

## **Distinguishing psychological characteristics of expert fencers in the three weapons**

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A great deal of research effort has concentrated on attempting to predict performance from psychological variables. Evidence showing relationships between psychological variables could be used to guide sport psychology interventions, and it has been proposed that sport psychologists can enhance performance by enhancing psychological skills. The aim of this study was to explore the Distinguishing psychological characteristics of expert fencers. The sample was comprised of 18 fencers classified according sword type (foil n= 8) (epee n=6) (sabre n = 4). All fencers are members in fencing Egyptian federation. Adding, age, anthropometric characteristics and training experience were record to achieve the humanistic . The subjects completed the Test of Performance Strategy: TOPS , Athletic Coping Skills Inventory: ACSI-28 and

Mental Toughness Questionnaire – 48 . The results of this analysis revealed significant differences between the three weapons in the psychological characteristics .In Conclusion. The findings indicated that the implication of this research for coaches working with past psychological characteristics is that to match athletes' preferences.

**Keywords:** TOPS, ACSI-28rbrain structures and functions. In an imaging study, increased brain volume both in the white and the gray regions was observed among older adults after aerobic training (Colcombe et al., 2006). In addition, it has been speculated that aerobic exercises can influence neural functions and cognitive capabilities by altering the plasticity of a person's neural system (Kramer & Erickson, 2007).

In addition to the length of sport participation, cognitive abilities are enhanced as a

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Abstract.

result of the specific demands of certain sports. For example, action inhibition, a subset of executive control, is best in players of some sports than it is in those of other sports. This shows the relation between a given sport and specific cognitive abilities. Kida, et al. (2005) indicated that the response inhibition was different between baseball batters of varying skill levels, but not skill levels. Hence, according that

differential improvement of mental abilities in different sports was observed. The aim of this study was to explore the distinguishing psychological characteristics of expert fencers in the three weapons.

#### Material and Methods

##### Participants

The sample was comprised of (22) fencers classified according sword type (foil n= 7) (epee n=8) (sabre n = 7). All fencers are members in fencing Egyptian federation. Adding, age, anthropometric characteristics and training experience were record to achieve the humanistic .

#### Instrumentation

##### Test of Performance Strategy: TOPS

Test of Performance Strategy: TOPS is a 64-item measure of psychological skills. Thomas et al., 1999 determined Factors are common to training and competition except negative thinking for competition and attentional control for training.

##### The MTQ48

The MTQ48 (Clough et al., 2002) is a 48-item questionnaire that includes challenge, commitment, control, and confidence subscales. The control and confidence subscales are each comprised of 2 factors (emotional and life control, and interpersonal and self-confidence, respectively). Responses to items within the subscales were provided via a 5-point Likert-type scale ranging from 1 (strongly agree) to 5 (strongly disagree). An example of an item is as follows: "I am generally confident in my own abilities". The questionnaire inquires about mental toughness in general; participants were asked to consider the items in relation to their main sport. Scores were summed across all items to obtain a mental toughness score.

The inventory has been used in multiple studies (Horsburgh et al., 2009; Nicholls et al., 2008; Clough et al., 2002; Crust and Azadi, 2010).

### **Athletic Coping Skills Inventory – 28**

The Athletic Coping Skills Inventory – 28 (ACIS-28; Smith, et al. 1995) is a 28-item scale measuring seven classes of sport-specific psychological coping skills including coping with adversity, peaking under pressure, goal setting and mental preparation, concentration; freedom from worry, confidence and achievement motivation, and coachability. Individuals were asked to respond to each statement by indicating how often they experience different situations using a 4 point scale (e.g., I put a lot of pressure on myself by worrying about how I will perform”, 0 = almost never to 3 = almost always). Each subscale consists of four items that are averaged to provide a subscale range of 0

### **Results**

to 3. Additionally, the seven subscales are summed and averaged to provide a total personal coping resource score. Psychometric properties of the scale have been demonstrated via confirmatory factor analyses and preliminary evidence for construct and predictive validity have been found with high school athletes and professional baseball players (Smith, et al. 1995).

#### **Statistical Analysis**

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between the three groups were reported as mean difference  $\pm$  95% confidence intervals (mean difference  $\pm$  95% CI). ANOVA one way was used to determine the differences in psychological parameters between the three groups. The  $p < 0.05$  was considered as statistically significant.

**Table (1)**  
**Table 1. Age, anthropometric characteristics, and training experience of the groups (mean  $\pm$  SD)**

Group	N	Age [years]	Weight [kg]	Height [cm]	Training experience
Foil	7	20.89 $\pm$ 1.34	68.47 $\pm$ 4.3	177.16 $\pm$ 5.06	9.00 $\pm$ 1.2
Epee	8	21.00 $\pm$ 1.01	70.35 $\pm$ 4.4	179.29 $\pm$ 5.2	8.94 $\pm$ 1.6
Sabre	7	21.14 $\pm$ 1.13	72.04 $\pm$ 5.2	178.29 $\pm$ 6.6	8.03 $\pm$ 0.9

Table 1 shows the age, anthropometric characteristics and training experience of the subjects. No significant differences were observed for the subjects.

