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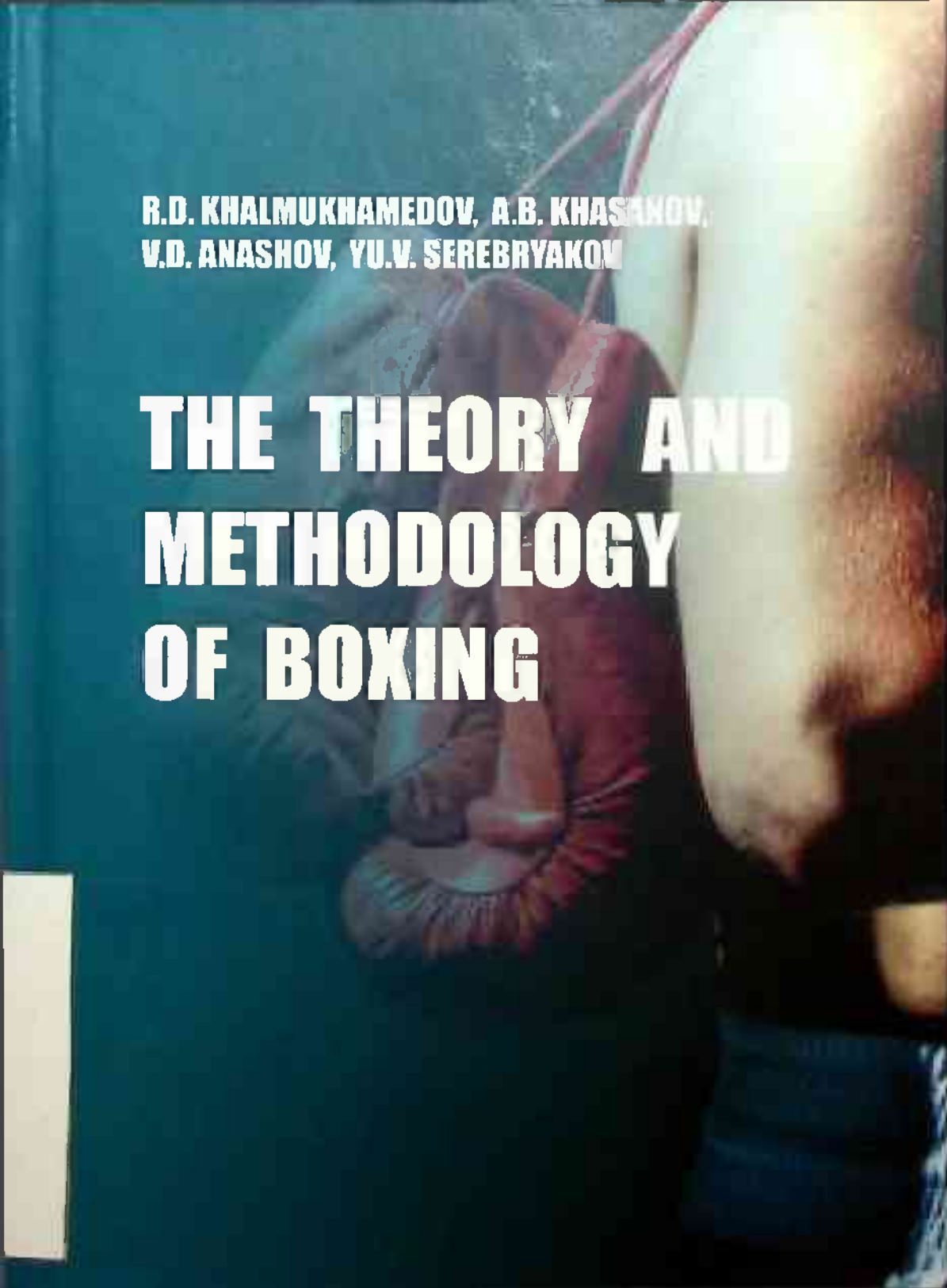

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THE THEORY AND METHODOLOGY OF BOXING

Improving a Boxer's Sports Mastery in Individual Training

Textbook

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A team of authors has developed this textbook based on the culmination of many years of training experience with leading coaches in Uzbekistan. The book outlines the key sections of the methodology for conducting individual boxing training sessions using "flat mitts." It presents the tools, methods, and methodological techniques used in separate lessons, provides a classification of individual lessons, explains the methodological rules that a boxing coach must master, and includes the results of scientific research conducted to enhance the specialized training process for boxers. The book systematically examines the tasks, opportunities, and strategies for improving a boxer's work capacity in flat mitt sessions. It also addresses the nuances of applying competitive and training loads during individual training sessions.

This textbook is recommended for instructors of higher educational institutions, students of the Institute for Retraining and Advanced Training of Specialists in Physical Education and Sports, coaches of Olympic and Paralympic sports training centers, and coaches of the Youth Sports Schools (IBO'SM, BO'SM).

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INTRODUCTION

According to Presidential Decree No. PQ-5099 of the Republic of Uzbekistan dated April 29, 2021, "On Measures for the Further Development of Boxing," the primary goals of developing boxing are to thoroughly study the athlete training methodology created by the country's leading boxing coaches, to scientifically justify the effectiveness of this methodology, and to implement it across all sports educational institutions and organizations.

At the current stage of amateur boxing development, the athletic training process is increasingly becoming the focus of specialized scientific research. The improvement of athletes' performance and the growing competitiveness in international competitions present several urgent new challenges for coaches. One of these challenges is the need to significantly enhance the methodology for conducting individual training sessions using "flat gloves" as an important form and method for preparing qualified boxers.

Currently, the methodology for individual training sessions with "flat gloves" has been extensively developed in terms of content. Most methodological works and experimental studies concentrate on revealing the tools, methods, and instructional techniques used in the individual training process. However, in specialized methodological and scientific literature on boxing, there is a significant lack of studies addressing the design of individual lessons with "flat gloves" based on scientific principles—specifically aimed at maintaining an athlete's specific working capacity, which includes not only endurance but also a wide range of specialized qualities and skills of a boxer.

The urgency of this issue is tied to the fact that the development of this sport leads to an increase in workload, intensity of physical activity, and psychological strain caused by training demands. The lack of experimental research in these areas results in training loads—particularly in individual sessions with "flat gloves"—being implemented without accounting for the athlete's physiological response to the performed activities.

Therefore, assessing the dynamics of working capacity and identifying ways to enhance it within the boxer's specialized activity is critically important. It is essential to examine how the speed of perception and information processing (during individual training with "flat gloves") depends on the nature and focus of the tasks performed by the trainee. The

results of such research can lead to the development of specific recommendations, enabling coaches to purposefully influence a boxer's working capacity during individual training sessions with "flat gloves."

The feasibility of conducting such research is also noted in the works of Doctor of Pedagogical Sciences, Professor L.P. Matveyev. He stated that "in high-performance sports, the initial structure of training – namely, the structure of an individual session – has been the least studied."

This study attempts to address some shortcomings in the existing methodology of individual training in boxing theory and practice.

Specifically, it aims to equip coaches with methodological recommendations for regulating training loads during individual sessions to enhance the specialized working capacity of boxers.

CHAPTER I. CHARACTERISTICS OF THE FUNDAMENTAL PRINCIPLES OF DEVELOPING TECHNICAL SKILLS IN BOXING

1.1. Characteristics of Modern Boxing and Its Development Traditions

Boxing, as a sport, has a wide age range for achieving high athletic results: Olympic medalists have ranged from 16 to 38 years old, with the optimal age for peak performance generally considered to be between 18 and 28. Every boxer has their own "golden period" during which their talent fully unfolds due to the dominant development of certain abilities. Boxing offers equal opportunities for both young athletes and veterans. Younger boxers often succeed due to their speed, excellent reaction time, courage, and a rebellious attitude toward authority. In contrast, older athletes compensate for reduced speed and slower reactions with superior specialized endurance, stronger punches, and advanced tactical awareness.

In recent times, the number of individuals engaging in boxing has significantly declined, especially in major cities of Uzbekistan. Current training programs restrict the starting age for boxing to 12–13 years old, which results in adolescents aged 14–16—particularly those who have been dismissed from other sports such as football, swimming, or track and field—being left out. Due to their age, they are often not accepted into Youth Sports Schools. This presents a serious social issue, as this particular age group is considered highly sensitive and complex.

However, experience shows that age is not the most crucial factor. Many aspects depend on the length of time an individual has been practicing boxing: this sport allows for a wide age range when it comes to achieving high-level athletic performance.

In recent years, we have seen the emergence of young, naturally gifted boxers in the ring—athletes who shine brightly like a shooting star in the boxing sky, only to disappear from view either temporarily or permanently. These "one-day" boxers often possess all the qualities of top-tier athletes, except for one critical element: they have not gone through proper schooling and remain unskilled in terms of technical and tactical mastery. The root of the problem lies in the training system adopted by many coaches. Specialists are dedicating less and less time to boxing technique, opting instead to select physically gifted athletes who often lack technical refinement. As a result, we are seeing the rise of

"unskilled masters." Referees also fail to support the development of technical and tactical skills in young boxers, as they judge bouts from the perspective of adult boxing – focusing on the number of punches landed rather than evaluating the full range of technical and tactical proficiency.

Special attention must be given to the selection of adolescent boxers. It must be acknowledged that the issue of selection in sports is complex in general, but in boxing, experts believe that a more critical problem lies in attracting beginners to the sport and retaining them over time.

Modern boxing is highly complex and multifaceted. It encompasses a wide variety of schools, approaches, and stylistic features that reflect the sporting mastery of a vast number of boxers from different countries and continents.

The leading boxers of the Cuban and American boxing schools possess highly developed physical qualities, along with a well-established level of technical and tactical mastery. Their high endurance supports fast-paced fights and even allows them to increase intensity by the fourth round. Many of these boxers have powerful punches and use them skillfully during bouts. It's also important to highlight their strong willpower—they continue to fight to the very end, even under extremely difficult conditions. While they often prefer medium and close-range fighting, they are equally effective across all combat distances.

For most Cuban boxers, bouts are characterized by stable and automated techniques combined with sharp offensive action. In contrast, American boxers are known for their diverse and distinctive techniques and tactics, their ability to adapt and reorganize movements during a match, and their extensive use of various tactical strategies.

A distinctive feature of the best representatives of our national boxing school is the widespread use of a skillful dominance strategy, based on various techniques and a high level of physical preparation. Uzbek boxers stand out for their ability to combine refined technique with exceptional mobility, speed, and endurance. Many of them are known for possessing powerful punches; however, delivering a strong blow is not treated as an end in itself. As a rule, a knockout punch is seen as the logical conclusion of a tactically well-executed bout.

This style is also characteristic of many boxers from European countries. In contrast, some boxing schools in Asian and African countries are still developing and lack a firmly established identity. Boxers from these regions typically rely on well-developed physical attributes and tend to prioritize power-based pressure over refined technique. Their fighting

style is often linear, with a readiness to exchange punches directly and overpower opponents through sheer force, while paying relatively little attention to defensive strategies.

An analysis of the competitive performance of highly skilled athletes conducted by O.P. Frolov and Yu.B. Nikiforov shows that the intensity of bouts is extremely high—with 217 to 233 punches thrown during a match. The number of punches generally increases from round to round. However, the efficiency coefficient of offensive actions remains relatively low, averaging around 0.24.

Highly skilled boxers frequently employ punch combinations, with 121 to 144 series executed during a match. The sustained high pace of the bout—and the ability to increase intensity toward the end—indicates a high level of endurance in the athlete. This is supported by an endurance coefficient of 1.01.

Boxers deliver offensive punches most frequently, accounting for 47% of all punches, followed by counter-punches at 28%, and response punches at 25%. These figures indicate that boxers predominantly employ an active-offensive fighting style, with a strong emphasis on attacking and countering strategies.

According to data from Yu.B. Nikiforov, among all types of defense, hand-based blocking is used most frequently (49%), while defenses involving footwork and body movement are used less often—49% and 18% respectively. During more than half of the bout time (57%), boxers remain at long range. At the same time, athletes actively attempt to enter the "danger zone"—the close range of the opponent. Middle and close-range positions account for 28% and 15% of the total match time, respectively.

Most athletes skillfully take advantage of favorable moments—such as when the opponent loses balance or is left vulnerable after delivering a powerful punch. The effectiveness of applying situational actions is fairly high, with an efficiency coefficient of 0.54.

Pedagogical observations by competent experts have revealed that many of the world's leading boxers possess powerful single and combination punches, as well as the ability to quickly adapt and restructure their tactics during the course of a bout.

An analysis of the fighting styles of medalists in major international competitions shows that the majority of athletes (50–52%) can be classified as "pace-setters," 21–28% as "universal fighters," 16–18% as "stylists" or "technical players," and 6–9% as "knockout specialists."

However, it is often difficult to categorize many boxers strictly into these types. Approximately two-thirds of boxers demonstrate the ability to quickly adapt and restructure their tactics during a match. In contrast, knockout specialists and pace-setters tend to make tactical adjustments less frequently during bouts.

Let us highlight some traditions specific to modern boxing. These include the widespread use of active-offensive tactics, frequent application of attacking actions across all phases and distances of a bout, and the skillful and consistent use of technical-tactical techniques. These are effectively combined with high levels of specialized physical preparation—such as punching speed and power, as well as endurance.

A notable trend in modern boxing is the growing tradition of universalization, expressed through boxers' mastery of multiple fighting styles. It is anticipated that over the next 4–5 years, boxing will continue to develop towards greater tactical versatility among athletes. An increase in bout intensity and punching power is also expected. Additionally, a shift toward greater individualization in boxing is projected, where chosen combat strategies increasingly align with each athlete's unique characteristics. This evolution will foster the emergence of distinctive, charismatic fighters with personalized styles. Recognizing the features and developmental traditions of modern boxing calls for a revision of the criteria used to select promising boxers, as well as adjustments in their training methodologies.

According to advanced practice, a boxer cannot achieve consistent success without mastering the three main forms of combat: exploratory (probing), offensive, and defensive. These forms are interconnected and transition fluidly from one to another, each distinguished by the dominance of certain psychological traits and processes.

During reconnaissance actions, the boxer gathers information about the opponent's movements and combat behavior, processes this data, and makes decisions regarding fight strategy and the appropriate tools to use at that moment. Thus, during this phase, the processes of perception and operational thinking become highly active. However, the mechanisms involved in decision-making differ significantly between phases that involve long-term strategic planning and those that require immediate tactical decisions. In the first case, the boxer analyzes and synthesizes the situation on the spot, making decisions about the fight plan based on key indicators and information retrieved from long-term memory. In the second case, decisions are based on predictive forecasting and

anticipatory reactions, by identifying the opponent's intentions and upcoming moves. In both instances, the boxer's ability to observe and detect the most relevant cues—known as perceptiveness—is crucial for making successful decisions and executing effective actions.

When executing offensive combat actions, volitional qualities such as determination, courage, and perseverance begin to play a leading role, as they help the boxer overcome the opponent's resistance.

In defensive combat, especially when facing a strong opponent, qualities such as composure and decisiveness play a crucial role in stopping the opponent's attack. The reconnaissance phase emerges as an independent stage of the bout when the boxer must determine what needs to be done, which aspects to focus on in the upcoming moments, and how to adjust the fight plan and strategy based on the gathered information and the evolving combat situation.

