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The relationship between mental skills and level of cricket participation

JULIUS JOOSTE[1], JOHANNES G.U. VAN WYK[2] AND BAREND J.M. STEYN[3]

[1]*Department of Sport, Rehabilitation and Dental Science, Faculty of Science, Tshwane University of Technology, South Africa; E-mail: joostej1@tut.ac.za*
[2]*Department of Biokinetics, Sport and Leisure Sciences, Faculty of Humanities, University of Pretoria, South Africa*
[3]*Department of Biokinetics, Sport and Leisure Sciences, Faculty of Humanities, University of Pretoria, South Africa*

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Abstract

The purpose of this study was to compare the mental-skills differences at participatory level among three progressive levels of cricket participation recognised by the Northerns Cricket Union (NCU) in the Pretoria Gauteng region of South Africa. The study sample included 39 junior academy players, 68 premier league club/senior academy players and 20 first-class senior provincial players (N=127). Mental skills were assessed by means of the Athletic Coping Skills Inventory-28 (ACSI-28) (Smith *et al.,* 1995) and the Bull's Mental Skills Questionnaire (Bull *et al.,* 1996). One-way analysis of variance (one-way Anova) indicated that there were no differences between the respondents in the three levels of participation as regards their performance on the various mental-skills subscales. A definite psychological-skills profile did come to the fore, indicating that successful cricket participants, regardless of their level of participation, expressed high proficiencies in motivation, self-confidence, concentration ability, imagery ability, coachability and peaking under pressure. The essential conclusion was that there are no mental-skills differences between the various levels of cricket-playing performances in the one-day cricket format. However the study did reveal that mental skills are key antecedents of successful cricket participation and development.

Keywords: Mental skills, cricket players, level of participation.

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Introduction

A human being's biomechanical and physiological harmonisation of movement is the product of various aspects of psychological involvement (Bergenheim, Johansson, Granlund & Pedersen, 1996). As a result, psychological research into sport has produced rapid and even exponential development in the drive to provide a framework for explaining the importance of cognition in sport (Hill, 2001; Orlick, 1992). Within this framework researchers have demonstrated the

predictive relationship between various kinds of psychological variables such as personality traits (Morgan, 1980), mood states (Beedie, Terry & Lane, 2000), and levels of sport performance. In recent years there has been increasing interest in predicting sports performance by means of mental skills. Mental skills also referred to as psychological skills – are defined as athletes' cognitive abilities and efforts used during sports participation for the purpose of increasing inner satisfaction and enhanced physical performance standards (Weinberg & Gould, 2011).

Competitive mental skills have proved to be effective in sports participation and performance. The literature reveals that mental readiness is a noteworthy factor determining final Olympic performance placement (Orlick, 1992). Furthermore, mental skills are noted to be among the foremost prerequisites for peak performance in professional and collegiate golfers (Cohn, 1991). They also constitute key antecedents of performance excellence in internationally renowned classical musicians (Talbot-Honeck & Orlick, 1998) and the maintenance of expert performance in kick-boxers (Devonport, 2006). MacNamara, Button and Collins (2010) proposed that psychological factors play a fundamental role in establishing the development capacity of an individual as well as facilitating the transforming of potential into talent. These researchers identified the fact that mental skills and other psychological characteristics of developing excellence such as motivation, commitment, coping under pressure, self-belief, imagery, game awareness and vision of what it takes to succeed, are necessary for both the acquisition and the manifestation of expertise.

The cricket skills of bowling, batting and fielding require considerable mental effort. Chopra (2009) explains that, in a short spell of play, the psychological state of a cricketer could change from one of high confidence to one of utter diffidence. This distinguishes skilled players from the less skilled, not so much due to raw talent but to a certain degree of work ethic, and a focused state of mind. Owens (2008) concedes that, in cricket, successful bowlers and batsmen are the ones who can apply the correct type of attentional focus to the task at hand, thus allowing them to knit together the emotional, physical and mental strands of the situation. In other words, it is the cricket player's ability to concentrate on task-relevant cues, adapt attentional focus to the everchanging game context, and continuously employ effective personal coping resources.

Pressure to perform can affect a cricketer at any stage in the game. Findings have indicated that the negative interpretation of stress was significantly related to endangerment of the cricketer's personal performance goals (Holt, 2003). Therefore, the main object of coaches and team selectors remains the ever difficult task of identifying which bowlers, batsmen and fieldsmen will perform consistently under pressure. Despite the fact that coaches know that cricket is also strongly founded in the mind, limited or no time is spent on mental skills and aspects that are required to reach and maintain maximum performance (Cooper & Goodenough, 2007).

