

Psychological Profiling of Table Tennis Players: A Comparative Study of Mental Toughness, Anxiety, and Concentration in Perak and Yinchuan

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Abstract

This study explores the psychological profiles of table tennis players from Perak, Malaysia, and Yinchuan, China, focusing on mental toughness, anxiety, and concentration, which are critical for competitive success. A cross-sectional research design was employed, involving 60 state-level players (30 from each region) assessed using standardized instruments, including the Mental Toughness Questionnaire (MTQ), the Competitive State Anxiety Inventory-2 Revised (CSAI-2R), and the Concentration Grid Test (CGT). The findings revealed that Malaysian players scored slightly higher on mental toughness dimensions such as reboundability ($M = 2.33, SD = 1.56$ vs. $M = 1.87, SD = 1.01$) and concentration ($M = 18.43, SD = 4.64$ vs. $M = 15.50, SD = 3.13$), with a statistically significant difference in concentration levels ($t(58) = -2.870, p < .01$). Chinese players demonstrated greater consistency across psychological traits, as evidenced by smaller standard deviations. Anxiety patterns differed significantly, with Malaysian players exhibiting higher cognitive anxiety ($M = 12.50, SD = 3.72$ vs. $M = 11.43, SD = 2.46$), and Chinese players showing elevated somatic anxiety ($M = 17.07, SD = 3.18$ vs. $M = 15.37, SD = 3.64$), though these differences were not statistically significant. Correlation analysis revealed that cognitive anxiety negatively correlated with self-confidence among Malaysian players ($r = -.570, p < .01$) and somatic anxiety positively correlated with concentration among Chinese players ($r = .604, p < .01$). These results emphasize the importance of tailored psychological interventions and structured training regimens to address the specific needs of each group. This study offers valuable insights for coaches, sports scientists, and policymakers to optimize player development and performance, providing a foundation for further research on psychological dynamics in competitive sports.

Keywords: Mental Toughness, Anxiety, Concentration, Table Tennis, Psychological Profiling

Introduction

Table tennis is a sport that demands a remarkable blend of physical agility, mental resilience, and strategic intelligence, evolving into one of the most widely recognized sports worldwide. The sport's journey, from its humble beginnings in 19th-century England to becoming China's "national ball," highlights its cultural and historical significance (Mousset et al., 2021). While

table tennis has achieved global prominence, the psychological factors that underpin elite-level performance remain underexplored, particularly in comparative contexts. Mental toughness, anxiety, and concentration are essential psychological constructs that directly influence the performance of athletes in this dynamic and high-pressure sport.

The evolution of table tennis in China is an exemplary tale of institutional and cultural investment. Spanning from the Initial Stage of promotion in the 1950s to its current dominance in global competitions, China's emphasis on systematic training and psychological preparation has positioned it as a powerhouse in the sport (Boucher & Pope, 2022). Conversely, Malaysia's table tennis journey reflects a growing but relatively modest investment in the sport. Initiatives such as hosting international tournaments and the integration of the Table Tennis Association of Malaysia (TTAM) into global federations signify Malaysia's aspirations to elevate its standing in the sport (Al Hakiim et al., 2023). The contrast between China's dominance and Malaysia's developmental phase offers a unique opportunity to study the psychological traits that may contribute to this disparity.

Research underscores the significance of psychological factors such as mental toughness, anxiety, and concentration in achieving peak athletic performance. For instance, studies have linked high levels of mental toughness to resilience and composure under pressure, while anxiety has been shown to influence focus and motor performance in high-stakes scenarios (Liting et al., 2020; Rowland & van Lankveld, 2019). Concentration, a critical cognitive skill, enables athletes to maintain precision and anticipate opponents' strategies during fast-paced matches (Haryanto & Amra, 2020). However, a comprehensive comparative analysis of these psychological attributes among state-level players in Malaysia and China remains underexplored.

The motivation behind this study stems from the growing recognition of the psychological dimension of sports performance, particularly in competitive table tennis. While physical and technical training has been extensively studied, understanding how mental traits such as mental toughness, anxiety, and concentration vary across different cultural and training environments can provide a more holistic perspective on performance enhancement. Moreover, identifying these psychological dynamics contributes to the development of more personalized training programs that address the specific needs of athletes from diverse backgrounds.

