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SPORT PSYCHOLOGICAL SKILLS PROFILE OF TRACK AND FIELD ATHLETES AND COMPARISONS BETWEEN SUCCESSFUL AND LESS SUCCESSFUL TRACK ATHLETES

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ABSTRACT

The aim of this study was to compile a sport psychological skills profile of track and field athletes and to compare the psychological skill levels of successful and less successful track athletes during the 2011 University Sport South Africa Athletics Championships. The participants included 143 athletes (age= 21.6±2.32 years). Their perceived importance and need for psychological skills training, as well as their perceived ability to be mentally prepared for training sessions and competitions were investigated. Practical significant differences were observed between the top (n=21) and bottom (n=21) sprinters for Peak Performance Profile (PPP) total and stress control, Psychological Skills Inventory (PSI) total and achievement motivation, as well as between the top (n=21) and average (n=20) sprinters for PPP total, concentration, stress control, PSI total, achievement motivation, maintaining self-confidence and concentration. The successful (n=21) middle- and long-distance athletes recorded significantly higher achievement motivation values than their less successful (n=21) counterparts. Collectively, these results confirm a relationship between psychological skills and track and field success. The effect of psychological skills training programmes on psychological skills development and performance enhancement requires further empirical studies.

Key words: Track and field athletes; IAAF scores; Performance; Sprinters; Middle- and long-distance athletes.

INTRODUCTION

Pierre de Coubertin proposed the Olympic motto, *Citius, Altius, Fortius,* a Latin phrase meaning faster, higher, stronger (Van der Merwe, 2005). Although this motto is not limited to the sport of track and field (commonly referred to as athletics), these objectives are especially relevant to this sport. Most athletics events are individual contests with athletes challenging each other to decide a single victor. Depending on the particular event, many different factors, such as talent, training, trainability, physical factors, body composition, nutritional status, technique, tactical awareness, motivation and other psychological characteristics have been shown to contribute to sport success (Maughan, 2009).

Sport challenges athletes both physically and psychologically, due to the diversity, unpredictability and intensity of training and competition (Kumar & Shirotriya, 2010). Noakes (2003) believes that the preparation of the mind is as important to perform as physical preparation. Elite performers require a "psychological edge that enables them to generally

cope better than their opponents with the many demands (e.g. competition, training, life style), that sport places on a performer" (Jones *et al*., 2002:209). These researchers noted that successful athletes tend to be more determined, focused, confident and in control despite the pressures and demands that top-level sport places on them. Vernacchia *et al*. (2000) observed that the use of imagery, perseverance and confidence were related strongly to Olympic track and field success. Gould *et al*. (2002a) highlighted the ability of Olympic athletes to cope, control their anxiety, focus and block out any distractions, and to set and achieve their goals. In addition, they possessed high levels of confidence, sport intelligence, hope, optimism and adaptive perfectionism, and demonstrated competitiveness and a strong work ethic. Olympic medallists exhibited greater emotional control and experienced less negative thinking than the non-medallists experience (Taylor *et al*., 2008). Iranian medal winners (during the Asian Games), were shown to react more positively to stress than the non-medal winners (Salmela *et al*., 2009), whilst elite Greek athletes were better than their non-elite counterparts with regard to emotional control, goal setting, imagery, activation, positive thinking and relaxation (Katsikas *et al*., 2009).

MacNamara *et al*. (2010) identified psychological factors as key determinants that enable talented athletes to turn their potential into optimal performance. Hard work, motivation and the ability to perform under pressure are essential performance determinants (Butt *et al*., 2010). Kruger and Pienaar (2012) found that talented junior sprinters were more effective in setting goals than less talented sprinters. Hollings *et al*. (2014) observed that having a significant commitment to a clearly defined and realistic goal was the primary reason why some elite juniors went on to become successful senior track and field athletes and others did not.

Coaches play a critical role in enhancing psychological skills and creating a positive but tough practice environment. Olympic coaches believe that their athletes need to have plans to deal with distractions and that high confidence levels are required for optimal performance (Gould *et al*., 2002b). However, Leslie-Toogood and Martin (2003) noted that track coaches were unable to assess the mental strengths and weaknesses of their athletes accurately, despite being confident in their ability to do so. Furthermore, Weinberg and Gould (2011) observed that psychological skills training (PST) is often neglected by coaches due to a perceived lack of time and a limited understanding of how to teach and practise psychological skills.

Gould *et al.* (2009:53) defined psychological preparation as "cognitive, emotional, and behavioural strategies athletes use to arrive at an ideal performance state or condition that is related to optimal psychological states and peak performance either for competition or practice". Arousal regulation, imagery/mental preparation, self-confidence, motivation, commitment, goal setting and attention/concentration skills should be developed by athletes in order for them to perform successfully (Weinberg & Gould, 2011). PST, in combination with physical training, has been shown to improve performance more than physical training alone (Kumar & Shirotriya, 2010). The work of Wann and Church (1998) underlined the importance of PST programmes and mental preparation in the sport of track and field. A PST programme, consisting of relaxation skills, self-talk, goal setting, imagery and concentration skills, resulted in significantly improved performances among middle-distance athletes (Pieterse & Potgieter, 2006).

Interventions aimed at developing sport psychological skills are mapped typically within Cognitive-Behaviour Therapy (CBT). CBT is the most widely used model in sport psychology and has been used successfully in various settings. It is an umbrella term for the two approaches originally based on cognitive therapy and behavioural therapy and describes interventions that aim to decrease psychological distress and maladaptive behaviours by modifying cognitive processes (Hill, 2001). This model emphasises the interaction between current situations, cognitions (what we think), emotions (what we feel) and behaviours (what we do). CBT primarily focuses on methods that strengthen positive and weaken negative behaviour (Behncke, 2004). Over time, it conditions the individual to think in specific ways to create the desired psychological states. The goal of CBT is to change the way the athlete approaches a given task and to lay the foundation for implementing specific performance-enhancement techniques.

