychological well-being (Sahdra et al., 2010; Wang et al., 2016; Whitehead et al., 2019). Multiple studies have shown general nonattachment to mediate the relationship between mindfulness and increased well-being (Ho et al., 2022), including Zhang et al.’s (2021) study on athletes. As explained by the S-ART framework (Vago & Silbersweig, 2012; Verhaeghen, 2019), an athlete with high levels of mindfulness may be better able to regulate egoic fixations and, in turn, experience greater well-being and transcendence from self-concerns.

Less attention has been paid to the concept of self-actualization in sport, with few studies spanning past the 1980s, and even fewer including predictor variables (e.g., Ibrahim & Morrison, 1976). Self-actualization refers to the realization of one’s potential, characterized by a shift from egoic fixation to a deep sense of interconnectedness with others, appreciation for life and purpose in one’s pursuits (Kaufman, 2018; Maslow, 1950). According to Maslow’s (1943) hierarchy of human needs, self-actualization can be realized once an individual has fulfilled their needs for safety, belonging, connection, and self-esteem. A recently summarized list of Maslow’s (1950) characteristics of self-actualization include appreciation, acceptance, authenticity, equanimity, purpose, efficient perception of reality, humanitarianism, peak experiences, moral intuition, and creative spirit (Kaufman, 2018).

At first glance, detaching from the self appears inconsistent with self-actualization. However, a closer look at Maslow’s (1962/1998) theory of deficiency versus growth motivation highlights some similarities between NTS and self-actualization. Maslow (1962/1998) theorized that individuals with deficiency motives are driven by a perceived need deficit (e.g., pursuing success to resolve one’s lack of self-esteem) and subsequently live in the “deficiency realm” (D-realm). The D-realm may be likened to *bhava tanha* and *vibhava tanha*, the egocentric desires to become and get rid of. Conversely, those who are no longer motivated by deficiencies turn to growth motivation, encompassing the drive to explore, create, and love (Kaufman, 2018). Having moved beyond the need to become something, self-actualizers dwell in the present moment and hence live in the “being realm” (B-realm). What Maslow (1962/1998) described as the B-realm may represent the equanimous state that Desbordes et al. (2015) theorized to arise from nonattachment.

Both mindfulness (Beitel et al., 2014; Brown & Ryan, 2003; Whitehead et al., 2020) and general nonattachment (Whitehead

et al., 2020) have been positively associated with self-actualization in general populations. Interestingly, Whitehead et al. (2020) found support for the commonly theorized model, i.e., “mindfulness → general nonattachment → self-actualization,” and an alternative model, i.e., “general nonattachment → mindfulness → self-actualization.” These findings suggest that, just as mindfulness may promote nonattachment, the self-reflective properties of general nonattachment may promote mindfulness (Sahdra et al., 2010). From a sporting lens, an athlete who develops their ability to let go of egoic attachment may be better able to focus their attention on the task at hand, and in doing so, they may experience increased well-being and self-actualization.

Considering researchers have theorized how mindfulness and other Buddhist constructs may form reciprocal relationships (Grossman & Van Dam, 2011), we believe it is important to explore mindfulness and NTS as stemming from a larger Buddhist framework. Taking a holistic perspective towards these mental qualities, rather than dissecting them as singular components, may deepen our understanding of how athletes can cultivate them.

The present study aims to explore the roles that mindfulness and NTS play in athlete well-being—an area that few studies have examined. In line with the literature discussed, it is hypothesized that (*H1*) mindfulness and NTS will exhibit significant, positive effects on well-being and self-actualization in athletes, and (*H2*) NTS will mediate the relationship between mindfulness and both well-being and self-actualization in athletes (see Fig. 1). An alternative model, in which mindfulness mediates the relationship between NTS and both well-being and self-actualization, will also be tested.

Method

Participants

Of the 298 participants who provided informed consent to participate in the survey, 46 were excluded because they did not attempt the questionnaires, 26 were excluded because they provided incomplete responses, and another three were excluded because they did not meet the inclusion criteria of being 18 years and over. The final sample consisted of 223 participants, of which 48.9% resided in Australia, 48.0% resided in New Zealand, and 3.1% resided elsewhere. All participants identified as one of two binary genders (120 men, 103 women). Participants were aged between 18 and 65 years, with a mean age of 27.81 years ($SD=8.36$). An athlete’s highest level of representation was used to classify elite level status. In line with Swann et al.’s (2015) taxonomy, elite level ranged on a continuum from semi-elite (i.e., senior national or talent development programs)

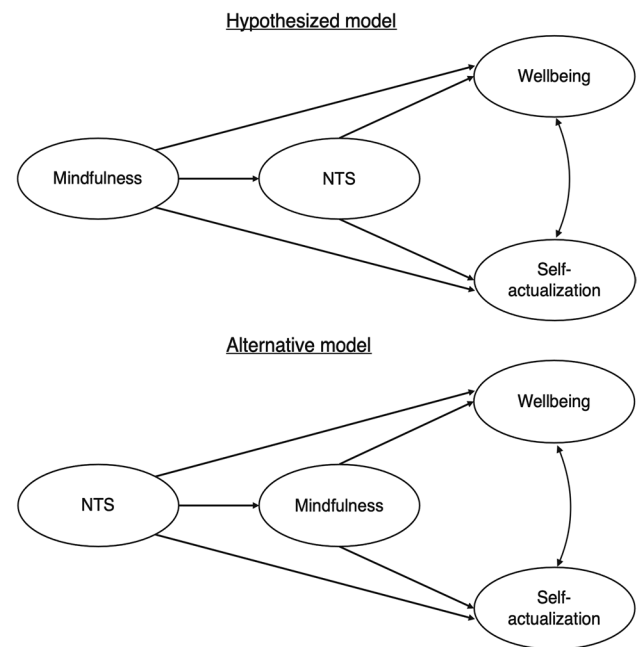


Fig. 1 Hypothesized and alternative models displaying mediational relationships to be tested

to world-class elite (i.e., success at international level), while non-elite level primarily consisted of club level athletes. 65.5% of the sample were elite athletes (26.9% senior international performers, 18.8% senior national performers, and 19.8% junior international or national performers) and 34.5% were non-elite athletes. Participants represented a total of 26 sports, with 75.3% representing team sports (field hockey, cricket, and soccer were most common) and 24.3% representing individual sports (athletics and road/trail running were most common). At the time of the survey, the mean time spent training per week was 10.97 h ($SD=7.56$). Regarding the spirituality of participants, 49.3% reported never meditating, 35.0% reported meditating infrequently, and 15.7% reported meditating frequently (i.e., weekly or daily). 16.1% of participants identified as religious, 26.0% identified as spiritual but not religious, and 57.9% identified as neither religious nor spiritual. There was no missing data in the final sample.

Procedure

Convenience sampling was used to recruit participants, primarily through word of mouth and social media advertisements. Athletes over the age of 18 who were practicing a competitive sport were invited to take part. High-performance coaches from Australia and New Zealand were also contacted to distribute the survey to the athletes they worked with. Participants provided online informed consent prior to participating. The survey took approximately 15–20 min.

Measures

Participants first answered a range of demographic questions. After this, participants completed the following questionnaires, as well as four additional questionnaires to be used in future projects. All questionnaires demonstrated sound internal consistency in the current study (see Cronbach's α and McDonald's ω in Table 1).

Mindfulness

We measured mindfulness with the 16-item Athlete Mindfulness Questionnaire (AMQ; Zhang et al., 2017). Items load onto three factors: present-moment attention (e.g., "I can maintain attention on my training"), awareness (e.g., "During training or competition, I can be immediately aware of my emotional changes"), and acceptance (e.g., "During training and competition, I can put up with unpleasant thoughts and feelings"). Items were rated on a 5-point Likert scale, from 1 (never true) to 5 (always true). The AMQ has demonstrated good internal consistency ($\alpha=0.82$; Zhang et al., 2021).

Nonattachment-To-Self

We used the 7-item Nonattachment-To-Self Scale (NTS Scale; Whitehead et al., 2018), which is a unidimensional measure of NTS. Participants were instructed to respond to the items in relation to their experiences in their primary sport (e.g., "I can experience my personal ups and downs without getting caught up in them"). Items were rated on a 7-point Likert scale, from 1 (strongly disagree) to 7 (strongly agree). The NTS scale has demonstrated sound internal consistency ($\alpha=0.88$; Whitehead et al., 2021).

Well-being

We used the 14-item Mental Health Continuum-Short Form (MHC-SF; Lamers et al., 2010) to measure general

well-being. Items load onto three factors: emotional well-being (e.g., feeling "happy"), psychological well-being (e.g., feeling "that your life has a sense of direction or meaning to it"), and social well-being (e.g., feeling "that you belonged to a community"). Participants indicated how often they experienced the statements across the past month on a 6-point Likert scale, from 0 (never) to 5 (every day). The MHC-SF has demonstrated sound internal consistency ($\alpha=0.89$; Lamers et al., 2010).

Self-actualization

We used the Characteristics of Self-Actualization Scale (CSAS; Kaufman, 2018), encompassing 30 items across ten factors of self-actualization: continued freshness of appreciation, acceptance, authenticity, equanimity, purpose, efficient perception of reality, humanitarianism, peak experiences, good moral intuition, and creative spirit. Participants reported the extent to which they agreed with the 30 statements on a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). The CSAS has demonstrated sound internal consistency ($\alpha=0.92$; Kaufman, 2018).

Data Analyses

All analyses were performed in R (version 4.1.0), using the R-Studio interface (version 1.4.1717). Descriptive statistics, internal consistency reliabilities, and correlational analyses were performed first using the psych package (Revelle, 2021). We then performed latent-variable SEM using the lavaan package (Rosseel, 2012) with bias-corrected bootstrapping and maximum likelihood estimation. Latent-variable SEM is advantageous over path analysis (on composite variables) in that it reduces the biasing effects of measurement error and enables one to distinguish goodness-of-fit between measurement and structural models (Coffman and MacCallum, 2005). Following Anderson and Gerbing's (1988) two-step approach to SEM, we first validated the measurement models before testing the structural components of the models. We then

Table 1 Descriptive statistics, internal consistency reliabilities, and intercorrelations

| Variables | <i>M</i> | <i>SD</i> | α | ω | 1 | 2 | 3 | 4 | 5 | 6 |
|------------------------------|----------|-----------|----------|----------|--------|--------|--------|--------|--------|---|
| 1. Mindfulness | 3.78 | .42 | .82 | .85 | – | | | | | |
| 2. Nonattachment-to-self | 31.16 | 7.88 | .88 | .91 | .38*** | – | | | | |
| 3. Well-being | 4.32 | .85 | .92 | .94 | .34*** | .41*** | – | | | |
| 4. Self-actualization | 112.02 | 13.29 | .89 | .91 | .43*** | .48*** | .56*** | – | | |
| 5. Meditation frequency | – | – | – | – | .12 | .22*** | .14* | .24*** | – | |
| 6. Spirituality ^a | – | – | – | – | .09 | .07 | .06 | .29*** | .32*** | – |

Following the authors' use of the respective questionnaires, mindfulness and well-being were calculated by averaging the items. NTS and self-actualization were calculated by summing the items

^aSpirituality was coded as 0 = not religious or spiritual and 1 = religious and/or spiritual

* $p < .05$; ** $p < .01$; *** $p < .001$

compared the fit of the hypothesized and alternative structural models using model fit statistics.

We used four global fit indices to determine model fit, including chi-square (χ^2), the comparative fit index (CFI; Bentler, 1990), the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993), and the standardized root mean square residual (SRMR; Kline, 2015). Cut-off values for acceptable fit have been much debated, but heuristics that are generally recommended are 0.95 or above for the CFI and 0.08 or below for SRMR and RMSEA (Hu & Bentler, 1999). We also assessed local fit by examining the shared variance between the indicators, using the standardized residual covariance matrix and modification indices. Once model fit had been assessed, we examined the structural path coefficients in the model, which were deemed significant if the confidence interval did not include zero.

Results

Descriptive Analyses

Descriptive statistics and correlations are presented in Table 1. As expected, mindfulness and NTS are significantly positively correlated with well-being and self-actualization. A number of demographic variables, including age, gender, ethnicity, elite level status, sport type, meditative practices, and spirituality, were examined in relation to the focal variables. The only demographic variables that were moderately correlated ($r > 0.20$; Gignac & Szodorai, 2016) with the focal variables were meditation frequency and spirituality. These were introduced as control variables when testing the structural model and are shown in Table 1.

Validating the Measurement Models

In line with the first step of Anderson and Gerbing's (1988) approach, we developed not only satisfactory, but also more parsimonious measurement models for each latent variable. Including every item for each latent variable would have resulted in an unsatisfactory participant-to-parameter ratio (Kline, 2015). Hence, we obtained three indicators for each latent variable, providing a just-identified measurement space for superior tests of structural model parameters (Matsunaga, 2008).

For measures with subscales (i.e., mindfulness, well-being, and self-actualization), facet-representative and domain-representative parceling was used to establish parsimonious measurement models (Kishton & Widaman, 1994; Little et al., 2013). Facet-representative parceling involves forming composite scores of the items that represent each sub-scale, while domain-representative parceling involves randomly allocating one item from each sub-scale to a parcel, such that each parcel reflects the global construct of

investigation (e.g., for measures with three factors, each parcel contains three items: one from factor *a*, one from factor *b*, and one from factor *c*). Rather than distorting the measurement model by forming parcels that are divorced from the established theory underpinning of the scale, both facet-representative and domain-representative parceling are advantageous in that they maintain the theoretical consistency with the original factor structure (Little et al., 2002, 2013). If facets share unique, facet-level variance with other variables in a model, domain-representative parceling is preferred, given the global parcels contain a large portion of the construct variance and less facet-specific variance (Little et al., 2013).

Facet-representative parceling was used for well-being, while domain-representative parceling was used for self-actualization and mindfulness. Considering the CSAS contains ten factors (which would have been too many indicators for our SEM model), we randomly allocated one item from each factor to form three parcels of ten aggregated items. The domain-representative approach was also used for mindfulness, after an initial CFA using the composite mindfulness sub-scales demonstrated shared facet-specific variance between mindful acceptance and NTS (as indicated by the modification indices). Considering domain-representative parceling is preferred in this situation (Little et al., 2013), we found the three highest loading items for each of the three mindfulness factors, and randomly assigned one item from each factor to a parcel, making three global mindfulness parcels.

NTS was the only measure that contained one principal factor and no subscales, so we used correlational parceling to establish parcels comprising of items that most strongly correlated with each other (Landis et al., 2000). This is recommended when items in a scale are known to covary (Little et al., 2013), and considering Whitehead et al. (2018) specified covariances between items 4 and 5, as well as items 6 and 7 in their development and validation of the NTS scale, we deemed this approach to be most appropriate. Upon examining the correlation matrix of the seven NTS items in our study, we found the most highly correlated pairs of items were reflective of that in Whitehead et al. (2018) and also expressed the most similar semantic properties. We hence established three parcels comprising of these pairs of items. We dropped the remaining item because this would have led to an uneven number of items between the parcels.

Having obtained three parsimonious indicators for each latent variable, all of which exhibited sound internal consistency ($\alpha = 0.82, 0.80, 0.85, 0.92$; $\omega = 0.82, 0.81, 0.85, 0.92$ for mindfulness, NTS, well-being and self-actualization, respectively), we tested the full measurement model using CFA with maximum likelihood estimation on the full sample. Correlations were specified between the four latent variables. The full measurement model exhibited sound global fit ($\chi^2(48) = 67.280, p = 0.034, CFI = 0.987, SRMR = 0.039, RMSEA = 0.042$ [95% CI 0.012–0.065]). The majority of

the standardized loadings were high ($\beta \geq 0.72$), showing factorial validity, although NTS parcel 2 was slightly lower ($\beta = 0.57$). Factor covariances ranged from 0.49 to 0.66, providing no evidence of multicollinearity.

Testing the Structural Models

After validating the parsimonious measurement models, we proceeded to the second step of Anderson and Gerbing's (1988) approach and tested the hypothesized and alternative structural models using SEM with bias-corrected bootstrapping. To control for covariates, meditation frequency was allowed to correlate with NTS and self-actualization, as well as spirituality with self-actualization.

The hypothesized structural model showed excellent fit to the data ($\chi^2(69) = 85.991$, $p = 0.081$, CFI = 0.989, SRMR = 0.044, RMSEA = 0.033 [95% CI 0.000 – 0.054]). Interestingly, the alternative structural model exhibited even better fit to the data ($\chi^2(69) = 83.449$, $p = 0.113$, CFI = 0.991, SRMR = 0.037, RMSEA = 0.031 [95% CI 0.000 – 0.052]). It is important to note that the fit of both models are very similar. A slight improvement to chi-square is observed in the alternative model; however, the other fit indices are identical when rounded to two decimal points. We hence present both models in Fig. 2.

We next examined the direct, indirect, and total effects of the models (see Table 2). As hypothesized in H1, mindfulness and NTS exhibited significant, positive effects on well-being and self-actualization. Interestingly, the direct pathways from NTS to well-being and self-actualization exhibited stronger effect sizes than that of mindfulness. Considering all direct and indirect pathways did not include zero in the confidence intervals, partial mediation was found in both the hypothesized and alternative models.

Discussion

The role mindfulness plays in athletic performance has garnered considerable attention in the scientific literature and public eye (Noetel et al., 2019). Few studies, however, have attempted to explore mindfulness as a predictor of well-being-related outcomes in athletes and as an intertwined construct with other Buddhist teachings. Considering the prevalent self-related mental health issues in athletes (Reardon et al., 2019), the current study aimed to illuminate the roles that NTS and mindfulness play in well-being-related outcomes in athletes. Rather than examining mindfulness as a singular construct, the current study sought to explore mindfulness and NTS as two constructs stemming from a holistic Buddhist framework.

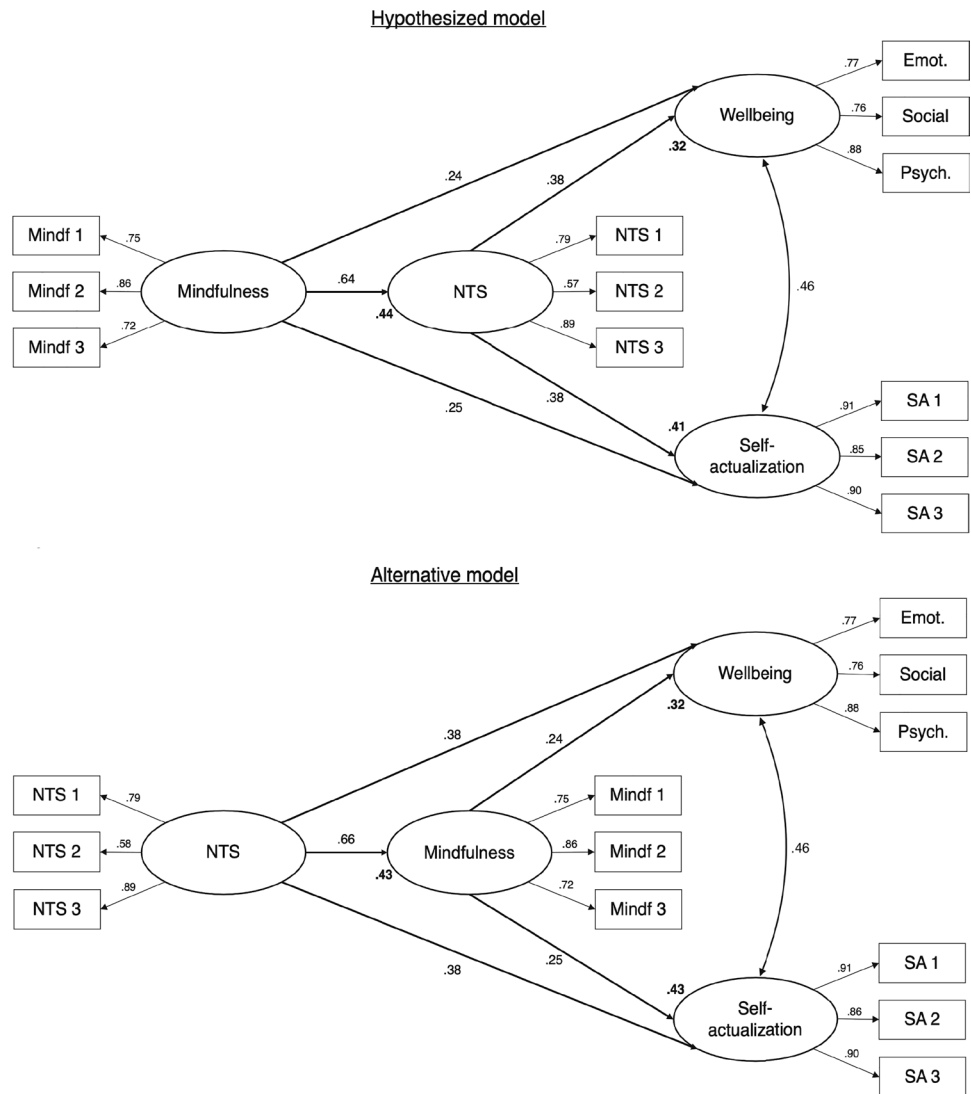
Supporting the first hypothesis (H1), mindfulness and NTS demonstrated significant positive effects on well-being and self-actualization. Interestingly, NTS exhibited a stronger effect on both well-being and self-actualization than mindfulness. Our second hypothesis (H2) proposed that NTS mediates the relationship between mindfulness and both well-being and self-actualization. While the hypothesized model exhibited excellent fit to the data, the alternative model, in which mindfulness mediates between NTS and both well-being and self-actualization, fits the data slightly better.

Few studies have investigated the alternative model; however, our findings are in line with Whitehead et al. (2020), who found support for the alternative pathway in the prediction of self-actualization. Despite scant focus on this model, the alternative pathway encompasses a theoretical explanation that, upon reflection of our findings, we consider to be just as compelling as the hypothesized pathway. Notably, the self-reflective properties of NTS may enable one to let go of egoic attachment, and in doing so, one's attention may be freed to focus on the present moment, promoting well-being and self-actualization (Whitehead et al., 2020). From a Buddhist perspective, once an athlete understands their egoic thoughts pertain to attachment, they cannot be controlled by them, nor be pulled into the past or future by them (Sumedho, 2014). Hence, understanding and releasing attachment to being the "best athlete" or wanting to win the game to impress selectors may enable the athlete to turn their attention more consistently to the here-and-now (Nakamura & Roberts, 2016). Free from egoistic concerns and more connected with the present moment, an athlete may then experience higher levels of well-being and self-actualization.

As represented in Maslow's (1962/1998) writings, releasing attachment to deficiency needs (i.e., releasing one's need to satisfy something that one currently lacks, like self-esteem) may enable one to ascend from a state of becoming to a state of being. In becoming (or the D-realm), the self is never enough; hence, considerable mental resources must be applied to bolster the ego. In being (or the B-realm), the self is abundantly enough. One no longer has to bolster the ego and is thus free to be in the present, open to exploration, purpose, and growth (Kaufman, 2018). If an athlete could find this even-minded plane from which to train, compete, and live, failure in sport may no longer become a self-defining experience. Rather than fearing mistakes they might make, the athlete can let go to the here-and-now in their pursuit of growth. In this sense, there is a possibility that NTS may be an important catalyst for athlete well-being and self-actualization.

However, it is important to note that our findings indicate that the hypothesized model, in which NTS mediates the relationship between mindfulness and both well-being and self-actualization, may also be a plausible pathway. Indeed, so have other studies in the general nonattachment literature (Ho et al.,

Fig. 2 The hypothesized and alternative structural models. Note: Mindf, mindfulness. NTS, nonattachment-to-self. Emot., emotional well-being. Psych., psychological well-being. SA, self-actualization. Values on arrows indicate β coefficients. Values in bold indicate R^2 for each latent variable. Hypothesized model global fit: $\chi^2(69) = 85.991, p = .081, CFI = .989, SRMR = .044, RMSEA = .033$ [95% CI .000–.054]. Alternative model global fit: $\chi^2(69) = 83.449, p = .113, CFI = .991, SRMR = .037, RMSEA = .031$ [95% CI .000–.052]



2022; Sahdra et al., 2016; Whitehead et al., 2019, 2020; Zhang et al., 2021). On a theoretical level, an athlete who maintains mindful attention, awareness, and acceptance of their internal experiences during sport performance may then experience increased nonattachment to their athletic identity. The even-mindedness that underpins NTS, in turn, may lead to increased well-being and self-actualization.

Another common theoretical explanation for the hypothesized pathway is that long-term mindfulness practice may promote the insight necessary for general nonattachment, which, in turn, promotes well-being (Desbordes et al., 2015; Sahdra et al., 2016). This explanation is less relevant to our study, given the cross-sectional nature of our data, and the fact that we focused on mindfulness during training and competition in sport, rather than in traditional forms of mindfulness practice, like meditation. When it comes to mindful sport performance, our findings suggest that both the hypothesized and alternative pathways could be equally plausible. Mindful sport performance may

decrease attachment to one’s athletic identity, just as NTS may free one’s attention for mindful sport performance. There is a possibility that both qualities may play interchangeable roles in the pathway towards well-being and self-actualization.

Could Mindfulness and NTS form a Reciprocal Relationship?

The question may not be whether mindfulness or NTS predicts the other, but rather how both interact and mutually contribute towards higher levels of well-being and self-actualization. Indeed, several researchers have suggested that mindfulness may form a mutually reinforcing relationship with other Buddhist constructs (Desbordes, et al., 2015; Grossman & Van Dam, 2011). Although it was beyond the realms of the current study to explore an upward spiral relationship between mindfulness and NTS (which would be best investigated with longitudinal data), the current results indicate the possibility of

Table 2 Direct and indirect effects in the hypothesized and alternative models

| Hypothesized model | | | | | Alternative model | | | | |
|---|---------|--------|------|-------|---------------------|---------|--------|------|-------|
| Pathways | β | 95% CI | | p | Pathways | β | 95% CI | | p |
| | | LL | UL | | | | LL | UL | |
| Mediator as outcome variable | | | | | | | | | |
| Mindf → NTS | .644 | .519 | .769 | <.001 | NTS → Mindf | .655 | .536 | .773 | <.001 |
| Well-being as outcome variable | | | | | | | | | |
| Mindf → Wellb | .240 | .008 | .472 | .043 | Mindf → Wellb | .244 | .014 | .474 | .038 |
| NTS → Wellb | .378 | .173 | .583 | <.001 | NTS → Wellb | .376 | .170 | .582 | <.001 |
| Mindf → NTS → Wellb | .243 | .105 | .381 | .001 | NTS → Mindf → Wellb | .160 | .006 | .314 | .042 |
| Total effect | .483 | .325 | .642 | <.001 | Total effect | .536 | .406 | .665 | <.001 |
| Self-actualization as outcome variable | | | | | | | | | |
| Mindf → SA | .248 | .046 | .450 | .016 | Mindf → SA | .248 | .048 | .447 | .015 |
| NTS → SA | .379 | .187 | .571 | <.001 | NTS → SA | .377 | .186 | .569 | <.001 |
| Mindf → NTS → SA | .244 | .111 | .377 | <.001 | NTS → Mindf → SA | .162 | .030 | .295 | .016 |
| Total effect | .492 | .367 | .617 | <.001 | Total effect | .540 | .428 | .651 | <.001 |

Mindf mindfulness, NTS nonattachment-to-self, Wellb wellbeing, SA self-actualization, CI confidence interval, LL lower limit, UL upper limit

both mental qualities as being facilitators of each other. Viewing mindfulness and NTS in tandem may constitute a different image of the mindful athlete. That is, an athlete who practices sport-based mindfulness in accordance with NTS may exhibit different characteristics to an athlete who practices sport-based mindfulness in accordance with egoic desire.

“Competitive edge” approaches to mindfulness, in which the athlete uses mindfulness to gain an “edge” on other athletes, may constitute a somewhat hollowed out version of mindfulness and may not contribute towards the high levels of well-being and self-actualization that we see in athletes who embrace even-mindedness towards their sporting self. Hence, it is important to consider the possibility that NTS may play a central role in the well-being and self-actualization of athletes. In the current study, NTS exhibited a stronger effect on both well-being and self-actualization than mindfulness, further accentuating the importance of detaching from egoic desire. In light of this finding, it may be necessary for athletes, coaches, and researchers to consider the role of NTS in sport and in broader life, especially given the prevalent mental health issues in athletes (Purcell et al., 2020) and self-related concerns (i.e., maladaptive perfectionism and performance-based self-esteem).

Perhaps the biggest challenge of an NTS intervention is determining how to effectively teach an inherently intuitive Buddhist framework to athletes. Considering the parallels between Acceptance-Commitment Therapy (ACT) and Buddhist philosophy (Hayes, 2002), ACT and the Mindfulness-Acceptance-Commitment approach (MAC; Gardner & Moore, 2004) may be useful interventions for cultivating NTS indirectly. ACT and MAC aim to develop psychological

flexibility, that is, the ability to remain present, without emotional suppression or avoidance, when acting in alignment with one’s values (Hayes et al., 2011). Interestingly, researchers have agreed that general nonattachment can be expressed and observed as psychological flexibility (Sahdra et al., 2010). ACT and MAC are well-established approaches that have been shown to promote mindfulness, psychological flexibility, well-being, and performance (Goodman et al., 2014; Gross et al., 2018; Josefsson et al., 2019) and may therefore promote NTS indirectly.

It may also be beneficial for athletes to learn NTS directly. Considering NTS demonstrated a stronger effect on well-being and self-actualization than mindfulness, it may be necessary to integrate NTS into existing athlete mindfulness interventions, or to devise new interventions, inspired by Buddhist teachings on the self. If NTS does indeed play an antecedental role, it may be important to design an intervention that considers NTS as a catalyst of well-being and self-actualization. In this scenario, NTS and mindfulness could play paired roles to support the deeper integration of these qualities in athletes’ lives. Athletes may therefore be less likely to assume a “competitive edge” view on mindfulness because they would have already been educated about NTS, which, at its core, is concerned with letting go of the very egoic views that can underpin “competitive edge” approaches. Maslow’s (1962/1998) D-realm versus B-realm theory could be an apt framework for teaching the release of egoic fixation and subsequent integration in the B-realm. To do so, further empirical exploration of Maslow’s (1962/1998) theory would be needed.

Limitations and Future Directions

There are certain limitations of the current study that need to be acknowledged. First, the cross-sectional data was taken from one time point, meaning the causal relations among the focal variables cannot be determined. Given the nature of our cross-sectional SEM study, we cannot make strong claims about causal processes (Bollen & Pearl, 2013). In this vein, both the hypothesized and alternative models in our study appear to be plausible, presenting an opportunity for future research to explore using study designs that enable stronger causal inferences. This might involve, for example, longitudinal panel data designed to examine cross-lagged and reciprocal relationships over time (Hamaker et al., 2015). Such analyses would shed important light on which variables would best be considered antecedents and outcomes, or whether reciprocal relationships exist.

