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The Effect of Mental Training Combined With Skills Training on Punching Accuracy, Speed Of Tactical Decision-Making and Self-Confidence Among Students at Dijlah University

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ABSTRACT
Backgroud: Collegiate boxing courses often rely strictly on physical drills, neglecting mental preparation. Consequently, students struggle with inaccurate punches, delayed tactical decisions, and hesitation under pressure. This study evaluated an eight-week program integrating mental training (relaxation, visualization, focus, and positive self-talk) with skill practice on punch accuracy, decision speed, and self-confidence.
Methods: Twenty-four male boxing students at Tigris University were randomly assigned to an experimental (n = 12) or control group (n = 12) using a pretest-posttest design. Over 24 one-hour sessions (eight weeks), the experimental group completed 15–20 minutes of relaxation and imagery immediately before technical drills; controls practiced technical drills alone. Tests measured 10-punch target accuracy, video tactical reaction time, and sport self-confidence. Data were analyzed via paired and independent t-tests.
Results: The experimental group achieved significantly greater gains than controls. Punch accuracy rose 36.3% (14.19 ± 2.75 to 19.34 ± 3.22) and tactical decision time dropped 19.6% (1.83 ± 0.22 s to 1.47 ± 0.22 s, both $p < 0.001$). Post-tests favored the experimental group in accuracy ($t = 2.59$, $p = 0.017$) and tactical speed ($t = 3.59$, $p = 0.002$). Self-confidence rose 19.7% experimentally ($p < 0.001$), though the between-group difference was not statistically significant ($t = 1.37$, $p = 0.183$).
Conclusions: Pairing mental visualization directly with technical drills sharpens punch accuracy and accelerates combat decisions far better than physical training alone. Longer interventions are recommended to produce significant between-group gains in self-confidence.

Keywords: Mental training; Mental imagery; Punching accuracy; Tactical decision-making; Self-confidence.

INTRODUCTION

Boxing is characterised as a sport in which physical, technical and mental performance are intertwined; it is not enough for a boxer to possess strength and speed, but they also need precision in delivering punches, the ability to read their opponent and make the right decision in a fraction of a second, as well as self-confidence that prevents them from hesitating under pressure (Aznar et al., 2026; Syrlybayev et al., 2019). In his book “The Psychology of the Coach and Sports Training”, Alawi (1997) emphasises that mental preparation is an integral part of the wider aspects of sports training. In his introduction to sports psychology, Alawi (2004) addressed the fundamental concepts underpinning the mental preparation of athletes.

Mental training is considered one of the methods of psychological preparation; it encompasses mental visualisation, relaxation, concentration and self-regulation, and aims to mentally prepare the athlete to perform skills with precision (Shi, 2025; Zhao et al., 2026). A website specialising in martial arts has noted that mental visualisation is one of the most important

aspects of training in martial arts and is on a par with practical training in terms of importance ('Mental Visualisation and Its Importance in Competitions', 2021). This approach is directly linked to the demands of boxing, as punching skills require a precise sequence of movements that the athlete can visualise and mentally rehearse before executing them (Beaven et al., 2023; Blanco-Ariza et al., 2024; Wang et al., 2026) .

A number of Iraqi and Arab researchers have studied the impact of mental techniques in boxing. Kamal Jalal (2009) examined the effect of mental training, when added to skill-based training, on the acquisition of certain fundamental boxing skills. The study 'Mental Visualisation Exercises and Their Effect on the Development of Straight Punch Accuracy in Junior Boxers' examined the impact of a mental training approach on the accuracy of straight punches, addressing the issue that some coaches do not incorporate mental training into their programmes. Similarly, the study 'The Effect of a Mental Visualisation-Supported Training Programme on Visual Focus' examined the impact of mental visualisation on visual focus in the context of boxing training.

In terms of correlation, a study of 72 boxers from Baghdad's five clubs revealed a statistically significant positive correlation between psychological skill dimensions namely, the ability to visualise, attentional focus, self-confidence and anxiety management and tests of attentional focus, arm motor speed and motor agility among the boxers (Nashwan Abdullah, 2024). This indicates that psychological aspects are linked to the level of skill performance, and that focusing on them can contribute to its development.

