

Research Article

Personality Traits as the Predictor of Mental Toughness and Competitive Anxiety in Racket Players

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Abstract

The present study explored the relationship between personality traits, mental toughness, and sports competition anxiety among racket sport athletes. While mental resilience is increasingly recognised as crucial for performance in high-pressure environments, little is known about how specific personality factors shape athletes' ability to cope with competitive stress. A quantitative, cross-sectional design was employed with purposive sampling. Sixty racket sport athletes (tennis, badminton, and table tennis), aged 18–25 years, participated in the study. Standardised measures assessed six personality dimensions, three components of mental toughness, and levels of competition anxiety. Descriptive and inferential analyses indicated significant associations between personality and psychological outcomes. Emotionality was positively related to competition anxiety, while Extraversion was negatively related. Regression analyses revealed that Emotionality served as a strong predictor of anxiety, whereas Extraversion functioned as a protective factor. Together, these traits explained a meaningful portion of variance in competition-related anxiety, underscoring their independent and combined influence on athlete performance. The findings highlight the importance of incorporating personality-informed interventions in sport psychology. Programs that strengthen emotional regulation for athletes high in Emotionality, and confidence-building for those lower in Extraversion, may enhance resilience and performance. Future research with larger and more diverse samples is recommended.

Keywords: Personality traits, Mental toughness, Competition anxiety, Racket sports, Athletes, Sport psychology

Introduction

In competitive athletics, success is frequently determined not so much by greater skill but by an athlete's ability to handle pressure and maintain performance when margins are at their thinnest. Among the psychological attributes that allow this, mental toughness is a complex construct of resilience, concentration, and control over emotions has become the bedrock of athletic achievement. Nowhere is this more pronounced than in racket sports like tennis and badminton, where competitors are subjected to prolonged one-on-one battles, quick changes in momentum, and the psychological test of reacting immediately to success or failure. The power to stay composed, self-assured, and focused in the midst of these pressures frequently decides the contest. Although increasing appreciation of its value, the factors that determine mental toughness are still only partly known. Personality traits are considered to have a basic function in determining resilience, but empirical evidence on these associations particularly in racket sports is yet to be known. Similarly, even though research has established that anxiety can both refine and detract from performance, how anxiety interacts with mental toughness and personality traits also needs to be examined. Filling this knowledge gap is critical to creating evidence-based interventions that enhance athletes' psychological preparedness and improve their competitive performance.

Importance of Mental Toughness

Mental toughness has been used to describe the ability to retain confidence, motivation, and performance under adversity and pressure

[1]. It encompasses emotional stability, self-belief, and persistence towards goals even in the presence of failure. Competitors who are mentally tough not only bounce back from mistakes quickly but also see obstacles as learning opportunities instead of success threats. This resilience sets apart top performers who repeat consistently in high-stakes contexts.

Mental toughness is more crucial in racket sports. Games require focused attention, tactical adaptability, and control of feelings over extended durations of play. A loss of concentration at a decisive moment, a return wide in badminton or a double fault in tennis can immediately shift match momentum. Psychological research has repeatedly established that higher-mental-toughness athletes exhibit higher levels of competitive performance. Because of this, coaches and sport psychologists increasingly view mental toughness as a non-negotiable aspect of athlete development rather than an adjunctive quality.

Personality as a Resilience Building Block

Whereas mental toughness has traditionally been conceptualized as something that can be trained, new evidence is pointing toward the fact that it also resides very much in stable personality traits. Two such traits in specific extraversion and conscientiousness, have repeatedly been linked to successful functioning under stress. Extraverted sports performers, being optimistic, assertive, and sociable, are more inclined toward seeking help and the use of active coping styles. These styles enhance resilience, and extraverts are able to bounce back from stress and adversity sooner.

Conscientious athletes, on the other hand, draw on discipline, planning, and long-term goal commitment. They show persistence in training and consistency of performance, skills that are critical to coping with the physical and mental pressures of elite sport. Both extraversion and conscientiousness are thus potentially psychological resources that enable athletes to gain the basis for establishing mental toughness. However, empirical data linking these personality factors directly to mental toughness in racket sport athletes is limited.