AIM OF STUDY

The aim of this study was to compile a sport psychological skills profile of student track and field athletes and to compare the sport psychological skill levels of successful and less successful track athletes based on their performance during a competition.

METHODOLOGY

Research design

A cross-sectional design was used to survey the sport psychological skill levels and athletic performance of participants at the 2011 University Sport South Africa (USSA) Athletics Championships, A-section.

Ethical issues

The Research Ethics Committee approved this study: Human Research (Non-health) of Stellenbosch University (Ref. 485/2010).

Participants

The study used an availability sample of 143 student athletes (75 male and 68 female) with a mean age of 21.6±2.32 years from 5 South African universities. Participants were included if they completed both measuring instruments and competed in at least 1 event during the Championships. Some athletes competed in more than 1 event, but only their best performance was used for further analysis. The group consisted of 62 sprinters (100m, 200m, 400m, 100mH/110mH or 400mH), 42 middle- and long-distance athletes (800m, 1500m, 3000m SC, 10km or 21km), 17 jumpers (high-jump, long-jump or triple-jump), 16 throwers (javelin, discus or shot put), and 6 multi-event athletes (male decathletes and female heptathletes).

Procedures

The USSA Athletic Championships organising committee granted permission for the study to be conducted. Team managers from all the participating teams were given an overview of the

study and were asked to allow and encourage their athletes to take part. Thereafter, the study was also explained to all the willing participants. Participation in the study was voluntary and participants were free to withdraw from the study at any time and without prejudice. Anonymity and confidentiality of information were guaranteed in order to reduce the possibility of socially desirable answers. All participants signed informed consent forms before completing the PSI and PPP in a classroom setting, before taking part in any events.

Measuring instruments

Psychological Skills Inventory (PSI)

Wheaton (1998) developed the PSI after an extensive review of sport psychology literature. A provisional 82-item inventory was administered to 304 sport science students. Test-retest reliability (over a period of 1 week) yielded correlations ranging from 0.79 to 0.97. The 10 items that correlated best from each mental skill were included in a 60-item inventory. It measures the following 6 sport psychological subscales (with 10 items contributing to each): achievement motivation; goal directedness; activation control; maintaining self-confidence; concentration; and imagery. The items are scored on a 5-point Likert-type scale anchored by descriptors ranging from "Never" [0] to "Always" [4]. Reversed scoring applies to 19 of the 60 items. Results are expressed as percentage scores, with higher values reflecting better sport psychological skill levels. Preliminary results showed that this inventory could differentiate between successful and less successful athletes. However, Wheaton, recommended that the inventory should be subjected to further testing. The study of Eloff *et al*. (2011), on field hockey players in South Africa, yielded acceptable α's ranging between 0.77 and 0.85 for the 6 subscales, and 0.81 for the PSI total score.

Peak Performance Profile (PPP)

The above-mentioned PSI was administered over a period of more than 5 years to 768 elite sportspersons, who were part of the government-sponsored *Sport Information and Science Agency* (SISA) high-performance programme. A Confirmatory Factor Analysis (CFA) was performed on the data, which produced disappointing results (Potgieter & Kidd, 2011). These included a Root Mean Square Error of Approximation (RMSEA) of 0.13 (acceptable value: $p<0.05$), a Goodness-of-Fit Index (GFI) of 0.8 (acceptable value: >0.95), and an Adjusted Goodness-of-Fit index (AGFI) of 0.79 (acceptable value: >0.95). The data were split into a calibration and a validation sample. After an Exploratory Factor Analysis (EFA), 4 independent factors (concentration, confidence, stress control and visualisation), that included 22 items emerged with loadings of >0.5. These factors explained 61% of the variance. Consequently, it was decided to present these items as a profile of mental attributes (namely the Peak Performance Profile), instead of an inventory of psychological skills. As visualisation did not follow this line of reasoning, it was eliminated. The CFA of the 13 remaining items, yielded satisfactory goodness-of-fit scores (RMSEA= 0.041; GFI= 0.99; AGFI= 0.98). The variance extracted and Chronbach α for concentration (0.59 and 0.85) and stress control (0.56 and 0.82), were satisfactory, whilst it was just under the normal threshold for confidence (0.50 and 0.70).

Two new items were added to the confidence subscale for future analysis. The authors envisaged additional development of the confidence subscale as part of the next phase in the development of the instruments. At present, the instrument consists of 15 items, scored on a

5-point Likert-type scale anchored by descriptors ranging from "Never" [0] to "Always" [4]. Reversed scoring applies to 8 of the 15 items. Results are expressed as percentage scores, with higher values reflecting better mental attributes. Table 1 reports the Chronbach α coefficients for the PSI and PPP calculated for the current data set and shows satisfactory internal consistency ranging from 0.71 to 0.86.

TABLE 1. **INTERNAL CONSISTENCY COEFFICIENTS FOR PSI AND PPP**

Psychological skills subscale	**Chronbach α**
Psychological Skills Inventory (PSI) Total	0.85
* Achievement motivation	0.72
* Goal directedness	0.82
* Activation control	0.83
* Maintaining self-confidence	0.86
* Concentration	0.77
* Imagery	0.84
Peak Performance Profile (PPP) Total	0.86
* Confidence	0.71
* Stress control	0.83
* Concentration	0.72

Dependent variable

The dependent variable was the performance of the athletes as calculated from the 2011 IAAF scoring tables. These tables express individual athletic performances as points, allowing a direct comparison of athletes across different events, genders and ages. The IAAF scores were calculated for each event in which the athletes competed, with the best performance used for further analysis in cases where the athletes participated in more than 1 event.

