

# Linear Study of the Predictive Effect of Pre-competitive Anxiety on Coping Strategies used by Elite Footballers u15 Registered in the Sectorial Training Centers of the Tunisian Football Federation

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**ABSTRACT:** *The abundance of psychological coaching among elite footballers in the sectorial training centers of the Tunisian Football Federation has created a state of ambiguity regarding the two-dimensional treatment of anxiety and coping. The objective of this study is to examine all the predictive relations existing between the different dimensions of precompetitive anxiety and the different coping strategies used by our elites, and the indirect relations through the mediation of coaching, of experience and the technical position, and to understand if the management of anxiety suits their level of elite. These interaction relationships were statistically processed through multiple linear regression analyses to examine direct predictive interaction and through PROCESS v2.16.3 macro model 4, (Hayes Andrew et al., 2013), to examine indirect predictive interactions. The results indicate that the different dimensions of pre-competitive anxiety directly explained all coping strategies used by our elites. On the other hand, all existing indirect predictive relationships have been explained by the effect of mediation and the technical position of the coach..*

**KEYWORDS:** *Direct predictive effects, Indirect predictive effects, Mediation, Coaching, Experience, Technical position*

## INTRODUCTION

The youth sports environment is shaped by a multitude of major sports, social and economic issues. It is in this particular arrangement that the athlete must achieve a performance that could trace the rest of his career. The technique, the physique, the tactics, and the management of the stress, are essential factors so that the performance of the athlete is at the closest of his potentials. Young elite athletes nurtured in an institutional system such as training centers, are not exempt from the daily confrontation marked by enormous demands relevant to competition and performance. In the psychological context, stress is the most important tension. According to (Le et al., 2005), the need to combat the causes of organizational stress is a priority for sports psychology specialists. Mental training is an essential means to help the elite athlete develop their different psychological qualities to combat the high-level stressful environment (Anshel et al., 2009). High performance athletes are those who can successfully manage stressful events (Gaudreau et al., 2010; Nicholls et al., 2007). On the other

hand, high-level athletes apply the best strategies to control the threatening competitive situation (Mahone et al., 1977; Orlick et al., 1988). The athlete environment interaction relationship was explained by the transactional approach of (Lazarus et al., 1984). The term “transactional” indicates that this relationship is always dynamic and mutually reciprocal. The transactional model was built around a concept that maintains the link between cognitive assessment and coping strategy. Many sources of stress have been established in the relationship between the young athlete and the competition (Smith et al., 1996). The competition is an opportunity to confirm sportsmanship and to compete with others. It is also a precious opportunity to evaluate the athlete by his entourage and more particularly by influential people such as parents, peers, leaders and coaches. The emotional impact of the competition on the young athlete has always been a fundamental concern. The influence of stress or anxiety is one of the most important tests faced by sports researchers in young athletes (Gould et al., 1983). Age is an important parameter (Baker et al., 2003) its transition involves a radical upheaval in bio-psycho-social stability. Several studies focus the coping progression with age. In this sense, (Reeves et al., 2009), confirm that athletes in the mid-adolescence phase benefit more from emotion, whereas athletes in their early teen’s strategies

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focused on the problem. (Compas et al., 2001), found that athletes in the adolescent phase can cope better with stressful events. (De et al., 2009), show that older children move more towards cognitive strategies. (Kowalski et al., 2001), reported that adolescents sometimes opt for avoidance-oriented coping determined by behavioral and cognitive behavioral escape from stress (Anshel et al., 2001). Generally, point out that young people are more oriented towards emotion-centered strategies, so the increase in age calls for greater use of strategies. Focused on the problem. On the other hand (Tamminen et al., 2010) argue that coping is an ability that can evolve with experience and with advancing age. (Hanton et al., 2008) indicate, that the level of experience of the athlete also affects the use of coping, and that elite athletes with high levels of experience adapt better with problem-oriented strategies. Our study aims to explain linearly the copying repertoire used by our elites in the different dimensions of precompetitive anxiety. Moreover, what are the properties and factors that influence the perception of stress by our young footballers in the preformation phase.

### ETHICS

This has been approved by an ethics committee for all subjects.