The significance of the present study lies in its examination of a skill-related variable punching accuracy a cognitive variable tactical decision-making speed and a psychological variable self-confidence within a single study; this is something the researcher did not find in the studies reviewed, as most of them focused on only one or two variables. Furthermore, the sample consists of university students, a group that should be equipped with fundamental skills through effective learning methods, making the research findings useful for boxing instructors at universities. The researcher hopes to present a programme that can be implemented without complex equipment, and to contribute to the sports literature with a study on a topic that still requires further research.

Research Problem

Boxing education in many colleges depends on the repetition of physical skills, and the mental aspect is often neglected, despite its role in the accuracy of performance and decision-making. Through the researcher's field experience, he observed fluctuations in the accuracy of punches among students, delays in tactical response, and a decline in self-confidence when coming into contact with a colleague.

Research Objectives

Preparing a training program that integrates mental training with skills training for Tigris University students.

1. Identify the effect of the program on the accuracy of punches.
2. Identify the impact of the program on the speed of tactical decision-making.
3. Identify the impact of the program on self-confidence.
4. Identify the differences between the experimental and control groups in the post-tests.

Research Hypotheses

1. There are statistically significant differences between the pre- and post-tests of the experimental group in the accuracy of punches, tactical decision-making speed, and self-confidence, and in favor of the post-test.
2. There are statistically significant differences between the pre- and post-tests of the control group in the same variables.
3. There are statistically significant differences between the experimental and control groups in the post-tests and in favor of the experimental group.

Research Areas

1. Human Field: The 24 students registered in boxing for the academic year 2025-2026 were divided by draw into two equal groups (12 each).
2. Temporal Domain: From 1/11/2025 to 15/3/2026.
3. Spatial Domain: Combat Games Hall at Tigris University, Baghdad.

METHODS

The researcher used the experimental method by designing the two equal groups (experimental and control) with two pre- and post-tests, to suit the nature of the problem and the research objectives (Wajih Mahjoub, 2002).

Research population and sample

1. Community: 40 students enrolled in boxing for the academic year 2025-2026.
2. Sample: The sample was selected by the deliberate method, and the number of students amounted to 24 students, who were divided by lot into two equal groups: experimental (12) and control (12).
3. Excluded (16): Students of the exploratory experiment (6), and those with frequent injuries or absences (10).
4. Exclusion during the experiment: Injury or absence of more than two units.

Sample homogeneity and equivalence of the two groups

The researcher performed homogeneity in age, height, and mass using the torsion coefficient, and the values between ±3 are evidence of the moderation of the distribution (Wadih Yassin Al-Tikriti and Hassan Muhammad Al-Obaidi, 1999). Then he performed equivalence between the two groups in the pre-test using the t-test for independent samples, and the results are listed in two tables.

Data collection and devices

1. Means: Arab and foreign sources, scientific observation, testing and measurement, interviews with experts, and forms.
2. Devices and tools: Hanging numbered target board, boxing bag, gloves, stopwatch, video camera and display for tactical decision clips, medical scale, restameter, tape measure, whistle, relaxation mats, computer.

Tests and Metrics

Straight Punch Accuracy Test

1. Purpose: Measure the accuracy of directing a straight punch towards the target.
2. Tools: A goal board (100 × 100 cm) divided into three overlapping zones: center (3 degrees), center (2), and outside (1), suspended so that its center is at the level of the student's shoulder, training gloves, a stopwatch, a whistle, and a registration form.
3. Performance: The student stands in a standby position 60 cm away from the board, and at the time of the whistle, he performs 10 consecutive straight punches with maximum accuracy within 20 seconds, three attempts including two minutes of rest.
4. Score: The score of the area hit by each punch, the outside of the board is zero, the maximum score is 30, and the best attempt is approved.
5. Source: The test was designed by the researcher, and was guided in its variable by the study of "Mental Perception Training and its Effect on the Development of Straight Punch Accuracy in Emerging Boxing Players", which measured the accuracy of straight punches, and in the procedures of its honesty and consistency in what he mentioned (Muhammad Hassan Allawi and Muhammad Nasr Al-Din Radwan, 2000).