Boxers conduct fights across three ranges—close, middle, and long distance. Fighting at each of these distances is governed and adjusted by a specific set of psychological processes and is supported by several of the athlete's mental qualities.

Long-distance fighting provides optimal conditions for comprehensively perceiving and differentiating the opponent's movements, as well as for decision-making and spatial orientation in the ring. Consequently, boxers have greater opportunities to react to incoming punches, and their psychological tension is generally lower compared to other distances. At this range, operational thinking becomes more expansive, and sensorimotor reactions are predominantly of the selective response type. Attention is distributed across a broad range of stimuli. In contrast, at middle and close distances, a boxer's focus narrows considerably and becomes selectively concentrated on critical elements such as the opponent's hand and body positioning. The time available for decision-making sharply decreases, requiring boxers to rely entirely on heuristic decision-making. Successful reactions at these distances are primarily responses to the opponent's striking movements.

In current boxing theory and methodology, several major and distinct individual-typical fighting styles have been identified. These styles are characterized by specific tactical tendencies aimed at gaining superiority over the opponent, achieving a knockout victory, or maintaining a high rate of punch delivery. Accordingly, boxers are conventionally classified into three groups: "stylists" (players), "knockout punchers," and "pace-setters." The choice of a particular fighting style is determined by a

boxer's anatomical-morphological, motor, physiological, and psychological characteristics. Anatomical-morphological traits include muscle fiber composition, body proportions such as neck length, and the relative lengths of arms and legs, as well as muscle function patterns. Physiological traits involve the athlete's functional capacities. Psychological traits encompass features of the nervous system, temperament, motor control tendencies, and cognitive abilities. Within each group, there exists a wide range of individual variations of typical styles, allowing each boxer to effectively apply their personal qualities during a bout.

The content of tactical guidelines and the three main fighting tempos also represent the methods by which boxers conduct a bout. When applying a winning strategy, a boxer aims to deliver a high number of accurate punches from long range—using feints and movement to avoid exchanges of powerful blows at middle and close distances. In doing so, the boxer seeks to evade the opponent's attacks while exploiting opportunities to land sharp, well-executed punches that can halt the opponent's attack or potentially lead to a knockdown or knockout. These approaches form the core of how different fighting styles are tactically implemented during a match.

The knockout tactic involves deliberately creating favorable conditions to deliver a powerful knockout punch—most often from middle distance—or seizing the moment when the opponent is in a vulnerable position at that range. The pace tactic focuses on achieving a high tempo of the fight, primarily at middle distance and at the borderline between medium and high pace, by using combinations and punch series to dominate the opponent.

Sports practice shows that under the intense conditions of modern competitions, it is extremely difficult for even a high-class boxer to achieve victory using only a single tactical approach or relying solely on their characteristic fighting style—whether against various opponents or even the same opponent in different encounters.

Thus, every high-level boxer who has mastered their chosen fighting style and its corresponding tactics must also be proficient in other tactical approaches. This versatility enables them to effectively counter strong and diverse opponents, regardless of their technical and tactical strengths.

Mastering the tactics of dominance equips a boxer with the ability to conduct reconnaissance and apply active defense against an aggressive opponent who fights intensely at middle and close distances.

The ability to deliver a powerful knockout punch can be effectively utilized in several contexts: through defensive actions against a "power" boxer at middle and close distances; through short punches (straight, hook, uppercut) at middle distance against a "stylist" boxer; and through effective defenses against a "pace-setter" boxer's rapid punch combinations.

Applying pace tactics allows a boxer to effectively counter an opponent launching counterattacks or one who possesses powerful punches. Pace tactics are especially useful during an evenly matched bout, helping the boxer gain the upper hand and conclude the fight successfully in their favor.

In the modern methodology of boxer training, instruction in the specific fight variants mentioned by name has not been fully developed. The content related to teaching the tools of combat—preparatory, offensive, defensive, and counter-offensive techniques—has been elaborated in greater detail and is better described. Unfortunately, the approach to teaching these combat tools remains too narrow and is not sufficiently integrated with the core components of a fight—its forms and methods.

An analysis of scientific and methodological literature, along with ongoing research in boxing, reflects—on one hand—general principles of sports training, and on the other hand—specific characteristics unique to this particular sport.

The main directions of scientific research conducted by specialists developing boxer training technologies include the analysis of techniques and the justification of instructional methodologies, as well as the study of psychological and pedagogical aspects throughout long-term training. At the same time, many coaches lack sufficient knowledge regarding the criteria for selecting adolescent boxers. Currently, only the initial selection of trainees is being conducted, while their potential is typically identified only after several years of boxing training.

1.2. Development of Boxing in Uzbekistan

Boxing is regarded as one of the most cherished and traditional sports among the youth in Uzbekistan. Hand-to-hand combat has been prevalent in Central Asia since ancient times, serving both as a form of entertainment and as a discipline of bravery.

By a twist of fate, Sidney Jackson arrived in Tashkent in 1917. In 1922, he officially accepted Russian citizenship to reside in the country permanently. After studying the local people's attitudes toward sports and their way of life, he began working to develop and popularize boxing. He was determined to make boxing a prominent sport in the region. To foster interest in boxing among the public, he developed and implemented strategies that contributed to the sport's growth. The first Central Asian Olympics took place in 1921. A year later, in 1922, exhibition boxing events were organized in the city of Samarkand. Sidney Jackson's training methods mirrored those of professional boxing, as he was one of America's most renowned light middleweight boxers.

In 1923, an intercity competition organized by the "Dynamo" sports society in Moscow was held, which held the status and significance of a national championship.

The Uzbek boxing school has earned a strong reputation on the international sports scene. In 1926, at the first championship of the former Soviet Union, Uzbekistan's representative K. Nikitin won a silver medal. The achievements of multiple-time USSR champion and Honored Master of Sports Rufat Risqiyev are also widely recognized. In 1974, he became the first Soviet boxer to win a world championship title at the World Championships held in Havana, Cuba. In 1976, he went on to earn a silver medal at the XXI Olympic Games in Montreal. Another representative of the Uzbek boxing school, a graduate of the Higher School of Sports Excellence (HSSU), multiple-time USSR champion, 1974 World Cup winner, and champion of the international "Friendship-84" tournament, was Vladimir Shindir. Soviet champions such as N. Anfimov, N. Khromov, S. Vasilenko, Z. Abduqodirov, R. Trishev, national cup winners G. Pinchuk and A. Matchonov, along with Spartakiad champion of the peoples of the USSR and silver medalist of the 1991 World Championship, winner of the first "Goodwill Games" in 1990—Artur Grigoryan (HSSU)—and many other great Uzbek boxers have raised the national flag to the highest levels. They shared this honor with their legendary coaches—Honored Trainers of the USSR and Uzbekistan—such as S.A. Jackson, Yu.V. Bukhman, B.A. Granatkin, A.D. Din, M.B. Frank, B.S. Gazizov, B.P. Norkin, A.A. Karimov, V.V. Zolotaryov, M.G. Kuchkarov, A.A. Razmakhov, V.N. Shin, A. Karimov, L.S. Kuchkarov, Sh. Khudoyberdiyev, A. Kadirov, and T. Gulyamov—who helped carry the glory of Uzbek boxing to the world stage.

In the years following independence, boxing in Uzbekistan has grown even more popular. Boxing schools are now successfully operating in all regions of the country. Among them, the Andijan Boxing School stands out as a true leader and recognized center for boxing. It is home to prominent modern boxing specialists such as M.G. Kuchkarov and A.A. Razmakhov, who continue to work productively and contribute significantly to the sport.

World-renowned boxers who trained and developed at this school include: Muhammadqodir Abdullayev, winner of the 1998 World Cup, 1999 World Champion, Olympic Champion at the XXVII Olympic Games, and Honored Athlete of Uzbekistan; Ruslan Chagayev, World Champion in 1999 and 2000, and Honored Athlete of Uzbekistan; Sergey Mikhaylov, bronze medalist at the XXVII Olympic Games; O'tkirbek Haydarov, 1999 World Champion, Olympic medalist at the XXVIII Games, and Honored Athlete of Uzbekistan; Baxodir Sultonov, Olympic medalist at the XXVIII Games and Honored Athlete of Uzbekistan; To'lqin Turg'unov, 1997 and 1999 Asian Champion, finalist of both the World Championship and World Cup, and Honored Athlete of Uzbekistan; and Hasanboy Dusmatov, Champion of the XXXI Olympic Games and Honored Athlete of Uzbekistan.

The boxing schools of Bukhara, Samarkand, Fergana, Jizzakh, and Khorezm also play significant roles in the national boxing scene. Boxers from Tashkent city and region, as well as the Republic of Karakalpakstan, are recognized as strong and competitive athletes.

On April 9, 1992, during a conference attended by boxing coaches and specialists, the Uzbekistan Boxing Federation was established as an independent public organization. In the early years of independence, Uzbek boxers began securing their first victories in prestigious international competitions.

A. Grigoryan won the championship at the CIS Championship, and Uzbek boxers went on to win seven more medals at various international tournaments. Thus, the independent Uzbekistan boxing school began to take shape.

One of the most significant events of 1993 was the participation of our athletes in the World Championship held in Tampere, Finland. Tashkent native Hikmatilla Akhmedov won a silver medal in the under-51 kg weight category.

In 1994, Uzbek boxers participated successfully in international competitions, winning a total of 41 medals, including 22 gold medals. The

year 1994 marked the XII Asian Games held in Hiroshima, where representatives of independent Uzbekistan made their first appearance before the Asian sporting community. Our athletes achieved remarkable results at the Games. Karakalpakstan's representative A. Avazboyev and O. Maskayev from the Tashkent region became champions in the heavyweight categories—under 91 kg and over 91 kg, respectively. N. Otayev (67 kg, Bukhara) and D. Yorbekov (75 kg, Samarkand) earned bronze medals. At the World Cup held in Bangkok in June 1994, N. Otayev won a gold medal, O. Maskayev claimed silver, and T. Ibragimov earned a bronze medal. At the first Asian Championship held in Tashkent from September 1–5, 1995, Uzbek boxers achieved a resounding victory over their rivals from Kazakhstan, Kyrgyzstan, Tajikistan, and Turkmenistan. Our athletes secured prize-winning places in all weight categories. The following boxers became champions: D. Yuldashev (48 kg, Fergana), M. Abdullayev (60 kg, Andijan), N. Otayev (67 kg, Bukhara), K. To'laganov (71 kg, Tashkent region), and R. Chagayev (91 kg, Andijan). Silver medals were won by T. Tulyakov (54 kg, Andijan), D. Karimov (57 kg, Jizzakh), T. Ibragimov (81 kg, Khorezm), and N. Sultanov (63.5 kg, Tashkent). In 1996, Uzbek boxers participated as an independent team for the first time at the XXVI Olympic Games. Seven boxers represented Uzbekistan: U. Ibragimov, M. Abdullayev, N. Otayev, K. To'laganov, D. Yorbekov, T. Ibragimov, and R. Chagayev. Among them, K. To'laganov delivered the most outstanding performance at the Olympics, under the guidance of his coaches F. Pak and Kh. Mukhamedov. He competed in intense bouts and earned a bronze medal, while N. Otayev and D. Yorbekov shared 5th to 8th places. Following the Olympic Games, our boxers participated in international tournaments held in Tampere (Finland) and Shymkent (Kazakhstan), where they won a total of 13 medals, including 8 golds.

From November 1 to 11, 1996, at the World Youth Championship held in Havana, Cuba, R. Chagayev secured a bronze medal. The main competitions of 1997 included the Second Central Asian Games, the 19th Asian Championship, and the World Championship. During the preparation period for these events, our national team participated in several international tournaments. In total, our boxers won 46 medals of various standings, including 16 gold medals. Our boxers achieved significant victories in tournaments held in Italy, Czechoslovakia, and Finland, where they proved to be worthy of

Europe's strongest fighters. R. Chagayev attained major success in these competitions. In the second half of August, the 19th Asian Championship took place in Malaysia. Uzbek boxers secured 3 gold, 4 silver, and 3 bronze medals, placing first in the overall team standings. M. Abdullayev (60 kg, Andijan) and S. Mikhaylov (81 kg, Andijan) were crowned Asian champions. A. Rahimov (51 kg, Urgench), N. Otayev (67 kg, Bukhara), I. Berdiyev (71 kg, Tashkent region), and D. Yorbekov (75 kg, Samarkand) won silver medals. The bronze medals went to F. Bakirov (63.5 kg, Tashkent region), T. Ibragimov (91 kg, Urgench), and L. Zokirov (over 91 kg, Jizzakh). Our boxers achieved tremendous success at the Second Central Asian Games held in Almaty, Kazakhstan. Six of our athletes became champions, five secured silver medals, and one boxer earned a bronze. From October 16 to 27, 1997, the 9th World Championship took place in Budapest, Hungary, where our boxers faced a serious challenge. Among the five boxers representing our national team, R. Chagayev earned the title of World Champion, while the other athletes finished in fifth place. The most important competitions of 1998 included the World Cup, the Goodwill Games, and the 13th Asian Games. In preparation for these events, our national team participated in several major international tournaments held in nine Asian countries, including Turkey, Iran, Thailand, and Kyrgyzstan. In total, they earned 25 prize-winning places, including 13 gold medals. The World Cup was held in China from June 14 to 20, where our boxers won two gold, one silver, and three bronze medals. The national anthem of Uzbekistan was played twice in honor of M. Abdullayev and L. Zokirov. T. Turg'unov claimed a silver medal, while D. Yuldashev, N. Otayev, and D. Yorbekov were awarded bronze medals. From July 27 to August 1, the "Goodwill Games" took place in New York City (USA). T. Tulyakov won a gold medal, while D. Yorbekov earned a bronze medal.

At the end of 1998, Uzbek boxers once again proved they were the strongest in the entire Asian region by securing first place in the overall team standings at the 13th Asian Games held in Bangkok, Thailand. The national anthem of Uzbekistan was played three times in honor of Andijan-born boxers M. Abdullayev, S. Mikhaylov, and R. Chagayev. Four of our athletes—T. Tulyakov, T. Turg'unov, G. Sulaymonov, and D. Yorbekov—won silver medals, while N. Otayev and K. Zokirov earned bronze.

The 1999 World Championship in the USA, the Central Asian Games, and the Asian Championship were the most important competitions of the year for Uzbek boxers. During the preparation period, our national team participated in international tournaments held in Hungary, Bulgaria, Greece, and Russia, where they won a total of 21 medals, including 13 gold. R. Chagayev stood atop the winners' podium three times, while M. Abdullayev achieved first place twice.

From August 20 to 27, our boxers competed in the World Championship held in Houston, USA, and for the first time in the history of independent Uzbekistan, they achieved a remarkable team result—finishing in an honorable third place overall, behind the powerful national teams of the USA and Cuba. The Andijan Boxing School played a major role in this historic success, as its representatives earned two gold medals (M. Abdullayev and O. Haydarov) and one silver medal (T. Turg'unov).