### METHODOLOGY

#### Population

These are 76 Tunisian U15 footballers (average age = 14.00, standard deviation = 0.327), affiliated to the four sectoral pre-training centers. Our young footballers took part in this study after having obtained the authorization of the National Technical Direction of the Tunisian football Federation, our participants responded to the Arabic version of CSAI-2R (Hajji et al., 2017) 30 minutes before the competition and to the Arabic version of ISCCS (Hajji et al., 2016) one hour after the competition. These athletes are subject to a pre-training program supervised by the Tunisian National Technical Department. Our athletes are housed in homes and are subject to an adequate school system for daily training. Every weekend they join their home clubs for Sunday's competition. Sectoral and national groupings were made to select the best to join the U15 Tunisian national team.

### Measuring Instrument

To study the manifestation of pre-competitive situational anxiety in our participants and to measure the intensity, direction and frequency of cognitive, somatic, and pre-competitive self-confidence anxiety a few minutes before the sport competition, we used the version Tunisian revised inventory of state anxiety for the sporting competition CSAI-2R, (Hajji et al., 2017). To identify the coping strategies used to deal with pre-competitive situational anxiety among our elites, we used the Arabic version of the coping strategies inventory of the ISCCS sports competition, (Hajji et al., 2016) with its ten top-notch coping strategies divided into three super-second-order factors: task-based coping, distraction-based coping, and disengagement-based coping.

### Procedure

We used the SPSS software to collect the data. These analyses were administered in two stages to identify all explanatory links between all components of pre-competitive anxiety and coping strategies. The first step relates to locating the predictive effects through the coaching factors, level of experience and technical position. In this step, we used linear regression with the "step-by-step" method and the "filter variable" technique. The second step, relates to the examination of the total indirect effect imposed by pre-competitive anxiety on the coping strategies used, and to the study of the mediating effect of coaching, level of experience and position technical. In this step, we used model 4 of the PROCESS macro v2.16.3, (Hayes et al., 2013).

### RESULTS

#### Direct Predictive Effects

The results obtained are all indicated in the Tables: 1-7

#### Direct Predictive Effects Relative to the Coaching Factor

In relation to the coaching factor, the following coping strategies: Control of thoughts, Relaxation, Mental distraction, Deployment

**Table 1.**  
Summary of models: Training center (coaching)

Training Center	Dependent variables	Independent Variables	R-two adjusted	Variation of F	Sig. Variation of F	Durbin-Watson
Center 1	Control of thoughts	-	0.213	5.882	0.027	1.977
	Relaxation	DCA	0.419	13.966	0.002	1.678
	Mental distraction	-	0.248	6.928	0.017	1.913
Center 2	Control of thoughts	DSC	0.502	5.25	0.036	1.717
		FSA				
		DCA				
	Deployment of efforts	ISC	0.222	6.409	0.021	1.961
Deployment of efforts	ICA	0.19	5.443	0.031	1.258	
Center 3	Relaxation	DSC	0.253	7.427	0.014	2.125
	Logical analysis	DSA	0.153	4.443	0.049	1.671
	Logical analysis	ISA	0.198	4.955	0.042	0.73
Center 4	Ventilation of emotions	DCA	0.437	13.41	0.002	1.175
ICA : Intensity of Cognitive Anxiety		DCA : Direction of Cognitive Anxiety		FCA : Frequency of Cognitive Anxiety		
ISA : Intensity of Somatic Anxiety		DSA : Direction of Somatic Anxiety		FSA : Frequency of Somatic Anxiety		
Isc : Intensity of Self-Confidence		Dsc : Direction of Self-Confidence		Fsc : Frequency of Self-Confidence		