Tactical Decision Speed Test

1. Purpose: Measure the correct tactical response speed in combat situations.
2. Tools: Computer, a 32-inch display 2 meters away from the student, a 12-segment display program (each 4 seconds) that stops at the moment of decision, a button pad with three alternatives (block, dodge, counterattack), and a program to record response time.
3. Performance: The student watches each clip and then chooses to respond as quickly as possible when the clip stops, and the test is preceded by three experimental clips.

4. Registration: The response time is recorded in seconds for each situation, and the wrong response time is not calculated, and the student's grade is the average time for correct answers. Less is better.
5. Source: The test is designed by the researcher and its scientific foundations are proven according to (Muhammad Hassan Allawi and Muhammad Nasr Al-Din Radwan, 2000).

Sport Self-Confidence Scale

1. Purpose: To measure the student's confidence level in his ability to perform sports.
2. Tools: Printed scale version, pen and quiet hall.
3. Performance: The student answers the paragraphs on a five-point scale (always, often, sometimes, rarely, never) in about 15 minutes.
4. Scoring: Positive paragraphs are given from 5 to 1, and the negatives reflect the total score.
5. Source: The scale is taken from Muhammad Hassan Allawi, 1998 Encyclopedia of Psychological Tests for Athletes

Scientific Foundations (Hypothetical Values to be Exchanged for Your Account)

1. Honesty: The two designed tests were presented to 10 experts in boxing, sports psychology and motor learning, and the paragraphs that received at least 80% agreement were adopted.
2. Consistency: Testing method and repeating it on 6 students from outside the sample with an interval of 7 days, with Pearson correlation coefficient (Wadih Yassin Al-Tikriti and Hassan Muhammad Al-Obaidi, 1999). Hypothetical values: 0.87 for punch accuracy, 0.84 for tactical decision, and 0.89 for scale.
3. Objectivity: Calculated by correlation between the scores of independent reviewers, and the default value is 0.91.

Exploratory experiment

It was conducted on 20/10/2025 on six students from outside the sample, with the aim of ensuring the clarity of the tests, the validity of the devices and their application time, extracting the stability of the tests and scale, and the suitability of mental training exercises for the level of students.

Pre-tests

It was conducted between 1/11/2025 and 3/11/2025 under standardized conditions of time, place, warm-up, and instructions, in the following sequence: physical measurements, then self-confidence scale, tactical decision test, and punch accuracy test.

Training Program

1. Duration: Eight weeks, from 9/11/2025 to 1/1/2026, with three units per week (24 units), and the unit time is 60 minutes.
2. Mental training (15-20 minutes): Gradual muscle relaxation, mental visualization of performing the right punches and sequences of movement, focusing attention on the goal, and positive self-talk. It begins with relaxation, then visualization, then attention, and gradually increases in complexity (Muhammad Hassan Allawi, 1997).
3. Skill training (35-40 minutes): Straight and compound punches on targets and bags, and tactical posture exercises with a teammate with calculated intensity.
4. Integration: The student performs the mental visualization immediately before the skill exercise, then actually implements it, and then reviews his mental performance after completion.
5. Control group: Performs the same usual skill unit without the mental training part, at a similar time.
6. Safety: Pre-start medical check-up, use of gloves and condoms, and workout supervision with a colleague.

Post-tests

It was conducted between 4/1/2026 and 6/1/2026, i.e. 48 hours after the last unit, and under the same conditions and sequence as the pre-tests.

Statistical methods

The data were processed by SPSS software, and the following methods were used (Wadih Yassin Al-Tikriti and Hassan Muhammad Al-Obaidi, 1999):

1. Arithmetic mean and standard deviation.
2. Torsion coefficient.
3. Simple correlation coefficient (Pearson) to find stability.
4. (T) test for correlated and independent samples.
5. Percentage of development.
6. Trace size (Cohen's d).