The performance gap between Malaysian and Chinese table tennis players is well-documented, with China consistently excelling in international competitions (Guo et al., 2020; Ibrahim et al., 2022). While physical attributes and training methodologies have been examined, the role of psychological traits in this gap warrants deeper investigation. Understanding the levels of mental toughness, anxiety, and concentration among Perak and Yinchuan players provides insights into how cultural and training environments shape these psychological factors. Such knowledge is invaluable for coaches, sports psychologists, and policymakers seeking to design interventions tailored to their athletes' unique challenges.

This study aims to bridge the research gap by assessing and comparing the levels of mental toughness, anxiety, and concentration among table tennis players from Perak, Malaysia, and Yinchuan, China. Additionally, it seeks to examine the correlations between

these psychological traits to identify patterns that influence performance outcomes. By integrating quantitative assessments and contextual analysis, this study contributes to the growing body of knowledge on cross-cultural psychological profiling in sports.

Specifically, this study addressed the following research questions:

1. What are the levels of mental toughness among Perak and Yinchuan table tennis players?
2. What are the levels of anxiety among Perak and Yinchuan table tennis players?
3. What are the levels of concentration among Perak and Yinchuan table tennis players?
4. Is there a correlation in psychological levels (mental toughness, anxiety, and concentration) between Perak and Yinchuan table tennis players?

Literature Review

Mental Toughness in Table Tennis

Mental toughness is a vital psychological attribute in table tennis, a sport that demands quick decision-making, precision, and the ability to cope with pressure. Defined as the capacity to maintain focus, motivation, and confidence under challenging conditions, mental toughness equips athletes to remain resilient in the face of adversity (Liew et al., 2019; Wilson et al., 2019). Its importance in table tennis is amplified due to the fast-paced nature of the sport, where players must adapt rapidly to shifting dynamics. Components such as confidence, focus, determination, and composure are integral to mental toughness, enabling players to excel in high-stakes matches (Wilson et al., 2019; Poulus et al., 2020).

The correlation between mental toughness and performance is well-documented. Athletes with higher levels of mental toughness can effectively manage the pressures of competition, recover from setbacks, and maintain optimal performance during critical moments (Brown et al., 2020; Kegelaers et al., 2020). Studies by Maranan et al. (2021) and Sharma (2022) underscore the positive impact of mental toughness on elite table tennis players, linking it to improved performance outcomes. Maranan et al. (2021) further revealed that mental toughness aligns with attributes such as athletic identity and intra-team communication, highlighting its role in fostering collaborative and self-aware athletes.

Developing mental toughness involves targeted strategies such as visualization, goal-setting, and stress management. Visualization techniques, which include mentally rehearsing successful performances, help players build resilience and confidence (Tuli, 2023). Goal-setting provides athletes with specific, achievable objectives, enhancing their focus and motivation (Jeong et al., 2023). Stress management techniques like deep breathing and positive self-talk are also crucial for maintaining composure during intense competition (Fritsch & Jekauc, 2020). Together, these strategies create a framework for athletes to strengthen their psychological endurance.

Training programs designed to enhance mental toughness have proven effective in equipping athletes with critical skills such as emotional control, concentration, and self-confidence. Research by Samadi et al. (2021) and Stamatis et al. (2020) highlights the benefits of combining psychological skills training, cognitive-behavioral techniques, and mindfulness practices. These methods, tailored to high-pressure sports like table tennis, foster a comprehensive approach to mental toughness, enabling athletes to navigate the demands of competition more effectively (Arsene & Grosul, 2022). Overall, mental toughness emerges as a fundamental element for success in the competitive arena of table tennis.

Anxiety in Competitive Sports

Anxiety is a prevalent psychological phenomenon among athletes in competitive sports, including table tennis. It manifests as a response to pressure and uncertainty, impacting both mental and physical performance. Sonia and Wahjuningtjas (2019) found that the majority of table tennis players experience moderate to high levels of anxiety before competitions, with only a small percentage reporting minimal anxiety. This highlights the need for a nuanced understanding of anxiety types, their effects, and interventions to manage them effectively. Competitive anxiety often serves as a double-edged sword; while moderate anxiety can enhance performance, excessive levels may lead to detrimental outcomes (Rowland & van Lankveld, 2019).

Anxiety in sports psychology is categorized into two main types: trait anxiety and state anxiety. Trait anxiety refers to a personality characteristic that predisposes individuals to perceive situations as threatening, leading to consistent anxiety across various contexts (Merino Fernández et al., 2019). In contrast, state anxiety is a transient and situational response, triggered by specific events such as competitive matches (Ren et al., 2022). Both types significantly influence athletic performance. Research by Ehrlenspiel and Mesagno (2023) underscores that elevated levels of state anxiety often correlate with decreased attentional control and motor skill impairment in table tennis players, potentially increasing the likelihood of performance failure under pressure.

Moderate levels of anxiety can have a beneficial impact on athletic performance by heightening arousal and focus, improving reaction times, and aiding decision-making abilities (Rowland & van Lankveld, 2019). However, excessive anxiety, especially state anxiety, can lead to negative outcomes such as "choking" during critical moments (Harris et al., 2023). Sekiya and Tanaka (2019) demonstrated a negative correlation between high state anxiety levels and performance in table tennis, emphasizing the importance of managing anxiety levels to prevent adverse effects. This underscores the fine balance athletes must maintain to leverage anxiety as a performance enhancer rather than a hindrance.

Interventions to manage anxiety in athletes have shown significant promise in mitigating its adverse effects and enhancing performance. Cognitive-behavioral techniques such as cognitive restructuring help athletes identify and reframe negative thought patterns contributing to anxiety (Ahmed et al., 2023). Relaxation techniques, including progressive muscle relaxation and deep breathing, reduce physiological arousal and foster calmness (Jermaina et al., 2022). Mindfulness practices, such as yoga and mindfulness meditation, enhance present-moment awareness and emotional regulation, equipping athletes to cope with anxiety-inducing situations effectively (Longshore & McAlarnen, 2021; Lyon & Plisco, 2020). Integrated approaches combining these techniques have proven particularly effective in managing anxiety and optimizing performance in high-pressure sports like table tennis (Samadi et al., 2020). Understanding and addressing anxiety in competitive sports is essential for fostering resilience and achieving peak performance in athletes.

Concentration and Performance

Concentration and focus are vital cognitive abilities that significantly influence the performance of table tennis players. In this fast-paced sport, maintaining high levels of concentration during both training and competition allows players to execute technical skills

accurately, make swift decisions, and anticipate their opponents' movements (Ardiyanto et al., 2021). The rapid nature of table tennis requires athletes to stay fully engaged and avoid distractions, as even momentary lapses in focus can have a substantial impact on the outcome of a match. Research by Ardiyanto et al. (2021) underscores the pivotal role of concentration in elite players' success, showing that those with higher levels of focus consistently outperform their less focused counterparts.

The importance of concentration in table tennis is highlighted by its impact on technical execution and strategic gameplay. For instance, Ardiyanto et al. (2021) found that players with higher concentration levels demonstrated greater accuracy in their forehand serves and were better equipped to adapt to their opponents' strategies. Concentration enables players to block out distractions and maintain situational awareness, which is crucial for reacting effectively to opponents' moves (Haryanto & Amra, 2020). This ability to sustain attention and stay composed under pressure provides a competitive edge, particularly in high-stakes matches.

However, concentration is influenced by various internal and external factors, such as fatigue, anxiety, and environmental distractions. Fatigue, whether physical or mental, has been shown to negatively correlate with concentration levels, as highlighted by studies conducted by Sun et al. (2021) and Sun et al. (2022). Similarly, anxiety can disrupt focus by diverting attention toward negative thoughts and performance-related worries, reducing athletes' attentional control (Palazzolo, 2020). These findings emphasize the importance of managing fatigue and anxiety to maintain optimal concentration levels during competition.

To enhance concentration, table tennis players can adopt strategies such as mindfulness practices, imagery, and attentional control techniques. Mindfulness meditation, for example, helps athletes develop present-moment awareness and minimize the impact of distractions (Gross, 2020). Imagery, which involves mentally rehearsing successful performances, enables players to visualize desired outcomes and maintain focus on executing their skills effectively (Predoiu et al., 2020). Additionally, attentional control strategies, such as pre-performance routines and focusing on specific cues, can help athletes sustain focus during critical moments in a match (Li, 2023). By understanding the factors that influence concentration and implementing these techniques, players and coaches can optimize performance and enhance competitive success.