Woolmer, along with Noakes and Moffet (2008) in the biography *Bob Woolmer's art and science of cricket*, expressed the opinion that cricket participation at professional level is 90 per cent cognitively played and 10 percent with raw talent. Yet it appears that 100 percent of South African cricketers spend the majority of their time practising the physiological components of performance. Far too many players fail to reach their true playing potential because they neglect the mental aspects associated with the game (Ross, 2009). Humara (2002) argues that many coaches are exceptionally skilled at evaluating and identifying athletes'physical attributes relating to success but often lack the ability to identify and develop the associated psychological attributes. They emphasise the point that well-developed psychological skills, in conjunction with physical attributes, are linked with level of mastery (Spieler, Czech, Joyner & Munkasy, 2007).Whereas talented cricket players who struggle with the psychological aspects of competition often tend to remain no more than players with potential and never really actualise their abilities into progressive levels of performance, there is evidence that the psychological skills associated with successful sports performance can be adequately learned and improved through regular, proper instruction and practice (Lesyk, 1998; Lesyk & Sanchez, 2001).

In South Africa, investigations addressing the psychological constructs conducive to good performance in cricket are limited at both the professional and the amateur levels of competition. At this stage, there are no available documented findings in which the relationship between mental skills and skilled performance in cricket is addressed.

The aim of this study was to explore the mental factors related to three distinctive levels of cricket participation ranging from amateur to first-class professional level. If, indeed, potentially talented cricketers can be determined by a specific psychological-skills profile, it could serve as an impetus to increase the implementation of behaviour modification programmes to identify and optimise cricket playing potential.

Methodology

Sample

A non-probability quota sampling process was used to select participants for this study. The subjects consisted of 127 A-side male cricketers playing one-day cricket across three progressive levels of competition recognised by the Northerns Cricket Union of Cricket South Africa, ranging from amateur to professional level. Complete data from both mental-skills inventories were gathered from all participants who were active members of the 2010/2011 cricket season in the Pretoria, Gauteng region of South Africa. More than half (53.6%) of the sample participated in cricket at premier league club or senior academy level.

Approximately one third (30.7%) participated at youth cricket academy/secondary school level while the remaining 15.7 percent participated at senior provincial level.

Instrumentation

Standardised psychometric measures for the purpose of scoring coping skills and mental-skills usage in sport were included in the study that had a matrix-type design with statements on the left and anchored responses on the right. Data was gathered by means of a once-off group administration of a questionnaire per team, under the guidance of the principle researcher. The questionnaire included the following instruments:

The Athletic Coping Skills Inventory-28 (ACSI-28) by Smith, Shutz, Smoll, and Ptacek (1995) which is a multi-dimensional measure of the following seven sport-specific psychological skills:

1. Peaking under pressure
2. Freedom from worry
3. Coping with adversity
4. Concentration
5. Goal setting and mental preparation
6. Confidence and achievement motivation
7. Coachability

The scales of this inventory can be summed up to yield a total Personal Coping Resources score, which is assumed to reflect a multifaceted psychological-skill construct (Smith *et al.*, 1995). The ACSI-28 total Personal Coping Resources score (based on the sum of seven subscales) has high internal consistencies with alphas of 0.84 (N=594) for males and 0.88 (N=433) for females, totalling 0.86 (N=1027). The test-retest reliability from a sample of male and female college athletes after a period of one week was found to be 0.87 (N=94) (Smith *et al.*, 1995). The ACSI-28 has been utilised in South Africa (Andrew, Grobbelaar, & Potgieter, 2007).

The Bull's Mental Skills Questionnaire by Bull, Albison and Shambrook (1996) contains 28 items that assesses participants along a six-point Likert scale, ranging from strongly agree to strongly disagree. This instrument measures the following mental skills:

1. Imagery ability (ia)
2. Mental preparation and goal setting (mp)
3. Self-confidence (sc)
4. Anxiety and worry management (awm)
5. Concentration ability (ca)
6. Relaxation ability (ra)
7. Motivation (m)

The Bull's Mental Skills Questionnaire revealed generally acceptable Cronbach alpha levels that range between 0.59 and 0.80 for the seven subscales in a sample of 219 athletes (Snauwaert, 2001). The Bull's Mental Skills Questionnaire has been utilised within the South African context (Danariah, 2007; Edwards, 2007). Edwards and Steyn, (2011) recently performed an exploratory study of 419 male and female university students in an attempt to establish preliminary norms for South Africa. Results for this population yielded a mean score for imagery similar to the score from Danariah's (2007) study, while the relaxation ability, motivation, self-confidence, anxiety and worry management scores concurred with Edwards' (2007) and Danariah's (2007) investigations.