Inspired by these victories, our boxers then went on to achieve confident success at the Third Central Asian Games and the 20th Asian Championship. In both tournaments, our team emerged as the overall champions, returning from Bishkek with an impressive haul of five gold, two silver, and four bronze medals.

At the 20th Asian Championship held in Tashkent, D. Yuldashev, A. Rahimov, T. Turg'unov, M. Abdullayev, S. Mikhaylov, R. Chagayev, and R. Saidov claimed championship titles, while D. Nabiyev and S. Naimov earned bronze medals.

By then, Uzbek boxers had become one of the world's boxing powerhouses and entered the year 2000 with a series of major victories. That year also marked the start of the four-year cycle leading to participation in the XXVII Olympic Games held in Sydney. During their preparation for the Olympics, our boxers took part in seven major international tournaments, winning a total of 28 medals, including 10 gold.

Ten athletes represented Uzbekistan in the Olympic delegation: D. Yuldashev, A. Rahimov, T. Turg'unov, M. Abdullayev, Sh. Khusanov, D. Yorbekov, and R. Saidov. At the Olympic Games, Andijan's M. Abdullayev achieved a remarkable victory, earning Uzbekistan's first-ever Olympic gold medal in boxing. S. Mikhaylov and R. Saidov also brought home bronze medals.

In 2001, Uzbek boxers prepared for the World Championship and the Goodwill Games. During this period, they participated in several major international competitions, winning a total of 40 medals, including

14 gold. The World Championship took place from June 3 to 11 in Belfast, Ireland. Our athletes achieved three podium finishes as a result of their participation. R. Chagayev stood out the most by competing in a new, heavier weight category (over 91 kg), where he claimed his second World Championship title. O. Haydarov won a silver medal, while Sh. Khusanov secured bronze. After the World Championship, our national team competed in six more major international tournaments, with the most prestigious among them being the Goodwill Games in Brisbane, Australia, where R. Saidov earned a silver medal and O. Haydarov took home bronze. At the 2003 World Championship held in Bangkok, Thailand, our boxers won one silver medal (Sh. Khusanov) and two bronze medals (B. Sultonov and R. Saidov). At the XXVIII Olympic Games in Athens in 2004, Bahodirjon Sultonov and O'tkirbek Haydarov both earned bronze medals. In 2005, at the World Championship in China, our boxers secured one silver medal (D. Mahmudov) and two bronze medals (O. Haydarov and J. Matchonov). At the 14th World Championship held in 2007 in Chicago, USA, Uzbek boxer Abbos Otayev won a gold medal in the 81 kg weight category. In 2008, during the Summer Olympic Games in Beijing, China, unfortunately, none of the members of the Uzbekistan national boxing team were able to reach the podium. At the 2009 World Championship held in Milan, Italy, our boxers won one gold medal (A. Otayev), one silver (E. Rasulov), and two bronze medals (B. Mahmudov and B. Sultonov). In the 2011 World Championship held in Baku, Azerbaijan, Uzbek boxers earned two bronze medals, won by J. Latipov and E. Rasulov. At the 2012 Olympic Games held in London, Abbos Otayev won a bronze medal. In 2013, at the 17th World Championship held in Almaty, Kazakhstan, our boxers earned one silver medal (J. Latipov) and one bronze (O. Mamazunnunov). At the 14th Asian Games held in Incheon, South Korea in 2014, our boxers participated with a renewed national team and won one silver medal (I. Madrimov) and two bronze medals (O. Mamazulunov and M. Abdullayev).

It is worth noting that from 1997 to 2000, M. Abdullayev was recognized as AIBA's Boxer of the Year. The remarkable victories of our boxers received high praise from the government. M. Abdullayev, S. Mikhaylov, Sh. Khusanov, T. Turg'unov, T. Tulyakov, O. Haydarov, R. Chagayev, D. Yorbekov, N. Otayev, A. Grigoryan, R. Saidov, T. Ibragimov, O. Maskayev, B. Sultonov, E. Rasulov, and A. Otayev were all awarded the honorary title of Honored Athlete of Uzbekistan.

Additionally, A. Grigoryan and R. Chagayev went on to become world champions in professional boxing. At the inaugural Youth Olympic Games held in Singapore in 2010, our promising young boxers achieved impressive results: A. Mamadjonov won silver, while Z. Khurboyev and S. Begaliyev secured bronze medals. At the second Youth Olympic Games held in Nanjing, China in 2014, B. Melikuziyev won gold, and S. Latipov earned silver (Table 1).

Table 1

Olympic Games Winners and Medalists

Year	Host city	Full name	Weight (kg)	Place
1976	XXI, Montreal	1. R.Risqiyev	75	II
1996	XXVI, Atlanta	1. K.To'laganov	71	III
2000	XXVII, Sydney	1. M.Abdullayev 2. S.Mixaylov 3. R.Saidov	63,5 81 91	I III III
2004	XXVIII, Athens	1. B.Sultonov 2. O'.Haydarov	54 81	III III
2012	XXX, London	1. A.Otayev	75	III
2016	XXXI, Rio de Janeiro	1.X.Dusmatov 2.Sh.Zoirov 3.F.Gaipnazarov 4.Sh.Giyasov 5.B.Meliqo'ziyev 6.R.Tulaganov 7.M.Ahmadaliyev	49 52 64 69 75 91 56	I I I II II III III
2021	XXXII, Tokyo	1. B.Jalolov	+91	I
2024	XXXIII, Paris	1. X.Dusmatov 2. A.Xalakov 3. A.Mo'ydinxo'jayev 4. L.Mullajonov 5. B.Jalolov	51 57 71 92 +92	I I I I I

At the XXXI Summer Olympic Games in 2016 in Rio de Janeiro, Brazil, Uzbek boxers achieved outstanding results, winning a total of 3 gold, 2 silver, and 2 bronze medals, which secured them an honorable first place in the overall team ranking.

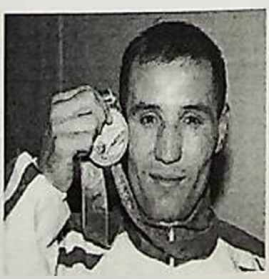
At the XXXII Summer Olympic Games in 2021 in Tokyo, Japan, Uzbekistan earned 1 gold medal.

At the XXXIII Summer Olympic Games in 2024 in Paris, France, Uzbek boxers dominated the competition, bringing home 5 gold medals. Hasanboy Dusmatov and Bakhodir Jalolov both became two-time Olympic champions.

Uzbek athletes who became winners and medalists at the Olympic Games

Riskiyev Rufat Asadovich
Silver medalist at the 1976 Montreal Olympic Games (75 kg)

To'laganov Karim Alishanovich
Bronze medalist at the 1996 Atlanta Olympic Games (71 kg)



Abdullayev Muxammadqodir Mamatqulovich
Gold medalist at the 2000 Sydney Olympic Games (63.5 kg)

Mixaylov Sergey Yegorovich

Saidov Rustam Tuxtasinovich

Sultanov Baxodirjon Maribjon o'gli

Bronze medalist at the 2000 Sydney Olympic Games (81 kg)

Bronze medalist at the 2000 Sydney Olympic Games (91 kg)

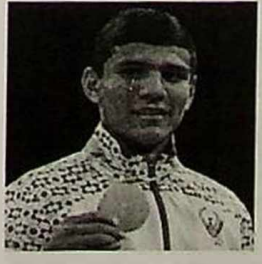
Bronze medalist at the 2004 Athens Olympic Games (54 kg)

Xaydarov Utkirbek Abdujalilovich
Bronze medalist at the 2004 Athens Olympic Games (81 kg)

Atoyev Abbos Abdurazzokovich
Bronze medalist at the 2012 London Olympic Games (75 kg)

Do'smatov Xasanboy Marfjon o'g'li
Gold medalist at the 2016 Rio de Janeiro and 2024 Paris Olympic Games (49 kg, 51 kg)

Zoirov Shaxobiddin Shokirovich



Axmadaliyev Murodjon Kaxarovich

Gaibnazarov Fazliddin Xasanbayevich

Gold medalist at the 2016 Rio de Janeiro Olympic Games (52 kg)

Bronze medalist at the 2016 Rio de Janeiro Olympic Games (56 kg)

Gold medalist at the 2016 Rio de Janeiro Olympic Games (64 kg))

Giyasov Shaxram Djamshedovich
Silver medalist at the 2016 Rio de Janeiro Olympic Games (69 kg

Melikuziyev Bektemir Ruzmatjon o'g'li
Silver medalist at the 2016 Rio de Janeiro Olympic Games (75 kg)

Tulaganov Rustam To'lqin o'g'li
Bronze medalist at the 2016 Rio de Janeiro Olympic Games (91 kg)

Xalokov Abdumalik Anvar o'g'li
Gold medalist at the 2024 Paris Olympic Games (57 kg)

Mo'ydinxo'jayev Asadxo'ja Zohiddinxo'jayevich
Gold medalist at the 2024 Paris Olympic Games (71 kg) .

Mullajonov Lazizbek Xasanjon o'g'li
Gold medalist at the 2024 Paris Olympic Games (92 kg)

Jalolov Baxodir Isomiddin ug'li

Gold medalist at the 2020 Tokyo and 2024 Paris Olympic Games (+91 kg, +92 kg).

At the 21st World Championship held in 2021 in Belgrade, Serbia, our boxers won one silver medal (A. Khalokov) and one bronze medal (M. Saydrakhimov) (Table 2).

At the 22nd World Championship held in 2023 in Tashkent, Uzbekistan, our boxers secured 5 gold medals, 2 silver medals, and 2 bronze medals, placing first in the overall team ranking.

Table 2

World Championship Medalists from Uzbekistan

Year	Host place	Full name	Weight (*kg*)	Place
1974	Cuba	1. R.Risqiyev	75	I
1991	Australia	1. A.Grigoryan	60	II
1993	Finland	1. X.Ahmedov	51	II
1995	Germany	1. D.Yorbekov	75	III
1997	Hungary	1. R.Chagayev	91	I
1999	USA	1. M.Abdullayev	63,5	I
		2. O'.Haydarov	75	I
		3. T.Turg'unov	57	II
2001	Ireland	1. R.Chagayev	91	I
		2. O'.Haydarov	75	II
		3. Sh.Xusanov	67	III
2003	Bangkok (Thailand)	1. Sh.Xusanov	69	II
		2. B.Sultonov	54	III
		3. R.Saidov	91	III
2005	China	1. D.Mahmudov	64	II
		2. O'.Haydarov	81	III
		3. J.Matchonov	91	III
2007	USA	1. A.Otayev	81	I
2009	Italy	1. A.Otayev	75	I
		2. E.Rasulov	81	II
		3. B.Sultonov	57	III
		4. B.Mahmudov	69	III
2011	Azerbaijan	1. J.Latipov	52	III
		2. E.Rasulov	81	III
2013	Kazakhstan	1. J.Latipov	52	II
		2. O.Mamazununov	81	III
2015	Qatar	1. M.Ahmadaliyev	56	II
		2. E.Abduraimov	60	III
		3. F.Gaipnazarov	64	II

		4. B.Meliqo'ziyev	75	II
		5. E.Rasulov	81	III
		6. B.Jalalov	+91	III
2017	Germany (Hamburg)	1. Sh.G'iyasov	69	I
		2. X.Dusmatov	49	II
		3. J.Latipov	52	II
		4. I.Xoldorov	64	II
		5. B.Meliqo'ziev	81	III
		6. S.Tursunov	91	III
2019	Russia (Yekaterinburg)	1. Sh.Zoirov	52	I
		2. M.Mirzaxalilov	57	I
		3. B.Boturov	69	III
		4. D.Ro'zmetov	81	II
		5. B.Jalolov	+91	I
2021	Serbia (Belgrade)	1. A. Xalokov	60	II
		2. M.Saydraximov	92	III
2023	Uzbekistan (Tashkent)	1. H.Do'smatov	51	I
		2. O.Jo'rayev	54	II
		3. A.Xalokov	57	I
		4. R.Abdullayev	63,5	I
		5. A.Mo'ydinxojayev	67	I
		6. S.Jafarov	71	II
		7. A.Abdullayev	75	III
		8. L.Mulajonov	92	III
		9. B.Jalolov	+92	I

Table 3

Winners and Medalists of the Asian Games

Year	Host place	Full name	Weight (kg)	Place
1994	Hiroshima (Japan)	1. A.Avezboyev	91	I
		2. O.Maskayev	91	I
		3. N.Otayev	67	III
		4. D.Yorbekov	75	III
1998	Bangkok (Thailand)	1. T.Tulyakov	54	II
		2. R.Chagayev	91	I
		3. T.Turg'unov	57	II
		4. M.Abdullayev	63,5	I
		5. S.Mixaylov	81	I
		6. T.Sulaymonov	60	II

		7. D.Yorbekov	75	II
		8. N.Otayev	67	III
		9. L.Zokirov	91	III
2002	Busan (Korea)	1. D.Mahmudov	60	I
		2. O'.Haydarov	75	I
		3. I.Berdiyev	81	I
		4. R.Saidov	91	I
		5. S.Mixaylov	91	I
		6. B.Xidirov	54	II
		7. B.Sarsekboyev	63,5	III
		8. Sh.Xusanov	67	III
		9. S.Naimov	71	III
2006	Doha (Qatar)	1. B.Sultonov	57	I
		2. E.Rasulov	75	I
		3. R.Saidov	91	I
		4. J.Matchonov	91	II
		5. B.Xidirov	60	III
		6. D.Mahmudov	64	III
2010	Guangzhou (China)	1. E.Rasulov	81	I
		2. A.Otayev	75	II
		3. O'.Rahmonov	69	II
		4. S.Rahmonov	64	III
		5. X.Tojiboyev	60	III
2014	Incheon (South Korea)	1. Sh.Zoirov	52	II
		2. I.Madrimov	69	II
		3. O.Mamazulunov	81	III
		4. M.Abdullayev	+91	III
2018	Jakarta, Palembang (Indonesia)	1. J.Latipov	52	I
		2. M.Mirzaxalilov	56	I
		3. I.Xoldorov	64	I
		4. B.Boturov	69	I
		5. I.Madrimov	75	I
		6. X.Do`smatov	49	II
		7. Sh.Abdurasulov	60	II
2022	Hangzhou (China)	1. H.Do'smatov	51	I
		2. A.Xalokov	57	I
		3. N.O'ktamova	54	III
		4. T.Habibullayev	80	III
		3. B.Jalolov	+92	I

		4. B.Meliqo'ziyev	75	II
		5. E.Rasulov	81	III
		6. B.Jalalov	+91	III
2017	Germany (Hamburg)	1. Sh.G'iyasov	69	I
		2. X.Dusmatov	49	II
		3. J.Latipov	52	II
		4. I.Xoldorov	64	II
		5. B.Meliqo'ziev	81	III
		6. S.Tursunov	91	III
2019	Russia (Yekaterinburg)	1. Sh.Zoirov	52	I
		2. M.Mirzaxalilov	57	I
		3. B.Boturov	69	III
		4. D.Ro'zmetov	81	II
		5. B.Jalolov	+91	I
2021	Serbia (Belgrade)	1. A. Xalokov	60	II
		2. M.Saydraximov	92	III
2023	Uzbekistan (Tashkent)	1. H.Do'smatov	51	I
		2. O.Jo'rayev	54	II
		3. A.Xalokov	57	I
		4. R.Abdullayev	63,5	I
		5. A.Mo'ydinxojayev	67	I
		6. S.Jafarov	71	II
		7. A.Abdullayev	75	III
		8. L.Mulajonov	92	III
		9. B.Jalolov	+92	I

