

Establishment of norms for the Bull's Mental Skills Questionnaire in South African university students: An exploratory study

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Abstract

In various South African academic and professional fields, such as Sport and Exercise Psychology, mental skills are measured individually and/or collectively using internationally developed scales. Local norms are needed for such measures. The purpose of this study was to establish preliminary South African norms, in the form of means and standard deviations, for one such United Kingdom developed collectively orientated mental skill measure. The Bull's Mental Skills Questionnaire, consists of seven mental skill subscales: imagery ability (ia), mental preparation (mp), self-confidence (sc), anxiety and worry management (awm), concentration ability (ca), relaxation ability (ra) and motivation (m), which collectively produce a total mental skills score. For the purpose of obtaining a large sample size for this exploratory study, data were collected from 419 male and female university students with a mean age of 20.18 years. Results suggested significant correlations among all subscales, except between imagery ability and anxiety and worry management, as well as significant differences between males and females for imagery ability and motivation. There were no significant differences between ages or between younger and older mean age groups. Results are compared with previous South Africa studies where the scale has been used. Recommendations for future research are made.

Key words: Mental skills, Bull's Mental Skills Questionnaire, South African university students, exploratory study.

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Introduction

Mental skills are naturally occurring, daily utilized, improvable abilities and/or techniques. In themselves, mental skills are all interrelated and form a unique, composite, inseparable whole (Weinberg & Gould, 2007). Their separation into arbitrary categories is for such purposes as teaching, learning, assessment and intervention, which can be undertaken in a variety of settings like sport and exercise. Although a great amount of research has been undertaken specifically in sport and exercise, mental skills assessment and training are also equally

applicable in other settings and performance domains. For example, Talbot-Honeck and Orlick (1998) successfully measured and developed mental skills in top classical musicians to enhance performance. Murphy and Orlick (2006) focused on mental skills application in the profession of acting. Commonly used mental skills include physiological and cognitive arousal, imagery, attention, concentration, self-confidence, goal setting and motivation (Edwards & Steyn, 2008).

In terms of both general life and specific contexts, physiological arousal is the current level of natural physical energy essential for movement and performance (Martens, Vealey & Burton, 1990). Cognitive arousal is the current level of natural cognitive energy. Mental imagery is the cognitive recreation and rehearsal of an action or experience (Gill, 2000). Attention involves focusing mental ability on a current task. Concentration entails sustaining attention over a period of time, whilst still being aware of environmental and situational factors (Harris & Harris, 1984). Goal setting is the establishment of desired objectives, with the achievement of such goals dependent upon factors such as motivation (Moran, 2004). Motivation is the force and focus of a person's energy. Self-confidence is the belief that one has the ability to successfully complete an event (Weinberg & Gould, 2007).

Mental skills are individually and/or collectively, qualitatively or quantitatively assessed. Most mental skill measurement scales are initially constructed and normed in the United States of America, Europe or Australia. In relation to mental skills being evaluated individually, physiological arousal can be gauged by breath and/or heart rate measurements, cognitive arousal and self-confidence can be evaluated using parts of the Competitive State Anxiety Inventory 2 (Martens et al., 1990), imagery measured by means of the Sport Imagery Questionnaire (Hall, Mack, Paivio & Hausenblas, 1998), attention and concentration assessed using concentration grids (Weinberg & Gould, 2007), goal orientation ability examined using the Perception of Success Questionnaire (Roberts, Treasure & Balague, 1998) and motivation level tested with the Self-Theory Questionnaire (Dweck, 1999).

In terms of mental skills being evaluated collectively, various questionnaires exist for this purpose with few as comprehensively composed as Bull's Mental Skills Questionnaire (Bull, Albinson & Shambrook, 1996; Snauwaert, 2001). This questionnaire measures imagery, mental preparation (goal setting), self-confidence, concentration, relaxation and motivation, anxiety and worry management. It produces an overall mental skills score. Although the Bull's Mental Skills Questionnaire was developed in the United Kingdom, it does not have United Kingdom norms, nor other international or South African norms.