Methodology

This study employed a **cross-sectional research design** to investigate the psychological profiles of state-level table tennis players from Perak, Malaysia, and Yinchuan, China, focusing on mental toughness, anxiety, and concentration. A cross-sectional approach was chosen to collect data at a single point in time, which provided a snapshot of the athletes' psychological characteristics in both regions (Creswell, 2014). This design allows for an efficient comparison of psychological traits, enabling the identification of regional and cultural influences on athletes' mental performance under competitive conditions (Cohen, Manion & Morrison, 2017).

Participants were selected using **purposive sampling**, ensuring they met specific inclusion criteria: aged between 13 and 21 years, with a minimum of five years of competitive

experience, and free from injuries or ongoing rehabilitation (Creswell, 2014). A total of 60 athletes participated, with 30 players each from Perak and Yinchuan. Gender distribution was maintained at 20 males and 10 females per group, ensuring a balanced and representative sample for comparison. By adhering to these criteria, the study minimized variability and ensured the homogeneity of participants, enabling a focused analysis of the psychological attributes of table tennis players.

The psychological dimensions of interest were assessed using three validated instruments. The **Mental Toughness Questionnaire (MTQ)**, developed by Clough, Earle, and Sewell (2002), measured resilience, confidence, and composure under pressure. Anxiety levels were assessed with the **Competitive State Anxiety Inventory-2 Revised (CSAI-2R)**, which evaluates cognitive and somatic anxiety as well as self-confidence (Cox et al., 2003). The **Concentration Grid Task**, based on the work of Weinberg and Gould (1999), provided insights into the players' attentional focus and cognitive performance during high-pressure scenarios. These instruments were selected for their demonstrated reliability and validity, particularly in the context of competitive sports (Perry et al., 2021; Cox et al., 2003).

Data collection was carried out systematically under controlled conditions to ensure consistency across both regions. Participants were briefed on the study's objectives, procedures, and ethical considerations, and informed consent was obtained prior to their participation. Assessments were administered in a distraction-free environment, with clear instructions provided to ensure accurate responses. The psychological tests were conducted individually to minimize potential biases and interference, with data anonymized and coded for confidentiality (Fraenkel & Wallen, 2015). These measures upheld ethical standards and ensured the integrity of the data collection process.

The collected data were analyzed using **SPSS version 29.0**, following a rigorous statistical framework. Descriptive statistics, including means and standard deviations, were calculated to summarize the levels of mental toughness, anxiety, and concentration in each group. Inferential statistical techniques, such as independent t-tests, were employed to identify significant differences between Perak and Yinchuan players. Pearson correlation analyses explored relationships among the psychological variables, providing insights into how mental toughness, anxiety, and concentration interact in competitive settings. This methodical approach enabled a comprehensive understanding of the psychological factors influencing table tennis performance in two distinct cultural contexts (Cohen et al., 2017).

Findings and Discussion

Levels of Mental Toughness

The analysis of mental toughness levels among Perak (Malaysia) and Yinchuan (China) table tennis players revealed that Malaysian players consistently recorded higher mean scores across all five dimensions of mental toughness: reboundability, handling pressure, concentration, confidence, and motivation. For instance, Malaysian players scored a mean of 2.33 (SD = 1.56) in reboundability, compared to 1.87 (SD = 1.01) for their Chinese counterparts. Similarly, they exhibited higher levels of handling pressure (M = 3.47, SD = 1.68) and concentration (M = 3.43, SD = 1.59) compared to Chinese players (M = 2.90, SD = 1.13; M = 2.97, SD = 1.77, respectively). Despite these trends, both groups scored similarly in

confidence and motivation, with Malaysian players slightly outperforming ($M = 3.70$ and $M = 4.03$) compared to Chinese players ($M = 3.63$ and $M = 3.97$).

However, independent-samples t-tests revealed no statistically significant differences in mental toughness dimensions between the two groups. For example, the difference in reboundability ($t(58) = -1.376$, $p > .01$) and handling pressure ($t(58) = -1.538$, $p > .01$) was not significant. Similarly, differences in concentration ($t(58) = -1.074$, $p > .01$), confidence ($t(58) = -0.173$, $p > .01$), and motivation ($t(58) = -0.186$, $p > .01$) were also non-significant. These results suggest that while Malaysian players recorded higher mean scores, the overall mental toughness levels of Malaysian and Chinese players were statistically comparable.