Table 3

Winners and Medalists of the Asian Games

Year	Host place	Full name	Weight (kg)	Place
1994	Hiroshima (Japan)	1. A.Avezboyev	91	I
		2. O.Maskayev	91	I
		3. N.Otayev	67	III
		4. D.Yorbekov	75	III
1998	Bangkok (Thailand)	1. T.Tulyakov	54	II
		2. R.Chagayev	91	I
		3. T.Turg'unov	57	II
		4. M.Abdullayev	63,5	I
		5. S.Mixaylov	81	I
		6. T.Sulaymonov	60	II

		7. D.Yorbekov	75	II
		8. N.Otayev	67	III
		9. L.Zokirov	91	III
2002	Busan (Korea)	1. D.Mahmudov	60	I
		2. O'.Haydarov	75	I
		3. I.Berdiyev	81	I
		4. R.Saidov	91	I
		5. S.Mixaylov	91	I
		6. B.Xidirov	54	II
		7. B.Sarsekboyev	63,5	III
		8. Sh.Xusanov	67	III
		9. S.Naimov	71	III
2006	Doha (Qatar)	1. B.Sultonov	57	I
		2. E.Rasulov	75	I
		3. R.Saidov	91	I
		4. J.Matchonov	91	II
		5. B.Xidirov	60	III
		6. D.Mahmudov	64	III
2010	Guangzhou (China)	1. E.Rasulov	81	I
		2. A.Otayev	75	II
		3. O'.Rahmonov	69	II
		4. S.Rahmonov	64	III
		5. X.Tojiboyev	60	III
2014	Incheon (South Korea)	1. Sh.Zoirov	52	II
		2. I.Madrimov	69	II
		3. O.Mamazulunov	81	III
		4. M.Abdullayev	+91	III
2018	Jakarta, Palembang (Indonesia)	1. J.Latipov	52	I
		2. M.Mirzaxalilov	56	I
		3. I.Xoldorov	64	I
		4. B.Boturov	69	I
		5. I.Madrimov	75	I
		6. X.Do'smatov	49	II
		7. Sh.Abdurasulov	60	II
2022	Hangzhou (China)	1. H.Do'smatov	51	I
		2. A.Xalokov	57	I
		3. N.O'ktamova	54	III
		4. T.Habibullayev	80	III
		3. B.Jalolov	+92	I

Table 4

Winners and Medalists of the Asian Championships

Yili	O'tkazilgan joyi	Ismi, familiyasi	Vazni (kg)	O'rin
1995	Tashkent	1. N.Otayev	67	I
		2. D.Yorbekov	75	I
		3. R.Chagayev	91	I
		4. M.Abdullayev	60	II
		5. T.Tulyakov	54	III
		6. K.To'laganov	71	III
1997	Malaysia	1. S.Mixaylov	81	I
		2. M.Abdullayev	63,5	I
		3. T.Turg'unov	57	I
		4. A. Rahimov	54	II
		5. N.Otayev	81	II
		6. I.Berdiyev	60	II
		7. D.Yorbekov	75	II
		8. F.Bakirov	67	III
		9. T.Ibrohimov	91	III
		10. L.Zokirov	+91	III
1999	Tashkent	1. D.Yo'ldoshev	48	I
		2. A.Rahimov	54	I
		3. T.Turg'unov	57	I
		4. M.Abdullayev	63,5	I
		5. S.Mixaylov	81	I
		6. R.Chagayev	91	I
		7. R.Saidov	91	I
		8. D.Nabiyev	60	III
		9. S.Naimov	67	III
2002	Malaysia	1. B.Xidirov	54	I
		2. B.Sarsekboyev	63,5	I
		3. O'.Haydarov	75	I
		4. I.Berdiyev	81	I
		5. R.Saidov	+91	I
		6. T.Doniyorov	51	III
		7. Sh.Xusanov	67	III
		8. S.Mixaylov	91	III

2004	the Philippines	1. B.Sultonov	57	I
		2. R.Saidov	+91	I
		3. D.Maxmudov	69	II
		4. Sh.Xusanov	71	II
		5. B.Xidirov	60	III
		6. O.Mamajonov	75	III
		7. T.Doniyarov	52	III
		8. N.Gulamov	54	III
		9. I.Albarov	81	III
2005	Vietnam	1. O'.Haydarov	81	II
		2. J.Matchonov	91	II
		3. R.Saidov	91	II
		4. Sh.Abduraxmonov	75	III
2007	Mongolia	1. E.Rasulov	75	I
		2. N.Otayev	81	I
		3. R.Saidov	91	I
		4. O.Shoyimov	54	II
		5. B.Xidirov	60	II
		6. O.Nazarov	48	III
		7. J.Matchonov	91	III
2009	China	1. S.Raxmonov	64	I
		2. E.Rasulov	75	I
		3. T.Daniyorov	57	II
		4. X.Tojiboyev	60	II
		5. S.Abdullayev	75	II
2011	South Korea	1. Sh.Abdullaeyv	75	I
		2. A.Maxmudov	52	III
		3. Q.Bobojonov	64	III
		4. N.Qosimov	69	III
2013	Jordan	1. O.Mamazununov	81	I
		2. Sh.Zoirov	52	II
		3. I.Ergashev	+91	II
		4. M.Xasanov	91	III

2015	Thailand	1. X.Dusmatov	49	I
		2. B.Meliqo'ziyev	75	I
		3. Sh.Zoirov	52	II
		4. M.Ahmadaliyev	56	II
		5. F.Gaipnazarov	64	II
		6. E.Rasulov	81	II
		7. R.Tulaganov	91	II
		8. E.Abduraimov	60	III
2017	Tashkent	1. X.Dosmatov	49	I
		2. J.Latipov	52	I
		3. M.Axmadaliyev	56	I
		4. E.Abduraimov	60	I
		5. I.Xoldarov	64	I
		6. Sh.G'iyasov	69	I
		7. I.Madrimov	75	I
		8. B.Meliqo`ziyev	81	I
		9. B.Jalolov	+91	I
2019	Bangkok	1. N.Mirzaxmedov	49	I
		2. M.Mirzaxalilov	56	I
		3. Sh.Raximov	60	III
		4. B.Bobousmon	69	I
		5. S.Tursunov	91	II
		6. B.Jalolov	+91	I
2021	Dubai	1. N.Mirzaahmedov	49	I
		2. Sh.Zoirov	52	I
		3. M.Mirzaxalilov	56	II
		4. A.Xalokov	60	III
		5. E.Abduraimov	64	III
		6. B.Boturov	69	I
		7. S.Jafarov	75	I
		8. D.Ro'zmetov	81	I
		9. S.Tursunov	91	III
		10. B.Jalolov	+91	I

2022	Jordan	1. H.Do'smatov	51	I
		2. Sh. Muzaffarov	54	III
		3. A.Xalokov	57	I
		4. A.Muxiddinov	60	III
		5. R.Abdullayev	63,5	I
		6. A.Mo'ydinxojayev	67	III
		7. S.Jafarov	71	I
		8. O.Aslanov	80	II
		9. M.Saydrahimov	92	II
		10. L.Mullajonov	+92	I
		11. N.Hamidova	66	I
		12. S.Ro'zmetova	75	II
		13. F.Fozilova	48	III

Table 5

Winners and Prize Winners of the youth Olympic Games

Year	Venue	Name	Weight (*kg*)	Place
2010	Singapur	1. A.Mamadjonov	69	II
		2. Z.Xurboyev	48	III
		3. S.Begaliyev	81	III
2014	Nankin	1. B.Meliqo'ziyev	69	I
		2. S.Latipov	52	III
2018	Buenos-Ayres	1. A.Xalokov	56	I
		2. J.Raxmonov	69	III
		3. T.Merjanov	81	III

Table 6

Winners and Prizewinners of the World Championships among Youth (Girls)

Year	Venue	Name	Weight (kg)	Place
2021	Poland	1. N.O'ktamova	54	I
		2. D.Bekova	60	III
		3. M.Abdullayeva	64	II
		4. X.Abdullayeva	69	III
		5. S.Ro'zmetova	75	III

1.2.1. General concept of boxing technique

In boxing, the technique is "the integration of offensive and defensive methods into a boxer's combat skill as a result of systematic training." G.O. Dzeroyan and O.P. Topishev define boxing techniqthe ue as a set of specific methods necessary for conducting a successful bout. V.I. Ostyanov and I.I. Gaydamak describe boxing technique as the kinematics of muscular movements, while physical qualities are viewed as the dynamics—i.e., the product of force.

V.A. Lavrov and A.V. Lavrov distinguish between the characteristics of an athlete's movements and their movement capabilities. The characteristics of movements consider spatial, temporal, spatiotemporal, dynamic, and rhythmic aspects. In movement, capabilities, volume, versatility, and efficiency are emphasized.

The essence of technique in combat sports lies in the efficient and specialized mastery of movement actions and methods for conducting a bout or fight. It also involves the athlete's ability to effectively apply their physical and volitional qualities, strength, and skills in various ways during competitions to achieve success.

K.V. Gradopolov includes in the broad concept of a boxer's technique the mastery of movement around the ring, all offensive and counter-offensive punches, various skills and knowledge related to defensive actions, and the ability to utilize all these elements in different combinations. A defining feature of a boxer's technique is the sequence and interconnection of movements: one movement should logically follow and continue from the previous one. The author offers the following classification of boxing technique: the boxer's basic stances, punches, and defensive actions. Basic stances include the fighting position, movement, shifting of body weight, understanding fighting distances, and the combat posture of the fist during a punch. Types of punches include straight, hook, and uppercut.

1.2.2. Fighting stances

The fighting stance is the optimal positioning of body joints in relation to one another, allowing for efficient execution of upcoming movement tasks. It serves as the universal starting position for all movements within the ring. This stance enables the boxer to maximize the use of their stronger hand for defending against opponents' punches while

simultaneously creating the best conditions for delivering strikes, as the stronger hand is positioned comfortably at the outset. Depending on the boxer's functional asymmetry and their physical development level, three types of stances are identified (Figures 1, 2, 3): right-sided – typically used by left-handed boxers; left-sided – commonly adopted by right-handed boxers; and face-to-face (square) stance – utilized for addressing tactical challenges in close-range fighting.

Figure 1. Left-sided fighting stance

Figure 2. Right-sided fighting stance

Figure 3. Face-to-face (square) fighting stance

1.2.3. Fighting distances

In modern boxing practice, there are three main distances: long, middle, and close. The distances in a ring bout change as a result of addressing technical and tactical challenges, and they also depend on the boxer's psychological and physical attributes, as well as their fighting style. Typically, a boxer who can perform effectively at all distances can utilize a broader range of technical tools.

Long distance

Long distance refers to the kind of distance where a boxer in a fighting stance can reach the opponent with a punch by stepping forward (Figure 4). To effectively launch an attack from long range, the boxer must continually distract the opponent's attention with feints and deceptive movements. Thus, long distance requires flawless execution of preparatory and fake movements, light footwork, and active sharp attacks combined with defensive actions during counterattacks. Long distance is determined individually by the boxer based on their unique body structure, physical fitness, and technical-tactical abilities. In a bout, boxers who tend to retreat from active exchanges primarily choose long distance for tactical purposes. These boxers take advantage of their superior movement speed. In determining distance, the ability to sense timing, reaction speed, and accurately assess the opponent's tactics plays a crucial role.

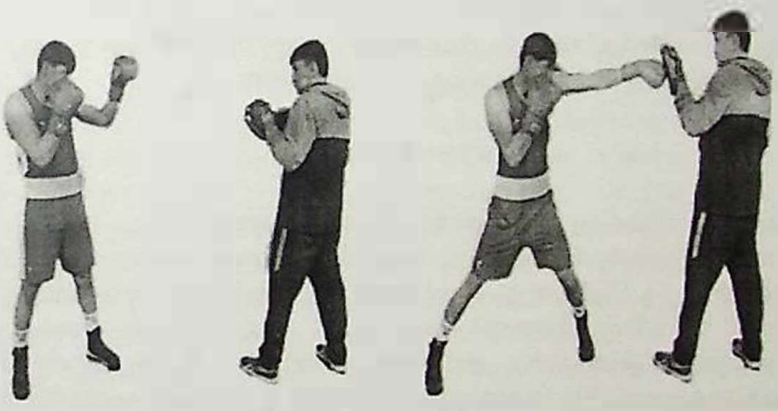


Figure 4. Long distance

Middle distance

Middle distance is the range between long and close distances. It is the distance at which a boxer can deliver punches with their arms without stepping forward (Figure 5). Compared to long distance, boxers have significantly less time to consider their actions at this range. Therefore, fighting at middle distance tends to be more dynamic and intense. At this distance, rapid punch combinations are frequently used. The most powerful punches are typically delivered from middle distance, as the boxer's stance is more stable and solid, allowing for maximum force in strikes.

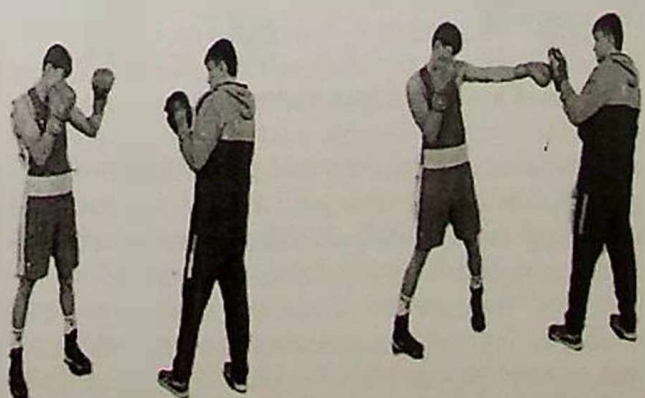


Figure 5. Middle distance

At this distance, defensive movements that utilize the body are primarily executed, alongside short, sliding steps that demand exceptional physical and technical preparation from the boxer.

Close distance

This is a situation in which boxers may physically touch each other with part of their bodies and can only deliver short punches with their hands (Figure 6). Fighting at close range is more intense and meaningful compared to other distances. Boxing at this distance requires the development of kinesthetic awareness, relaxation skills, timely force exertion, and the ability to sense the opponent. Since the opponent is very close, boxers primarily respond to punches using blocking and overlapping techniques—placing one hand over the opponent's, occupying the inner position with their hands, or laying the palm over the opponent's wrist to gain control.