Anxiety as a Double-Edged Sword

In addition to resilience, athletes also have to deal with anxiety, the most ubiquitous of psychological performance barriers. Moderate levels of anxiety, on the other hand, can stimulate alertness, enhance concentration, and energize performance, a “facilitative anxiety.” Conversely, excessive anxiety disrupts, impairing choice, heightening doubt, and yielding physical symptoms like muscle tension and tachycardia. The latter are especially disabling in racket sports, in which precision and poise are crucial. Athletes of greater mental toughness do seem more likely to manage anxiety and direct it towards performance gain, not impairment. Low-resilience athletes, on the other hand, see anxiety as overwhelming, leading to decreased performance. This leaves open the possibility of a moderating effect of mental toughness in the link between personality traits and anxiety, a link that has not yet been wholly demystified in empirical studies.

The Case for Racket Sports

Racket sports provide a distinctive window through which to examine these psychological constructs. In contrast to most team sports, victory in tennis or badminton rests largely with the individual athlete. Every point is an independent psychological test, and mistakes cannot be balanced out by teammates. In addition, the speed of play with shuttlecocks reaching over 200 miles per hour in badminton or quick rallies in tennis requires continual focus and the ability to manage emotions in the moment. These circumstances make racket sports an especially insightful setting for exploring the interaction of personality, mental resilience, and anxiety. The high psychological pressure, along with the individual responsibility for performance, heightens the significance of resilience and emotional control. And yet, even under this distinctive setting, most of the current research has either made assumptions from team sports or centred on one psychological aspect at a time.

Rationale of the Present Study

The main focus of this study is to examine the personal experiences of several Indonesian badminton athletes who have excelled at the international level. The study is directed at efforts to reveal personality traits, influential environments, and career stages possessed by athletes. Many things are not known about Indonesian athletes who are high achievers. This issue will never be revealed as long as the study of personal experiences between them is not carried out in-depth.

Although personality traits are important prerequisites for achievement, environmental factors cannot be ignored. Many potential athletes do not develop optimally simply because the environment is less supportive. Therefore, identifying the environment that influences

an athlete's performance and how that environment affects it is an integral part of this study. After the traits and environment have been identified, the research continues by examining the career stages of the athlete. All of these problems will be revealed simultaneously through a qualitative approach. Based on these problems, the objectives of this study are (1) to find the personality traits possessed by Indonesian badminton athletes who are high achievers, (2) to identify and describe the environment that influences the development of personality traits and athlete achievement, and (3) to identify and describe the career stages of athletes in achieving high performance. If the problems in this study can be answered, it will have significant implications for sports coaching. Coaches will find it helpful to develop a pattern of coaching athletes from an early age. Scouting talent by paying attention to psychological factors can also be done. The results of this study will be very useful as one of the considerations in selecting athletes in addition to other considerations such as physical and physiological factors.

Objective

The aim of the research is to assess personality traits as the predictors of mental toughness and competitive anxiety in racket players. For the research design the Quantitative Cross-sectional Study Design was employed as it allows the examination of relationships among variables at a single point in time, making it both efficient and practical for the present context.

Hypotheses

H₁. There is a significant correlation between Conscientiousness and Extraversion with mental toughness among sports players.

H₂. There is a significant correlation between mental toughness and Competitive Anxiety among sports players.

Methods

Participants

Participants were selected from a sports academy in Delhi with an age range from 18 to 25 years. The male participants with Mean 22.6 and SD 1.79 while the female participants had with mean 21.6 and SD 1.79. Skewness and kurtosis tested indicates that the variables are nearly normally distributed since their skewness and kurtosis measures are within the range of -1.0 to +1.0.

Recruits for the current study were enrolled from a sports academy that provided training in tennis, badminton, and table tennis. Purposive sampling was used, where participants were intentionally chosen by the feature that was most relevant to the research itself. The non-probability technique allowed for analyzing only those athletes with competitive experience in racket sports, thus making the data more relevant and applicable. By targeting a well-defined group, purposive sampling enabled the study to produce findings that are contextually meaningful and practically relevant in accessing the psychological dynamics of racket players.

To narrow down the sample, strict inclusion and exclusion criteria were used. Participants had to be current racket sport players (tennis, badminton, or table tennis), between 18 and 25 years of age, and have basic English proficiency to allow them to understand the research

tools. Both male and female participants were recruited to enable a balanced view per gender.

Measures

The following psychological tests were used in the present study viz. HEXACO–60 [2] was employed to measure personality traits with six broad dimensions: Honesty–Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. The HEXACO–60 has shown satisfactory internal consistency, with Cronbach’s alpha coefficient, $\alpha \approx 0.75$. It has criterion validity $r = 0.53$. Mental toughness was assessed by the Sports Mental Toughness Questionnaire [3], a 14-item questionnaire examining three subscales: Confidence, Constancy, and Control. Exploratory and confirmatory factor analyses yield a strong three-factor solution, in addition to a higher-order global mental toughness factor. Internal consistency reliability is adequate, with alpha coefficients of over 0.70 on the three subscales. Construct validity evidence is provided by significant correlations with optimism, positive affect, and hardiness, and Criterion Validity $r = 0.429$. Sports Competition Anxiety Test [4] was used to measure competitive anxiety tailored to assess anxiety in competitive sporting situations. The SCAT has also been extensively validated within athletic groups, as Cronbach’s alpha values are generally above 0.80, reflecting high internal consistency. Test–retest reliability coefficients between 0.77 and 0.89 illustrate temporal stability. Criterion validity is evidenced through correlations with physiological indicators of arousal and performance-stress, with $r \approx 0.45 - 0.70$

Procedure

Participants were excluded if they were participating in sports other than racket games, were under 18 or over 25 years of age, or had a diagnosed psychological disorder, likely to bias measures of anxiety and mental toughness. Participants who lacked the necessary English language proficiency were also excluded, as this may influence the validity of self-reported ratings. These measures were taken to

create a homogeneous, targeted sample that is representative of the population being studied. These circumstances render racket sports a highly illuminating setting

in which to examine the interaction between personality, mental toughness, and anxiety. The heightened psychological pressure, combined with the individual responsibility for performance, heightens the role of resilience and emotional control. However, given this special setting, much previous work has either extrapolated from team sports or concentrated on examining one psychological factor in isolation.

Statistical Analysis

Descriptive and Inferential statistics analyses were carried out on the collected data using the SPSS 22.0 software. The Pearson product-moment correlation was performed to determine the relationships between personality factors and dimensions of Sports Mental Toughness and Sports Competition Anxiety was computed. Further the Multiple regression analysis was used to find out predictors of personality Factor-Emotionality and Extraversion with Sports Competition Anxiety. To test the hypothesis Statistically the level of significance was maintained at 0.05 level and 0.01 level.

Result

The Table 1 shows information gathered using the sixty participants, who were both male and female racket sport players, was initially verified to ensure that it constituted a normal distribution. This was crucial to verify that the values were statistically valid and within acceptable parameters. Descriptive measures such as averages, variation, skewness, and kurtosis all showed that data were good for analysis.

Table 2, there is a significant correlation between personality dimensions and mental toughness at 0.05 and 0.01 significance levels. Results show that there is significant positive correlation of Emotionality with Constancy and sports competition anxiety, (0.33) and (0.44) respectively.

Table 1: Age ranges and Mean and SD of Racket Players

Gender	N	Minimum	Maximum	Mean	SD	Skewness		Kurtosis	
							Std. Error		Std. Error
♀ Age	22	19	25	22.6	1.79	-0.19	0.49	-0.71	0.95
♂ Age	38	19	26	21.6	1.79	0.38	0.38	-0.35	0.75
♀ & ♂ Age	60	19	26	22	1.83	0.16	0.31	-0.73	0.61

Table 2: Descriptive statistics of study variables

	Mean	S.D.	Skewness	Kurtosis
MT1	17.7	2.76	-. 00	-0.76
MT2	10.5	1.76	0.34	0.35
MT3	10.9	2.35	-0.35	1
SCAT1	20.27	2.59	-0.4	0.32
HH	33.93	6.54	0	0.58
EMO	31.47	5.64	-0.09	-1
EXT	32.53	5.81	0.23	-1.04
AGR	32.3	6.29	-0.07	-0.36
CON	34.77	6.22	-0.28	-0.69
OPN	36.57	6.43	-0.05	-0.84

Note: MT1=Confidence, MT2=Constancy, MT3=Control, SCAT= Sports Competition Anxiety, HH= Honesty-Humility, EMO= Emotionality, EXT= Extraversion, AGR=Agreeableness, CON=Conscientiousness, OPN= Openness to experiences.