Table 1

Comparison of Mental Toughness Levels Between Malaysian and Chinese Table Tennis Players

Dimension	Malaysia (M ± SD)	China (M ± SD)	Mean Difference	t- value	p- value	Significance
Reboundability	2.33 ± 1.56	1.87 ± 1.01	-0.467	-1.376	.174	Not significant
Handle Pressure	3.47 ± 1.68	2.90 ± 1.13	-0.567	-1.538	.130	Not significant
Concentration	3.43 ± 1.59	2.97 ± 1.77	-0.467	-1.074	.287	Not significant
Confidence	3.70 ± 1.69	3.63 ± 1.27	-0.067	-0.173	.863	Not significant
Deal with Motivation	4.03 ± 1.50	3.97 ± 1.27	-0.067	-0.186	.853	Not significant

The comparable levels of mental toughness align with previous research suggesting that structured psychological interventions yield similar outcomes across cultural and regional contexts. Studies by Rose and Burton (2019) and Guskowska and Wójcik (2022) emphasize that mental toughness training programs—focusing on visualization, stress management, and confidence-building—can effectively enhance resilience and composure, irrespective of geographic or cultural differences. These findings indicate that psychological preparation may follow universal principles, leading to relatively consistent outcomes in athletes' mental toughness across regions.

The slightly higher mean scores observed in Malaysian players might reflect individual differences or environmental influences rather than disparities in training approaches. Cultural factors, such as Malaysia's emphasis on individual resilience versus China's collective teamwork approach, could subtly influence how athletes develop and perceive mental toughness. Schinke et al. (2024) argue that psychological and cultural contexts play a critical role in shaping athletes' mental attributes, even when training frameworks are similar. This perspective highlights the importance of understanding regional nuances in interpreting psychological profiles among athletes.

Levels of Anxiety

The analysis of anxiety levels among table tennis players from Perak (Malaysia) and Yinchuan (China) examined three dimensions: cognitive anxiety, somatic anxiety, and self-confidence. The findings revealed minor differences between the two groups, with no statistically

significant disparities. Malaysian players reported slightly higher cognitive anxiety ($M = 12.50$, $SD = 3.72$) compared to Chinese players ($M = 11.43$, $SD = 2.46$). However, this difference was not significant according to the independent-samples t-test ($t(58) = -1.310$, $p = .195$), suggesting that both groups experienced comparable levels of mental concern or apprehension before competition.

Chinese players exhibited marginally higher somatic anxiety levels ($M = 17.07$, $SD = 3.18$) than Malaysian players ($M = 15.37$, $SD = 3.64$). While the independent-samples t-test results approached significance ($t(58) = 1.925$, $p = .059$), the difference did not meet the threshold for statistical significance. This finding indicates that both groups displayed similar physiological responses to stress, such as muscle tension or increased heart rates, during competitive scenarios.

Self-confidence levels were comparable between the two groups, with Chinese players achieving a mean score of 13.13 ($SD = 2.68$) and Malaysian players scoring slightly lower at 12.97 ($SD = 3.86$). The t-test confirmed no significant difference in self-confidence levels ($t(58) = 0.194$, $p = .847$). This result suggests that both groups possessed similar levels of belief in their ability to succeed in competition, highlighting a shared psychological readiness to perform under pressure.

Table 2

Comparison of Anxiety Levels Between Malaysian and Chinese Table Tennis Players

Dimension	Malaysia (M ± SD)	China (M ± SD)	Mean Difference	t-value	p-value	Significance
Cognitive Anxiety	12.50 ± 3.72	11.43 ± 2.46	-1.067	-1.310	.195	Not significant
Somatic Anxiety	15.37 ± 3.64	17.07 ± 3.18	1.700	1.925	.059	Not significant
Self-Confidence	12.97 ± 3.86	13.13 ± 2.68	0.167	0.194	.847	Not significant

These findings align with existing literature emphasizing the complex interplay between anxiety dimensions and cultural or training contexts. Research by Horvath et al. (2022) and Sangwan and Malik (2024) suggests that cognitive anxiety often reflects athletes' mental preparedness and self-awareness of performance expectations, while somatic anxiety is influenced by physiological stress responses. The slightly higher cognitive anxiety among Malaysian players may indicate greater self-reflection or concern about performance outcomes. Conversely, the elevated somatic anxiety among Chinese players could be attributed to their more intensive training regimens, which may heighten physical stress markers.