Statistical analysis

The Statistical Data Processing package was used to analyse the data (StatSoft, Inc., 2010). Descriptive statistics (mean and SD) were calculated. A one-way analysis of variance (ANOVA) was used to determine the differences between the bottom 21, average 20 and top 21 sprinters regarding their sport psychological skill levels. The t-test was used to compare the bottom 21 and top 21 middle- and long-distance athletes. The jumpers, throwers and multi-event athletes were not compared due to the small sample size. Statistical significance was set at $p \leq 0.05$. Effect sizes (ES) were calculated for each of these comparisons according to the formula described by Thomas *et al.* (2005), $ES = (M_1 - M_2)/s_p$ where M_1= mean value of the first group, M_2= mean value of the second group and s_p= pooled standard deviation.

$$s_p = \sqrt{\frac{s_1^2(n_1-1) + s_2^2(n_2-1)}{n_1+n_2-2}}$$

Here, S_1^2= the variance of the participants of the first group; S_2^2= the variance of the participants of the second group; n_1= number of participants in the first group; n_2= number of participants in the second group. Effect sizes of around 0.8 indicate large practical significance, around 0.5 indicate moderate practical significance, and around 0.2 indicate small practical significant differences.

RESULTS

Figure 1 to Figure 5 depict the perceived importance of PST programmes of the athletes, their previous consultations to sport psychologists and/or exposure to PST programmes, their perceived ability to prepare mentally for training sessions and competitions, and their need for PST programmes. Figure 1 reveals that 73% of the total group perceived PST programmes as "important" or "very important". Almost a quarter (24%) of the participants held a neutral perception about its importance, whereas only 3% deemed it to be "unimportant" or "a waste of time".

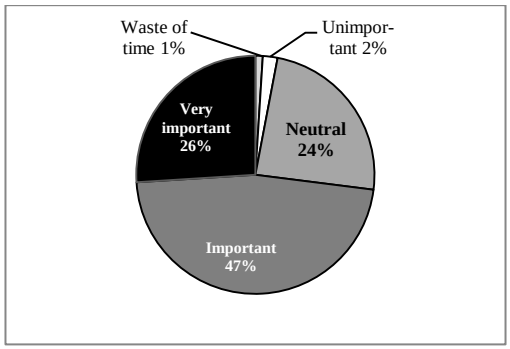


FIGURE 1. **PERCEIVED IMPORTANCE OF PST PROGRAMMES**

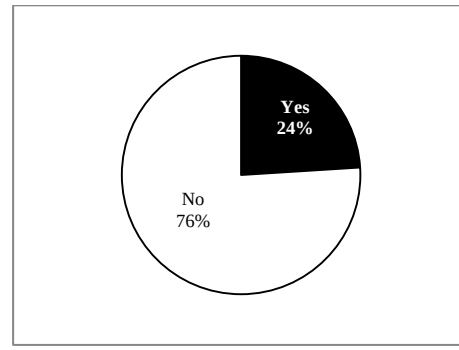


FIGURE 2. **PREVIOUS CONSULTATION WITH SPORT PSYCHOLOGIST AND/OR EXPOSURE TO PST PROGRAMMES**

Despite the perceived importance of PST programmes as illustrated by Figure 1, only 24% of the participants had previously consulted a sport psychologist and/or had any exposure to PST programmes (Figure 2).

Figure 3 illustrates similar results with regard to the perceived ability to prepare mentally for training sessions and competitions of the athletes. These figures also showed that 40% of the participants could potentially benefit from PST as they rated their ability to be mentally prepared as "average" or "below average".

Despite the potential room for improvement implied by the results depicted in Figures 3, 44% of the participants were "uncertain" about their need for PST programmes, with a further 12% expressing "no need" for such programmes (Figure 4). Encouragingly, the remaining 44% expressed a "need" or "great need" for PST.