Following the First World Congress of Sport Psychology in 1965 in Rome, due to political, economic and social factors, sport and exercise psychology did not develop in South Africa as was the case in some other countries. However, over the last 20 years there has been relatively more progress. Sport and Exercise Psychology is now a developing field in South Africa (Witton, 2004). In relation to research on mental skills, various studies, some of which have included the use of the above-mentioned individually and collectively orientated mental skills measures, have been undertaken in South Africa (Pieterse & Potgieter, 2006; Danariah, 2007; Edwards, 2007; Edwards & Edwards, 2007). While some norms for individually orientated mental skills measures, such as the Sport Competition Anxiety Test (SCAT) (Potgieter, 2009) have been established, preliminary norms for many individually and collectively orientated mental skills measures have not been established. Although the Bull's Mental Skills Questionnaire has been used in South Africa, no local norms exist and overseas Cronbach alpha levels (Snauwaert, 2001) have been utilized to gauge outcomes. Recommendations for the normalization of Bull's Mental Skills Questionnaire within the South African context were made in previous studies (Edwards, 2007; Edwards & Steyn, 2008).

The objective of this study was to establish preliminary norms, in the form of means and standard deviations, for Bull's Mental Skills Questionnaire among South African university students. This could potentially encourage more research using the scale in general life and specific contexts such as sport and exercise with a variety of sporting codes at various sporting levels. It is envisaged that such pilot research will lead to a more comprehensive standardization with larger samples of participants, in order to establish a South African version of this scale. The establishment of South African norms could be compared with United Kingdom or other international norms should such norms be established.

Methodology

Sample

The sample consisted of 419 participants, 151 males and 268 females, with a mean age of 20.18 years. Participants were first and second year students from two South African universities who were studying psychology and sport science, which are the two main fields which comprise Sport and Exercise Psychology.

Purposeful sampling technique

For the purpose of establishing preliminary norms for the Bull's Mental Skills Questionnaire, this large sample group was required. The sample was also

chosen on the basis of their potential understanding of the concept of mental skills.

Design

In this positivistic study, a descriptive purposeful sample design was used and quantitative data analysis methods were employed.

Instrument of the study

Bull's Mental Skills Questionnaire

Bull's Mental Skills Questionnaire, developed in the United Kingdom, measures: imagery, mental preparation (goal setting), self-confidence, anxiety and worry management, concentration, relaxation and motivation, which results in individual scores and a total scale score (Bull et al., 1996; Snauwaert, 2001). The questionnaire has 28 items and assesses participants along a six point Likert scale, requiring item responses ranging from 'strongly agree' to 'strongly disagree'. There is currently no United Kingdom or other international norms for the scale. The scale was based on Nelson and Hardy's (1990) Sport-Related Skill Questionnaire (SPSQ). The SPSQ consists of the following categories: imagery skill, mental preparation, self-efficacy, cognitive anxiety, concentration skill, relaxation skill and motivation. The SPSQ was initially completed by 100 participants with selected statements from all of seven subscales having a Cronbach alpha level above 0.78.

The Bull's Mental Skills Questionnaire has been translated into Dutch, where it was assessed with 219 athletes and shown to have generally high Cronbach alpha levels of .80, .64, .62, .61, .59, .72 and .72, respectively for the seven subscales (Snauwaert, 2001).

It has been previously used within the South African context (Danariah, 2007; Edwards, 2007; Edwards & Edwards, 2007). Danariah's (2007) study assessed 60 participants, with a mean age of 17 years. Respective subscale means were as follows: imagery ability 18.60, mental preparation 20.20, self-confidence 18.90, anxiety and worry management 16.10, concentration ability 17.40, relaxation ability 18.40, motivation 20.50 and total score 130.10. No data on standard deviations (SD) were reported.