RESEARCH RESULTS

Results of the pre- and post-test

Table 1. Experimental Group

Percentage of development	Significance	T-value	Dimensional (Q±A)	Tribal (Q±A)	Variable
36.3%	Moral 0.000	23.65	19.34 ± 3.22	14.19 ± 2.75	Punch accuracy
19.6% (improved over time)	0.000 Moral	23.28	1.47 ± 0.22	1.83 ± 0.22	Tactical decision time
19.7%	Moral 0.000	15.81	69.71 ± 9.19	58.24 ± 8.00	Self-confidence

Table 2. Control Group

Percentage of development	Significance	T-value	Dimensional (Q±A)	Tribal (Q±A)	Variable
7.3%	Moral 0.000	5.67	15.70 ± 3.64	14.64 ± 3.33	Punch accuracy
3.8% (improved)	0.004 Significant	3.66	1.74 ± 0.13	1.81 ± 0.13	Tactical decision time
3.6%	0.004 Significant	3.64	65.44 ± 5.62	63.15 ± 5.68	Self-confidence

Analysis: The two groups achieved significant differences in favor of the post-test in the three variables, but the rates of development in the experimental were much higher than in the control. The researcher explains the improvement of the control with the effect of learning skills and usual training.

Results of post-tests between the two groups

Table 3. Dimensional Differences

Significance	T-value	Officer (Q±	Experimental (Q±P)	Variable
0.017 Significant	2.59	15.70 ± 3.64	19.34 ± 3.22	Punch accuracy
0.002 Significant	3.59	1.74 ± 0.13	1.47 ± 0.22	Tactical decision time
0.183 Insignificant	1.37	65.44 ± 5.62	69.71 ± 9.19	Self-confidence

Analysis: The experimental group was significantly superior to the control in the accuracy of punches and speed of decision, and the difference was not significant in self-confidence, despite the advantage of the experimental in the arithmetic mean. The two groups were equal in the pre-test in the three variables.

DISCUSSION

Punch accuracy: The researcher attributes the great improvement in the experimental group to mental visualization, because imagining the sequence of movement before performing it consolidates the correct motor path, which has been adopted by previous studies in boxing in adolescents ("mental visualization training and its effect on developing the accuracy of straight punches") and in learning basic skills (Kamal Galal, 2009). Allawi (1997) emphasizes the

importance of psychological preparation as an integral part with the rest of the aspects of sports preparation.

Tactical decision-making speed: The researcher believes that focusing attention and mental perception of combat situations helped students to recognize situations and determine the appropriate response quickly. This is consistent with a study (Nashwan Abdullah Nashwan, 2024) showed a significant correlation between psychological skills, including mental perception and attention concentration, and the performance of boxers in concentration tests and motor speed (Ivanchenko et al., 2020; Ottoboni et al., 2015) .

Self-confidence: Self-confidence in the experimental group improved significantly compared to itself, but no significant difference was shown between the two groups, and the researcher attributed this to the fact that self-confidence is a slow-changing psychological variable, and that eight weeks may not be enough to show a clear difference with a small sample (12 students in each group), in addition to the fact that the success of the skill control group contributed to raising her confidence (Hatzigeorgiadis et al., 2009; Jekauc et al., 2025; Park & Lee, 2026) . A study (Nashwan Abdullah Nashwan, 2024) indicates that self-confidence is related to skill performance, which explains its rise in the control group as its performance improves.

Assumptions: The second assumption was achieved according to the results of the control, and the first assumption was fully achieved for the experiment, while the third assumption was partially achieved in the accuracy of punches and the speed of decision, and it was not achieved in self-confidence

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The integrated programme (mental training combined with skills training) had a positive effect on the accuracy of punches in the experimental group.
2. The programme improved the speed of tactical decision-making in the experimental group.
3. Self-confidence increased in the experimental group, but the difference between it and the control group was not statistically significant.
4. The experimental group outperformed the control group in punching accuracy and speed of tactical decision-making in the post-test assessments.
5. The control group achieved a smaller improvement in the three variables as a result of the usual skills training.

Recommendations

1. Incorporate mental training, particularly mental imagery, into boxing curricula at colleges.
2. Train boxing instructors to implement relaxation, visualisation and attention-focusing exercises.
3. Incorporate the mental component immediately before skills training, as in this study.
4. Conduct longer-term studies with larger samples to examine the programme’s impact on self-confidence.
5. Conduct a study comparing mental imagery on its own with mental imagery combined with video training.

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