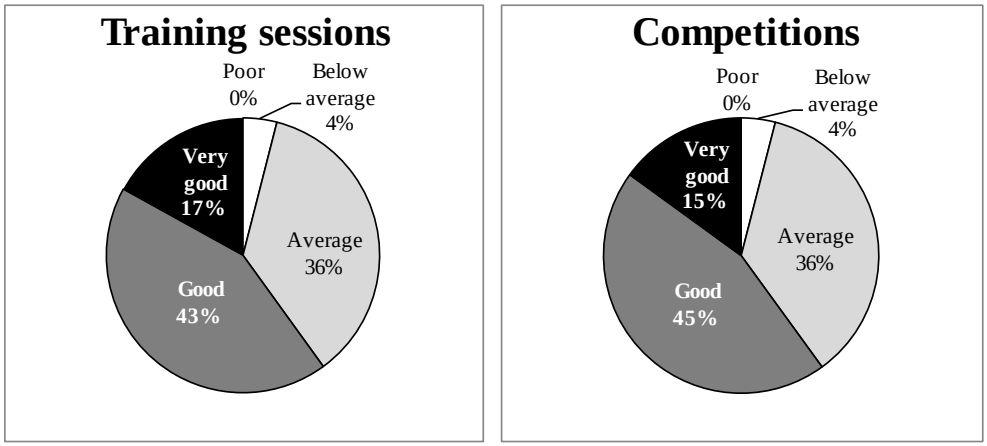


FIGURE 3. **PERCEIVED ABILITY TO PREPARE MENTALLY FOR TRAINING SESSIONS AND COMPETITIONS**

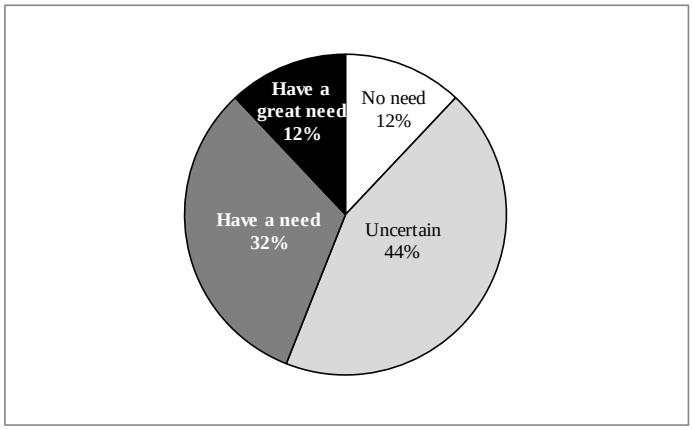


FIGURE 4. **EXPRESSED NEED FOR PST PROGRAMMES**

Table 2 contains the descriptive statistics (Mean±SD) of the total sample (N=143) and each of the 5 subgroups regarding their psychological skills and athletic performance. The lowest mean scores of the total sample were recorded for 'confidence' (56.4±15.78%), whereas 'achievement motivation' yielded the highest mean scores (75.7±10.45%). These results indicate substantial room for improvement with regard to psychological skills of student track and field athletes. The sprinters were the largest subgroup (n=62), and on average achieved the best IAAF scores (918.6±119.70 points). The multi-event participants were the smallest group (n=6) and obtained the lowest IAAF scores (681.3±248.44 points) during the championships.

Table 3 provides the psychological skill scores (measured with the PSI and PPP) for the 3 groups of sprinters (categorised according to their IAAF scores): Bottom 21 (scores ranged from 530 to 896); Average 20 (903 to 972); and Top 21 (980 to 1099). Figure 5 and Figure 6 depict the comparison of the PPP and PSI subscales scores of the 3 groups of sprinters. From this table and figures, it is clear that the Top 21 sprinters had a significantly higher PPP total, stress control, PSI total, achievement motivation and concentration scores than the Average 20 and Bottom 21 sprinters. The Top 21 sprinters also outperformed the Average 20 sprinters in maintaining self-confidence. Collectively, these results show that more and less successful sprinters can be distinguished as a function of their psychological skill levels.

Table 4, Figure 7 and Figure 8 show the PSI and PPP subscale comparisons between the Bottom 21 (IAAF scores range: 131 to 891) and the Top 21 (scores: 896 to 1066) middle- and long-distance athletes. It shows that the more successful athletes obtained slightly better scores than the less successful athletes for each of the psychological skill subscales except for concentration (as measured with the PPP). The only significant difference, however, was observed for 'achievement motivation' in which the Top 21 athletes obtained better values than the Bottom 21 athletes (Top 21: 78.9±11.25%; Bottom 21: 73.2±8.45%).

TABLE 2. **PPP AND PSI PROFILES AND IAAF SCORES OF TOTAL SAMPLE AND FIVE SUBGROUPS**

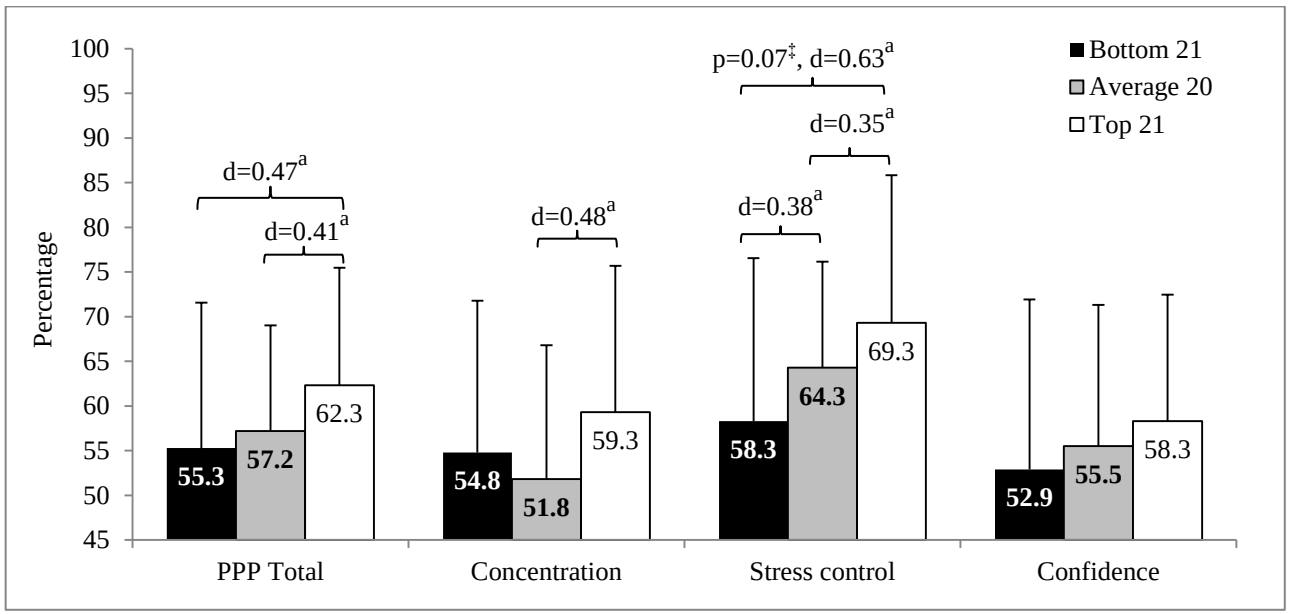
Parameters	**TOTAL SAMPLE** (N=143) M±SD %	**SPRINTERS** (n=62) M±SD %	**MIDDLE/LONG DISTANCE** (n=42) M±SD %	**JUMPERS** (n=17) M±SD %	**THROWERS** (n=16) M±SD %	**MULTI-EVENT** (n=6) M±SD %
PPP Total	60.0±13.84	58.3±14.00	58.6±13.60	66.3±11.90	64.8±13.08	56.7±17.16
* Concentration	56.7±17.37	55.3±16.19	53.8±18.77	66.2±14.63	60.0±16.73	55.0±22.80
* Stress control	66.9±16.24	64.0±16.22	68.3±16.40	72.4±16.40	69.7±14.31	63.3±18.07
* Confidence	56.4±15.78	55.6±16.35	53.7±14.69	60.3±14.84	64.7±16.07	51.7±14.02
PSI Total	63.5±10.40	62.5±10.72	64.1±9.60	64.2±12.07	64.9±9.73	65.0±11.75
* Achievement motivation	75.6±10.45	74.5±10.40	76.1±10.24	76.6±12.90	77.5±9.66	77.1±8.58
* Goal Directedness	70.1±15.09	69.3±14.98	73.6±13.00	61.6±19.34	71.4±11.83	75.4±18.13
* Activation Control	56.9±15.11	55.3±15.52	55.7±14.62	61.0±14.42	62.7±13.18	55.4±19.71
* Maintain self-confidence	59.4±12.07	57.3±12.75	59.0±10.58	63.7±14.06	63.9±10.20	59.2±10.08
* Concentration	59.7±13.74	58.4±12.57	58.3±14.11	66.2±13.26	62.2±13.38	58.8±22.46
* Imagery	59.3±16.78	60.1±15.61	61.7±13.72	55.9±19.28	51.7±23.18	64.2±19.15
IAAF score	877.1±157.22	918.6±119.70	839.0±200.16	894.7±83.94	865.6±113.30	681.3±248.44

M= Mean SD= Standard Deviation

TABLE 3. **COMPARISON OF PPP, PSI AND IAAF SCORES OF THREE GROUPS OF SPRINTERS**

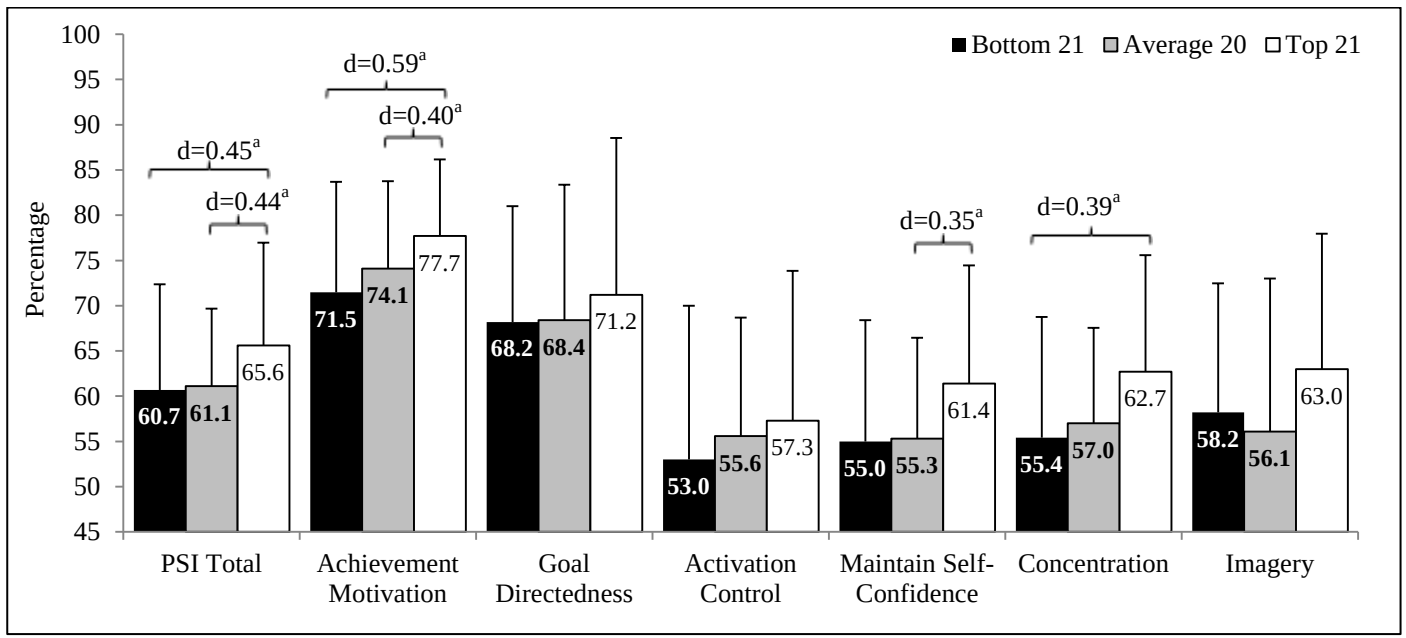
Parameters	Bottom 21 M±SD %	Average 20 M±SD %	Top 21 M±SD %	**ANOVA (p-value) Statistically significant difference** Bottom 21 & Ave. 20	Bottom 21 & Top 21	Ave. 20 & Top 21	Bottom 21 & Ave. 20	**Effect size results (Cohen's *d*-value) Practical sign. diff.** Bottom 21 & Top 21	Ave. 20 & Top 21
PPP Total	55.3±16.26	57.2±11.82	62.3±13.16	0.91	0.24	0.47	0.13	0.47[a]	0.41[a]
* Concentration	54.8±16.99	51.8±14.98	59.3±16.38	0.82	0.64	0.30	0.19	0.27	0.48[a]
* Stress control	58.3±18.26	64.3±11.84	69.3±16.53	0.46	0.07[‡]	0.57	0.38[a]	0.63[a]	0.35[a]
* Confidence	52.9±19.01	55.5±15.80	58.3±14.17	0.86	0.53	0.85	0.15	0.33	0.19
PSI Total	60.7±11.67	61.1±8.59	65.6±11.36	0.99	0.31	0.38	0.10	0.45[a]	0.44[a]
* Achievement motiv.	71.5±12.21	74.1±9.67	77.7±8.47	0.70	0.13	0.50	0.16	0.59[a]	0.40[a]
* Goal directedness	68.2±12.82	68.4±14.98	71.2±17.35	0.99	0.80	0.82	0.01	0.13	0.12
* Activation control	53.0±16.99	55.6±13.08	57.3±16.56	0.85	0.65	0.94	0.12	0.18	0.07
* Maintain self-con.	55.0±13.42	55.3±11.15	61.4±13.05	0.99	0.23	0.27	0.01	0.33	0.35[a]
* Concentration	55.4±13.35	57.0±10.56	62.7±12.89	0.91	0.14	0.30	0.09	0.39[a]	0.33
* Imagery	58.2±14.26	56.1±16.91	63.0±14.97	0.57	0.92	0.34	0.07	0.22	0.29
IAAF score (Range)	530–896	903–980	981–1099	–	–	–	–	–	-

