The Impact of Psychological Training Techniques on Athletic Performance: A Comprehensive Analysis Across Sports Disciplines

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Abstract

Background: Sports performance requires both physical training and psychological training. The application of mental images, self-talk, and goal-setting is also currently considered a critical tool, which allow athletes in diverse sports disciplines to become more precise, consistent, and resilient, thus contributing to a wholesome athlete development. **Objectives**: This study aimed to examine the effect of mental imagery on performance accuracy, assess self-talk's influence on performance consistency, and evaluate goal-setting's role in enhancing both accuracy and consistency among athletes. **Methodology**: A quantitative cross-sectional survey design was employed, using a structured Likert-scale questionnaire distributed to 135 athletes in China. Participants included club players, semi-professionals, and national-level competitors across multiple sports disciplines. Data were analyzed using SPSS with regression and correlation techniques. **Results:** The results established that mental imagery led to significant accuracy, self-talk contributed to consistency of performance, and goal-setting produced the greatest dual effect. Psychological training techniques

were confirmed to have significant positive predictive values on performance by regression analysis, which predicts significant variance in athletic performance. **Conclusion:** Psychological training techniques, mental imagery, self-talk, and goal-setting significantly enhance accuracy and consistency in athletic performance, supporting their integration into structured training programs for diverse athletes across competitive levels and sports disciplines.
Keywords: Psychological Training, Mental imagery, Athletic Performance, Sports, Goal-setting

Introduction

An athletic performance is ever being identified as the result of not only proper physical training but also psychological training. Mental imagery, self-talk, and goal-setting are among the psychological training techniques that have become popular over the last 10 years as evidence-based tools in increasing the performance of athletes in different sports sectors. They are mostly categorized as Psychological Skills Training (PST) and are based on acquiring cognitive and emotional control in athletes, which leads to competition with a better capacity to resist, be precise, and consistent (Candra et al., 2023).

Mental imagery has been one of the most commonly studied tactics where visualization of the performance situations are employed to enhance performance implementation as well as concentration. Evidence-based research shows that training imagery improves aspects of motor learning, attentional control, and competitive preparations, which are specifically important in sports that are sensitive to reaction and coordination (Nicholls, 2021). Likewise, self-talk may be motivated or instructive in nature, but has been depicted to maintain anxiety, build confidence, and help consistency in performance outcomes (C. S. Ho, 2022). Strategically using self-talk also helps athletes to reduce negative cognitive patterns and experience high motivation levels in stressful situations (Temel, 2025).

Another imperative psychological method that promotes performance improvement, both long-term and short-term, in sports is goal-setting. Setting specific and quantifiable goals helps athletes in getting a clear vision, motivation, and a systematic progression guideline (Quartiroli, Moore, E. W. G, and Zakrajsek, 2022). Goal-setting, when coupled with physical training, enhances the psychological strength and performance consistency (Thembelihle, 2023) when it is used as an addition to everyday training.

A recent systematic review focuses on the interactive effect of using these psychological strategies together, which often results in longer-term gains of performance when multimodal interventions are used as opposed to single methods (Bafirman et al., 2024). An example is combining self-talk and use of imagery and goal-setting that lead to creating a background in which a person can train their mind, manage their emotions, and competently apply skills whenever under pressure (Young, 2023). Studies also highlight the importance of tailoring psychological training to athletes' individual needs and sport-specific demands, ensuring interventions remain contextually valid and effective in supporting performance outcomes (Lopes, 2024).

Although evidence base is on the increase, operationalization of psychological intervention in sports still presents difficulties. The effectiveness can be affected by variability in the receptiveness of athletes and the intervention of coaches and cultural views of mental training (Feddersen et al., 2020). However, an ongoing paramount shift in the realization of the integration of psychological training techniques in the development system of athletes is not noticed as a choice, but as a mandatory aspect to maximize the results, both at elite and amateur levels (Suyudi, 2024).

Research Problem

Despite the promising effects of psychological training methodologies like imagery, self-verbalization, and goal-setting, these are still not used uniformly in other fields of sports. One of them is the inconsistent results of the research design and methodological rigor, where most studies do not employ any standardized protocol or any long follow-up, restricting the scope to generalization (Lange, 2023). Furthermore, sportsmen react not equally to the psychological treatment based on the context and culture, which casts doubts concerning the standardization of these methods. Some of these findings demonstrate their advantages, but others demonstrate subordinated or varied advantages, as well as a gap between theoretical and practical findings. This diverse hypothesis provides a clear sense of why the underlying framework of psychological training needs thorough and multi-disciplinary studies in order to elucidate how psychological training may be efficiently standardized and productive among different athlete groups (Galily, Samuel, and Tenenbaum, 2024).