Edwards' (2007) study assessed 20 participants who had an average age of 18 years. Respective subscale means and standard deviations (in brackets) were as follows: imagery ability 19.20 (3.68), mental preparation 16.50 (4.25), self-confidence 18.25 (3.80), anxiety and worry management 16.40 (4.49),

concentration ability 18.75 (5.01), relaxation ability 16.00 (5.02) and motivation 18.75 (3.92). A total score of 123.85 with a standard deviation of 19.80 was obtained.

Edwards and Edwards' (2007) study assessed 9 participants with a mean age of 18 years. Respective subscale means and standard deviations (in brackets) were as follows: imagery ability 15.33 (3.81), mental preparation 13.00 (2.87), self-confidence 14.22 (3.70), anxiety and worry management 12.22 (3.38), concentration ability 16.00 (3.87), relaxation ability 14.67 (4.09) and motivation 16.67 (2.87). A total score of 102.11 with a standard deviation of 18.93 was obtained.

Administration of the instrument

Consent was obtained from the author of the questionnaire to undertake research and establish preliminary norms for the scale. The purpose of the study was explained to participants. Consent was obtained from each participant. Confidentiality was guaranteed and participants informed that they were free to withdraw from the study at any stage. Each participant completed a Bull's Mental Skills Questionnaire. All information was presented in a group format and kept in a confidential manner.

Analysis of the data

The quantitative data was analysed using the computer-based SPSS statistical software package with correlational and descriptive statistics computed.

Results and Discussion

In Tables 1, 2 and 3, the Bull's Mental Skills Questionnaire subscales are coded as follows: imagery ability (ia), mental preparation (mp), self-confidence (sc), anxiety and worry management (awm), concentration ability (ca), relaxation ability (ra) and motivation (m).

Table 1 refers to the correlation between Bull's Mental Skills Questionnaire subscales based upon the student sample. Significance positive correlations at the 1% alpha level were found among all measures except between imagery ability and anxiety and worry management (0.09). Imagery ability correlated with mental preparation (0.29), self-confidence (0.28), concentration ability (0.18), relaxation ability (0.23) and motivation (0.36). Mental preparation correlated with self-confidence (0.35), anxiety and worry management (0.13), concentration ability (0.13), relaxation ability (0.29) and motivation (0.38). Self-confidence correlated with anxiety and worry management (0.44), concentration ability

(0.35), relaxation ability (0.47) and motivation (0.49). Anxiety and worry management correlated with concentration ability (0.34), relaxation ability (0.43) and motivation (0.27). Concentration ability correlated with relaxation ability (0.29) and motivation (0.31). Relaxation ability correlated with motivation (0.51). Similar to Snauwart's findings, reliability analysis of all subscales yielded a satisfactory, high Cronbach alpha of 0.76.

Table 1: Correlation matrix of Bull's Mental Skills Questionnaire subscales – Pearson's correlation (N=419)

	IA	MP	SC	AWM	CA	RA	M
IA							
MP	.29**						
SC	.28**	.35**					
AWM	.09	.13**	.44**				
CA	.18**	.13**	.35**	.34**			
RA	.23**	.29**	.47**	.42**	.29**		
M	.36**	.38**	.49**	.27**	.31**	.51**	

* p<.05, ** p<.01

Table 2 refers to means and standard deviations for the Bull's Mental Skills Questionnaire subscales based upon the student sample. Respective means and standard deviations (in brackets) were as follows: imagery ability 18.48 (3.44), mental preparation 18.61 (3.54), self-confidence 17.47 (4.05), anxiety and worry management 15.38 (4.91), concentration ability 17.88 (4.37), relaxation ability 16.17 (3.57), motivation 19.07 (3.49) and total score 123.09 (18.27). Respective subscale male and female means and standard deviations (in brackets) were as follows: imagery ability 18.99 (3.19) and 18.19 (3.55), mental preparation 18.40 (3.49) and 18.73 (3.57), self-confidence 17.81 (3.81) and 17.28 (4.17), anxiety and worry management 15.76 (4.97) and 15.16 (4.87), concentration ability 17.64 (4.21) and 18.01 (4.45), relaxation ability 16.67 (4.63) and 15.90 (4.52), motivation 19.93 (3.03) and 18.59 (3.64), and total score 125.21 (17.00) and 121.90 (18.88). Analysis of variance indicated significant differences between males and females on imagery ability, $F(1, 419) = 5.36, p = 0.02$ and motivation, $F(1, 419) = 14.65, p = 0.00$. Inspection of means in Table 2 indicated that these differences are due to higher mean scores of males than females on each of these variables. These results are similar to the findings from the Weinberg, Butt, Knight, Burke and Jackson (2003) study where a sample of university men, compared with a sample of university women, used imagery more frequently and perceived it to be more effective. The results also concur with Kirkpatrick, Hebert and Bartholomew's (2005) research, which suggested higher levels of motivation in college men than college women with special