The comparable self-confidence levels suggest that consistent psychological preparation and competitive exposure in both groups have fostered a strong belief in their abilities. This observation supports findings by Lange-Smith et al. (2024) and Nicholls (2021), who highlighted the effectiveness of structured mental skills training in enhancing athletes' confidence regardless of cultural or geographical differences. Overall, the study underscores the nuanced relationship between anxiety dimensions and performance, offering valuable insights for tailoring psychological interventions to the needs of athletes.

Levels of Concentration

The analysis of concentration levels among table tennis players from Malaysia and China, as measured by the Concentration Grid Test (CGT), revealed notable differences. Malaysian players achieved a higher mean concentration score ($M = 18.43$, $SD = 4.64$) compared to Chinese players ($M = 15.50$, $SD = 3.13$). The wider standard deviation among Malaysian players indicates greater variability in their concentration abilities, while the more consistent scores among Chinese players suggest a narrower range of cognitive performance. These differences underline the varying levels of focus and attention exhibited by the two groups.

An independent-samples t-test confirmed a statistically significant difference in concentration levels between the two groups ($t(58) = -2.870$, $p < .01$). Levene's test for equality of variances was significant ($F = 4.708$, $p < .01$), necessitating the use of adjusted t-test values. The findings confirmed that Malaysian players outperformed their Chinese counterparts in concentration abilities. However, the wider variability in scores among Malaysian players raises questions about the uniformity of their cognitive training practices, suggesting potential disparities in access to psychological resources or individualized preparation.

Table 3

Comparison of Concentration Levels Between Malaysian and Chinese Table Tennis Players

Measure	Malaysia (M ± SD)	China (M ± SD)	Mean Difference	t- value	p- value	Significance
Concentration (CGT)	18.43 ± 4.64	15.50 ± 3.13	-2.933	- 2.870	.006	Statistically significant

The observed differences in concentration levels may be influenced by cultural and psychological training practices. Studies by Uludağ et al. (2021) and Xiang et al. (2023) emphasize the importance of structured cognitive training, such as attentional control and imagery techniques, in enhancing athletes' focus. The consistency in Chinese players' scores could reflect a more standardized training system, typical of China's centralized approach to athlete development. Conversely, the higher mean scores but greater variability among Malaysian players might indicate individualized training practices or differences in the availability of psychological support across their training environments.

These findings underscore the importance of systematic psychological preparation in achieving optimal concentration levels. While Malaysian players demonstrated stronger concentration abilities on average, the variability within the group highlights opportunities for more standardized and cohesive training interventions. By implementing targeted cognitive training programs, both Malaysian and Chinese table tennis players can enhance their focus and overall performance in competitive settings.

Correlations among Psychological Traits

The analysis of correlations among psychological traits—mental toughness, anxiety, and concentration—revealed distinct relationships between these components for table tennis players from Perak and Yinchuan. Among Yinchuan players, a significant positive correlation between cognitive and somatic anxiety ($r = .472$, $p < .01$) suggests an interconnection between these anxiety dimensions, indicating that heightened cognitive anxiety may amplify somatic symptoms during competition. This finding aligns with Rowland et al. (2021), who

highlight the intertwined nature of anxiety dimensions in competitive sports. Additionally, concentration positively correlated with traits such as handle pressure ($r = .604$, $p < .01$) and confidence ($r = .372$, $p > .01$), underscoring the role of resilience and self-assurance in sustaining focus under competitive stress (Petersen, 2024).

For Perak players, cognitive anxiety exhibited significant negative correlations with self-confidence ($r = -.570$, $p < .01$) and handle pressure ($r = -.553$, $p < .01$), suggesting that higher anxiety undermines confidence and stress management capabilities. These patterns echo findings by Mahoney and Meyers (2021), who emphasize the detrimental impact of cognitive anxiety on psychological traits essential for optimal performance. Conversely, positive correlations between concentration and motivational factors such as deal with motivation ($r = .660$, $p < .01$) and level of confidence ($r = .607$, $p < .01$) highlight the importance of intrinsic motivation and self-belief in fostering focus, as supported by Self-Determination Theory (Deci & Ryan, 1985).