[‡] Borderline statistically significant differences ($p \leq 0.10$) [a] Moderate practical significant differences ($d \approx 0.5$) motiv.= motivation con.= confidence



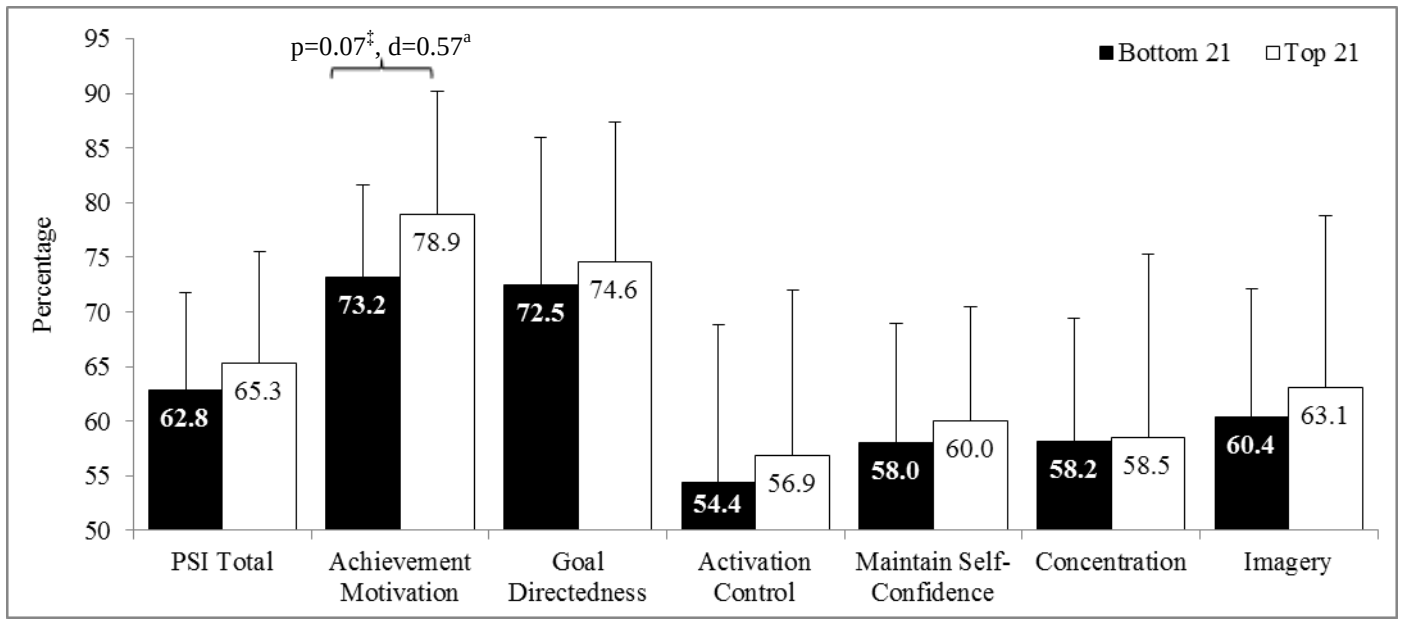
‡ Borderline statistical significance (p≤0.01) a Moderate practical significance (d≈0.5)

FIGURE 5. **COMPARISON OF PPP SUBSCALE SCORES (MEAN±SD) OF THREE GROUPS OF SPRINTERS**



[a] Moderate practical significance (d≈0.5)

FIGURE 6. **COMPARISON OF PSI SUBSCALE SCORES (MEAN±SD) OF THREE GROUPS OF SPRINTERS**



‡Borderline statistically significant differences (p≤0.10) [a] Moderate practical significant differences (d≈0.5)