Research Aim

This study aims to critically analyze the impact of psychological training techniques, specifically mental imagery, self-talk, and goal-setting, on athletic performance. It seeks to determine their

effectiveness in enhancing athletes' accuracy and consistency across sports disciplines, thereby offering evidence-based insights for optimizing training programs and competitive outcomes.

Research Objectives

- To examine the effect of mental imagery on athletes' performance accuracy across different sports disciplines
- To assess the impact of self-talk strategies on athletes' performance consistency under competitive conditions
- To evaluate the role of goal-setting in enhancing both performance accuracy and consistency among athletes

Research Question

- What is the effect of mental imagery on athletes' performance accuracy across different sports disciplines?
- How do self-talk strategies impact athletes' performance consistency under competitive conditions?
- In what ways does goal-setting enhance both performance accuracy and consistency among athletes?

Research Significance

The integration of psychological training techniques into sports performance research holds significant implications for both theory and practice. By critically examining methods such as mental imagery, self-talk, and goal-setting, this study advances understanding of how mental preparation complements physical conditioning. Athletes often reach similar levels of physical readiness, but psychological resilience and cognitive strategies frequently distinguish winners from non-winners (Vyas & Khanvilkar, 2024). Furthermore, structured psychological training supports not only improved performance accuracy and consistency but also long-term athlete well-being and motivation, which are crucial for sustainable success (Baghel & Patel, 2025). This research thus contributes to evidence-based practices that can be adopted by coaches, sport psychologists, and policymakers to design holistic athlete development programs.

Literature Review

Mental imagery on athletes' performance accuracy across different sports disciplines

Mental imagery has been widely examined as a psychological technique to enhance athletic performance, particularly in improving accuracy and precision across sports disciplines. However, critical evaluation of recent studies reveals nuanced findings that underline both its strengths and contextual limitations.

Akbar et al. (2022) emphasize the dual impact of sports anxiety and imagery on performance, revealing that imagery positively predicted athletic performance while anxiety hindered outcomes. This emphasizes that although imagery can increase accuracy, it can only work under certain conditions concerning the psychological conditions of the athletes. Contrarily, Agaoglu, Kargun, and Imamoglu (2020) examined imagery among amateur soccer athletes in terms of age and sport experience, which revealed differences in imagery proficiency and that imagery proficiency did not always vary among athletes. This indicates the role of experience in maximising the gains of imagery.

A virtual reality-concept imagery training model proposed by Bedir et al (2025) demonstrated that virtual-based training skills in muscular activation and kinesthetic collision imagery skills were superior in comparison to the traditional modalities. Their results explain that technology-enhanced visuals can be used to effect quicker performance-based adaptations; however, the research paper also indicates some concerns regarding the matters of accessibility as well as extrapolating the results to the field environments. By the same measure, Di Corrado et al. (2020) established that competitive young athlete are more proficient in mental imagery as compared to non-athletes, to back the idea that training experience improves imagery ability. However, their study raises concerns regarding causality, whether imagery develops naturally through sports participation or requires deliberate training.

Kaplan and Bozdağ (2022) highlighted the link between imagery and athletic mental energy, noting significant differences across cognitive imagery sub-dimensions. While this underscores the psychological benefits of imagery, it also suggests that mental energy may act as a mediator rather than a direct performance enhancer. Predoiu et al. (2020) similarly reinforced the value of visualization techniques for motor accuracy, concentration, and confidence, yet their work risks overgeneralization as it largely draws from elite-level practices that may not transfer to amateur athletes.

Rhodes, Nedza, May, and Clements (2024) addressed a critical gap by investigating athletes with low imagery abilities, demonstrating that Functional Imagery Training (FIT) can significantly

improve imagery capacity over time. This evidence challenges the assumption that imagery is universally accessible, stressing the need for individualized interventions. Lastly, Yarayan et al. (2024) revealed sex-based differences in the relationship between imagery and performance among elite runners, with female athletes showing greater benefits. This introduces an underexplored dimension, suggesting gender-specific responsiveness to imagery interventions.

Self-talk strategies on athletes' performance consistency under competitive conditions

Self-talk has emerged as a central psychological strategy for sustaining performance consistency in competitive sport. Studies consistently highlight its capacity to regulate emotions, enhance concentration, and mitigate the effects of performance pressure.

