

# Analysis of Relationship Between Selected Psychological Dimensions with Skill Performing Competencies of Table Tennis Players

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## Abstract

*The goal of this research was to determine whether there was a connection between a player's mental toughness and his ability level in state-level Table Tennis competition.*

**Methods:** State-level male table tennis players (n=25) took the Sports Mental Toughness Questionnaire (a measure of characteristics associated with mental toughness) and the Pushpendra Purashwani Table Tennis Skill Test (a test of table tennis skills; the Alternate Push Test and Alternate Counter Test were chosen).

*The data reveal a favourable relationship between mental toughness and overall athletic performance. Consistency and the Alternate Counter Test were positively correlated at the .01 level of significance.*

*The study's findings corroborate a link between measures of mental toughness and success on the field, suggesting that mentally strong athletes also enjoy greater physical and mental prowess.*

*There is a need for further research on the correlations of mental toughness with training experience and age of players, as well as effective strategies to increase mental toughness, as well as the differences between individual and team sports.*

## Introduction

Racket sports like table tennis need a high level of precision, speed, and assurance despite the game's relatively compact playing area. Anxiety may cause physical symptoms including shaking, poor motor control, and a loss of confidence, all of which can be detrimental to a player's performance. To wit: (Schlager & Gross, 2011). According to research (Scully & Hume, 1995), mental toughness is more important for athletic achievement than any other single characteristic. In the first studies on mental toughness, 82% of wrestling trainers ranked it as an important component in their athletes' performance (Gould et al., 1987). Although "mental toughness" is often used to characterise a person's success in sports, it has not been conclusively shown that it is related to performance. Athletes, journalists, and coaches commonly use the term "mentally tough" to characterise top performers in their sport. Due to the limited focus of the studies, a comprehensive overview of the literature on mental toughness is outside the scope of this article. Numerous definitions of mental toughness have been proposed by academics, and they often contradict one another. What constitutes "mental toughness" has been the subject of much debate between experts. According to (Jones, 2002), an athlete with mental toughness is able to regularly and forcefully display mental abilities including attention, motivation, confidence, and self-control. (Middleton et al., 2004) The capability to persevere the face of hardship is what researchers who interviewed sportsmen from different sports defined as "mental toughness." using the four Cs as a measure of emotional and psychological resilience. According to these theorists, mental toughness is built on the four most important pillars of challenge, resolve, control, and confidence. Despite the lack of a consensus on what "mental toughness" really entails, many individuals use it to refer to the effective application with a number of different psychological abilities. It has been suggested by Bull et al. (2005) that the features of mental strength in general may differ from the way it is interpreted in a specific sport. It's also logical to suppose that different kinds of mental toughness are needed to compete in different sports. Some sports, like swimming, may need a different sort of mental toughness than others, like rugby. Research by Bull et al. (2005) and Thelwell et al. (2005) on mental strength in cricket and soccer indicated that coaches' and players' understandings of the term were consistent with the broad definition

offered by Jones et al (Jones, 2002). (Gucciardi et al., 2008) developed a set of criteria for mental strength among Australian football based on interviews with eleven male coaches in the Western Australian Football League. Moreover, they deduce that an athlete needs a wide range of psychological abilities to be psychologically robust. A person's mental fortitude and capacity to push through adversity are the product of their beliefs, which include their outlook, values, routines, and feelings (Gucciardi et al., 2008). While the several suggested definitions of mental toughness use somewhat different language, the basic characteristics—psychological fortitude and successful coping with challenges—appear to be universal. The present research relied on both the broad definition offered by (Jones, 2002) and the more nuanced work of (Gucciardi et al., 2008), which focused on the mental characteristics that contribute to resilience.

Two studies have shown a link between skill and resilience (Golby et al., 2003; Kuan & Roy, 2007). One possible moderator of the relation between mental strength and ability performance is one's degree of innate talent.

The primary objective of the research was to explore the link between mental strength and the characteristics of elite male table tennis players. It was hypothesised (1) that there would be a positive correlation between levels of mental strength and the ability to play well in Table Tennis.

## **Methodology**

Twenty-five state-level male table tennis state athletes were recruited from Inspire Table Tennis Academy, Secundarabad for the research (Telengana). The participants' ages varied from 17 to 23.

The variables which were used in the analysis were confidence, consistency, and control in the domain of mental toughness, and alternate push and alternate counter in the domain of table tennis skill competencies, all chosen on the basis of the existing literature and the findings of the related research studies.

The Sports Mental Toughness Questionnaire (SMTQ) (Sheard et al., 2009) created by Michael Sheard, Jim Golby, and Anna Van Wersch with 14 items on a 4-point Likert scale anchored by Very true, Mostly true, A little true, and Not at all was used to analyse mental toughness. Students were urged to read each sentence thoroughly and then truthfully choose the proper scale.

From the Pushpendra Purashwani Table Tennis Skill Test (Purashwani, 2011), two of the tests—the Alternate Push Test and the Alternate Counter Test—were chosen for this investigation.

In the 30-second Alternate Push Test, participants were given a controller and told to execute the required number of push returns. The object must maintain control of the ball between the rope and the net. Subject was tasked with keeping the ball wedged between the rope and the net. When given the "Start" instruction, the controller began the rally with enough balls in hand or pocket to continue it if a ball were to be lost. Two opportunities were provided. When the ball went through the space between the net and the rope, it was considered a return. When the ball crossed the rope but still stayed inside the confines of the net, just half of a return was recorded. The winning score was the average of the two attempts made within 30 seconds (Purashwani, 2011).