Table 4

Correlations Among Psychological Traits for Yinchuan and Malaysian Table Tennis Players

Variable	Cognitive	Somatic	Self-confidence	Reboundability	Handle Pressure	Concentration	Level of Confidence	Deal with Motivation	CGT
Yinchuan Players									
Cognitive	1.000	.472*	-.219	-.129	-.133	.193	.372*	.236	.114
Somatic	.472**	1.000	-.252	-.395*	.079	.245	.253	.111	.035
Self-confidence	-.219	-.252	1.000	.199	.028	-.021	-.005	.315	.256
Malaysian Players									
Cognitive	1.000	.658*	-.570**	-.475**	-.553*	-.570**	-.472**	-.574**	.249
Somatic	.658**	1.000	-.431*	-.368*	-.419*	-.380*	-.086	-.359	.148
Self-confidence	-.570**	-.431*	1.000	.297	.588*	.632**	.545**	.729**	-.066

Note: $p < .01$, $p < .05$.

The contrasting correlation patterns between Perak and Yinchuan players reflect underlying differences in psychological dynamics, potentially shaped by cultural and environmental factors. Yinchuan players' stronger positive correlations, such as between concentration and confidence, may indicate a more systematic approach to psychological training, consistent with China's centralized and standardized training systems. Conversely,

the stronger negative correlations observed among Perak players suggest a greater susceptibility to anxiety, possibly reflecting less uniform psychological preparation or access to mental training resources.

These findings underline the importance of targeted psychological interventions tailored to athletes' unique cultural and environmental contexts. While Yinchuan players benefit from integrated mental preparation practices that bolster confidence and focus, Perak players may require additional support in anxiety management and confidence-building strategies. Addressing these specific needs could help optimize psychological readiness and overall performance for both groups.

Conclusion

This study explored the psychological profiles of table tennis players from Perak, Malaysia, and Yinchuan, China, focusing on mental toughness, anxiety, and concentration. The findings provide insights into the similarities and differences between the two groups, emphasizing the role of cultural and training contexts in shaping psychological readiness for competition. Malaysian players demonstrated slightly higher levels of mental toughness and concentration on average, while Chinese players exhibited greater consistency within their psychological traits. These outcomes underline the significance of individualized and standardized training approaches in enhancing psychological resilience and performance.

The study highlighted distinct anxiety patterns, with Malaysian players reporting higher cognitive anxiety and Chinese players showing elevated somatic anxiety. These variations suggest that Malaysian players may experience heightened mental stress during competition, while Chinese players exhibit stronger physiological responses to pressure. Both groups displayed comparable self-confidence levels, indicating a shared ability to maintain belief in their performance capabilities despite differences in anxiety responses. These findings underscore the importance of targeted psychological interventions to address the unique needs of each group and optimize their competitive readiness.

This study makes a significant contribution to the field of sports psychology and cross-cultural research in athletics. By identifying the psychological strengths and vulnerabilities of players from two distinct cultural and training environments, the research provides a framework for designing evidence-based interventions that are both culturally sensitive and performance-focused. For coaches, the findings offer actionable strategies to develop tailored mental training programs that address specific anxiety responses and build resilience. Sports psychologists can leverage this knowledge to refine psychological profiling techniques and enhance support systems for athletes. Policymakers and stakeholders in sports development can use the insights to prioritize resources, professional development, and collaborations that bridge performance gaps between regions.

Furthermore, the study contributes to a growing body of literature on the interplay between culture and psychological traits in sports. By comparing players from Malaysia and China, it advances our understanding of how cultural norms, training methodologies, and institutional support shape psychological readiness for competition. This comparative approach not only highlights key areas for improvement but also fosters cross-cultural learning and collaboration that can elevate the standards of training and competition globally.

Overall, this research offers both theoretical and practical value. It lays the groundwork for future studies to explore the long-term impact of psychological factors on athletic performance and to investigate the role of motivation and cultural influences more deeply. By addressing gaps in the literature and providing actionable insights for stakeholders, this study serves as a pivotal resource for optimizing athlete development and success in table tennis and beyond.

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