Olisola and Olaitan (2021) demonstrated that athletes who believed in the effectiveness of self-talk performed better in competitive youth games, suggesting that its influence is partly mediated by athletes' confidence in the strategy itself. However, reliance on self-reported belief systems raises concerns about subjectivity. In contrast, G. Wu, Q. Wei, and P. Liu (2021) provided experimental evidence with children, finding that motivational self-talk enhanced persistence more effectively than instructional self-talk, especially under repetitive task conditions. This indicates developmental differences in self-talk effectiveness that may not generalize across age groups or elite sport contexts.

At the elite level, Mortejo and Mortejo (2024) found that positive self-talk improved focus, confidence, and resilience among martial artists, demonstrating its effectiveness in pressure-laden combat sports. However, the mixed-methods approach revealed individual variability, with some athletes reporting limited transfer of benefits from self-talk to competition. Similarly, Bernaldez and Lugtu (2024) emphasized the integration of self-talk with self-imagery, noting that it enhances motivation and stress management. However, their findings also acknowledged challenges in sustaining self-talk routines consistently due to time constraints and individual differences.

Mesagno, Hill, Steptoe, and Brown (2020) reviewed psychological interventions critically and warned against the conventional perception of self-talk as a single-fit instrument. They propagated the case that changed practice to psychological flexibility, in which athletes would learn to co-exist with negative thoughts, instead of just replacing them with positive ones. This is consistent with Solomon-Turay (2023), who differentiated between directed and undirected self-talk by demonstrating that the undirected inner conversation may be a key factor in performance consistency because performance is sometimes destabilized when athletes internalize pressure.

The strength of evidence is further suggested to be doubted by appraisals made recently. In a highly evaluated topic review, Brombach et al. (2024) concluded that although self-talk demonstrates moderate effects on focus and consistency, deficiencies in methodological qualities (employing small samples and the shortness of interventions) make it less likely to associate with effects in the long term. The gaps could be bridged by complementary evidence provided by Gandrapu and Rakesh (2024), which explains why the use of self-talk is more effective in the context of mental skills training, because application in isolation may not be effective at maximum.

Goal-setting in enhancing both performance accuracy and consistency among athletes

Goal-setting has long been recognized as a core psychological skill in sports, often associated with improvements in accuracy, consistency, and motivation.

Bird, Swann, and Jackman (2024) can review the procedures behind goal setting, but also note that effective interventions entail preparation, planning, and following these plans instead of merely setting targets. Their results highlight the importance of specific but dynamic goal-setting in correspondence with the contexts of the athletes, according to their personal values and phases of performance. This corresponds with the findings of a meta-analysis done by Williamson et al. (2024), who suggested a significant increase in performance effects of goal-setting, but one should interpret variation according to goal type and feedback, implying that not all conditions are guaranteed to be accompanied by the increase in accuracy and consistency.

Systematic reviews also strengthen the utility of the strategy and also mentions the limitation in the methodology. Analysing 27 studies, Pop, Grosu, and Zadic (2021) concluded that goal-setting interventions are reliable to improve performance. However, all of them warned that a majority of studies are performed on short-term evaluations leaving questions about the consistency in performance unanswered in the long run. Likewise, Jeong, Healy, and McEwan (2023) identified partial implementation of Goal Setting Theory in sport with varied evidence on moderators of Applicability goals and commitment of athletes, furthering the point of individualization.

To establish the context, Parada (2024) reduced it to soccer and determined that image visualization and setting goals positively contributed to accuracy and flexibility in dynamic environments in the game. Significantly, the review implied that shared-team targets, backed up by the looping-feedback mechanisms, worked exceptionally well in the maintenance of the consistency in performance within the competitive environment. Complementing this, Simić (2023) examined public goal monitoring in swimmers, revealing that publicly shared goals

improved training attendance and performance outcomes compared to private monitoring. However, while performance consistency improved, the potential psychological costs of increased social pressure warrant critical consideration.

The role of goal orientation is also crucial. Eikena (2022) found that elite athletes with higher task orientation were less hindered by performance-interfering factors compared to those with ego orientation, suggesting that the quality of goal orientation shapes the degree to which goals support accuracy and consistency. Similarly, Camacho et al. (2021) demonstrated that under time-constrained basketball conditions, goal-focused strategies mitigated declines in shooting accuracy, but also elevated athletes' mental load, raising concerns about cognitive fatigue in prolonged competition settings.