**Table (2)**  
**Anova for MT-48 Test**

Factors		Sum of Squares	DF.	Mean Square	F	Sig.
<b>Challenge</b>	Between Groups	5.81	2	2.90	1.884	.000
	Within Groups	70.50	15	7.05		
	Total	76.31	17			
<b>Commitment</b>	Between Groups	70.92	2	35.74	0.343	.000
	Within Groups	128.00	15	12.80		
	Total	198.92	17			
<b>Emotional Control</b>	Between Groups	24.36	2	12.35	14.168	.000
	Within Groups	135.00	15	13.50		
	Total	159.69	17			
<b>Life Control</b>	Between Groups	6.67	2	3.34	0.504	.000

**Follow Table (2)**  
**Anova for MT-48 Test**

Factors		Sum of Squares	DF.	Mean Square	F	Sig.
<b>Confidence in Abilities</b>	Within Groups	36.25	15	3.63		
	Total	42.92	17			
	Between Groups	29.42	2	14.71	1.561	.000
	Within Groups	107.50	15	10.57		
<b>Interpersonal Confidence</b>	Total	136.92	17			
	Between Groups	40.67	2	20.43	0.901	.000
	Within Groups	70.25	15	7.03		
	Total	110.92	17			

Data in Table 2 shows that there is a significant difference in MT-48 Test between the fencers in the three weapons in Emotional Control factor for foil fencers

**Table (3)**  
**ANOVA for TOPS factors in training**

Factors		Sum of Squares	DF.	Mean Square	F	Sig.
<b>Goal setting</b>	Between Groups	5.81	2	2.90	0326	.000
	Within Groups	70.50	15	7.05		
	Total	76.31	17			
<b>Self talk</b>	Between Groups	70.92	2	35.47	1.023	.000
	Within Groups	128.00	15	12.80		
	Total	198.92	17			

**Follow Table (3)**  
**ANOVA for TOPS factors in training**

Factors		Sum of Squares	DF.	Mean Square	F	Sig.
<b>Relaxation</b>	Between Groups	24.69	2	12.35	2.03	.000
	Within Groups	135.00	15	13.50		
	Total	159.69	17			
<b>Automatically</b>	Between Groups	6.67	2	3.34	0.504	.000
	Within Groups	36.25	15	3.63		
	Total	42.92	17			
<b>Activation</b>	Between Groups	29.42	2	14.71	0.668	.000
	Within Groups	107.50	15	10.75		
	Total	136.92	17			
<b>Emotional control</b>	Between Groups	40.67	2	20.34	2.43	.000
	Within Groups	70.25	15	7.03		
	Total	110.92	17			
<b>Imagery</b>	Between Groups	39.73	2	34.87	0.478	.000
	Within Groups	63.50	15	6.35		
	Total	133.231	17			
<b>Attentional control</b>	Between Groups	6.67	2	3.34	1.211	.000
	Within Groups	36.25	15	3.63		
	Total	42.92	17			

Data in Table 3 shows training between the fencers in that there is no significant the three weapons. difference in the TOPS in

**Table (4)**  
**ANOVA for TOPS factors in competition**

Factors		Sum of Squares	DF.	Mean Square	F	Sig.
<b>Goal setting</b>	Between Groups	23.07	2	11.54	2.11	.000
	Within Groups	70.00	15	7.00		
	Total	93.07	17			
<b>Self talk</b>	Between Groups	2.83	2	1.41	0.677	.000
	Within Groups	76.25	15	7.63		
	Total	79.07	17			
<b>Relaxation</b>	Between Groups	3.15	2	1.57	0.974	.000
	Within Groups	34.08	15	3.41		
	Total	37.33	17			
<b>Automatically</b>	Between Groups	17.39	2	1.70	0.504	.000
	Within Groups	36.92	15	3.69		
	Total	54.31	17			
<b>Activation</b>	Between Groups	8.64	2	4.32	2.014	.000
	Within Groups	69.67	15	6.53		
	Total	78.31	17			
<b>Emotional control</b>	Between Groups	16.30	2	8.16	0.368	.000
	Within Groups	52.92	15	5.29		
	Total	69.23	17			
<b>Imagery</b>	Between Groups	4.58	2	2.29	1.390	.000
	Within Groups	76.50	15	7.65		
	Total	81.08	17			
<b>Negative thinking</b>	Between Groups	14.58	2	7.23	1.114	.000
	Within Groups	23.42	15	2.34		
	Total	38.00	17			

Data in Table 4 shows that there is no significant difference in the TOPS in competition

between the fencers in the three weapons.

**Table (5)**  
**ANOVA for Athletic Coping Skills Inventory – 28**

Factors		Sum of Squares	DF.	Mean Square	F	Sig.
<b>coping with adversity</b>	Between Groups	38.21	2	19.1	1.661	.000
	Within Groups	129.00	15	11.73		
	Total	167.21	17			
<b>peaking under pressure</b>	Between Groups	40.18	2	20.09	0.887	.000
	Within Groups	94.75	15	8.61		
	Total	134.93	17			
<b>goal setting and mental preparation</b>	Between Groups	6.02	2	3.01	10.168	Sign
	Within Groups	122.33	15	11.12		
	Total	128.36	17			
<b>Concentration</b>	Between Groups	3.61	2	1.81	0.987	.000
	Within Groups	231.25	15	21.01		
	Total	234.86	17			
<b>freedom from worry</b>	Between Groups	104.02	2	52.01	2.144	.000
	Within Groups	106.36	15	9.71		
	Total	210.86	17			
<b>confidence and achievement motivation</b>	Between Groups	29.42	2	14.71	1.054	.000
	Within Groups	140.58	15	12.78		
	Total	170.00	17			
<b>coachability</b>	Between Groups	26.24	2	13.14	1.324	.000
	Within Groups	130.58	15	11.87		
	Total	156.86	17			

Data in Table 5 shows that there is a significant difference in the ACSI-28 between the fencers in the three weapons in goal setting and mental preparation factor for epee fencers.

#### Discussion

In general, sport psychologists have realized the importance of

the mental side of sports and have begun to develop programs to enhance athletes' performances (i.e., PST programs). Research studies have investigated the viability of these programs. To a large extent, regardless of the type of skills introduced, the results indicate that PST programs are



of benefit for the athletes who participate in them (Driskell, et al. 1994; Lerner, et al. 1996; Rogers, et al. 1991).

Typical PST programs incorporate several psychological skills; therefore, it is sometimes difficult to determine which part of the program had the most impact. Patrick and Hrycaiko (1998) discovered that the combination of skills (relaxation, imagery, self-talk, and goal setting) in a PST program resulted in an improvement in the endurance of the runners who participated in the study. Other studies have also indicated that there is a significant improvement in performance when psychological skills are applied by the athletes (Kendall, et al. 1990; Savoy, 1993). These studies showed marked improvement of performers in their respective sports, significantly improving the performance statistics of the participants. Davis (1991), in a single subject research design study, developed a performance enhancement program for a tennis player. The results indicated that this PST program helped improve the individual's tennis specific

skills. These studies support teaching psychological skills to fencers to possibly help improve their performance.

Although the idea of mental toughness has been around for many years, the use of mental abilities in sport has become a formalized technique only in the last several decades. It has been applied by a number of athletes in various sports. One study (McCaffery&Orlick, 1989) surveyed professional golfers to determine their use of psychological skills within their sport. These professionals indicated that imagery was an important part of their mental preparation for practice and tournaments. Some studies have shown that imagery may lead to improved physical performance. Driskell, et al. (1994) performed a meta-analysis of current literature to determine how effective imagery was in relation to performance of a skill. The researchers determined that imagery use significantly improved performance. In a study that evaluated the effectiveness of imagery on dart throwing, Epstein (1980) discovered that imaging immediately prior to the task shows no significant

improvement. Ille and Cadopi (1999) found that gymnasts performed better when they had better imagery skills.

Loehr (1982, 1986) emphasized that athletes and coaches felt that at least fifty percent of success is due to psychological factors that reflect mental toughness. Similarly, Gould, et al. (1987) emphasized that coaches feel that mental toughness is important in achieving success, while Norris (1999) has emphasized the importance of mental toughness in developing champion athletes.

Ruiz and Hanin, (2004) concluded that the content of metaphors used by athletes to describe their emotional states was different prior to, during, and after performances, as well as across their best and worst competition performances. High action readiness was manifested in best performance situations, while low action readiness was reflected in worst performance situations.

A review of literature pointed to mental toughness as being one of the most important determinants of peak athletic performance. Gould, et al. (1987) reported that 82 percent of wrestling coaches ranked

mental toughness as the primary quality associated with competitive success. Williams, et al. (1999) found that mental toughness may be more important in determining the final outcome of a sporting event than factors such as speed and ability.

These findings are consistent with the non-handball game literature as well. For instance, some studies indicate that successful athletes coped with stress more effectively than non-successful athletes (Scanln, et al., 1991). Others have also demonstrated that anxiety, mood, stress, coping, and control collectively contributes to the prediction of performance (Robinson and Howe, 1987). Equally important are the psychological factors of the stress and coping paradigm that predict training outcomes and adherence. Indeed, one study used changes in mood as a measure to assess whether Olympic canoers became "stale" from too much training. These studies point to the relevance of psychological factors in the training process.

#### Conclusion

The findings of this study indicated that Square Stepping Exercise are related to

cognitive skills. Kindergarten teachers working with children need to take these factors into account when preparing for physical education class.

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