FIGURE 7. **COMPARISON OF PSI SUBSCALE SCORES (MEAN± SD) OF TWO GROUPS OF MIDDLE- AND LONG-DISTANCE ATHLETES**

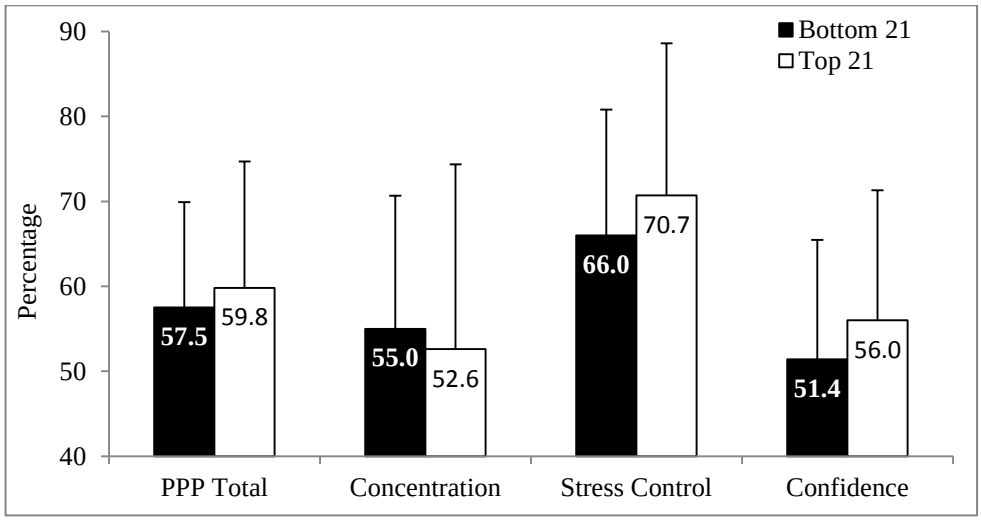


FIGURE 8. **COMPARISON OF PPP SUBSCALE SCORES (MEAN±SD) OF TWO GROUPS OF MIDDLE- AND LONG-DISTANCE ATHLETES**

TABLE 4. **COMPARISON OF PPP, PSI AND IAAF SCORES OF TWO GROUPS OF MIDDLE- AND LONG-DISTANCE ATHLETES**

Variables	**Bottom 21** Mean±SD %	**Top 21** Mean±SD %	**p-value**	**Effect size** (Cohen's d)
PPP Total	57.5±12.41	59.8±14.91	0.60	0.17
* Concentration	55.0±15.65	52.6±21.77	0.69	0.13
* Stress control	66.0±14.80	70.7±17.91	0.35	0.29
* Confidence	51.4±14.07	56.0±15.30	0.32	0.31
PSI Total	62.8±8.99	65.3±10.22	0.39	0.27
* Achievement motivation	73.2±8.45	78.9±11.25	0.07‡	0.57[a]
* Goal directedness	72.5±13.49	74.6±12.73	0.60	0.16
* Activation control	54.4±14.42	56.9±15.06	0.59	0.17
* Maintain self-confidence	58.0±10.89	60.0±10.43	0.54	0.19
* Concentration	58.2±11.24	58.5±16.78	0.96	0.02
* Imagery	60.4±11.71	63.1±15.65	0.52	0.20
IAAF score (Range)	131–891	896–1066	–	–

‡ Borderline statistically significant differences (p≤0.10) [a] Moderate practical significant differences (d≈0.5)

DISCUSSION

Perceived importance of PST

The benefits of mental preparation for training and competition are well-documented (Wann & Church, 1998; Ferraro & Rush, 2000; Jones *et al*., 2002; Pieterse & Potgieter, 2006). Encouragingly, 26% of the athletes in the current sample perceived the development of psychological skills as "very important", whilst 47% perceived it as "important". Weinberg and Gould (2011) emphasised that athletes need to value the importance of PST before they will participate in PST programmes. Although the current results are promising, other factors will also influence whether or not student athletes would participate in such programmes if they were given the opportunity to do so.

Previous consultations with sport psychologist and/or exposure to PST programmes

Only 24% of the athletes reported previous consultations with sport psychologists or exposure to PST programmes. This may be due to limited access to sport psychology experts and a lack of structured PST programmes at high school level due to budget constraints (Hughes, 1990). Van den Heever *et al*. (2007) found that 24.06% of U19, 34.18% of U21 and 43.75% of senior athletes in South Africa had been exposed to sport psychologists during individual consultations or team sessions. Although their results are based on a cross-sectional survey, it suggests that many athletes are exposed to PST programmes during the post-high-school period when many South African athletes attend university.

Alternatively, the current results indicate that the athletes might be resisting PST, despite perceiving it to be important. In this regard, Ferraro and Rush (2000) found that many athletes felt that they were not serious enough about their sport to invest in consultations with a sport psychologist and that they would be wasting their time and money. The excessive time demands (studies, training, competitions) placed on elite student track and field athletes (Burnett *et al*., 2010), may also contribute to these athletes not making use of sport psychology services. Track and field coaches also reported hindrances, which resulted in the under-utilisation of such services (Wilding, 2009). Financial limitations and the unavailability of sport psychologists were the main reasons cited by coaches as to why they were not implementing PST programmes (Grobbelaar, 2007).

Perceived ability to prepare psychologically for training and competitions

The self-reported "average" (36%) or "below average" (4%) ability of the sample to prepare themselves psychologically for training and competition, coupled with the lack of previous exposure to PST, indicate that coaches and sport psychologists could play a more active role in this regard. According to Gould and Maynard (2009), successful and less successful athletes experienced an increase in stress in the lead-up to important competitions. However, most of the successful athletes worked with sport psychologists to integrate mental training as part of their training programmes in order to deal with these stressors and other unexpected events. Gould *et al*. (2009) noted that sport psychologists no longer only prepare athletes for competitions, but that there has been a shift towards helping athletes to train more effectively by being more focussed.