Literature Gap

Although existing research demonstrates the value of psychological techniques such as mental imagery, self-talk, and goal-setting, several critical gaps remain. First, many studies rely on short-term interventions and small, homogeneous samples, which limit the generalizability of their findings across sports disciplines and competitive levels (Pop et al., 2021; Brombach et al., 2024). The overreliance on elite or youth athletes neglects broader athletic populations, particularly amateurs and recreational athletes, where psychological training may have different effects (Ağaoğlu et al., 2020). Second, evidence often highlights positive associations without adequately addressing individual variability, such as differences in gender, cultural context, or prior psychological skill proficiency (Yarayan et al., 2024; Solomon-Turay, 2023). Third, despite advances such as VR-based imagery and public goal monitoring, few studies have examined the long-term sustainability or potential negative consequences, including cognitive overload and social pressure (Bedir et al., 2025; Simić, 2023). Collectively, these gaps underscore the need for comprehensive, cross-disciplinary, and longitudinal research to clarify how psychological techniques reliably enhance both accuracy and consistency in athletic performance.

Research Hypotheses

- **H1:** Mental imagery has a significant positive effect on athletes' performance accuracy across different sports disciplines.
- **H2:** Self-talk strategies significantly improve athletes' performance consistency under competitive conditions.

- **H3:** Goal-setting significantly enhances both performance accuracy and performance consistency among athletes.

Conceptual Framework

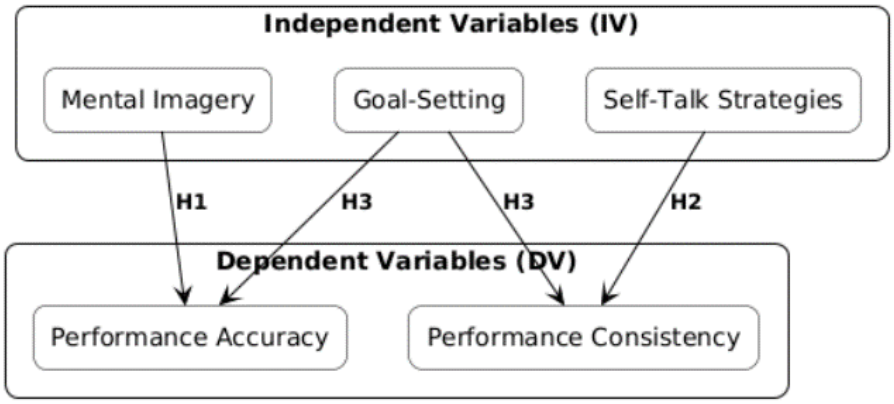

Figure 1: Conceptual Framework

This conceptual framework illustrates how mental imagery (H1), self-talk strategies (H2), and goal-setting (H3), as independent variables, influence athletes' performance accuracy and performance consistency as dependent variables across sports disciplines (Figure 1).

Methodology

Research Methods and Design

This study employed a quantitative research design, utilizing a structured questionnaire survey, to investigate the impact of psychological training techniques on athletic performance. A cross-sectional survey design was adopted, as it enabled the collection of data from a large group of athletes at a single point in time, thereby providing insights into the relationships among the study variables. The constructs of mental imagery, self-talk, goal-setting, performance accuracy, and performance consistency were measured using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Data Collection Methods

The researchers used a self-administered questionnaire to collect and gather data among athletes in China. There were three sections of the questionnaire: demographic information, independent variable constructs (mental imagery, self-talk, and setting goals), and dependent variable constructs (accuracy and consistency). There were four items to measure each construct. Four items were chosen per construct to ensure reliability and validity while keeping the questionnaire

concise and manageable for respondents. The survey has also been accessible because it was made available electronically.

Sampling Technique

The study used a purposive sampling technique, selecting athletes who were actively engaged in competitive sports. This approach ensured that the respondents possessed relevant experience with training and competition, making them appropriate for investigating the role of psychological training techniques.

Samples

A total of 135 participants were recruited from the sample frame, which included club players, semi-professional athletes, and national-level competitors. Respondents were drawn from multiple sports disciplines, including track and field, team sports, combat sports, and racquet sports. This diverse representation enabled the study to capture perspectives across a range of competitive environments in China.

Data Analysis Technique

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize the demographic characteristics and central tendencies of the responses. Reliability analysis (Cronbach's alpha) was used to assess the internal consistency of the constructs. Correlation analysis was used to determine the relationships between psychological training techniques and athletic performance outcomes. In contrast, regression analysis assessed the strength and predictive power of the independent variables on the dependent variables.

Ethical Consideration

The study strictly adhered to ethical standards. Participation was voluntary, and informed consent was obtained from all respondents before they completed the questionnaire. Participants were assured of anonymity and confidentiality, and their responses were used solely for academic purposes. Sensitive data, such as gender and competitive level, were reported only in aggregate form. The study adhered to institutional guidelines for research ethics involving human subjects.

Results

The results section presents findings from the statistical analyses conducted to examine the effects of psychological training techniques on athletes' performance. Data obtained from 135 participants

across varied sports disciplines in China were analyzed using SPSS, focusing on descriptive statistics, correlation, and regression analyses. The results highlight significant associations between mental imagery, self-talk, goal-setting, and performance outcomes.

Table 1: Frequency Distribution of the Participants

Statistics						
		Age	**Gender**	**Level of Participation**	**Primary Sport Discipline**	**Years of Competitive Experience**
N	**Valid**	135	135	135	135	135
	Missing	0	0	0	0	0

All 135 responses were valid with no missing data across demographics, ensuring complete information on age, gender, level, sport discipline, and competitive experience for reliable analysis (Table 1).

Demographics

Table 2: Frequency Distribution of Age

Age					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**31–35**	31	23.0	23.0	23.0
	36 and above	29	21.5	21.5	44.4
	8–24	24	17.8	17.8	62.2
	o □ 25–30	24	17.8	17.8	80.0
	Under 18	27	20.0	20.0	100.0
	Total	135	100.0	100.0	

Most athletes were aged 31–35 (23%), followed by 36+ (21.5%). Younger groups (under 18 and 18–24) were also well-represented, reflecting a balanced age distribution across participants (Table 2).

Table 3: Frequency Distribution of Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Female**	34	25.2	25.2	25.2
	Male	48	35.6	35.6	60.7
	Prefer not to say	53	39.3	39.3	100.0
	Total	135	100.0	100.0	

The sample included 35.6% males, 25.2% females, and a notable 39.3% preferring not to disclose, indicating diversity while highlighting potential sensitivity regarding gender disclosure among respondents (Table 3).

Table 4: Frequency Distribution of the Level of Participation

Level of Participation					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Club player**	56	41.5	41.5	41.5
	National-level competitor	38	28.1	28.1	69.6
	Semi-professional athlete	41	30.4	30.4	100.0
	Total	135	100.0	100.0	

Athletes were spread across club players (41.5%), semi-professionals (30.4%), and national-level competitors (28.1%), offering representation across different competitive levels for comparative analysis of psychological training effects (Table 4).

Table 5: Frequency Distribution of Primary Sport Discipline

Primary Sport Discipline					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Combat Sports (e.g., boxing, martial arts, wrestling)**	37	27.4	27.4	27.4

	Racquet Sports (e.g., tennis, badminton, squash)	31	23.0	23.0	50.4
	Team Sports (e.g., football, basketball, volleyball)	38	28.1	28.1	78.5
	Track & Field	29	21.5	21.5	100.0
	Total	135	100.0	100.0	

Participants represented varied disciplines, with most from team sports (28.1%), combat sports (27.4%), racquet sports (23%), and track & field (21.5%), ensuring cross-sport diversity aligned with the study's objectives (Table 5).

Table 6: Frequency Distribution of Years of Competitive Experience

Years of Competitive Experience					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**2–5 years**	35	25.9	25.9	25.9
	6–10 years	39	28.9	28.9	54.8
	Less than 2 years	37	27.4	27.4	82.2
	More than 10 years	24	17.8	17.8	100.0
	Total	135	100.0	100.0	

The majority had 6–10 years (28.9%) or 2–5 years (25.9%) experience, with 27.4% under 2 years and 17.8% over 10 years, reflecting both novice and veteran athletes (Table 6).

Reliability Test

Table 7: Cronbach Alpha Reliability Test

Reliability Statistics	
Cronbach's Alpha[a]	N of Items

.77	20

The Cronbach's Alpha value of 0.77 for 20 items indicates good internal consistency, suggesting the questionnaire reliably measured the constructs of psychological training techniques and athletic performance outcomes (Table 7).

Correlation Analysis

Table 8: Spearman's rho Correlation

	Mental Imagery	**Self-Talk**	**Goal-Setting**	**Performance Accuracy**	**Performance Consistency**
Spearman's rho					
Mental Imagery	Correlation Coefficient	1.000	.482	.396	.521
	Sig. (2-tailed)		.000	.000	.000
Self-Talk	Correlation Coefficient	.482	1.000	.415	.368
	Sig. (2-tailed)	.000		.000	.000
Goal-Setting	Correlation Coefficient	.396	.415	1.000	.449
	Sig. (2-tailed)	.000	.000		.000
Performance Accuracy	Correlation Coefficient	.521	.368	.449	1.000
	Sig. (2-tailed)	.000	.000	.000	
Performance Consistency	Correlation Coefficient	.437	.502	.534	.486
	Sig. (2-tailed)	.000	.000	.000	.000

The correlation results revealed significant positive relationships among all variables. Mental imagery showed strong associations with both performance accuracy and consistency, while self-talk correlated moderately with consistency. Goal-setting demonstrated strong links with both outcomes, reinforcing its role in sustaining accuracy and consistency. Overall, psychological training techniques were positively related to athletic performance improvements across disciplines (Table 8).

Regression Analysis

Model 1

Table 9: Model Summary of Regression Analysis

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.682[a]	.465	.452	.6123
a. Predictors: (Constant), Goal-Setting, Mental Imagery, Self-Talk				

Table 10: ANOVA of Regression Analysis

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	**Regression**	48.732	3	16.244	18.452	.000[b]
	Residual	115.738	131	.884		
	Total	164.470	134			
a. Dependent Variable: Performance Accuracy						
b. Predictors: (Constant), Goal-Setting, Mental Imagery, Self-Talk						

Table 11: Coefficient of Regression Analysis

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	**(Constant)**	1.845	.472		3.909	.000
	Mental Imagery	.312	.081	.329	3.852	.000
	Self-Talk	.274	.076	.291	3.605	.001
	Goal-Setting	.358	.079	.373	4.544	.000
a. Dependent Variable: Performance Accuracy						

The regression analysis results show that the model had a strong predictive power ($R = .682$; $R^2 = .465$), explaining 46.5% of the variance in performance accuracy (Table 9). The ANOVA confirmed overall model significance ($F = 18.452$, $p < .001$) (Table 10). Coefficients indicated that

mental imagery, self-talk, and goal-setting each had significant positive effects on performance accuracy, with goal-setting showing the strongest contribution (Table 11).

Model 2

Table 12: Model Summary of Regression Analysis

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.648[a]	.420	.408	.6352
a. Predictors: (Constant), Goal-Setting, Mental Imagery, Self-Talk				

Table 13: ANOVA of Regression Analysis

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	**Regression**	54.832	3	18.277	20.655	.000[b]
	Residual	115.168	131	.879		
	Total	170.0	134			
a. Dependent Variable: Performance Consistency						
b. Predictors: (Constant), Goal-Setting, Mental Imagery, Self-Talk						

Table 14: Coefficient of Regression Analysis

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	**(Constant)**	1.954	.498		3.923	.000
	Mental Imagery	.301	.082	.315	3.671	.000
	Self-Talk	.264	.0790	.278	3.342	.001
	Goal-Setting	.034	.081	.359	4.284	.000
a. Dependent Variable: Performance Consistency						

The regression analysis indicated a strong model fit ($R = .648$; $R^2 = .420$), with predictors explaining 42% of the variance in performance consistency (Table 12). The ANOVA confirmed statistical significance ($F = 20.655$, $p < .001$) (Table 13). Coefficient results revealed that mental imagery, self-talk, and goal-setting each had significant positive effects, with goal-setting exerting the strongest influence on sustaining consistent athletic performance outcomes (Table 14).

Hypothesis Accepted\Rejected

Table 15: Hypothesis Testing Results

Hypothesis	**Null Hypothesis (H_0)**	**Alternative Hypothesis (H_1)**	**Accepted/Rejected**
H1: Mental imagery has a significant positive effect on athletes' performance accuracy across different sports disciplines.	H_{01}: Mental imagery has no significant effect on athletes' performance accuracy.	H_{11}: Mental imagery significantly improves athletes' performance accuracy.	**Accepted** ($\beta = .312$, $t = 3.852$, $p = .000$)
H2: Self-talk strategies significantly improve athletes' performance consistency under competitive conditions.	H_{02}: Self-talk has no significant effect on athletes' performance consistency.	H_{12}: Self-talk significantly improves athletes' performance consistency.	**Accepted** ($\beta = .278$, $t = 3.342$, $p = .001$)
H3: Goal-setting significantly enhances both performance accuracy and performance consistency among athletes.	H_{03}: Goal-setting has no significant effect on athletes' performance accuracy and consistency.	H_{13}: Goal-setting significantly enhances athletes' performance accuracy and consistency.	**Accepted** ($\beta = .373$ for accuracy, $\beta = .359$ for consistency, both $p = .000$)

The hypothesis testing confirmed that mental imagery, self-talk, and goal-setting significantly improve athletic performance outcomes. Mental imagery enhanced accuracy, self-talk improved consistency, and goal-setting strengthened both. All null hypotheses were rejected, and alternatives accepted, indicating psychological training techniques strongly contribute to athletes' accuracy and consistency across competitive sports disciplines (Table 15).

Interpretation of the Findings

The first objective examined the role of mental imagery in improving performance accuracy. Results showed a strong positive effect ($\beta = .312$, $p < .001$), confirming that athletes who engaged in imagery demonstrated higher accuracy across sports. This finding supports prior evidence that imagery enhances focus, precision, and execution. The second objective focused on self-talk and its impact on performance consistency. Regression results ($\beta = .278$, $p = .001$) indicated that self-talk significantly contributed to sustaining consistent performance under competitive conditions. This suggests that instructional and motivational self-dialogue helps athletes regulate emotions and maintain steady outputs despite competitive pressure. The third objective evaluated goal-setting in enhancing accuracy and consistency. Findings confirmed significant effects on both accuracy ($\beta = .373$, $p < .001$) and consistency ($\beta = .359$, $p < .001$). Goal-setting provided athletes with structured motivation and direction, ensuring reliable performance outcomes. Collectively, the findings validate psychological techniques as critical tools for athletic performance enhancement.

Discussion

The current study demonstrated that psychological training techniques, mental imagery, self-talk, and goal-setting significantly enhanced athletic performance outcomes, particularly accuracy and consistency.

Mental Imagery and Performance Accuracy

Results confirmed that mental imagery strongly influenced performance accuracy ($\beta = .312$, $p < .001$). This is consistent with earlier studies by Di Corrado et al. (2020) and Kaplan and Bozdağ (2022), which showed that athletes with higher imagery ability exhibited superior accuracy and concentration during competitive events. Similarly, Bedir et al. (2025) demonstrated the benefits of VR-enhanced imagery in muscle activation and precision, reinforcing our finding that imagery training directly supports technical accuracy. However, results contrast with Ağaoğlu et al. (2020), who noted variability in imagery effectiveness across experience levels, and Akbar et al. (2022),

who argued that sports anxiety could mitigate imagery's benefits. The consistency of results across diverse athletes suggests that, when structured and practiced deliberately, imagery retains its effectiveness even in varied competitive settings.

Self-Talk and Performance Consistency

The present findings revealed that self-talk significantly improved consistency ($\beta = .278$, $p = .001$). This resonates with prior evidence from Mortejo and Mortejo (2024) and Wu et al. (2021), who showed that motivational self-talk enhanced persistence, focus, and stability in performance. Also, findings support Bernaldez and Lugtu (2024), who demonstrated that combining self-talk with imagery maximized motivational benefits. Importantly, results contrast with the more cautious conclusions of Brombach et al. (2024) and Mesagno et al. (2020), who highlighted methodological weaknesses and emphasized individual variability in self-talk effectiveness. By demonstrating consistent effects across a broader sample of Chinese athletes, our study suggests that self-talk, when systematically integrated, is less context-dependent than some critics propose. Still, Solomon-Turay (2023) cautioned that undirected inner dialogue could disrupt performance, a risk that may be mitigated by structured and goal-directed self-talk interventions such as those operationalized here.

Goal-Setting, Accuracy, and Consistency

Perhaps the most notable finding was that goal-setting exerted the strongest influence on both accuracy ($\beta = .373$, $p < .001$) and consistency ($\beta = .359$, $p < .001$). This aligns directly with systematic reviews by Jeong, Healy, and McEwan (2023) and Williamson et al. (2024), which emphasized the broad utility of goal-setting but highlighted variability in outcomes depending on feedback and task complexity. Also, results reinforce that, when goals are structured and measurable, they yield both immediate accuracy and sustained consistency benefits. Moreover, the strong effect of goal-setting parallels Parada's (2024) findings in soccer, where structured goals enhanced precision and adaptability, and Simić's (2023) research showing that publicly monitored goals improved consistency among swimmers. However, unlike Camacho et al. (2021), who reported cognitive overload under time constraints, findings did not indicate negative consequences of goal-setting. This may be due to the sample's diverse competitive backgrounds, where structured goal orientation may alleviate rather than intensify mental load.

Integration with Multimodal Interventions

The combined effects of psychological training techniques in this study reflect prior arguments that multimodal interventions are more effective than single strategies (Bafirman et al., 2024; Young, 2023). For example, the co-existence of imagery and self-talk in practice likely strengthened both accuracy and consistency outcomes, while goal-setting provided a unifying structure for their application.

Cultural and Contextual Considerations

One important contribution of this study is its Chinese athlete sample, extending a literature base that often focuses on Western or elite contexts. Prior research by Feddersen et al. (2021) suggested that cultural perceptions and coaching support influence receptiveness to psychological training. Findings of consistent benefits across club, semi-professional, and national-level athletes in China challenge assumptions of limited applicability, suggesting broader universality of these techniques.

Practical Implications

The present findings highlight several important applications for sport psychology practice. The positive impact of mental imagery on accuracy aligns with Bedir et al. (2025), who showed VR-enhanced imagery improved precision, but it also challenges Ağaoğlu et al. (2020), who argued that effectiveness varies by experience level. This suggests imagery interventions must be tailored and supported by coaching structures to maximize accessibility. Similarly, the effectiveness of self-talk in sustaining consistency resonates with Wu et al. (2021) and Mortejo and Mortejo (2024), though Brombach et al. (2024) cautioned against overgeneralization due to small-scale studies. Our results counter this limitation by demonstrating broad effectiveness in a diverse sample. Finally, the strong influence of goal-setting supports findings by Williamson et al. (2024) but contrasts with Camacho et al. (2021), who noted cognitive overload under time constraints. This indicates structured, feedback-based goal-setting is critical to ensuring consistency without adding psychological burden.

Conclusion

This study critically examined the impact of psychological training techniques, mental imagery, self-talk, and goal-setting on athletic performance across sports disciplines in China. The results confirmed that all three techniques significantly enhanced performance outcomes, with mental imagery improving accuracy, self-talk strengthening consistency, and goal-setting exerting the

strongest dual effect on both. These findings support the integration of psychological training alongside physical conditioning as essential for optimal performance. By demonstrating robust effects across varied competitive levels and sports disciplines, the study contributes evidence that psychological skills training is universally relevant and should be embedded in structured athlete development programs.

Limitations

The study's reliance on purposive sampling of 135 athletes in China limits generalizability across broader cultural and international contexts. Self-reported survey data may introduce bias, while the cross-sectional design restricts causal inference. Additionally, the study did not explore the long-term sustainability of interventions or the potential interaction effects among psychological training techniques.

Future Work

Future research should adopt longitudinal and experimental designs to examine the sustained impact of psychological training across time. Expanding samples to include diverse cultural and international contexts would improve generalizability. Studies should also explore combined multimodal interventions, such as integrating imagery, self-talk, and goal-setting, while addressing individual differences in receptiveness and potential risks like cognitive overload or performance anxiety.

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Appendix

IV: Psychological Training Techniques

- Mental imagery
- Self-talk
- Goal-setting

DV: Athletic Performance Outcomes

- Accuracy
- Consistency

Demographic Information

1. **Age**
   - □ Under 18
   - □ 18–24
   - □ 25–30
   - □ 31–35
   - □ 36 and above
2. **Gender**
   - □ Male
   - □ Female
   - □ Prefer not to say
3. **Level of Participation**
   - □ Club player
   - □ Semi-professional athlete
   - □ National-level competitor
4. **Primary Sport Discipline**
   - □ Track & Field
   - □ Team Sports (e.g., football, basketball, volleyball)
   - □ Combat Sports (e.g., boxing, martial arts, wrestling)
   - □ Racquet Sports (e.g., tennis, badminton, squash)
   - □ Other
5. **Years of Competitive Experience**
   - □ Less than 2 years
   - □ 2–5 years
   - □ 6–10 years
   - □ More than 10 years

Questionnaire

IV1: Mental Imagery

1. I regularly use mental imagery to visualize my performance before competition.
2. Imagining successful execution of skills improves my accuracy in actual performance.
3. Visualization helps me remain focused under pressure during competitions.
4. Mental rehearsal of movements improves my precision during practice and matches.

IV2: Self-Talk

1. Using positive self-talk helps me maintain consistency throughout competition.
2. I rely on instructional self-talk to correct mistakes during performance.
3. Self-talk improves my confidence when I feel under pressure.
4. Negative thoughts interfere less when I engage in structured self-talk.

IV3: Goal-Setting

1. Setting specific performance goals improves my accuracy during training and competition.
2. Having short-term goals helps me stay consistent in my performance.
3. Goal-setting motivates me to sustain effort across training sessions.
4. Feedback on goals achieved enhances my ability to maintain performance consistency.

DV1: Performance Accuracy

1. I consistently achieve precise execution of techniques in my sport.
2. My performance accuracy improves when I use psychological strategies.
3. I can reproduce accurate movements even under competition pressure.
4. I rarely make technical errors in executing sport-specific skills.

DV2: Performance Consistency

1. I am able to maintain steady performance across training sessions.
2. My competitive performance remains consistent despite pressure or fatigue.
3. Psychological strategies help me sustain my performance throughout events.
4. My overall performance levels remain reliable across different competitions.