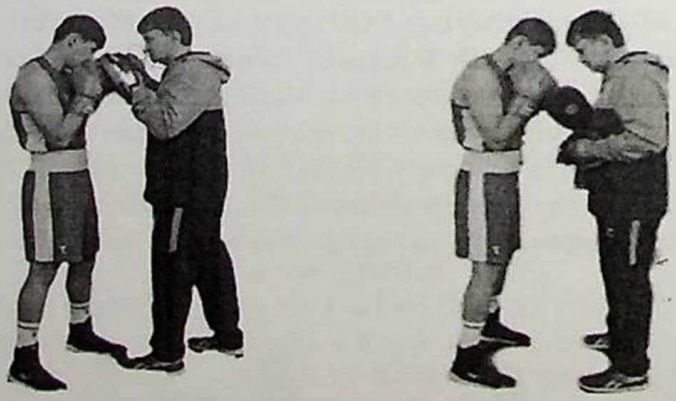


Figure 6. Close distance

Each of these punches can be delivered with either the left or right hand, targeting the head or body. In this way, the author identifies 12 main types of punches. Punches are classified by quantity as single, double, or combinations. They are divided by tactical application into offensive, counter-offensive, and feint punches. Counter-offensive punches are further categorized into intercepting and response punches. Punches can be executed from a stationary position or while moving, with the body weight either maintained or shifted onto the desired leg.

Defensive actions are classified based on the use of hands, feet, body, and combined movements. Hand movements include parries, blocks, and deflections; body movements consist of slips to the side, leaning backward, and ducking; foot movements involve stepping back, moving left or right, or combining these actions with pivots. A boxer's technique varies depending on individual characteristics, tactical tasks, the opponent's position, the nature of movements, and other related factors.

The development of a boxer's technique—evidenced by new variations, methods of execution, and the overall quantity and frequency of use in bouts—depends on several factors, including:

- differences in the rate of development between offensive and defensive tools (offensive tools typically evolve faster than defensive ones);
- changes in the bout rules;
- improvements in fight tactics that define technical execution;
- advancements in the level of physical fitness development.

The classification of boxing technique consists of two sections: defensive technique and offensive technique. Offensive technique includes all types of punches, while defensive technique encompasses all defensive actions. Fighting stances and movements (where "movements" specifically refer to footwork in the ring, not shifting body weight) apply to both sections. Beyond the basic classification of stances as right-sided and frontal, there are also open and closed stances, along with their variants—such as high and low. In movement technique, jumps and steps are distinguished. Additionally, beyond the primary types of punches—straight, hook, and uppercut—other classifications like strong, sharp, fast, and regular punches are mentioned. However, the meanings of these terms are not clearly defined, and the distinctions between them (e.g., sharp vs. fast vs. regular) remain unclear. Depending on distance, long and short punches are distinguished. It is also unclear why the authors highlight these specific features while leaving out classifications based on purpose or quantity. Furthermore, it raises questions that the authors include in the defense section not only traditional defenses using the hands, body, and feet, but also counterpunches involving the shoulder, shoulder area, and palm, classifying them as defensive techniques.

As seen from the above, there is still no unified view regarding the classification of a boxer's core technical actions or secondary actions such as movement around the ring.

According to V.M. Romanov, typical technique embodies all the best qualities developed during the evolution of boxing in our country. However, no matter how well a boxer has mastered movements with the hands and body, and no matter how refined their technique in this area may be, it can only become truly effective when the boxer closes the distance with the opponent. In this context, footwork constitutes the most essential part of boxing technique.

1.3. Methods for enhancing the technical-tactical training process for boxers

Among the various tasks of technical-tactical training in boxing, one of the most significant challenges is accelerating the transition from executing movements learned during training to applying them effectively in competitions. The difficulty in hastening this process lies in the fact that, during competitive bouts, mechanisms of movement execution are activated that only superficially manifest in training exercises and sparring. Among these mechanisms are, first and foremost, tactical skills developed during the preparation of specific actions, as well as personal qualities that ensure the successful execution of offensive and defensive techniques – such as endurance, self-control, the ability to take calculated risks, initiative, and dominance. The manifestation of specialized types of movement reactions also plays a crucial role, including the ability to anticipate, in time and space, the opponent's momentary and spatial movement parameters and to predict and distinguish between the opponent's deceptive and real actions.

The typical approach to boxing training generally involves improving the main types of movements. These include:

a) Preparatory movements – such as various stances, positions, distances, shifts, footwork, and feints;

b) Offensive movements – strikes delivered with both hands to the head and body from straight, side, and upper angles;

c) Defensive movements – techniques using the hands, body, footwork, and combined defense methods;

d) Counter-offensive movements – counter and response strikes delivered with both hands to the head and body from straight, side, and upper angles.

In addition to the basic movements practiced in almost every training session, the following elements are mastered based on individual training plans:

• new techniques and movements, tactical variations of their application, combinations of the most effective and frequently used movements, and the development of skills for preparing and using them in simulated resistance scenarios are specialized;
• repetition of preferred movements in identical situations;
• combat actions and scenarios designed to counter specific opponents;
• a specific set of actions for engaging with standard tactical models – either in an offensive or defensive style, rapidly or patiently, through maneuvering or in a positional manner;
• psychological aspects of preparing and applying key types of movements;
• means of overcoming psychological barriers that hinder the use of certain basic movements.

Exercises performed without a partner include:
• independent repetition of hand placement for strikes, defensive imitations, positional changes, footwork, and feints;
• performing techniques in sequences;
• giving mutual guidance during breaks between exercises;
• performing techniques in continuous flow.

It is worth noting that nearly all exercises performed without a partner are essentially a form of gymnastics, aimed at mastering the structural movement of techniques, which involve their own dynamics of body part interaction when performing various movements. While independently repeating specialized movements, athletes follow precise instructions for executing specific boxing techniques. The coach's supervision allows for immediate assessment of performance levels and the correction of any inaccuracies or mistakes as needed. Executing techniques based on commands or signals helps regulate the integrity of the specified movement structures or their division into component (spatial) parts. In such cases, the coach's instructions are given in a way that requires trainees to mentally visualize the structure of the movements before executing them. Performing techniques in sequences creates conditions for an individual athlete or a group of trainees to repeatedly and continuously practice the movements being learned. This fosters a high level of motor intensity, contributing to the development of specific endurance. Providing mutual guidance involves trainees helping each other during practice, enabling them to begin acquiring basic instructional skills. If the exercise assigned by the coach is performed alternately by

trainees in a common formation, they have the opportunity to evaluate the technique by pointing out both the strengths and the clearly visible weaknesses of their partners' execution. Performing techniques in a continuous flow involves the sequential execution of tasks, where the completion of a movement by one trainee signals the athlete standing to the left or right to begin. This creates a fan-like execution pattern, allowing the coach to observe each participant and conduct rapid evaluations. Training with an imaginary (visualized) partner or opponent is often referred to as "shadow boxing." It includes executing combinations of techniques involving basic offensive and defensive movements, as well as counters and counterattacks. These combinations and individual sequences must be performed without breaks. The boxer acts as if anticipating the opponent's moves in advance and engages in the fight using strategically appropriate combat techniques as perceived from the imagined opponent's perspective. In preparing boxers for matches, exercises performed with boxing equipment and training machines play a significant role. Depending on the nature of the target—whether it is fixed (e.g., hanging on a wall) or moving with an unpredictable range of motion—various pedagogical objectives can be addressed. These may include improving the accuracy and power of punches, as well as enhancing the boxer's ability to adapt to different types of motion and conditions during combat. Numerous studies have shown that accurately hitting a target primarily depends on adherence to the model punching technique, the ability to adapt that technique to unexpected and changing situations, anticipatory perception, reaction selection, and the degree of specialization in layered (complex) reactions. Moreover, training with moving targets is crucial for enhancing punching accuracy, as it accelerates the trainees' adaptation to competitive conditions. Therefore, performing a wide range of target-based exercises—from different distances, with instructions to deliver fast and accurate punches—helps develop the specialized motor skills that boxers need to demonstrate during actual bouts.

The most common ways to conduct training exercises include:

- partner-based drills;
- one-on-one work with the coach using focus mitts (flat gloves);
- sparring (free fights);
- independent improvement of footwork techniques;
- exercises performed on punching bags and training machines;
- a series of sparring sessions.

Partner-based exercises serve as a foundational method for training and practicing, particularly in group sessions with beginners and young boxers. At the same time, certain types of partner drills are also utilized in the training of highly skilled athletes. The effectiveness of these exercises lies in the wide range of possibilities they offer—from cooperative movements where partners help each other perform techniques to fast-paced and unpredictable one-on-one engagements that closely simulate real combat situations.

Among the various forms of organizing pair exercises are drills performed with mutual assistance. These are employed when mastering the movement structure of a particular technique or tactical skill is essential. In most cases, one partner attacks while the other responds using pre-agreed defensive techniques, which may involve absorbing or deflecting the strike. Initially, these exercises can be performed in a stationary position, helping trainees develop a better sense of timing and spatial awareness during execution. Later, the exercises become more challenging through the incorporation of movement and maneuvering, particularly when the attacking (and later, defending) partner takes the initiative, thereby increasing the tactical complexity of the drill.

This method of organizing exercises helps stabilize punching technique, particularly when performing coach-assigned movement types such as defensive responses, counterattacks, and counter-defensive moves with counter-responses.

Peer-led sessions are also frequently conducted, especially in the practice of training skilled boxers. Unlike standard drills based on a broad range of coach-given actions, these sessions involve collaborative execution and support between partners. In some cases, specific conditions are set where one partner explains the exercises and evaluates the techniques being performed while engaging in cooperative actions with the other.

Partner-based combat drills conducted in a game-like format help stabilize technical skills, specialize movement speed, and develop tactical abilities such as exchanging straight, uppercut, and hook counterattacks—either from a stationary position or while maneuvering. These exercises also accelerate the development of defensive techniques and counter-response strikes by integrating them into dynamic, interactive scenarios.

In each drill, the continuous interaction cycle between partners typically lasts 20 to 70 seconds, promoting quick decision-making and fluid execution.

Speed-based resistance drills, often referred to as "counter" drills, hold significant importance in boxing training. These exercises primarily focus on two key pedagogical objectives:

• Improving the technique of offensive and defensive actions involving counterattacks;

• Specializing in movement speed and enhancing reaction timing and responsiveness.

In "counter" drills that simulate one-on-one combat conditions, the coach determines key variables—such as the distance between the partners (opponents). Initially, boxers train in partially abstract situations, where they know when the attack will begin but must operate under non-ideal conditions. According to the instructions, the attacker performs only one specific offensive action assigned by the coach—for example, two feints followed by a straight punch to the head. The defender, in this case, is allowed to use only one predefined defensive action, such as slipping to the side. In these controlled scenarios—where the defender knows exactly which body part will be attacked and how—the only way for the attacker to succeed is by executing the action quickly and unexpectedly from the very start of the movement. One-on-one practice with the coach using focus mitts (flat gloves) is an essential and independent aspect of boxing training and exercise. However, regarding young athletes, the volume and repetition of movements in such drills often fall short compared to partner-based exercises and combat practice in terms of their methodological impact on technical and tactical development. Nonetheless, focus mitt training with the coach stands out for its control functions—allowing for the rapid and targeted correction of technical errors—and for its ability to simulate specific segments of realistic competitive scenarios, making it a valuable and highly effective training tool. Compared to other training approaches, combat practice (sparring) entails smaller volumes and is conducted periodically—at least 2–3 times a month in the form of evaluative (control) bouts. These sessions serve as the foundation for developing boxers' functional readiness to endure long-lasting and mentally intense competitive fights. Within training and control sparring series, the tactical structure of movements, including their preparation and execution, is optimized. Additionally, individual adjustments are made to refine each boxer's performance. Up to this point, only the teaching of techniques and the formation of model movement structures for basic actions have been described in detail. This process occurs under simplified training conditions and involves the dynamics

and kinematics of body movements while performing actions. The current situation necessitates the systematization of combat practice tools and methods, as well as the development of exercises that align the preparation and execution of movements more closely with real competition conditions. Methodological recommendations must be grounded in objective data regarding the structure of actions performed by boxers during training bouts and the indicators recorded in official competitions. All of this helps to: Identify the differences between the technical-tactical structures used in training and those applied in competitions; Define a methodology for improving combat practice; Test it in practice; and Conduct experimental research, including selecting young athletes, in order to develop a methodology for enhancing the technical and tactical preparedness of boxers.

1.3.1. Rational and effective techniques for developing boxing skills.

Coaches and scientists have always sought more rational and effective methods for developing techniques. I.P. Degtyarev (1979), in his classification system, systematized combat stances and included several other types of stances based on those demonstrated by renowned athletes in competitions (B. Lagutin, S. Shcherbakov, A. Shosikas, B. Nikanorov).

Views on technique development vary significantly among coaches and researchers. Some, such as Ye.I. Ogurenkov, focus more on technical actions at close range, while others, including B.S. Denisov and A. Shosikas, emphasize mastering techniques at long range. Many specialists, however, train boxers to perform effectively at all distances.

Perfect technique is considered the most rational and effective way of performing an exercise. The growth of athletes' preparedness and the improvement of training methodologies do not always directly contribute to the evolution of technique. Therefore, the search for optimal technique suited to different athletes and the analysis of its evolution at every stage are always essential.

The methods of performing motor actions—organized in a purposeful way and carried out with relatively high efficiency—are commonly referred to as the technique of physical exercises.

Sport technique plays a crucial role in achieving high results. Technical preparation is the main leading link and serves as a kind of "entry gate" to overall sports training.

Boxing technique is a set of specialized methods essential for a boxer

to successfully conduct a fight. It enables the boxer to solve specific tactical tasks in various combat situations within the rules of boxing.

Before moving on to the analysis of other components of technique (punches, defenses, footwork, etc.), let us focus on the most important aspects to which coaches and experts have paid close attention.

In boxing, the punch is the main tool of attack and a key component of a boxer's technical arsenal. The level of an athlete's skill is determined by the range and precision of perfectly executed punch variations.

When delivering a punch, it is essential to strike a specific target area on the opponent and generate sufficient power to negatively impact the opponent's combat effectiveness.

The power of a punch is influenced by two main factors: the mass of the striking body part (the greater the mass, the more powerful the punch) and the speed at which that mass moves. Punch power is proportional to speed. In most cases, the maximum punch force depends primarily on the velocity of the striking mass.

The boxer's level of skill.

Functional asymmetry is expressed in a boxer's inability to perform punching actions of the same high quality with both the left and right hand. For example, research shows that when executing a punch to the right, the left hand is approximately 40% weaker than the right hand.

Rigidity of the kinematic chain: The greater the rigidity between the striking objects, the more powerful the punch will be. To achieve this, during a punch, it is necessary to create maximum stiffness within the kinematic chain (arm – torso – legs) by locking the wrist, elbow, and shoulder joints at the end of the motion. The movements are executed with the help of scapular mobility. In the combat stance, it is also essential to know how to relax the main muscle groups, as this creates the necessary conditions for efficient movement and punch execution.

To deliver punches effectively, it is essential to maintain a proper position, keep the appropriate distance, and create unexpected situations for the opponent—especially when they are not anticipating a quick attack at that moment in the fight. One must also know how to throw punches without telegraphing by extending the arms too early so that the opponent does not have time to anticipate your intentions.

Defense is one of the most important components of a boxer's technical mastery, developed and enhanced over many years by coaches and scientists who have improved various defensive techniques. Mastering and refining defensive movements demand a thorough and

systematic approach. At any moment during a fight, a boxer must be ready to execute effective defensive actions. Creating the right position and distance for each specific type of defense is essential. Only after a successful defense can a boxer create favorable conditions for attacks, counterattacks, and other technical maneuvers. Developing strong, consistent habits for defending against different offensive actions is crucial. A boxer must also identify vulnerable areas that require extra protection during the fight—this is vital for maintaining defense as a noble art over time. Skillful defense minimizes the risk of injury, helps athletes maintain longevity in the sport, and contributes to sustained success in competition.

It is important to address a crucial factor in defensive movements—maintaining the proper distance. A boxer must consistently establish distances that are uncomfortable for the opponent's attacks yet optimal for their own effective defense and later for executing counterattacks and offensive moves. Defensive techniques have continuously evolved throughout boxing's development. The founders of boxing—the English—originally offered a relatively limited defensive arsenal based on movement, hand placement, and slipping techniques, which matched the technical level of boxing at that time. However, as coaches and scientists worked to advance boxing techniques, they gradually expanded the defensive arsenal. With boxing's evolution, the demands placed on defense significantly increased. The wide range of offensive techniques demonstrated by master boxers—along with the many variations in execution—created a need for a greater variety of defensive actions and diverse ways of applying them.

Many athletes have developed their own unique defensive techniques. One notable example is Jack Dempsey, a professional ring master and undisputed world champion from 1919 to 1926, who successfully used a technique in fights that later became known as the "Dempsey Sunshade." This highly effective method was adopted by many renowned boxers, including S.S. Shcherbakov and others.

Another key aspect of boxing technique is movement, which can complicate or facilitate the effectiveness of many offensive and defensive actions. This involves the coordinated effort of the feet, which must be synchronized with both attacking and defensive techniques. Through proper movement, a boxer can control and adjust the necessary distance; avoid opponents' punches; perform feints; lure the opponent into attacking; and execute a wide range of tactical maneuvers required during

combat. Skilled footwork creates numerous favorable opportunities for the boxer to successfully perform both offensive and defensive actions.

Ye.I. Ogurenkov, in his examination of close-range fighting techniques in boxing, proposed numerous technical methods and combinations (both offensive and defensive), along with various tactical variations for executing them. He provided comprehensive recommendations to coaches on how to enhance close-range fighting techniques using focus mitts and other training equipment. Ogurenkov also emphasized which specific features of the technique coaches should focus on during training.

At the same time, to improve in sports, it is essential to organize training so that boxers can develop coordinative skills in advance, allowing them to master close-range fighting techniques without excessive effort or extreme physical and mental strain.

A movement performed for the first time—especially a complex one—is rarely executed perfectly. Based on memory and accumulated experience, movements gradually begin to improve. With repeated execution, strong neural connections form between nerve processes, eventually leading to the development of a dynamic stereotype. The motor skill becomes a motor habit, and the process of improvement gradually leads to a high level of proficiency. The duration and effectiveness of this process largely depend on the athlete's foundational coordination abilities.

When a teenage athlete begins training, their movements often contain many unnecessary elements. This indicates that they have not yet adapted to coordinated motor actions. Every impulse triggers an excitation center in the cerebral cortex. These impulses travel from the brain to several antagonist muscles, which not only fail to assist in the movement but may actually hinder it. Only through conscious training can the brain's excitation be properly focused, allowing movements to become more fluid and efficient while involving only the necessary muscle groups for execution. As a result, a stereotype is formed that enables the movement to be lighter and more economical.

A boxer's training essentially involves the continuous functioning of reflexes. During the process of teaching boxing technique, each movement must be clearly demonstrated by the coach, and the athlete must repeat it many times to internalize it effectively.

1.3.2. Technical and tactical structures of competition bouts in boxing

A boxer's performance during a match reflects a range of distinct features that define their competitive activity in a tournament, an individual fight, or a specific match-up. These include:

- the multi-phase nature of combat, expressed in the variability of physical effort levels, sudden breaks, and recurring high-intensity situations where the outcome of specific actions can directly determine victory or defeat;
- an intense personal confrontation between opponents, aimed at achieving a result through direct physical and tactical influence on each other. To analyze the technical-tactical structures of a boxer's competitive activity, it is essential to consider specific situations that determine the selection, preparation, and application of combat actions. Among the most important are:
- the varying significance of factors that define the tactical nature of movements and fighting situations;
- the freedom in choosing actions across diverse situations, especially when there are wide possibilities for exchanging attack and defense techniques;
- tactical flexibility that allows the boxer to select counterattacks and responses while anticipating the opponent's actions and preparing tactical solutions in advance;
- the high randomness of situations, where the success of actions largely depends on the boxer's individual characteristics and adaptability;
- uncertainty in the number and context of tactical decisions made in reaction to goals or actions during the fight;
- the unpredictability of initial distances and how they may change throughout the bout;
- variation in offensive and defensive parameters, even in model-based spatial starting and ending positions.

The characteristics of competitive activity shape the formation of model-based technique structures, the significance of various types of movements, and their tactical preparation and execution, along with the display of physical and psychological qualities during competition. Comparing athletes' competitive performance with their level of preparedness offers an objective measure for assessing the effectiveness

of pedagogical interventions. It also enables the optimization of training tools, methods, and conditions, providing opportunities to enhance specialization within the training process. Boxing is viewed as one of the most intricate types of sports activity. While training in boxing, the athlete gradually masters specific model operations that integrate movements (techniques) and tactical objectives (goals). This is marked by the diversity of boxers' actions in a bout, complex movement coordination, and the high demands for swift and precise execution of actions in unexpected and rapidly changing tactical scenarios. Many specialists assert that the actions of boxers in a bout are complex motor acts that encompass all the features of various conditioned reflex connections. Indeed, they can be regarded as a complex model of simple, selective, layered, and anticipatory motor reactions. There are action variants where the latent period corresponds to a simple reaction, while the motor structure (i.e., the technique itself) follows the architecture of a multi-phase complex motor act. This scheme is characteristic of many offensive maneuvers—attacks executed with feints (deceptions) or combined assaults. Conversely, there are instances in which the athlete must react with a movement whose motor structure aligns with a simple reaction scheme, while the latent period often approaches that of layered (complex) reactions, such as counterattacks or counters against preparations. In these situations, any action in the bout must occur under conditions where the boxer needs to predict not only the opponent's movements but also the spatial and immediate characteristics of their own actions in advance. Throughout a bout, the execution of movements in time and space must correspond with model positions and actions while maintaining combat stances, rotations, footwork, and jumps (without disrupting them). This alignment is crucial as errors can ultimately negatively impact the outcome of the fight. When evaluating boxers' actions based on their readiness to deploy movements according to the situation, it is essential to identify pre-planned (pre-intended) actions. These types of actions can largely be classified among those predicated on simple reaction speed. The mechanism for executing such actions in fights is guided by the probability of anticipating specific movements from the opponent.

Spontaneous actions often arise from choice reactions. They occur during the boxer's continuous process of adapting to ever-changing situations in the bout. In this context, the spontaneous selection of movements is executed alongside the choice of distance for their application during the bout. Conversely, pre-planned spontaneous actions

involve a predetermined initiation of the bout, while the conclusion is anticipated to happen spontaneously.

The technique of hand movements and footwork must align with the chosen tactical objectives. The level of coordination between them is measured by how much their execution extends the opponent's reaction time and increases the likelihood of inappropriate or mistimed responses from the opponent. Therefore, combat techniques, which rely on the opponent's wide range of possible reactions, should be performed without unnecessary movements that could act as advance signals to the opponent.

Additionally, rapid approaches and long-range attacks, along with sharp and superficial feints (fintlar) at high speeds, tend to accelerate the opponent's response reactions, making their reactions more intense and forceful.

Analyzing boxing tactics allows us to identify several key components that are crucial to consider, including:

- diversity in selecting goals and actions;
- time constraints before and during fight episodes;
- limited space available for footwork and movement;
- insufficient information about the opponent's intentions;
- the necessity of concealing or disguising one's goals and actions.

The foundation of tactical combat in boxing lies in its inherently confrontational nature. This confrontational aspect implies a complex model of combat in which each opponent strives to create the optimal situation to successfully land a strike on the other. The confrontational nature of one-on-one combat, due to its motor and sensory complexity, creates time and space constraints that significantly influence the content of tactical schemes and objectives. In turn, tactical thinking during a fight requires the boxer to act faster than the opponent, outmaneuver them, and make instant and precise decisions. It also demands accuracy and speed in executing movements and stability in conditioned reflex connections in emerging situations. Such competitive conditions undoubtedly affect the boxer's mental sphere, expanding its limits, enhancing the logical structure of activity, and improving the speed of thought processes. The traditional tactical categories specific to boxing bouts include the following:

- Timing and preparation for attacking or countering an attack;
- Speed of targeting in sudden or unexpected situations;
- Decision-making and executing those decisions during the bout.

- Selecting the optimal distance before an attack and maintaining it while moving.

These factors complement the specialized analysis of information, including:

- Considering the criteria for the effectiveness of movements;
- Understanding the tactical essence of model actions and bout situations;
- Having information about effective methods of fighting against opponents with specific styles;
- Comparing evidence and insights gained from competition experience.

The selection of a specific action during a bout involves a focus divided between preparing one's own attack and identifying strategies to counter the opponent's potential offensive actions. Additionally, the decision between alternative fighting tactics and types of actions—whether a direct attack or a feint, defense or counterattack—remains a distinctive characteristic of one-on-one combat. Consequently, the confrontational and personal nature of the bout, combined with the boxer's technical, tactical, volitional, and mental attributes, fosters a high level of emotional intensity in the fight. Moreover, the necessity for immediate decision-making among alternative actions (often while anticipating the opponent's move and waiting for the right moment to launch one's own attack) and the mutual effort to act first introduces an element of extreme tension to every bout.

A distinctive feature of a boxing match is clearly illustrated by the specific demands on attack and defense techniques, the choice of tactical repertoire, the accuracy and speed of reactions, and the application of particular styles of technical preparation.

However, boxing bouts typically progress rapidly, making it increasingly challenging to sustain proper technique during unexpected changes in distance while attacking or defending. Therefore, as various movements are perfected, significant time must be dedicated to training them through multi-speed drills—both pre-arranged and spontaneously devised by the coach or opponent.

When working with boxers, it is crucial to recognize that not all offensive and defensive tools hold equal importance in securing victory during a bout. Methodological approaches and training situations should be prioritized that specifically enhance technique and tactics aimed at

mastering the most effective combat actions, especially when the quantitative ratio between their main types is optimized.

Strong maneuvering skills, the ability to execute unexpected attacks, and reliability in countering sudden strikes—reinforced by quick and accurate visual and tactile reactions—establish the necessary conditions for achieving high sporting results.

Self-Assessment Questions

1. Define what a knockout is.
2. Describe the concept of pace tactics.
3. Explain the general idea of boxing technique.
4. How is long distance defined?
5. How is medium distance defined?
6. How is close distance defined?
7. Share information about common training exercise methods.
8. Discuss a boxer's training.

Recommended Literature

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CHAPTER II. IMPROVING THE BOXER'S FUNDAMENTAL MOVEMENTS AND COMBAT ACTIONS THROUGH "FOCUS MITT" TRAINING

2.1. The Functions of Using Boxing "Focus Mitts" During Training

One of the most commonly used pieces of sports equipment (training tools) in the preparation of a boxer is the boxing "focus mitt." Focus mitts utilized by coaches are regarded as essential elements of a coach's training gear in boxing.

Boxing "focus mitts" serve as a universal tool (trainer) used by the coach for the technical-tactical preparation of boxers. They are employed for the purpose of:

- Enhancing the technique of single punches and punch combinations;
- Integrating offensive and defensive actions while simulating opponent movements;
- Practicing complete action sequences, such as preparing for an attack, executing it, and exiting safely.

Focus mitts can be used for teaching boxing techniques to beginners as well as preparing professional fighters for competitions. During training, boxing focus mitts help address the following important tasks:

1) teaching and reinforcing technical skills;
2) developing tactical awareness;
3) enhancing reaction speed;
4) increasing movement speed;
5) building endurance;
6) developing coordination of movements;
7) mastering the sense of distance and timing;
8) acquiring the skill of efficiently distributing muscular tension.

These tasks are addressed not only simultaneously—for instance, when mastering technique or speed, the boxer must also learn to relax their muscles, properly distribute muscular tension, and develop a sense of distance—but also independently. The coach may choose to focus on one specific task and, for that purpose, use one or several focus mitt exercises tailored to that goal. The effectiveness of focus mitt drills depends not only on the coach or training partner but also on the boxer themselves.

2.1.1. Types of Boxing Focus Mitts

Boxing focus mitts are made from leather or synthetic leather substitutes and filled with multi-layered foam padding. These mitts must be lightweight and comfortable for long training sessions. At the same time, the multi-layer foam padding should be thick enough to absorb most of the impact force from punches.

Most boxing equipment manufacturers, while considering the comfort of coaches, strive to make boxing focus mitts as convenient as possible for use. These features include a comfortable glove lined with soft, non-slip materials on the inside, a grip ball inside the mitt to help the coach hold it firmly, and a secure wrist strap to fasten the mitt tightly. There are three types of boxing focus mitts: curved, flat, and circular (see Figure 7).

Curved Focus Mitt **Curved Focus Mitt** **Curved Focus Mitt**

Figure 7. Curved, Flat, and Circular Boxing Focus Mitts

First and foremost, curved boxing focus mitts are used to work on punching speed and accuracy. Compared to flat focus mitts, they are much more comfortable for the coach to hold, as their curved striking surface allows punches to land more naturally and securely. They are primarily designed to improve the speed and accuracy of punches delivered from various angles. Polyurethane foam serves as the padding material. When working with these focus mitts, it is recommended to wear gloves for added safety and comfort.

Focus mitts can be made from both synthetic leather (nylon) and genuine leather.

Flat (classic) boxing focus mitts are widely used. These mitts have an oval (egg-like) shape with a circular target in the center and are often referred to as classic focus mitts. They are utilized for practicing a variety

of punches and strikes with both hands and feet, making them highly versatile in training.

Circular focus mitts help train a boxer's punch accuracy, speed, and power. They are constructed from genuine leather or synthetic materials such as nylon substitutes (nylox). A special glove pocket on the back of the mitt includes individual securing features for each finger, ensuring that the mitt fits securely on the hand, does not slip off, and provides maximum comfort for the coach during training.

2.1.2. Guidelines for using focus mitts

It is known that once a beginner boxer has mastered the basics of the combat stance and movement around the ring, they begin learning the primary punch in boxing — the straight punch to the head with the lead hand (left hand for an orthodox boxer) — along with the corresponding defensive techniques. When working on this punch using focus mitts, the coach observes and corrects all of the student's mistakes related to body and foot positioning, as well as the positioning of the punching and defending hands. It is especially important to ensure that, for example, the boxer's hands are not tense during punches and that they do not lift their chin. Overusing focus mitts is not advisable. They should not be turned into just another routine training tool, and one must not forget their primary purpose—to develop and refine punches. Excessive reliance on focus mitts can lead to a decline in the boxer's independent thinking, as the coach plays a dominant role in choosing the punches and their sequences during such drills. When developing punch delivery skills, the correct positioning of the boxing focus mitts is extremely important. The focus mitts should be held close together and positioned within the punching zone. Extending the mitts too far to the sides or forward can hinder the boxer's ability to develop a proper sense of accuracy, distance, and target awareness.

It is important that the coach possesses the skill of properly absorbing (softening) the impact of the boxer's punches. The coach should not recoil backward or move the focus mitts to the sides during punches and should also avoid making counter-movements with the mitts to meet the punch.

2.1.3. General concept of punching technique using the hands

Hand punches are the primary means of attack in boxing and a key aspect of technical proficiency. When throwing a punch, it is essential to strike a specific area of the opponent's body and generate sufficient force to impair their combat capability. The accuracy of a punch hinges on its speed and duration. The faster the punch, the more challenging it becomes to control the movement; conversely, the shorter the motion, the harder it is to influence. Thus, the effectiveness of hand punches relies on the boxer's ability to maintain control at high speeds. Specific body joints are involved in executing a punch, and they engage in a particular sequence. In the mechanics of delivering a punch, the lower body participates through a three-joint kinematic chain: the foot, shin, and thigh. This kinematic chain provides impulse to the torso, facilitating hip rotation acceleration. When the boxer supports their weight on the left foot, the rotation occurs around a vertical axis that passes through the left foot and left hip joint; when supported on the right foot, rotation happens around an axis that passes through the right foot and right hip joint.

Repeated punches primarily consist of straight and hook punches delivered with the lead hand (the left hand) to the head. These punches are utilized from a distance for various tactical objectives: to set up an attack, disrupt the opponent's offense, maintain distance, or intensify movements for strategic reasons, among others. For repeated straight punches to the head with the left hand, the right focus mitt is positioned at head height, facing the boxer:

a) The coach moves in all directions in front of the boxer, assigning the task of maintaining a long distance while continuing to punch and move;

b) The boxer often "pursues" the retreating coach with follow-up punches;

c) As the boxer advances, the coach prompts them to counter the coach's "attack" using repeated punches.

Note: All of the previously mentioned repeated punches can be combined with a powerful right punch, delivered following the sequencing of the repetitions.

For repeated left hook punches to the head, these punches are primarily used to breach the opponent's defense and to set up a powerful right-hand punch. When training this technique, the coach holds the left focus mitt steady on the right side, allowing the boxer to deliver repeated hook punches from the left. As the boxer moves left, they aim to position themselves favorably to land a strong right-hand punch to the head. For

this purpose, the coach positions the right focus mitt at head height to receive the right-hand punch.

Offensive Punches. All basic boxing punches can serve as offensive punches in focus mitt drills. Exercises for offensive punches become more complex due to the need for proper preparation prior to the punch. This preparation should involve feints with the lead (left) hand.

The coach, holding the focus mitt aligned with the target level and facing the intended direction of the punch, positions themselves in front of the boxer. This requires the boxer to assess the punching distance without disrupting their movement.

Straight punch to the head. The coach, ready to receive a punch with the right focus mitt, holds the left focus mitt at waist level to act as a target for the boxer's movements.

Feints—both straight and hook—are executed by the boxer using the left hand.

Right hook to the head. To simulate a straight or hook feint, the coach holds the left focus mitt at waist height. The boxer prepares for the attack, and the coach then presents the right focus mitt to receive the main offensive punch.

Counter Punches. By imitating an attack with one focus mitt (usually the left) while holding the other mitt ready to receive a counterpunch, the coach helps the boxer develop both the power and accuracy of counter and response punches. This is done along with practicing various types of defensive techniques.

Left-hand straight counterpunch to the head. By simulating a straight punch to the head with the left hand and positioning the right focus mitt to receive the counterpunch, the coach can determine which type of defensive action the boxer will use before delivering the counter. In this case, the boxer may defend by using a parry with the right palm, then counter.

Right-hand straight counterpunch to the head. To simulate a straight or hook punch to the head, the coach uses the left focus mitt, while keeping the right focus mitt at head height, ready to receive the boxer's counterpunch.

The coach's simulation of an attack to the head should serve as a signal for the boxer to deliver a quick counterpunch.

When delivering a straight counterpunch to the head with the right hand, one of the most effective defensive techniques is to step to the left with the left foot, effectively evading to the left.

Response Punches. The coach initiates an attack with the left hand while holding the right focus mitt ready to receive a predetermined response punch. Simultaneously, the coach simulates a defensive move, allowing the boxer to respond accordingly. In this situation, the most suitable form of defense is to step back, after which the boxer can deliver any type of response punch.

Double Punches. Double punches are used tactically in both attack and counterattack. Double straight punch to the head. The coach holds the right focus mitt at head height, facing the boxer, focusing on the boxer's punch speed and accuracy. The boxer prepares these punches using feint movements beforehand.

Left uppercut to the body and straight punch to the head. After determining the sequence of these punches in advance, the coach holds the left focus mitt lower at waist level for the body shot and the right focus mitt at head height, facing the boxer for the head punch.

While preparing for the attack with short-range punches, the boxer should approach the coach in a compact position (between punches), thereby creating a favorable starting position for the next action.

Double Straight Counterpunch to the Head. The coach holds the right focus mitt at head height, facing the boxer, and simulates an attack to the boxer's head with the right hand while simultaneously throwing a fake straight left punch to the body. This feint serves as a signal for the boxer to launch a quick double counterattack – a straight punch with the left hand followed by the right – to the head, just before the incoming punch reaches them.

Double hook counterpunch to the head. To teach the boxer how to avoid being grabbed and remain active during the fight, the coach assigns the task of delivering counterpunches while moving backward. To do this, the coach steps toward the boxer as if attempting to grab them with both hands. Then, at a moment of their choosing, the coach suddenly raises both focus mitts in front of the boxer, holding them a short distance apart. This action signals the boxer to immediately launch a double counterattack – left and right hooks to the head – as indicated by the focus mitts.

A double counterpunch: a hook to the head with the right hand and an uppercut to the body with the left hand. Using the right-hand flat mitt, the coach asks the boxer to move backward and defend against a straight attack to the head. To deliver a quick counter from the right side to the head, the boxer must assume a proper starting position. The coach quickly

uses the right flat mitt as a target for the punch and simultaneously moves the left flat mitt forward to receive the second punch — a left uppercut to the body. The boxer must learn to combine both punches smoothly.

Combination Punches

In a fight, a series of punches acts as a tool to develop an attack or counterattack. Both attack and counterattack are initially practiced in a method divided into standard stages:

a) preparation for the attack, the initial strike, and developing the attack with successive punches;

b) defense combined with a counter or response punch, followed by executing a series of punches to enhance the counterattack.

All stages of attack and counterattack are first practiced separately using focus mitts and then combined into full movements. When learning and combining a series of punches with focus mitts, the boxer should not view these combinations as fixed or final patterns for a real fight.

There are many variations for combining punches in mitt drills. Through repeated practice, the boxer develops the ability to smoothly and quickly switch between combinations during an actual fight.

Preparing this attack with feints and deceptive movements, the boxer delivers two quick, alternating straight punches to the coach's head-level right-hand mitt, with the second punch (from the right hand) being delivered with extra power. After a brief pause to redirect the body and regain balance, the boxer throws three quick uppercuts (left–right–left) without focusing on the coach's left-hand mitt. Finally, the boxer delivers a strong punch with the right hand to the coach's right-hand mitt, which is held steady on the left side at head height. After the attack, the boxer must quickly return to a fighting stance.

Counterattack with a series of punches. The key condition for every counterattack is a precise initiation. In this case, the boxer evades the opponent's (coach's) attacking punch, takes advantage of the opponent's (coach's) resulting defensive position, responds with a counterpunch, and then follows up with a combination of successive punches.

The best defense for enabling a counterattack. The most effective defense that facilitates a counterattack is retreating against all types of attacking punches. As the boxer moves backward, they must observe the opponent's body position to identify any openings and determine which punch to use for the counterattack. By retreating, the boxer should position themselves in an optimal starting stance to launch the first strike of the counterattack.

In mitt drills, the coach predetermines the first punch of the counterattack as well as the sequence of the following punches that form the combination. For example, after the boxer steps back (to defend against a straight punch to the head), the coach moves the right-hand mitt forward, prompting the boxer to respond with a straight punch to the head using the left hand. This punch serves as the starting point of a counterattack developed through a series of follow-up punches.

Counterattack with a series of punches. This counterattack begins with a counterpunch combined with a defensive move, allowing the boxer to evade the "opponent's" (coach's) attacking punch. After that, the boxer continues the counterattack by delivering a series of follow-up punches.

Example: The coach attacks the head using the left-hand mitt, suggesting that the boxer move to the left and defend. After a brief pause, the boxer identifies the position of the "opponent's" (coach's) body and follows up with a consecutive counterattack consisting of an uppercut to the body (to the coach's right-hand mitt) followed by two emphasized punches (left–right).

Straight punch using left hand. The punch is delivered from the fighting stance, with the left fist positioned close to the target. Because the path of the fist's movement is short, straight punches with the left hand serve as fast and relatively accurate strikes (see Figure 8).

Figure 8. Straight punch to the head with the left hand while stepping forward with the left foot

Properly softening the punch helps prevent injuries to the hands of both coaches and boxers.

The straight punch with the right hand is delivered from the fighting stance. For orthodox boxers, the right fist is positioned farther from the target than the left, making such punches often used as powerful strikes. However, the longer path of the right fist to the target provides the opponent with more time to organize an effective defense. As a result, straight right-hand punches are used less frequently than straight left-hand punches (see Figure 9).

Figure 9. Straight punch to the head with the right hand while stepping forward

As soon as the boxer's glove makes contact, the coach moves their palm downward. As a result, the glove slides along the surface of the "focus mitt"; this action helps soften the impact of the punch.

Hook Punches. In boxing, hook punches are commonly used. They can be executed as both powerful and fast strikes with great effectiveness. A left hook to the head is performed while the rear foot's position remains unchanged, and the other joints of the body also stay in their previous positions (see Figure 10).

When delivering hooks, both left and right focus mitts ("pads") are used accordingly to receive left and right hooks. It is also possible to use only one focus mitt by turning it toward the direction of the incoming punch (e.g., toward the moving left glove).

Figure 10. Left hook to the head while stepping forward with the left foot

A right hook to the head. Against an orthodox boxer — just like against a southpaw — short punches are used most frequently and quickly. In a fighting stance, the boxer's right fist is positioned relatively farther from the target. During the punching motion, the fist must travel a longer distance to reach the target, giving the opponent enough time to recognize the boxer's intention and organize an effective defense. Therefore, long-range punches in an attack are used less often and are more commonly applied against southpaw opponents. When executing a power-designated punch, the boxer simultaneously pushes off the ground with the right foot and rotates the torso around the vertical axis. A moment later, the arm extends at the elbow joint and moves toward the target with increasing speed (see Figure 11).

Figure 11. Right hook to the head while stepping forward

Figure 12. Left uppercut to the head while stepping forward with the left foot

Left uppercut to the head. Short punches are often used when the opponent's right hand does not protect their body. In practice, this punch is primarily applied as a powerful strike. When executing a power-designated short punch, the boxer first performs preliminary movements: quickly shifting body weight onto the front (left) foot (moving the center of mass to the left edge of the base) while slightly rotating the torso to the left around its vertical axis. The left elbow is pulled back, and the fist moves backward and downward, creating a coiled, spring-like position. Next, the boxer pushes off from the left foot's support while simultaneously rotating the torso to the right, rapidly driving the left shoulder forward. The arm rotates at the shoulder joint, and the fist travels in a rising arc—from below, forward, and upward—toward the target with increasing speed. For uppercuts, the right focus mitt is more commonly used, positioned at head or body level (see Figure 12).

Right uppercut to the head. Short punches are frequently used when the opponent's left hand is not blocking the target's path. In practice, this punch is typically applied as a powerful strike. When executing a power-designated short punch, the boxer simultaneously pushes off from the rear (right) foot and rotates the torso around its vertical axis at the initial stage. Meanwhile, the right elbow is slightly pulled back, and the right fist moves backward and downward along an arc. The motion continues with the torso rotating to the left, a push-off from the right foot, and the right shoulder driven forward. At the same time, the bent arm (with restricted movement at the elbow joint) moves forward, and the fist travels in a rising arc—from below to forward and upward—with increasing speed. The fist rotates with the fingers facing outward and is directed at the target. During the punch, movement in the elbow and shoulder joints is restricted, forming a rigid striking lever. At the moment the fist contacts the target, an additional movement increases the punch's power—a slight uncoiling of the body at the waist (more precisely, at the hip joint). This is important because, during the punch, the right fist travels a relatively long distance to reach the target (see Figure 13).

Left uppercut to the body. When executing a power-designated short punch, preparatory movements are performed first: the body weight is quickly shifted onto the front (left) foot (the center of mass moves to the left edge of the base), and the torso rotates slightly to the left around its vertical axis. The left elbow is pulled backward, and the fist moves backward and downward, creating a coiled or loaded position. Next, the boxer simultaneously pushes off from the left foot and rotates the torso to

the right, driving the left shoulder rapidly forward. The arm rotates at the shoulder joint, and the fist moves in a rising arc—from below to forward and upward—toward the target with increasing speed (see Figure 14).

Figure 13. Right uppercut to the head while stepping forward

Figure 14. Left uppercut to the body while stepping forward with the left foot

Figure 15. Right uppercut to the body while stepping forward with the right foot

Figure 16. Straight punch to the body with the left hand while stepping forward with the left foot

During the initial phase of delivering a power-designated short punch, the boxer simultaneously pushes off from the rear (right) foot and rotates the torso around the vertical axis. At the same time, the left elbow is slightly pulled back, and the right fist moves in a straight path toward the body along an arc (see Figure 17).

Figure 17. Straight punch to the body with the right hand while stepping forward

Single counterattacks in the attack. Single counterattacks and offensive punches are effective tools for defending against an opponent's attacks. To execute these techniques, boxers maneuver strategically to utilize these strikes when facing positional pressure in the center of the ring. They also function effectively along the ropes and in the ring's corners (see Figures 18, 19, 20, 21, 22, and 23).

Figure 18. Counter straight punch to the head with the left hand

Figure 19. Counter straight punch to the head with the right hand

Figure 20. Counter hook to the head with the left hand

Figure 21. Counter hook to the head with the right hand

Figure 22. Counter uppercut to the body with the left hand

Figure 23. Counter uppercut to the body with the right hand

2.1.4. General concepts of hand strike defense techniques

Mastering a range of defensive movements against hand strikes greatly impacts a boxer's combat abilities. Defensive actions effectively shield the body's vulnerable areas from punches and help identify the right moment to shift from defense to counterattack or attack. At the heart of defensive movements is the skill to anticipate the opponent's attacks

and structure one's own response accordingly. In hand strike defense techniques, three primary classes of defensive methods are categorized:

1. Defense using the hands
2. Defense using the feet
3. Defense using body movement.

Defense using the hands.

The main advantage of hand-based defense is its high reliability and effectiveness. However, a significant drawback is that using the hands to block punches can temporarily limit the ability to launch a counterattack. In hand-based defense, two types can be distinguished: passive and active defense. Passive defense includes blocking, parrying, and guarding, while active defense includes counterpunches. Guarding involves stopping an opponent's punch by using the palm, shoulder, or forearm as a barrier. Blocking is a counteraction with the hand that intercepts the opponent's punch, preventing it from being executed at optimal speed and range. A counterpunch is a responsive strike delivered while the opponent is punching, meant to interrupt the attack at its peak. To be effective, it must reach the target faster than the opponent's punch. Depending on the phase of the opponent's punch: at the start of the punch, use a counterpunch or a block; in the middle of the punch, use a parry; at the end of the punch, use a guard. Parrying is a counter-motion with the hand that changes the direction of the opponent's strike. Defense using the feet is based on changing position through footwork to retreat, increase distance, or avoid a direct clash with the opponent. Key techniques include stepping backward and to the right, stepping backward and to the left, stepping to the right while rotating the torso, and stepping to the left while rotating the torso. Defense using body movement constitutes a more complex class of defense. Its advantage is that it allows the boxer to maintain a fighting stance while keeping the hands free to respond quickly to the opponent's attacks. The main techniques include slipping, which is dodging to the left or right without changing position; leaning back, which refers to dodging backward; and ducking, which involves moving under or to the side of the opponent's punching hand to evade the punch, without changing position. (See Figures 24 to 39 for illustrations of these techniques).

Figure 24. Defense by leaning to the left

Figure 25. Defense by leaning to the right

Figure 26. Defense by ducking to the left

Figure 27. Defense by ducking to the right

Figure 28. Defense by deflecting upward with the left hand

Figure 29. Defense by deflecting downward with the left hand

Figure 30. Defense by deflecting upward with the right hand

Figure 31. Defense by deflecting downward with the right hand

Figure 32. Defense by blocking with the left hand

Figure 33. Defense by blocking with the right hand

Figure 34. Defense by blocking when a punch is thrown to the head with the left hand

Figure 35. Defense by blocking when a punch is thrown to the head with the right hand

Figure 36. Defense by blocking when a punch is thrown to the stomach with the left hand

Figure 37. Defense by blocking when a punch is thrown to the stomach with the right hand

Figure 38. Defense by retreating backward using the legs

Figure 39. Defense by crouching

2.1.5. Straight punches and defensive combos

Straight punches to the head and body are primarily used at close and medium distances. Depending on the situation in the ring and tactical objectives, various combinations of these punches and defenses can be employed in offensive, counteroffensive, and response forms (Figures 40–50).

Figure 40. Straight punch to the head with the left hand and straight punch to the head with the right hand (double simple attack).

41-rasm. Figure 41. Straight punch to the stomach with the left hand and straight punch to the head with the right hand (double simple attack).

Figure 42. Straight punch to the head with the left hand and straight punch to the stomach with the right hand (double simple attack).

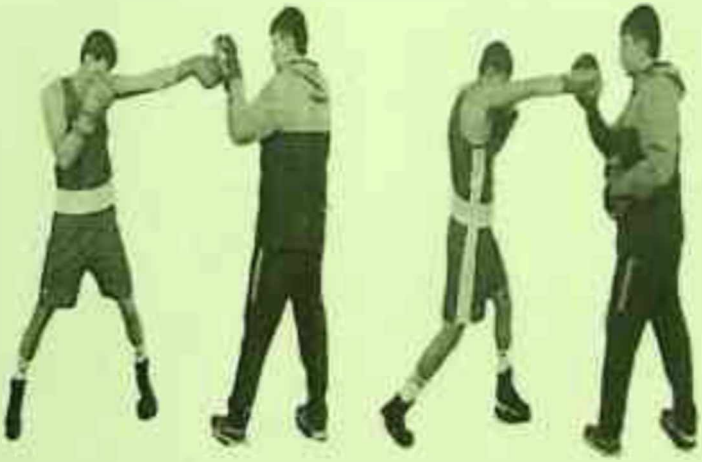

Figure 43. Straight punch to the head with the left hand and side punch to the head with the right hand (double simple attack)

Figure 44. Straight punch to the head with the right hand and side punch to the head with the left hand (double simple attack)

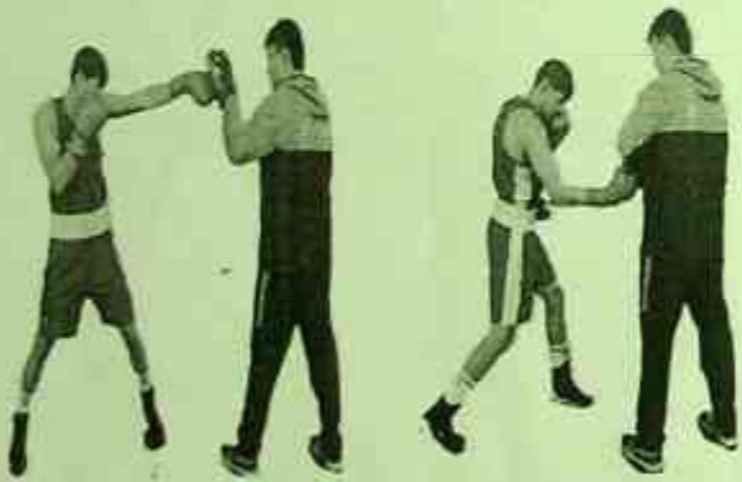

Figure 45. Straight punch to the head with the left hand and upward punch to the stomach with the right hand (double simple attack)

Figure 46. Straight punch to the head with the right hand and upward punch to the stomach with the left hand (double simple attack)

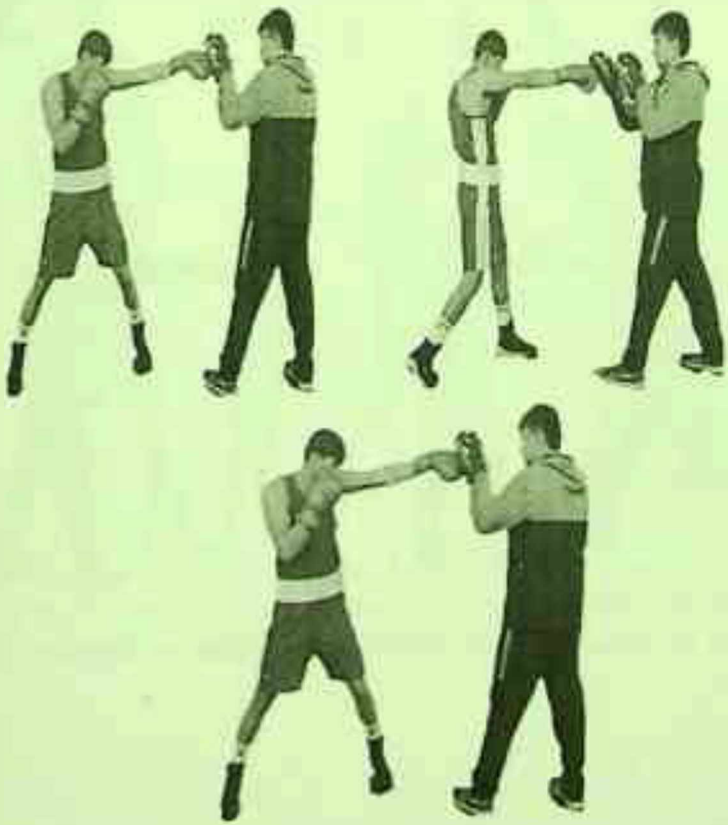

Figure 47. Triple straight punch to the head (complex attack)

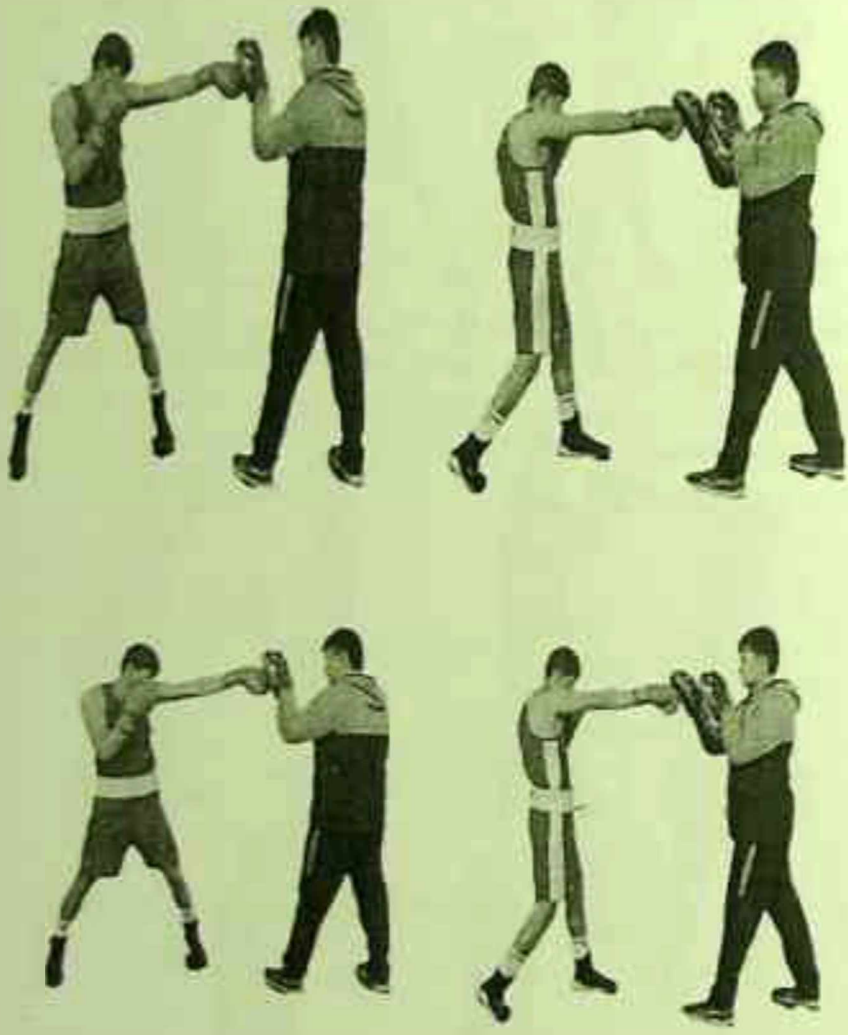

Figure 48. Quadruple straight punch to the head (complex attack)

Figure 49. Double straight punch to the head, followed by defensive leaning to the right, then a single straight punch to the head with the right hand (complex attack)

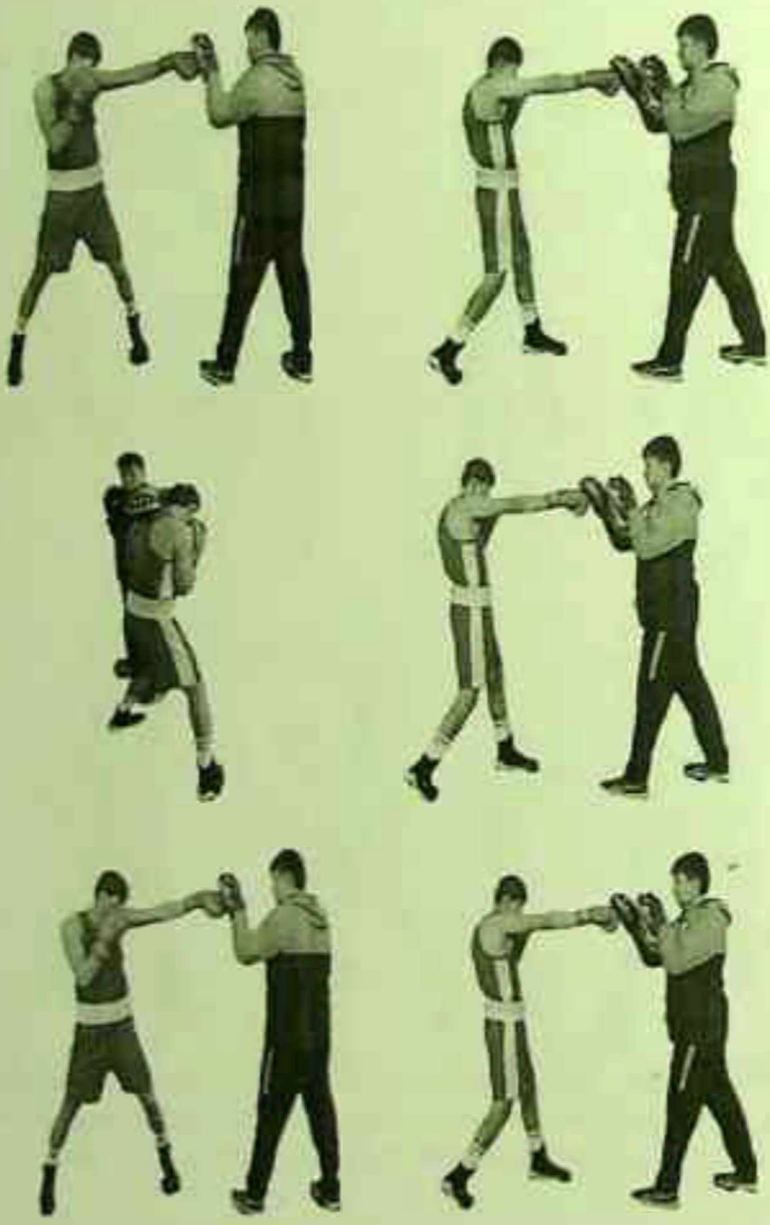

Figure 50. Double straight punch to the head, defensive leaning to the right, followed by a triple straight punch to the head (complex attack)

When the glove contacts a "flat pad" during side punches and uppercuts—just as with straight punches—a softening movement occurs due to the sliding effect.

If the goal is to practice a series of punches, the position of the "flat pads" must constantly change. In this case, the distance between the pads should be small, simulating combat conditions and enabling the coach to react more quickly to the boxer's punch exchanges. When the glove touches the "flat pads," the fist must be immediately clenched; after the punch is completed, the hand should relax and be quickly pulled back in a short motion.

There are several rules for working with "flat pads" that allow the coach to effectively organize the athlete's training process at all stages of preparation:

1. The "flat pads" must be positioned at a certain angle relative to the punch;

2. For uppercuts, the target point should be directed downward; for side punches, it should be positioned in the middle; and for straight punches, it should be placed in front;

3. In boxing, the "flat pad" must not be directed straight against the punch, as this may create a misleading perception regarding the power and accuracy of the punch;

4. To develop the boxer's counterpunch power and accuracy, one of the "flat pads" should be used to practice offensive punches, while the other should be placed under the counterpunch delivered by the boxer along with various types of defensive movements;

5. While practicing offensive or defensive series, it is necessary to determine in advance the order, direction, and number of punches. While delivering the punches according to the boxer's preference, attention should focus on the open sectors;

6. To create conditions similar to those in real competition, while placing the "flat pads" under the boxer's punches, it's necessary to move quickly away from them or approach with an attack, move in various directions, and signal the punches. This will compel the boxer to use different defensive techniques from various distances and then proceed to a counterattack.

2.1.6. Specific errors observed during personal training with "flat pads"

Some coaches tend to overuse "flat pads," turning them into an ordinary boxing tool. They forget that the primary purpose of using "flat pads" is to develop and refine all types of punches. