

Examining an Adapted Version of Ryff's Scales of Psychological Well-Being in Sport

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A Study Design
B Data Collection
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abstract

Background: In the sport literature, the majority of studies have failed to distinguish between general well-being and well-being specific to the sport context. This is partly because of a lack of sport specific measurement tools. The purpose of the present study was to adapt an existing eudaimonic well-being global instrument (i.e., Scales of Psychological Well-Being) for the sport context.

Material and methods: The study included two phases. A panel of nine experts assessed the content relevance of each of the modified items of three scales of the SPWB in Phase 1 and a set of 19 items was retained with modifications. Four hundred athletes ($M_{age} = 25.07$, $SD = 7.34$), participating in a variety of sports participated in Phase 2 and a three-factor model was examined using confirmatory factor analysis.

Results: The results revealed poor model fit and high inter-factor correlations (above .9). Thus, a two-factor model and one-factor model were also tested with results revealing again poor fit to the data.

Conclusions: The data from the modified items failed to confirm that the global measure of Scales of Psychological Well-Being can be adapted for the sport context. The need for the development of a sport-specific instrument is discussed.

Key words: eudaimonic well-being, validity, sport.

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INTRODUCTION

It is widely accepted that physical activity and participation in sport is linked to various physiological and psychological benefits [e.g., 1, 2], including but not limited to health related behaviors, cognitive development, enhanced self-confidence and self-esteem, high energy and vitality, and lower risk of depression. Sport provides opportunities for athletes to experience psychosocial development, thus promoting optimal functioning [3]. The World Health Organization emphasizes the concept of mental health as the foundation of well-being in which individuals realize their potential and increase their optimal functioning [4].

Research in different disciplines has articulated that well-being is an ambiguous, complex and difficult construct to define, without a universally accepted definition [5–7]. However, there is a consensus that well-being has been derived from two philosophical views: the hedonic perspective and the eudaimonic perspective [7]. The hedonic perspective, initiated from the Greek philosopher Aristippus, maintains that the fundamental goal of life is to achieve the maximum amount of pleasure and happiness [7]. Based on this, philosophers and psychologists who adopted the hedonic tradition have equated hedonic pleasure with well-being and have used the term of subjective well-being to assess the construct [8]. Specifically, subjective well-being refers to (i.e., cognitive judgments and affective responses) individuals' beliefs and feelings about their own lives and consists of life satisfaction, the presence of positive affect, and the absence of negative affect [9, 10].

Drawing from Aristotle, the eudaimonic view focuses on eudaimonia which refers to the highest human good and requires reaching the best that is within us, living a complete human life, and self-realization. Aristotle emphasized functions, processes, and values in order to define well-being [11]. Eudaimonic theorists posit that living well would lead to pleasure but not all antecedents of pleasure entail eudaimonic living and would not promote well-being [12]. Thus, subjective happiness does not fully conceptualize well-being [11].

Eudaimonistic views are at the core of Self-Determination Theory (SDT; [13, 14]), a theory of full functioning and motivation. The SDT perspective, proposes that individuals choose their behavior in an attempt to satisfy their basic psychological needs (i.e., autonomy, competence, and relatedness) which are the foundations of optimal development, integrity, and well-being [14]. According to this, the fulfillment of the psychological needs is equally essential and beneficial to all individuals, and the more the individual's basic needs are satisfied, the more one's levels of self-determined motivation may increase (e.g., intrinsic motivation), leading to enhanced well-being and healthy human functioning [14], whereas need thwarting diminishes well-being [15]. In other words, psychological need satisfaction predicts optimal, thriving functioning [16].

Ryff and colleagues [17–21] presented a multidimensional model of well-being based on philosophical underpinnings of eudaimonia and conceptual links of existential, humanistic, developmental, and clinical psychology regarding positive functioning. In particular, they identified six distinct components to describe well-being, which were: self-acceptance (i.e., awareness and acceptance of both personal strengths and limitations), positive relations with others (i.e., having quality interpersonal relationships with significant others),

autonomy (i.e., a sense of self-determination, independence, and regulation of behavior), environmental mastery (i.e., the capacity of managing effectively life situations), purpose in life (i.e., beliefs and goals asserting that life is meaningful), and personal growth (i.e., a sense of continued development one's potential).

To forge connections between the different conceptualizations and operationalizations of eudaimonic well-being, Huta and Waterman [22] discussed the points of convergence and divergence that exist between Ryan and Deci [7, 14] and Ryff's [17–19] work. Most pertinent to the present discussion, Huta and Waterman highlighted the contrast in operationalization for eudaimonia between these researchers. Ryan and Deci have used various scales to assess the eudaimonic elements which are based on the SDT framework. For example, the General Causality Orientation Scale [23] has been used to assess autonomy orientation, the Aspiration Index [24] to measure intrinsic aspirations (i.e., meaningful relationships, personal growth, and community contributions), the Subjective Vitality Scale [25] to assess subjective vitality at both the individual difference level and the state level, the Mindful Attention and Awareness Scale [26] to measure mindfulness, and the Basic Psychological Needs Scale [27] to assess the need for autonomy, competence, and relatedness. In contrast, Ryff [17] developed the Scales of Psychological Well-Being (SPWB) to measure the six components she and her colleagues [20, 21] believe comprise eudaimonic well-being.

Since Ryff [17] developed the SPWB, more than 500 publications have used the instrument and multiple studies conducted in different cultural contexts have provided support for the six-factor model of well-being [e.g., 20, 28, 29, 30, 31]. For example, van Dierendonck [30] indicated a reasonable model fit ($\chi^2_{(693)} = 1110.76$, $AIC = 1302.20$, $NNFI = .87$, $CFI = .88$, $SRMR = .06$), while Cheng and Chan [28] reported a moderate fit ($\chi^2_{(237)} = 1430$, $AIC = 1945$, $CFI = .93$, $SRMR = .06$) in a Chinese version of the SPWB.

However, a number of studies have raised concerns about the SPWB. In particular, some studies have suggested that it does not represent six distinct dimensions [e.g., 32–34]. The 20-item per scale version failed to produce a six-factor solution in a study by Kafka and Kozma [32]. Specifically, an Exploratory Factor Analysis produced 15 factors, whereas when the factors were limited to six, the items failed to load based on Ryff's [17] structure. Springer and colleagues [33, 34] highlighted the overlap among four of the six dimensions (i.e., personal growth, purpose in life, self-acceptance, and environmental mastery). For example, Springer and Hauser [33] used data from the Wisconsin Longitudinal Study (WLS), and analyses revealed high correlations between purpose in life and self-acceptance (.97), self-acceptance and environmental mastery (.97), and purpose in life and environmental mastery (.96). Although van Dierendonck [30] and Cheng and Chan [28] indicated that the best model fit was the six-factor model, they found factor correlations approaching .90 [30], and between .69 and .93 [28] among these dimensions, respectively. Van Dierendonck et al. [31] also reported that purpose in life demonstrated high intercorrelations with self-acceptance (.97) and environmental mastery (.89), and personal growth showed relatively lower correlations with self-acceptance (.74), environmental mastery (.74), and purpose in life (.79).

In the sport literature, the majority of studies have failed to distinguish between general well-being and well-being specific to the sport context despite the established relationship between sport participation and well-being (for a review see [6]). The life of an athlete especially on elite level can be characterized as highly demanding, challenging, and stressful. The high dedication to sport with excessive hours of training despite illness, pain, or injuries, nutrition restrictions, and limited personal and social life may lead athletes to undergo difficult sport experiences and diminished well-being [35]. Therefore, assessing sport-specific well-being is warranted.

The Positive and Negative Affect Schedule (PANAS; [36]) and the Satisfaction with Life Scale (SWLS; [37]) are two global measures of subjective well-being that have been employed with athletes [e.g., 38–42]. A few studies have used the SPWB [17] to assess athletes' eudaimonic well-being but this is again only a global measure. For example, Lundqvist and Raglin [42] used the 18-item version of SPWB to examine the effects of basic need satisfaction, motivational climate, and personality on elite active orienteers' well-being. Additionally, Ferguson, Kowalski, Mack, and Sabiston [43] explored self-compassion and well-being in young women athletes, by employing the 84-item version of SPWB, and Baltzell and Akhtar [44] investigated the effectiveness of a mindful meditation training intervention on well-being of women soccer players by assessing the 54-item version of SPWB. The Subjective Vitality Scale (SVS; [25]) has been broadly used in sport psychology studies to measure subjective vitality as an indicator of athletes' eudaimonic well-being [e.g., 3, 45–48]. Despite the fact that SVS is a validated measure, it only captures one aspect of the eudaimonic viewpoint. The lack of an instrument for assessing athletes' well-being in the sport context has been highlighted [6, 49].

Given the lack of measures of eudaimonic well-being specific to sport, the purpose of the present study was: a) to adapt an existing global measure of eudaimonic well-being (i.e., SPWB; [17]) for the sport context and to assess the content validity of each modified item (Phase 1), and b) to examine the factorial validity of the sport specific version of the SPWB (Phase 2).

Given our research was grounded in SDT, only three out of six subscales of the SPWB were adapted (i.e., personal growth, purpose in life, and self-acceptance) for a number of reasons. Personal growth and purpose in life dimensions of well-being constitute the pillars of eudaimonia [18, 21]. Haybron [50] commented that Aristotle places purpose at the center of eudaimonia, because the belief of having goals and a purposeful life leads to the sense that one's life has meaning. Moreover, trying to answer which is the highest good (i.e., eudaimonia or hedonia), Huta [51] described eudaimonia as the highest path to personal fulfillment and stated that "It's simply beautiful to try to do the right thing, try to grow" (p. 225). Additionally, contemporary eudaimonism characterized eudaimonia as a meaningful living in which all individuals have the responsibility to know themselves and strive to self-realization [21]. Accordingly, these dimensions (personal growth, purpose in life, and self-acceptance) were adapted.

Ryff's [17] multidimensional model of eudaimonic well-being and SDT as a model of eudaimonia are included under the umbrella of the contemporary eudaimonic psychological theories of well-being [52]. Both approaches incorporate the meaning of being fully functioning and eudaimonic [7]. That means that individuals can achieve optimal functioning through the pursuit

of eudaimonic goals, the engagement in activities that foster eudaimonic living, and the satisfaction of the three psychological needs [52]. Accordingly, autonomy, environmental mastery, and positive relations with others as measured by the SPWB align with SDT by exhibiting similarities with the three basic psychological needs. Considering SDT's notion that the basic psychological needs are essential in fostering well-being (whereas Ryff uses these needs to define well-being; [7]), and that they have been demonstrated as positive predictors of well-being indicators in sport participation [45], the autonomy, environmental mastery, and positive relations with others subscales of SPWB were not adapted. These constructs can easily be assessed through the administration of existing sport specific measures of psychological needs satisfaction [53].

PHASE 1

The purpose of Phase 1 was to adapt three subscales of Ryff's [17] SPWB for the sport context and assess the item-content validity (relevance) of the modified subscales.

MATERIAL AND METHODS

Participants. Nine expert judges ($n_{males} = 7$, $n_{females} = 2$, $M_{age} = 45.67$, $SD = 10.42$) participated in the study. Participants included five academic researchers who have published multiple articles related to SDT and currently are conducting research based on this framework, and four academic researchers who have published multiple articles related to eudaimonic well-being and currently are conducting research on it.

Procedure. Approval for the study was granted by the institutional research ethics board. Three investigators adapted the three scales (i.e., Personal Growth, Purpose in Life, and Self-Acceptance) of the SPWB [17] to the sport context. There were 14 items per subscale (see Table 1 for the initial list of the 42 modified items).

The investigators contacted a panel of expert judges ($N = 17$) via email to determine their willingness and availability to participate in an online survey. The nine aforementioned experts agreed to assess the item-content validity (relevance) of each of the modified items of the SPWB. Participants were forwarded a link to an internet based survey and asked to complete it.

After answering demographic questions, participants were asked to evaluate (yes or no) the technical qualities (i.e., length, readability, and clarity) of the modified items of the three scales (i.e., Personal Growth through Sport, Purpose in Sport, and Self-Acceptance in Sport) which have been reported to be important scale considerations [54]. More specifically, the experts were asked to assess the length ("Do you feel that any of the items are exceptionally lengthy?"), readability ("Do you feel that any of the items are too difficult to read?"), and clarity ("Do you feel that any of the items are unclear?") for each modified item. A comment box was also provided so the experts could explain any of their answers.

The last section of the questionnaire was related to the relevance of each item in assessing eudaimonic well-being in sport. Each expert first read the definition of each construct, and then rated (not relevant, relevant but needs

minor alternations, or very relevant and succinct) how relevant the content of each item was to measuring each of the three constructs [55]. Again, the judges had the option to explain any of their answers by using the comment box under each item. At the end of the survey, the participants were provided with another comment box so they could provide any further comments.

RESULTS AND DISCUSSION

The data were inspected to determine if there were any missing responses or outliers. Experts' feedback (i.e., ratings, comments, suggestions) on all sections of the questionnaire was considered. In regards to the technical qualities of the items, all experts answered the three questions for each item. Three experts indicated that PGS4 (selected once), PGS10 (selected twice), and PIS1 (selected once) were lengthy items. Four experts indicated that PGS4 (selected four times), PGS5 (selected once), PGS8 (selected once), PGS10 (selected once), PIS2 (selected once), SAS10 (selected once), and SAS12 (selected once) were difficult to read. Additionally, six participants identified unclear items; PGS4 and PGS5 were reported by two experts, PGS6, PGS8, PGS11, PGS12, PGS13, PIS1, PIS4, PIS5, PIS12, PIS14, SAS1, SAS2, SAS5 were selected once, and SAS13 was selected by two participants.

The majority of the experts assessed the item-content validity of each modified item (i.e., 42 items in total). One SDT expert did not rate one item from PGS and another SDT expert did not rate one item from PIS. One eudaimonic well-being expert did not assess any item from the SAS subscale. Items PGS3, PSI8, and PSI13, and items PGS6, PGS11, and PIS4 were identified by eight (88.9%) and seven experts (77.8%) respectively as very relevant and succinct.

Three reviewers recommended eliminating or rewording negative items. Research has shown disadvantages of combining positively and negatively worded items in scales [56]. For example, respondents may make a mistake by agreeing with a negative statement while they disagree, or they find difficult to understand the difference with the positively worded items and they misinterpret the negatively worded items [57]. Consequently, these problems may lead to loss of internal reliability in the scales [58]. Another potential disadvantage is that researchers may make errors in coding by forgetting to reverse the scoring of the negative items [57]. Based on this, six items from PGS (PGS1, PGS4, PGS6, PGS10, PGS13, and PGS14), seven items from PIS (PIS2, PSI3, PSI5, PSI6, PSI7, PSI11, PSI14, and seven items from SAS (SAS3, SAS4, SAS7, SAS9, SAS10, SAS11, and SAS14) were identified as negatively scored items and were deleted. Item PIS10 ("Some people wander aimlessly through their sporting life, but I am not one of them") and item SAS12 ("In sport the past had its ups and downs, but in general, I wouldn't want to change it") which were negatively worded but positively scored were also deleted.

A pool of 20 items was retained. Considering both ratings (only 44.4% of responses rated this items as very relevant and succinct) and comments (e.g., the item was characterized as double barreled or depersonalized) by the experts, item PGS7 was also deleted ("In my view, athletes of every age are capable of growing and developing"). The majority of the responses of the reviewers were found to have a high level of agreement regarding the 19 retained items. Specifically, 67% and 33% of the total responses indicated that the items were very relevant and succinct, and need minor alternations, respectively.

Table 1. Initial Set of the 42 Modified Items of SPWB from Phase 1

| Item No. | Item | Decision |
|--------------------------------------|--|----------|
| Personal Growth through Sport | | |
| PGS1 | I am not interested in activities that will expand my horizons in sports. | Deleted |
| PGS2 | As an athlete, I feel that I continue to learn more about myself as time goes by. | Retained |
| PGS3 | I am the kind of person who likes to try new things in sport. | Retained |
| PGS4 | I don't want to try new ways of doing things in my sport(s) — my life as an athlete is fine the way it is. | Deleted |
| PGS5 | I think it is important to try new sport experiences that challenge how you think about yourself and the world. | Retained |
| PGS6 | When I think about it, I haven't really improved much as a person through sport over the years. | Deleted |
| PGS7 | In my view, athletes of every age are capable of growing and developing. | Deleted |
| PGS8 | With time, I have gained a lot of insight about life through sport that has made me a stronger, more capable person. | Retained |
| PGS9 | I have the sense that I have developed a lot as a person through sport(s) over time. | Retained |
| PGS10 | I do not enjoy being in new sport situations that require me to change my old familiar ways of doing things. | Deleted |
| PGS11 | For me, sport has been a continuous process of learning, changing, and growth. | Retained |
| PGS12 | I enjoy seeing how my views as an athlete have changed and matured over the years. | Retained |
| PGS13 | I gave up trying to make big improvements or changes in my life as an athlete a long time ago. | Deleted |
| PGS14 | In sport there is truth to the saying you can't teach an old dog new tricks. | Deleted |
| Purpose in Sport | | |
| PIS1 | I feel good when I think of what I've done in sport in the past and what I hope to do in the future. | Retained |
| PIS2 | I live life in sport one day at a time and don't really think about the future. | Deleted |
| PIS4 | I have a sense of direction and purpose in sport. | Retained |
| PIS5 | My sport daily activities often seem trivial and unimportant to me. | Deleted |
| PIS6 | I don't have a good sense of what it is I'm trying to accomplish in sport. | Deleted |
| PIS7 | I used to set goals for myself in sport, but that now seems like a waste of time. | Deleted |
| PIS8 | I enjoy making plans for my future in sport and working to make them a reality. | Retained |
| PIS9 | I am an active person in carrying out the plans I set for myself in sport. | Retained |
| PIS10 | Some people wander aimlessly through their sporting life, but I am not one of them. | Deleted |
| PIS11 | I sometimes feel as if I've done all there is to do in my sport(s). | Deleted |
| PIS12 | My aims in sport have been more a source of satisfaction than frustration to me. | Retained |
| PIS13 | I find it satisfying to think about what I have accomplished in sport. | Retained |
| PIS14 | In the final analysis, I'm not so sure that my sporting life adds up to much. | Deleted |
| Self-Acceptance in Sport | | |
| SAS1 | When I look at the story of my life in sport, I am pleased with how things have turned out. | Retained |
| SAS2 | In general, I feel confident and positive about myself as an athlete. | Retained |
| SAS3 | I feel like many of the people I know have gotten more out of sport than I have. | Deleted |
| SAS4 | Given the opportunity, there are many things about myself as an athlete that I would change. | Deleted |
| SAS5 | I like most aspects of my personality as an athlete. | Retained |
| SAS6 | I made some mistakes in the past in sport, but I feel that all in all everything has worked out for the best. | Retained |
| SAS7 | In many ways, I feel disappointed about my achievements in sport. | Deleted |
| SAS8 | For the most part, I am proud of who I am as an athlete and the life I lead in sport. | Retained |
| SAS9 | I envy many people for the lives they lead in sport. | Deleted |
| SAS10 | My attitude about myself as an athlete is probably not as positive as most athletes feel about themselves. | Deleted |
| SAS11 | Many days I wake up feeling discouraged about how I have lived my life in sport. | Deleted |
| SAS12 | In sport the past had its ups and downs, but in general, I wouldn't want to change it. | Deleted |
| SAS13 | When I compare myself to friends and acquaintances in sport, it makes me feel good about who I am as an athlete. | Retained |
| SAS14 | In sport everyone has their weaknesses, but I seem to have more than my share. | Deleted |

PGS = Personal Growth through Sport; PIS = Purpose in Sport; SAS = Self-Acceptance through Sport.

Table 2. Initial Set of the 42 Modified Items of SPWB from Phase 1

| Item No. | Item |
|-------------------------------|---|
| Personal Growth through Sport | |
| PGS2 | As an athlete, I feel that I continue to learn more about myself. |
| PGS3 | I am the kind of athlete who likes to try new things. |
| PGS5 | It is important to try new sport experiences that challenge how I think about myself. |
| PGS8 | I have gained a lot of insight about life through sport. |
| PGS9 | I have developed a lot as a person through sport. |
| PGS11 | For me, sport has been a continuous process of personal growth. |
| PGS12 | I enjoy seeing how my views as an athlete have matured. |
| Purpose in Sport | |
| PIS1 | I think of what I hope to do in the future as an athlete. |
| PIS4 | I have a sense of direction in sport. |
| PIS8 | I enjoy planning my future in sport. |
| PIS9 | As an athlete I carry out the plans I set for myself. |
| PIS12 | My goals in sport have been a source of satisfaction. |
| PIS13 | I think about what I have accomplished in sport. |
| Self-Acceptance in Sport | |
| SAS1 | As an athlete, I am pleased with how things have turned out. |
| SAS2 | In general, I feel positive about myself as an athlete. |
| SAS5 | I like most aspects of myself as an athlete. |
| SAS6 | I made some mistakes in sport, but I feel overall everything has worked out for the best. |
| SAS8 | I am proud of the life I lead in sport. |
| SAS13 | When I compare myself to others in sport, I feel good about who I am as an athlete. |

PGS = Personal Growth through Sport; PIS = Purpose in Sport; SAS = Self-Acceptance through Sport.

PHASE 2

The purpose of this phase was to examine the construct validity of the 19-item modified version of the SPWB.

MATERIAL AND METHODS

Participants. Three hundred twelve male and 88 female athletes ($M_{age} = 25.07$, $SD = 7.34$) that engaged in 15 different team and individual sports participated in the study. The sports included soccer ($n = 186$), track and field ($n = 56$), volleyball ($n = 52$), running ($n = 33$), basketball ($n = 28$), futsal ($n = 10$), swimming ($n = 10$), triathlon ($n = 9$), golf ($n = 5$), cycling ($n = 3$), water-skiing, ($n = 3$), karate ($n = 2$), biathlon ($n = 1$), kickboxing ($n = 1$), and tennis ($n = 1$). The athletes played at club ($n = 21$), varsity ($n = 24$), regional ($n = 16$), provincial ($n = 287$), national ($n = 32$), and international ($n = 19$) levels (1 athlete did not specify his competitive level) with a large range of years of participation in their sport, ranging from 1 to 35 years ($M = 11.90$, $SD = 5.89$). The athletes also had a large range of practice hours, ranging from 2 to 30 hours per week ($M = 11.46$, $SD = 4.10$). In regard to the stage of the competitive season of their sport, most of the athletes reported that they were at the pre-season stage ($n = 276$). 91.3% of the participants were Caucasian ($n = 365$), whereas 8.7% included African American ($n = 9$), Hispanic ($n = 7$), Asian ($n = 3$), and other ($n = 16$) ethnic groups.

Procedure. Once approval was granted by the institutional research ethics board, participant recruitment began. One of the investigators first contacted the coaches in order to receive permission to contact the athletes. After receiving

permission from coaches, one of the investigators attended the practice facility and contacted the athletes before or after their practice, explaining to them briefly the purpose of the study. A letter of information was provided to the athletes and the interested athletes that wished to participate completed the questionnaire using paper and pencil (without the presence of the coaches) or emailed the investigator and requested the link to the questionnaire. An email script with the questionnaire link was sent by the investigator to the interested participants that wished to complete the survey online. Completion of the questionnaire indicated participants' consent to participate.

Measure. Eudaimonic well-being in the sport context was assessed via the 19-item modified version of SPWB [17] developed in Phase 1. All the items were answered on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree).

Data analysis. The factorial validity of the scales was examined with confirmatory factor analysis (CFA) using AMOS 24.0 software [59]. Specifically, a three-factor model was hypothesized with items restricted to load on their corresponding factor. The goodness-of-fit of the hypothesized model was tested using multiple indices [60]: the chi-square statistic (χ^2), the comparative fit index (CFI), the tucker-lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean residual (SRMR). According to Hu and Bentler [60], for CFI and TLI, values above .95 indicate an excellent fit while for RMSEA values equal or less than .06 are desired. Also, SRMR values less than .08 denote acceptable fit. Additionally, modification indices were examined to identify items that potentially cross-load or are problematic. Descriptive statistics and internal consistencies (Cronbach's alpha) of the three scales were also estimated.

RESULTS AND DISCUSSION

The hypothesized three-factor model with the 19 items showed a poor fit to the data ($\chi^2_{(149)} = 501.45, p = .00; CFI = .86; TLI = .84; RMSEA = .08, SRMR = .06$). Only one of the fit indices (i.e., SRMR) reached the cut-off criterion for a good fitting model. CFA also revealed high correlations (above .9) between the factors, particularly between PIS and SAS (.932), PGS and PIS (.929), and PGS and SAS (.917). Therefore, a two-factor (PIS and SAS were combined into one factor) and one-factor model with the 19 items were also tested. Both models again revealed a poor fit to the data. Similarly with the three-factor model, high inter-factor correlation was found for the two-factor model (.941). The fit indices of all the examined models are presented in Table 3. Additionally, the descriptive statistics and internal consistency of each scale can be viewed in Table 4.

Considering the poor model fit and the high inter-factor correlations, the data from the modified items failed to confirm that the three factors of well-being in sport are distinguishable. Additionally, after the three factors were combined into two factors, and then into a single factor, again a poor model fit was revealed, suggesting that the adapted version of SPWB [17] cannot represent a well-being instrument for the sport context.

Table 3. Fit Indices of Confirmatory Factor Analysis for Models Tested in Phase 2

| Model | χ^2 (df) | CFI | TLI | RMSEA | SRMR |
|----------------|---------------|-----|-----|-------|------|
| 3-Factor model | 501.45 (149) | .86 | .84 | .08 | .06 |
| 2-Factor model | 509.30 (151) | .85 | .84 | .08 | .06 |
| 1-Factor model | 520.66 (152) | .85 | .83 | .08 | .06 |

χ^2 = chi-squared test; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error off approximation; SRMR = standardized root mean residual.

Table 4. Descriptive Statistics and Internal Consistency Coefficients of the Three Scales from Phase 2

| Scale | M | SD | α |
|-------------|------|-----|----------|
| PGS-7 items | 5.06 | .66 | .76 |
| PIS-6 items | 4.87 | .73 | .77 |
| SAS-6 items | 4.72 | .76 | .75 |

PGS = Personal Growth through Sport; PIS = Purpose in Sport; SAS = Self-Acceptance through Sport; M = Mean; SD = Standard Deviation; α = Cronbach alpha coefficient.

GENERAL DISCUSSION

While there is considerable interest in athletes' eudaimonic well-being, there is no sport specific measure of this construct. The first purpose of this research was to adapt three scales (Personal Growth, Purpose in Life, and Self-Acceptance) of the SPWB [17] in order to measure eudaimonic well-being in the sport context and to assess the content validity (relevance) of each of the modified items. The initial adapted scales consisted of 14 items per scale (42 items in total), which were reduced to seven items for PGS, six items for PIS, and six items for SAS (19 items in total) based on the feedback (i.e., ratings, comments, and suggestions) from an expert panel.

The second purpose of the present study was to examine the factorial validity of the 19-item modified version of SPWB by using CFA. The data failed to confirm the hypothesized three-factor model. The results revealed that there was overlap among the three scales due to high inter-factor correlations, and therefore the three dimensions of well-being were not distinguishable. Springer and colleagues [33, 34] have suggested that there are less than six factors representing Ryff's [17] model of well-being. Specifically, the factorial validity of Ryff's SPWB was assessed by using data from three major surveys with large and diverse samples and various versions of the construct. Springer and Hauser found high inter-factor correlations (close to 1.0) among four dimensions of Ryff's model (personal growth, purpose in sport, self-acceptance, and environmental mastery). Similar results regarding the overlap between these factors were also found in subsequent studies [61–63].

Given our own findings and the work by Springer et al. [34], the three scales were also combined into two factors, and finally into one single factor. The results of both models were similar to the three-factor model, indicating that the modified items failed to represent well-being in sport. Although the SPWB has been employed in sport studies to assess athletes' well-being on a global level [e.g., 43, 44, 64] the present attempt to adapt this instrument to be sport specific was not successful.

A strength of the present study was the rigorous process employed to try and adapt three subscales of the SPWB to sport. The present study, however, is not

without limitations. One limitation of the study was the sampling characteristics in Phase 2; the majority of the participants were young male athletes. Furthermore, most of the athletes were soccer players at the pre-season stage of the competitive season. It is possible that if athletes were in the middle of the competitive season, the scores for each modified item might vary. Accordingly, comparisons based on athletes' characteristics should be investigated in future studies. Scholars should examine whether athletes' well-being varies with age, gender, sport, competitive level, and cross-cultural factors.

CONCLUSIONS

At the present time researchers have two options for assessing well-being in sport. One is to employ a global measure of well-being such as the SPWB. The second option, which has been typically used by SDT researchers, is to employ multiple instruments to assess different aspects of eudaimonic well-being. Neither approach is ideal, and an instrument that encompasses all the components of eudaimonic well-being would provide more opportunities to further investigate and understand the relationship between sport participation and well-being [6, 65]. Accordingly, researchers are encouraged to develop a sport-specific measure of well-being based on the eudaimonic perspective.

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