The rationale for using two different psychological-skills questionnaires was to draw attention to a broader range of skills and to discover the multi-dimensional profile of skills that could relate to cricket players from various levels of participation. The Mental Skills Questionnaire and the ACSI-28 in combination measure a total of 15 mental skills and partly overlap on only five subscales (concentration, confidence, motivation, goal setting, and mental preparation). The remaining 10 subscales measure a broad spectrum of psychological skills applicable to cricket participation.

Ethical Procedures

Ethical approval was gained from the Department of Biokinetics, Sport and Leisure Sciences at the University of Pretoria. An information letter explaining the aim of the project was given to each player. Consent was thereafter obtained from the individual participants as well as from their parents, where relevant. Consensus on the purpose of the study and confidentiality of each individual player were ensured.On request, coaches could access their team's overall results but not individual players' results. The reason for this was to reduce the probability of socially desirable answers from participants and to limit the influence these could have on team selection processes. Participants were informed that they were free to withdraw from the study at any stage.

Analysis of data

Quantitative data were analysed, using the computer-based IBM SPSS statistical software package. Correlation and descriptive statistics were computed.One-way analysis of variance (ANOVA) was used to determine whether there were statistically significant differences between mental skills and the levels of cricket participation.

Results and discussion

The performances of the groupings on the various subscales are presented in Tables 1 and 2.

No significant differences were found for the different levels of cricket participation on any of the mental skills subscales, so the findings provide trends only and will be discussed as such.

Table 1: Descriptive statistics and significant differences in performance on the coping skills inventory by level of participation in cricket

		Mean	Std. Deviation	Minimum	Maximum	p-value
Coping with adversity	Junior Academy/Secondary School Level	64.10	19.51	8.33	100.00	.972
	Premier League Club/Senior Academy Level	63.76	17.63	16.67	100.00	
	Senior Provincial Level	62.92	18.03	25.00	100.00	
	Total	63.59	18.15	8.33	100.00	
Coachability	Junior Academy/Secondary School Level	77.99	15.35	41.67	100.00	.640
	Premier League Club/Senior Academy Level	77.56	18.98	25.00	100.00	
	Senior Provincial Level	73.75	15.12	50.00	100.00	
	Total	**76.43**	17.25	25.00	100.00	
Concentration	Junior Academy/Secondary School Level	69.01	13.38	33.33	100.00	.177
	Premier League Club/Senior Academy Level	65.64	15.42	25.00	91.67	
	Senior Provincial Level	61.40	15.01	41.67	91.67	
	Total	65.35	14.83	25.00	100.00	
Confidence and motivation	Junior Academy/Secondary School Level	78.07	13.06	41.67	100.00	.137
	Premier League Club/Senior Academy Level	71.79	16.18	16.67	100.00	
	Senior Provincial Level	75.92	18.72	25.00	100.00	
	Total	**75.26**	15.82	16.67	100.00	
Goal setting and mental preparation	Junior Academy/Secondary School Level	56.83	21.45	.00	83.33	.690
	Premier League Club/Senior Academy Level	53.58	23.66	.00	100.00	
	Senior Provincial Level	57.50	20.75	25.00	100.00	
	Total	**55.98**	22.43	.00	100.00	
Peaking under pressure	Junior Academy/Secondary School Level	72.64	18.43	33.33	100.00	.145
	Premier League Club/Senior Academy Level	70.70	19.41	33.33	100.00	
	Senior Provincial Level	61.84	24.74	8.33	100.00	
	Total	68.39	20.16	8.33	100.00	
Freedom from worry	Junior Academy/Secondary School Level	49.78	23.61	.00	100.00	.487
	Premier League Club/Senior Academy Level	48.35	22.98	.00	100.00	
	Senior Provincial Level	42.10	24.29	.00	83.33	
	Total	**46.75**	23.32	.00	100.00	
					Total personal coping resource score:	
Junior Academy/Secondary School Level						66.92%
Premier League Club/Senior Academy Level						64.49%
Senior Provincial Level						62.21%

Shown in Table 1, the three levels of participation performed similarly on coping with adversity, coachability, and goal setting and mental preparation.

The senior provincial level respondents obtained the lowest scores of the group in respect of concentration, peaking under pressure, and freedom from worry. They were, however, the strongest in goal setting and mental preparation, but without any significant difference from the other two groups.

The premier league/senior academy respondents scored the lowest in terms of confidence and motivation as well as goal setting and mental preparation. Furthermore, they did not stand out above the other participants in any of the other coping skills.