Of the various characteristics, openness to experience yielded the largest average score, with conscientiousness, honesty-humility, and extraversion close behind. Agreeableness and emotionality were slightly lower but still within range. As for the psychological skills being measured, athletes indicated moderate levels of competitive anxiety, while confidence, control, and constancy each revealed significant but differing levels of mental toughness (Table 3).

When looking at the inter-correlations between these traits, some interesting trends emerged. Emotionality was positively linked with both constancy and sports competition anxiety. In simple terms, athletes who were more emotionally reactive also tended to show higher anxiety and a tendency toward persistence. Extraversion, on the other hand, was strongly associated with confidence, suggesting that outgoing players felt more assured in competitive situations. Conscientiousness and openness to experience were also positively related to confidence, suggesting that well-organised, self-disciplined, and open-minded participants were more confident in their sporting skill (Table 4).

Moving on to the predictive analyses, emotionality was the best predictor of sports competition anxiety. Participants who were higher in emotionality or were more reactive and sensitive to their

emotions tended to be higher in anxiety during competition. When emotionality was taken into account together with extraversion, the model revealed that the two attributes strongly predicted competitive anxiety, but in opposite directions. Emotionality heightened anxiety, whereas extraversion lowered it. The two attributes accounted for a significant proportion of differences in anxiety levels between players. Even after controlling for extraversion, emotionality was still a strong predictor, although its impact was weaker. This informs us that emotional sensitivity always increases the risk of competitive anxiety, and extroversion and social self-confidence can perhaps serve as a protective shield (Table 5).

Discussion

The current research focused on the role of personality traits, i.e., Emotionality and Extraversion, in explaining sports competition anxiety among racket sport athletes. Findings affirmed that these personality traits had significant and independent influences on competitive anxiety, as hypothesised by the study. Emotionality was positively correlated with increased anxiety, while Extraversion acted as a buffer to decrease vulnerability to anxiety. Collectively, the results highlight the significance of accounting for individual personality profiles in interpreting athletes' psychological performance at

Table 3: Correlations between Personality factors, Dimensions of Sports Mental Toughness and Sports Competition Anxiety.

Variables	Mean	SD	MT1	MT2	MT3	SCAT	HH	EM	EX	AG	CON	OPN
MT1	17.7	2.75		-0.10	-.28*	-0.02	-0.02	-.28*	.57**	-.32*	.34**	.39**
MT2	10.5	1.76			0.19	.46**	-0.05	0.24	-0.23	-0.11	-0.11	-0.04
MT3	10.9	2.34				0.15	0.09	.33**	-.37**	0.24	0.00	0.17
SCAT1	20.26	2.59					0.20	.40**	-.28*	0.06	0.14	0.22
HH	33.93	6.54						0.01	-0.21	.48**	.43**	.38**
EMO	31.46	5.64							-0.08	0.16	0.05	-0.03
EXT	32.53	5.81								-.43**	0.01	-0.06
AGR	32.3	6.29									0.23	.38**
CON	34.76	6.22										.70**
OPN	36.56	6.43										

*p<0.5, **p<0.1

Note: MT1=Confidence, MT2=Constancy, MT3=Control, SCAT= Sports Competition Anxiety, HH= Honesty-Humility, EMO= Emotionality, EXT= Extraversion, AGR=Agreeableness, CON=Conscientiousness, OPN= Openness to experiences.

Table 4: Regression results of personality Factor-Emotionality and Extraversion with Sports Competition Anxiety

Model	β	ΔR ²	Adjusted R ²	Std. Error
Emotionality	.400a	0.16	0.14	2.39
Extraversion	.474b	0.224	0.19	2.32

Table 5: Analysis of Covariance of Emotionality and Extraversion Predicting Sports Competition Anxiety.