Need for PST

The coaches in the study of Grobbelaar (2007), reported limited knowledge regarding PST. It is plausible that the athletes in the current sample may not be knowledgeable about PST, as there seems to be considerable uncertainty regarding their own *need for PST*, with 44% of the total sample being "uncertain" of whether they needed PST, whilst 12% stated that they had no need for it. The finding that some athletes did not express a need for PST is not surprising. Kumar and Shirotriya (2010) noted that for some athletes the application of psychological skills is an inherent ability, whereas others need help. Wrisberg *et al*. (2009) found that those athletes with prior experience of consulting sport psychologists were more likely to seek PST than those athletes without prior experience. The female student-athletes were more open to PST than the males. No such gender differences were noted in the current data. The uncertainty regarding a need for PST and the limited previous exposure to PST may indicate a need to educate and expose athletes to a variety of psychological skills.

Sport psychological skills profile

The sport psychological skills profile of the total sample and the five subgroups were reported in Table 2. Collectively, the results indicate poor overall sport psychological skill levels (with mean scores of less than 60% for four of the six PSI-subscales). The remaining two PSI subscales ('achievement motivation' and 'goal directedness'), yielded acceptable scores (>70%). These results are similar to that of Eloff *et al.* (2011), who observed that student field hockey players scored poorly in all the PSI subscales with the exception of achievement motivation, which yielded average scores. However, normative data on both the PSI and PPP is still needed to interpret these scores accurately.

Although between-group comparisons were not a specific aim of the study, some findings from these results will be discussed. Despite achieving the best athletics performance (mean IAAF scores), the sprinters showed the lowest 'achievement motivation', 'activation control' and 'self-confidence' scores of all the groups. The middle- and long-distance athletes had the lowest 'concentration' values, whereas the jumpers obtained the best values. The jumpers also recorded the highest 'stress control' scores, whilst the throwers had the best 'confidence', 'achievement motivation' and 'activation control' scores. The jumpers and throwers recorded the lowest 'imagery' scores, which are in contrast to the findings of Ungerleider and Golding (1991) that field athletes used more imagery and other forms of mental practice than track athletes did. In this regard, the multi-event athletes were the most 'goal-directed' group and made greater use of 'imagery', whereas their 'confidence' levels and ability to 'control their stress' levels were the lowest of all the groups.

Within-group comparisons between the sprinters

The Top 21 sprinters obtained the highest mean scores for all the sport psychological skills when compared to the remaining two groups. Practical significant differences of moderate magnitude were observed between the Top 21 and Bottom 21 sprinters for PPP total, stress control, PSI total and achievement motivation, and between the top 21 sprinters and Average 20 sprinters for PPP total, concentration, stress control, PSI total, achievement motivation, maintaining self-confidence and concentration. With regard to the Top sprinters' ability to control their stress levels, Turner and Raglin (1996) found that track and field athletes, whose

pre-competition anxiety fell inside their Individual Zone of Optimal Functioning (IZOF), performed better than those who were outside their IZOF.

The achievement motivation differences between the successful and less successful sprinters are in line with Mallet and Hanrahan (2004), who noted that elite athletes were highly driven by personal goals. Self-confidence was identified also as a discriminator between the successful and less successful athletes. Confident athletes conveyed that their belief in their own ability affected their Olympic performance positively, whereas non-confident athletes felt that it affected their performance negatively (Gould & Maynard, 2009). Highly confident track and field athletes also made greater use of imagery, although they did not necessarily have better imagery skills than those athletes with low confidence (Abma *et al*., 2002). Orlick and Partington (1987) observed a relationship between concentration (the ability to focus and deal with distractions), and peak performance during important competitions, whilst refocusing skills allowed track and field athletes to restructure their thinking to prepare mentally for the competitive demands of important competitions (Vernacchia, 1998).

Collectively, the current results confirm the importance of well-developed sport psychological skills in order to excel in sprinting, as there were significant differences between the successful and less successful sprinters regarding stress control, achievement motivation, self-confidence and concentration levels.

Within-group comparisons between middle- and long-distance athletes

Kruger *et al*. (2012) observed that talented adolescent distance runners had significantly better coping skills with adversity, optimal performance under pressure, goal setting and concentration scores than their less talented counterparts. In contrast, the only practical significant difference between the more and less successful middle- and long-distance athletes in the current sample was noted for achievement motivation, where the top athletes scored higher than the bottom athletes, which emphasises the importance of being highly motivated to achieve success in endurance events. A likely reason for achievement motivation being the only distinguishing factor, may lie in the diversity of the middle- and long-distance group, which comprised participants of the 800m, 1500m, 3000m steeple chase, 10km and 21km events. The differences between these events may present varying psychological demands, different usage of psychological skills, as well as different needs with regard to PST.

CONCLUSIONS

The majority of the athletes recognised psychological skills as an important performance factor, but generally, the services of sport psychology consultants were under-utilised. The athletes' perceived ability to prepare psychologically for training and competition was average, whereas there was a fair amount of uncertainty regarding their need for PST programmes. Overall, the group scored poorly on most of the sport psychological skills. With regard to the possible role of psychological skills in athletics performance, the more successful sprinters obtained significantly better scores than the less successful sprinters for various psychological skills. The successful middle- and long-distance athletes also had significantly better achievement motivation levels than their less successful counterparts.

Although the cross-sectional design precludes causal inferences, these results substantiate the general belief that superior psychological skills are associated with sport success. Caution should be applied when generalising the current results as the study used an availability sample of university level track and field athletes.

RECOMMENDATIONS

Future studies should investigate why athletes may be reluctant to use the services of sport psychologists and whether or not university level sport programmes make provision for this important performance factor. The development and implementation of PST programmes based on the current findings is recommended. The effectiveness of such programmes in developing psychological skills and enhancing athletic performance also should be researched further.

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