The junior academy respondents outscored the other respondents in the majority of the skills tested. These skills included coping with adversity, coachability, concentration, confidence and motivation, peaking under pressure, and freedom from worry.

Generally speaking, the junior academy cricket players demonstrated the best total coping-skills score (66.92%) of both the senior provincial (62.21%) and premier league cricket players (64.49%). This is presumably due to the less competitive demands that are placed on cricketers at different levels of participation. It could be that junior academy participants score high on coping skills because the performance demands they face are less daunting than those being experienced at senior club and senior provincial levels.

The results of the ANOVA analysis indicated that the above differences in scores on the ACSI-28 subscales were not statistically significant.

Table 2: Descriptive statistics and significant differences in performance on the mental skills subscales by level of participation in cricket

		Mean±SD	Minimum	Maximum	p-value
Imagery ability	Junior Academy/Secondary School Level	69.23±14.33	33.33	95.83	.113
	Premier League Club/Senior Academy Level	75.14±13.39	45.83	100.00	
	Senior Provincial Level	69.68±20.10	25.00	100.00	
	Total	71.35±15.02	25.00	100.00	
Mental preparation	Junior Academy/Secondary School Level	65.65±18.04	16.67	100.00	.491
	Premier League Club/Senior Academy Level	66.79±17.21	25.00	100.00	
	Senior Provincial Level	71.27	45.83	100.00	
	Total	**67.90**±16.96	16.67	100.00	
Self-confidence	Junior Academy/Secondary School Level	71.60±17.51	29.17	100.00	.835
	Premier League Club/Senior Academy Level	73.29±14.74	41.67	100.00	
	Senior Provincial Level	74.02±19.01	37.50	95.83	
	Total	**72.97**±16.17	29.17	100.00	
Anxiety and worry management	Junior Academy/Secondary School Level	63.57±17.93	25.00	100.00	.199
	Premier League Club/Senior Academy Level	68.06±18.57	25.00	100.00	
	Senior Provincial Level	59.79±23.11	16.67	91.67	
	Total	**63.81**±19.27	16.67	100.00	
Concentration ability	Junior Academy/Secondary School Level	69.85±19.14	29.17	100.00	.865
	Premier League Club/Senior Academy Level	71.78±18.52	16.67	100.00	
	Senior Provincial Level	72.08±21.59	33.33	100.00	
	Total	71.24±19.09	16.67	100.00	
Relaxation ability	Junior Academy/Secondary School Level	68.47±16.74	33.33	91.67	.530
	Premier League Club/Senior Academy Level	70.32±16.48	29.17	100.00	
	Senior Provincial Level	65.63±16.76	37.50	91.67	
	Total	68.14±16.55	29.17	100.00	
Motivation	Junior Academy/Secondary School Level	78.18±14.80	33.33	100.00	.774
	Premier League Club/Senior Academy Level	79.91±13.78	37.50	100.00	
	Senior Provincial Level	80.92±19.16	33.33	100.00	
	Total	**79.67**±14.91	33.33	100.00	

The three levels of participation performed very similarly on the Bulls' Mental Skills subscales (Table 2). The mental skills that were most strongly represented by the respondents were motivation (average = 79.67%), and self-confidence (average = 72.97%). The skills in which the respondents scored the lowest were anxiety and worry management (average = 63.81%), and mental preparation (average = 67.90%).

The senior provincial level respondents demonstrated the highest proficiency in motivation, concentration ability, self-confidence, and mental preparation. Regardless of scoring the highest in the majority of the mental skills tested, they did appear to demonstrate the weakest anxiety and worry management scores.

The premier league/senior academy level respondents indicated the strongest imagery ability, and anxiety and worry management scores of all respondents. The lowest score recorded for premier league/senior club respondents was mental preparation which, nevertheless, still outscored the junior academy level respondents.

The junior academy level respondents were outscored by the respondents in the other two levels in most of the mental skills tested. Like respondents in the other two levels, they also indicated higher scores in motivation and self-confidence.

One-way analysis of variance indicated that there were no statistically significant differences between the three levels of participation, in terms of their performance on any of the Bulls'subscales. This was confirmed by the non-parametric analysis.

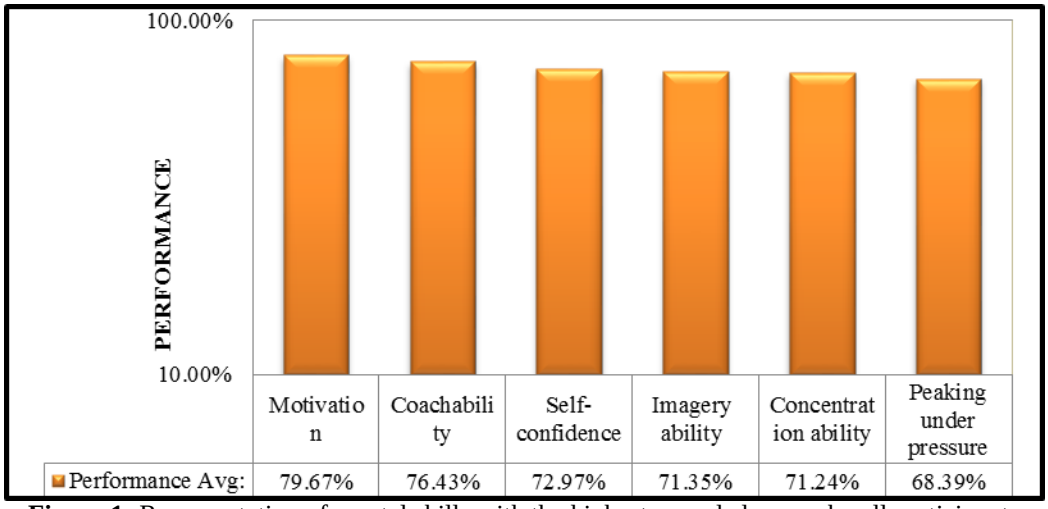

Figure 1: Representation of mental skills with the highest recorded scores by all participants

The result in Figure 1 illustrates the mental skills arising from both psychometric measures in which the participants from all three levels of competition recorded the highest scores. It is evident that a mental-skills profile consisting of motivation, coachability, self-confidence, imagery ability, concentration ability, and peaking under pressure is evident in successful cricket participation.

Judging from the results, there appears to be no significant difference between the mental skills usage of junior academy, premier league/senior academy and senior provincial cricket players. This finding opposes Gordon's (1990) estimate

that more skilled and experienced cricket players use more approximations of a variety of mental skills. A possible explanation could be that the sample of participants tested in this investigation consists of A-side participants from each level of participation and that all of them have the psychological potential to participate at a higher level of competition. Another rationale based on the thoughts of Ross (2009), and Woolmer *et al* (2008) is that training in mental skills has received such limited exposure in the context of all three levels of cricket participation in South Africa that it has resulted in an equal spread of psychological proficiency amongst the players.

Apart from the findings discussed above, a strong psychological-skills profile for cricket players from all three levels of competition was identified. The results yielded from the two mental-skills questionnaires (Figure 1) clearly showed that a psychological-skills profile does exist in skilled cricket players. To a certain extent the identified mental skills resemble the components listed by Orlick (1992) as the essence of human excellence in general but, more specifically,they also correspond to what Gordon (1990) discovered to be the most important mental-skills requirements in cricket when he evaluated the Western Australian state cricket team players. These identified mental skills also link up with what Thelwell and Maynard (2002) described as antecedents of repeatable good performance in professional cricket players.

These results indicate that successful cricket participation at amateur level requires the same key psychological attributes as participation at professional level. The conclusion to be drawn from the psychological-skills profile generated by this study is, therefore, that mental skills play an important role in successful cricket participation and development from an early stage of competition. As evidenced in this study, young cricketers have learned to master various psychological qualities that are necessary to play competitive cricket at a senior or more professional level. If the sample of this investigation had not been limited to only A-side players, a possible difference in their psychological frame of reference might have been validated.

Conclusion and recommendations

From the collective results of the psychological-skills scores it has become apparent that there are no significant mental-skills differences between cricket players from various levels of competition in one-day cricket. This, however, does not detract from the significant role played by mental skills in cricket since it is important to note that successful cricket participants in this study (ranging from amateur to professional) demonstrated noteworthy mental-skills profiles that resemble the antecedents of elite-level cricket performance highlighted by Gordon (1990) and Thelwell and Maynard (2003). These findings corroborate the fact that other physiological attributes such as physique, strength, speed and

skills levels should also be considered as determinants of performance (Cox & Yoo, 1995). This study, therefore, provides useful insight into the key psychological attributes of skilled cricketers. Cricket coaches should consider introducing training in the identified mental skills at developmental stages of the game since these are noted to be associated with successful participation and development at various levels. Future research on cricket players should aim to determine the mental-skills differences between successful and unsuccessful cricketers participating at the same level of competition, with a view placing greater emphasis on the role played by psychological skills in cricket performance. This could promote the purposeful development of cricket-specific psychological-skill training programmes which could facilitate behaviour modification that complements the physiological aspects of cricket performance.

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