reference to challenge, competition, strength and endurance in sport and exercise. There were no significant differences between ages or between younger and older mean age groups.

Table 3 refers to the comparison of the means and standard deviations for the four South African studies, which have used the Bull’s Mental Skills Questionnaire. The imagery and mean score from the Edwards and Steyn (2008) study is similar to the score from Danariah’s (2007) study, while the relaxation ability, motivation and total mean scores were in concurrence with Edwards’ (2007) study. The self-confidence and anxiety and worry management scores from the Edwards (2007) and Danariah (2007) study are also similar.

Table 2: Means and standard deviations of Bull’s Mental Skills Questionnaire subscales – Descriptive statistics for males, females, total participants (N=419)

	Number of participants		IA	MP	SC	AWM	CA	RA	M	Total
Total	419	Mean	18.48	18.61	17.47	15.38	17.88	16.17	19.07	123.09
		SD	3.44	3.54	4.05	4.91	4.37	3.57	3.49	18.27
Male	151	Mean	18.99	18.40	17.81	15.76	17.64	16.67	19.93	125.21
		SD	3.19	3.49	3.81	4.97	4.21	4.63	3.03	17.00
Female	268	Mean	18.19	18.73	17.28	15.16	18.01	15.90	18.59	121.90
		SD	3.55	3.57	4.17	4.87	4.45	4.52	3.64	18.88

Table 3: Comparison of means and standard deviations for the four South African studies which have used the Bull’s Mental Skills Questionnaire

Study	Number of participants		IA	MP	SC	AWM	CA	RA	M	Total Score
Edwards & Steyn (2011)	419	Mean	18.48	18.61	17.47	15.38	17.88	16.17	19.07	123.09
		SD	3.44	3.54	4.05	4.91	4.37	3.57	3.49	18.27
Edwards & Edwards (2007)	9	Mean	15.33	13.00	14.22	12.22	16.00	14.67	16.67	102.11
		SD	3.81	2.87	3.70	3.38	3.87	4.09	2.87	18.93
Edwards (2007)	20	Mean	19.20	16.50	18.25	16.40	18.75	16.00	18.75	123.85
		SD	3.68	4.25	3.80	4.49	5.01	5.02	3.92	19.08
Danariah (2007)	60	Mean	18.60	20.20	18.90	16.10	17.40	18.40	20.50	130.10
		SD	/	/	/	/	/	/	/	/

This study paves the way for further research using the questionnaire on larger international samples and collecting responses on multiple choices answer sheets for optical reader data analysis for comprehensive standardization of the scale through individual item analysis, reliability and validity checks. This could in

turn lead to the development of standardized computer assisted forms of assessment for research purposes and applied sport psychology interventions.

Conclusion and Recommendations

This research provided initial South African norms in the form of means and standard deviations for the Bull's Mental Skills Questionnaire using a purposeful large sample of 419 first and second year university students who were studying psychology and sport science. The study will be of benefit to researchers who use the scale in various South African academic and professional fields, such as Sport and Exercise Psychology. With preliminary norms having been established, the scale might now be more readily used in various contexts with a variety of sport codes and at different competition levels. These preliminary norms can be utilized towards the establishment of further South African, United Kingdom and other international norms for the scale.

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