Using the controller, the subject was directed to complete the required number of alternating counter rallies (one forehand and one backhand) in the left corner of the table within 30 seconds. This was done after the subject had warmed up and practised the required skills. The rally was initiated by the controller at the word "Start," who presumably had extra balls on hand or in a pocket in case one went out of play. A single observer tallied the highest possible results from two 30-second opportunities (Purashwani, 2011).

The first step was to use the Shapiro-Wilk test to ensure that the data were normally distributed. Parametric testing was used to conduct statistical analysis of the data collected from the players by determining whether or not there was a link between the variables using the Pearson product-moment correlation.

## Results

**Table 1. Descriptive Statistics (Mean and Standard Deviation) of following Variables**

Variables	N	Mean	Std. Deviation
Confidence	25	16.36	1.46
Consistency	25	9.04	1.36
Control	25	9.12	1.45
Alternate Counter	25	25.00	2.19
Alternate Push	25	16.64	1.68

Table 1 showed the descriptive statistics of Table Tennis group on selected psychological variables and Table Tennis skill competencies (Confidence, Consistency, Control, Alternate Push, Alternate Counter).

**Table 2. Analysis of Correlation between (Mean and Standard Deviation) of following Variables**

Variables	N	Pearson Correlation	Sig. (2-tailed)
Confidence with Alternate Counter	25	.90	.668
Confidence with Alternate Push	25	.148	.480
Consistency with Alternate Counter	25	.526**	.007
Consistency with Alternate Push	25	.369	.070
Control with Alternate Counter	25	.130	.534
Control with Alternate Push	25	.104	.621

\*\*Significant at 0.01 Level of Significance

Table 2 showed the observative relation between psychological dimensions of Mental Toughness (Confidence, Consistency, Control) with Table Tennis skill competencies (Alternate Push test, Alternate Counter Test).

## Discussions

Most studies' conclusions corroborate the link between mental strength and sporting achievements. Even athletes with high levels of mental strength feel the pressure, tension, and anxiety that comes with sporting competition (Jones et al., 2007), but they are able to deal with these emotions more effectively (Kaiseler et al., 2009). This was what set apart the best track and field players from the rest of the pack, as opposed to those with only ordinary athletic abilities (Nicholls et al., 2011). According to research by Gucciardi, Gordon, and Dimmock (2009), those who are mentally strong during competition maintain positive outlooks and provide 100% of their attention and focus to the task at hand (Nicholls et al., 2008). The correlation between mental fortitude and success in athletics has been well-documented. Those with a solid mental game also tend to flourish in their respective sports. The ability to use one's motor abilities effectively under stress requires a certain level of mental strength in sports (Crust & Clough, 2005). As of yet, the exact method through which mental toughness affects performance has not been determined (Clough & Earle, 2002). Further investigation and theoretical analysis are needed to understand the mechanisms behind the connection between mental andresistance and athletic performance. Mental toughness was a hallmark of the older players, who generally

outperformed their younger counterparts. According to some research (Gucciardi, Gordon, & Dimmock, 2009; Drees & Mack, 2012), athletes who are older tend to be more psychologically strong since they have more life experience and a more well-rounded set of coping mechanisms at their disposal (Nicholls et al., 2009). Intriguingly, a wrestler research found that years of expertise in the sport did not relate with highstage of mental strength. The selected classification of players based on their sports experience may have influenced the lack of significance of this connection. Wrestlers were distributed into four different categories based on their training tenure: those with less than two years, two to five years, six to ten years, and more than ten years. Competitors with less to the five years of experience belong in the second category (group one). There should be three groups: beginners, intermediates, and veterans (Drees & Mack, 2012). However, Grgurinovi and Sindik's findings (Grgurinovic&Sindik, 2015) revealed no age or experience-related variations in mental toughness among Croatian sportsmen. Further study is needed on these topics, ideally incorporating athletes of varying ages and levels of experience. When it comes to developing mental toughness and fostering an atmosphere conducive to learning new mental abilities, the coach may make all the difference. When it comes to working with female teammates, coaches need to pay extra attention to helping their charges gain confidence (Newland et al., 2013). Mental fortitude includes possessing this trait. According to a number of sources, including (Gucciardi, Gordon, Dimmock, et al., 2009), coaches used to play a critical role in helping their athletes develop mental toughness by fostering healthy relationships, establishing a solid work philosophy, providing a conducive training environment, and teaching them effective strategies (e.g., learning to react to a mistake). According to Cowden (Cowden, 2016), not only is there a link between mental toughness and tennis victory, but technical, tactical, and motor abilities also play a significant role in determining who comes out on top in a tennis match. These considerations need to be included into future studies. Different conceptions of mental toughness underlie the wide range of scales and assessments available. In their efforts to provide the most precise definition feasible, researchers draw from a wide variety of psychological ideas and models (Gucciardi et al., 2017).

## Conclusions

Following a comprehensive literature search, we found the following results.

1. There is a strong link between mental strength and performance in athletics, as shown by several empirical studies.
2. Level of significance, a positive connection was found between Consistency and the Alternate Counter Test.
3. Further research is required to determine if there is a difference in mental strength between males and females, whether it increases with training experience or age, and whether there are any effective ways to develop mental toughness.

Furthermore, the following restrictions must be recognised:

Results which not be direct compared because

- (1) Mental toughness was defined and measured in different ways and
- (2) Different research methods were used in the various studies.

The limited sample sizes of most studies prevent conclusive generalisation of the findings.

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