	Sum of Squares	df	Mean Square	F	Sig.
Emotionality	63.176	1	63.176	11.01	0.002
	332.557	58	5.734		
	395.733	59			
Extraversion	88.814	2	44.407	8.24	0.001
	306.92	57	5.385		
	395.733	59			

competition. The findings are consistent with existing research illustrating the negative function of Emotionality under competition. The emotionally sensitive, reactive, and stress-prone athlete is seemingly more susceptible to worry, fearfulness, and instability in the face of pressure [5]. Such traits can undermine attentional control and increase physiological arousal above ideal levels, thus hampering performance. This is in contrast to Extraversion, which had a negative correlation with competition anxiety, a reflection of previous evidence that extraverted athletes, by virtue of their sociability, assertiveness, and approach-oriented coping tendencies, are well-placed to cope with competitive stress. Their ability to perceive challenges as exciting instead of threatening can be a psychological cushion against anxiety [6-8].

From an applied perspective, the consequences are significant. Interventions targeting athletes high in Emotionality need to emphasise emotional regulation, cognitive restructuring, and stress management skills, such as mindfulness training, relaxation techniques, and visualization practices. Interventions for less Extraverted athletes that enhance confidence, encourage positive self-talk, and build social support networks can enhance resilience in high-stress situations. Personality-specific approaches like these will be more successful than standardized psychological preparation packages. The research adds to the increasing literature on personality and sport psychology by placing Emotionality and Extraversion in a focal role in determining athletes' competitive experiences. Nevertheless, some limitations must be noted. Involving a cross-sectional design excludes causal interpretations, and the comparatively small sample size restricts generalizability. Furthermore, only two dimensions of personality were examined in detail; other personality traits like Conscientiousness or Openness can perhaps also contribute in significant ways to predicting mental toughness and anxiety [9-12].

The current investigation accentuates the dual role of personality traits in competitive anxiety, whereby Emotionality emerges as a risk factor and Extraversion acts as a protective buffer. These results have significant implications for the practice of sport psychology. Personality tests can be used by coaches and practitioners to select athletes who are likely to be susceptible to performance anxiety and develop specific interventions with a focus on emotional control, cognitive behavioral techniques, confidence development, and social support networks. With the understanding that a one-size-fits-all approach may not be effective for every athlete, personality-guided psychological training can develop resilience and enhance performance under extreme pressure [13]. The limitations of the study, such as its cross-sectional nature, small sample, and emphasis on just two personality dimensions, imply strong directions for future research. Longitudinal research involving larger and more heterogeneous groups of athletes is warranted to allow consideration of causal sequences and to determine the roles played by other personality dimensions [14-16].

Future Research Directions

To overcome current limitations, future research should adopt longitudinal and experimental designs to clarify the causal links between personality traits and racket players' performance, especially during the early stages of talent development. Incorporating multi-

source assessments—such as coach ratings, objective performance metrics, and physiological markers (e.g., heart rate variability, VO_2 max)—can enhance measurement validity while minimising potential biases. Researchers are encouraged to statistically account for key confounders, including gender, training history, cultural background, and sport-specific demands, using multivariate models or structural equation modelling. Standardization of both personality instruments and performance indicators is also necessary to improve study comparability and reproducibility [17,18]. Lastly, cross-cultural validation studies are essential to examine sociocultural variability in trait-performance relationships and to support the development of culturally responsive athlete selection frameworks. Future studies would also need to test whether psychological skills training would operate as a moderator of the personality–anxiety relationship. These steps collectively can move toward a more focused and practical knowledge of how personality influences the psychological outcomes of athletes, toward making connections between research and evidence-based sport performance improvement [19-27].

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Author Contributions

Conceptualisation Upasana Yadav and Y. K. Nagle; original draft preparation Upasana Yadav; Writing of review, methodology, presentation of results, discussion and editing Upasana Yadav and Y. K. Nagle. Both the authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors declare that they have no competing interests.

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