**Table 2.**  
Model coefficients: Training center

	Dependent Variables	Independent	B	Bêta	T	Sig.	Tolerance	VIF
Training Center	Control of thoughts	(Constant)	13.25	-	14.134	0	-	-
		DCA	-0.239	-0.507	-2.425	0.027	1	1
Center 1	Relaxation	(Constant)	14.761	-	27.601	0	-	-
		DCA	-0.203	-0.672	-3.737	0.002	1	1
	Mental distraction	(Constant)	15.500	-	29.892	0	-	-
		DCA	-0.138	-0.538	-2.632	0.017	1	1
Center 2	Control of thoughts	(Constant)	3.648	-	1.532	0.145	-	-
		DSC	0.512	0.849	4.441	0	0.717	1.395
		FSA	0.489	0.559	3.097	0.007	0.804	1.245
Center 3	Deployment of efforts	(Constant)	12.932	-	4.694	0	-	-
		ISC	-0.395	-0.512	-2.532	0.021	1	1
	Deployment of efforts	(Constant)	6.596	-	3.564	0.002	-	-
		ICA	0.345	0.482	2.333	0.031	1	1
Center 4	Relaxation	(Constant)	12.56	-	16.711	000	-	-
		DSC	-0.213	-0.54	-2.725	0.014	1	1,000
	Logical analysis	(Constant)	11.205	-	11.122	0	-	-
		DSA	-0.276	-0.445	-2.108	0.049	1	1
	Logical analysis	(Constant)	13,909	-	7.935	0	-	-
ISA		-0.304	-0.498	-2.226	0.042	1	1	
Center 4	Ventilation of emotions	(Constant)	14.26	-	22,814	,000	-	-
		DCA	-0.331	-0.687	-3.662	0.002	1	1

**Table 3.**  
Summary of Models: Level of Experience

Level of experience	Dependent variables	Independent variables	R-two adjusted	Variation of F	Sig. Variation of F	Durbin-Watson
Less than 2 years	Control of thoughts	DCA	0.178	6.423	0.018	2.013
	Deployment of efforts	DSC	0.142	5.124	0.033	1.46
	Control of thoughts	FCA DSA	0.131	4.912	0.032	1.59
Greater than 2 years	Relaxation	ISA FCA	0.162	4.341	0.043	1.445
	Logical analysis	ISC DCA	0.158	4.163	0.047	1.105
	Ventilation of emotions	FCA	0.071	4.728	0.035	1.595

**Table 4.**  
Model coefficients: Level of experience

Level of experience	Dependent variables	Independent variables	B	Bêta	T	Sig.	Tolerance	VIF
Less than 2 years	Control of thoughts	(Constant)	13.965	-	17.559	0	-	-
		DCA	-0.245	-0.459	-2.534	0.018	1	1000
	Deployment of efforts	(Constant)	11.916	-	11.589	0	-	-
		DSC	-0.221	-0.419	-2.264	0.033	1	1000
Greater than 2 years	Control of thoughts	(Constant)	12.589	-	12.717	0	-	-
		FCA	0.13	0.299	2.243	0.03	0.997	1-003
		DSA	-0.106	-0.296	-2.216	0.032	0.997	1.003
	Relaxation	(Constant)	13.17	-	8.349	0	-	-
		ISA	0.303	0.397	2.991	0.004	0.969	1.032
	Logical analysis	FCA	-0.152	-0.277	-2.084	0.043	0.969	1.032
		(Constant)	16.659	-	6.522	0	-	-
		ISC	-0.379	-0.335	-2.555	0.014	0.998	1.002
	Ventilation of emotions	DCA	-0.156	-0.268	-2.04	0.047	0.998	1-002
		(Constant)	17.037	-	14.417	0	-	-
	FCA	-0.156	-0.299	-2.174	0.035	1	1	

**Table 5.**  
Summary of Models: Technical position

Technical position	Dependent Variables	Independent Variables	R-two adjusted	Variation of F	Sig. Variation of F	Durbin-Watson
Goalkeeper	Control of thoughts	DCA	0.466	8.847	0.018	1.488
	Deployment of efforts	FSC	0.206	6.461	0.019	1.235
Defender	Control of thoughts	DCA	0.183	5.704	0.027	2.627
	Mental distraction	DSC	0.387	6.135	0.023	1.927
		DCA				
Deployment of efforts	ICA	0.228	6.920	0.016	1.428	
Midfielder	Relaxation	FCA	0.160	4.805	0.041	1.753
	Logical analysis	FSC	0.296	9.421	0.006	1.454
	Control of thoughts	ICA	0.413	5.963	0.024	2.253
	ISA					
Attack Player	Logical analysis	FSA	0.258	8.665	0.008	2.138
	Ventilation of emotions	DCA	0.164	5.305	0.032	1.688

**Table 6.**  
The coefficients of the models: Technical position

Technical position	Dependent Variables	Independent Variables	B	Bêta	T	Sig.	Tolerance	VIF
Goalkeeper	Control of thoughts	(Constant)	14.591	-	13.825	0	-	-
		DCA	-0.394	-0.725	-2.974	0.018	1	1
	Control of thoughts	(Constant)	13.688	-	17.428	0	-	-
		DCA	-0.235	-0.471	-2.388	0.027	1	1
Defender	Deployment of efforts	(Constant)	17.466	-	5.69	0	-	-
		FSC	-0.28	-0.494	-2.542	0.019	1	1
	Mental distraction	(Constant)	14.847	-	26.686	0	-	-
		DSC	0.133	0.498	2.916	0.009	0.998	1.002
	DCA	-0.12	-0.423	-2.477	0.023	0.998	1.002	
Midfielder	Deployment of efforts	(Constant)	2.36	-	0.819	0.423	-	-
		ICA	0.564	0.517	2.631	0.016	1	1
	Relaxation	(Constant)	18.047	-	9.146	0	-	-
		FCA	-0.259	-0.449	-2.192	0.041	1	1
Logical analysis	(Constant)	20.223	-	5.677	0	-	-	
	FSC	-0.37	-0.576	-3.069	0.006	1	1	
	(Constant)	21.999	-	13.712	0	-	-	
Control of thoughts	ICA	-0.363	-0.503	-3.055	0.006	0.984	1.017	
	ISA	-0.212	-0.402	-2.442	0.024	0.984	1.017	
Attack Player	Logical analysis	(Constant)	9.187	-	6.738	0	-	-
		FSA	0.297	0.54	2.944	0.008	1	1
	Ventilation of emotions	(Constant)	14.462	-	19.573	0	-	-
DCA		-0.205	-0.449	-2.303	0.032	1	1	

of efforts, Logical analysis, Ventilation of emotions, are directly explained by the different measures of intensity, direction and frequency of somatic anxiety over time (Table 1). Table 2 indicates that the different measures of intensity, direction, and frequency of somatic anxiety over time that represent the independent variables of the study contribute significantly to the model.

### Direct Predictive Effects Relative to Level of Experience

In relation to the coaching factor, the following coping strategies: Control of thoughts, Deployment of Efforts, Relaxation, Logical Analysis and Ventilation of Emotions, are directly explained by measures of somatic anxiety and self-confidence, various measures of direction, and frequency of cognitive anxiety (Table 3). Table 4 indicates that measures of somatic anxiety

intensity and self- confidence, different measures of direction, and frequency of cognitive anxiety that represent study-independent variables contribute significantly to the model.

### Direct Predictive Effects versus technical position

In relation to the coaching factor, the following coping strategies: Control of thoughts, Deployment of Efforts, Mental Distraction, Relaxation, Logical Analysis and Ventilation of Emotions are directly explained by the different measures of frequency, measures of the intensity of somatic and cognitive anxiety, and by the direction of cognitive anxiety and self- confidence (Table 5). Table 6 indicates that different measures of frequency, measures of somatic and cognitive anxiety intensity, and measures of the direction of cognitive anxiety and self-confidence that represent the independent variables of the study contribute significantly to the model.

## The Mediation Effect of Coaching, Experience and Technical Position

For the indirect relations examined the results indicate the mediation of the coaching and the technical position. The results of the indirect effect of coaching mediation, level of experience and technical position are shown in Table 7.

### DISCUSSION

#### Direct Predictive Effects

Dependent variables to predict are task-oriented coping strategies, disengagement and distraction, while independent variables are the different dimensions and measures of precompetitive anxiety.

We have opted for multiple linear regression analyses to assess whether, and to what extent, pre-competitive anxiety can predict the coping strategies implied by our young elites to manage a competitive environment.

- The coefficients of the multiple linear regressions indicate that we did not have problems of multi-collinearity since there are no perfect linear relations between the independent variables. Consequently, the correlations are not too strong and all the values of the tolerance and VIF (Variance Inflation Factor) for the different models are close to 1 (Tables 2, 4 and 6).
- For error independence, residual values are not correlated between individuals. The Durbin-Watson values of all models work around the value 2, indicating the lack of correlation. In general, these values are in the range (Tables 1, 3 and 5).
- Adjusted R2 is an index adjusted to explain the relationship between dependent variables and independent variables. This index represents the strength of the predictive relationship and the percentage of variance explained by the model (the combination of the independent variables). In our study, the adjusted R2 values significant at  $p < 0.05$  fluctuate between 0.045 and 0.466, which proves that the data are satisfactorily adjusted to the model and sometimes inadequately.
- Another index is centralized by our analysis: it is the standardized regression coefficient "Beta", which explains the variation of the variable to predict Y when we vary by one unit the dependent variable. This index indicates the change in standard deviation of the dependent variable for each one standard deviation increase of the independent variable when the other values are constant. The standardized

regression coefficient "Beta" verifies the weight or predictive power of the model. The absolute values of the standardized regression coefficient "Beta" of our models are between 0.241 and 0.725, which means that the power of our models evolves from satisfactory to good.

The coping strategies revealed by multiple linear regression analysis, represent the three categories of coping:

- Task-oriented coping: logical analysis, control of thoughts, relaxation, Deployment of efforts
- Disengagement-oriented coping: ventilation of unpleasant emotions
- Distraction-oriented coping: mental distraction

All dimensions and measures of pre-competitive anxiety have predicted these coping strategies used by our elites, this proves that the use of coping by our elites is irregular. Recently, researchers like (Nicolas Michel et al., 2011; Sabato et al., 2016; Doron et al., 2016; Catherine et al., 2004; Dinca et al., 2007), have shown that elite athletes often use task-oriented coping strategies, such as effort expenditure, thought control, relaxation, logical analysis, mental imagery, and support seeking to cope with stressful situations.

#### Indirect Predictive Effects

The regression analysis through model 4 of PROCESS macro v2.16.3, (Hayes et al., 2013), indicate the effects of mediation of coaching and technical position that indicates the importance of the effect of the coach and the effect of the player's technical position on the field. These results converge with those published in the work of (Martin et al., 2014; Balaguer et al., 2007; Brustad et al., 2001) for coaching, and in the work of (Najah et al., 2015; Thelwell et al., 2005), for the technical position.

### CONCLUSION

Our elites in the sectorial training centers supervised by the National Technical Directorate of the Tunisian Football Federation do not recognize the profile of an elite athlete characterized by a task-based management repertoire. This is because they have not been subjected to a psychological preparation program. The impact of the psychological state on the athlete's performance is as important as the technical and tactical skills. For this reason, training programs should be of greater interest (Taylor et al., 2005). The psychological demands imposed by the coach and the technical position are important factors that may be related to the athlete's mental abilities. These factors are part of the guidelines of our doctoral research. Mental abilities have often been studied

**Table 7.**  
Indirect effects through mediation

Independent variables X	Dependent variables Y	Mediation M	The indirect effect
The direction of self-confidence DSC	Mental imagery	Coaching	- 0.0337
	Relaxation	Coaching	+ 0.0482
	Logical analysis	Coaching	+ 0.0405
	Mental distraction	Coaching	+ 0.0299
The frequency of self-confidence	Relaxation	Coaching	+ 0.0675
FSC	Mental distraction	Coaching	+ 0.0426
	Logical analysis	Coaching	- 0.0461
The frequency of self-confidence FCS	Logical analysis	Technical position	- 0.0440

in relation to the behavior of the coach (Wolfenden et al., 2005; Reinboth M et al., 2006) at the experience level (Tamminen et al., 2010; Hanton et al., 2008) and technical positions (Cox Richard et al., 1995).

## LIMITATIONS

Some limitations were revealed during this study. Our participants were examined through factors, coaching, experience and technical position, while factors like competence (elite and non-elite) were omitted. (De Bosscher et al., 2006), state that micro-factors corresponding to the individual characteristics (genetics) of the athlete and to the family context, peers, coaches ... must be controlled for elite athletes in training centers who present complicated and likely stations to reach the high level.

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