Second, the current study consisted exclusively of self-report measures taken at one time point, which can create common method variance in the data and potentially inflate mean effect sizes (Podsakoff et al., 2003). Future studies could employ preventative measures to reduce said biasing effects by, for example, introducing a time lag between the antecedent, mediator, and outcome variables.

Third, NTS' parcel 2 displayed a lower standardized factor loading than the other parcels. This parcel consisted of the lowest loading items in Whitehead et al.'s (2018) development and validation of the NTS scale. There may hence be an element of measurement error, which may be effecting the reliability of the NTS scale. While the total parceled solution for NTS in our SEM analysis displayed sound internal consistency reliability, future research may be needed to validate the NTS scale in different samples.

Fourth, our inclusion of self-report measures from general and sporting contexts may have potentially biased the results. For example, an alternative explanation for NTS being a stronger predictor than sport-specific mindfulness could be that the NTS scale was designed as a general measure and may thus correlate more strongly with the general-context outcome measures. Future studies could include both sport and general mindfulness measures to examine any differences regarding general and sporting outcomes.

Fifth, we sampled a broad range of athletes, with level of sporting representation ranging from international performers to club-level athletes, and age ranging from 18 to 65 years. While age and level of representation were only weakly correlated with the focal variables (as per Gignac & Szodorai, 2016), and subsequently were not included in the SEM, there is still a possibility that athletes could have responded to the survey differently based on these demographic variables. Notably, mindfulness and general nonattachment have been known to increase with age (Ho et al., 2022; Sahdra et al., 2016), as has self-actualization

(Ivtzan et al., 2013). There may also be differences in NTS among elite and non-elite athletes. Given the stakes are higher to perform at their best, elite athletes may be more likely to experience a narrow athletic identity than non-elite athletes. We recommend future studies narrow their sample to target specific age groups and levels of eliteness.

Sixth, participants' prior experience with mindfulness practice and meditation may have influenced their understanding of the key words used in our measures (e.g., present-moment attention, awareness, acceptance). A notable challenge arising from this is the potential discordance between a participant's "true" level of mindfulness and their perception of how mindful they think they are (Grossman & Van Dam, 2011). When measuring mindfulness, we opted to use the AMQ (Zhang et al., 2017) because it was designed and validated for athletes, thereby entailing sport-specific language that may be more commonly understood than that used in meditation focused measures. Nevertheless, athletes with differing experiences in mindfulness, meditation, religion, and spirituality may have interpreted keywords differently across not just the AMQ, but also the NTS scale and the CSAS. This can have a biasing effect on the results and is a common issue of self-reported mindfulness measures (Grossman & Van Dam, 2011).

It is inherently difficult to use self-report measures to capture intuitive concepts like mindfulness and NTS. For example, we observed shared facet-specific variance between mindful acceptance and NTS (before domain-representative parceling was used for mindfulness), highlighting a similarity between these constructs. Conceptually, acceptance tends to be applied in relation to negative internal experiences (McAndrews et al., 2019), while NTS applies to all self-related experiences, and addresses the root cause from which fixations stem (Whitehead et al., 2018). However, with multiple definitions of mindfulness in the literature, and overlapping constructs like nonattachment and psychological flexibility, it can be difficult to determine whether self-report questionnaires capture the constructs they purport to measure (Desbordes et al., 2015; Van Dam et al., 2018). To better address semantic complexities, future studies could explore mindfulness and NTS in qualitative research (Grossman & Van Dam, 2011).

After all, determining how to communicate an NTS intervention may pose not only the greatest challenge, but also the greatest opportunity for the deeper integration of mindfulness into athletes' lives. Many athletes may seek to cultivate unwavering calmness; however, amidst high-pressure sporting environments and without an understanding of egoic fixation, they may not have the necessary resources to do so. It is imperative that we build the bridge for athletes to move beyond the realm of deficiency, closer towards the realm of being.

Author Contribution KJL designed and executed the study, performed the analysis and wrote the original and revised manuscript. CCW collaborated in the study design, methodology and writing of the paper. GWR collaborated with the statistical model design, data analyses and writing of the paper. MSO collaborated in the study design, methodology and writing of the paper.

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Data Availability Supporting data are not available as participants of this study were not asked to consent for their data to be shared publicly.

Declarations

Ethics Approval Human research ethics approval was obtained from the University of Melbourne to conduct the study. Ethics approval reference: 2021–21406-17406–3.

Informed Consent All participants gave informed consent prior to their inclusion in the study.

Conflict of Interest The authors declare no competing interests.

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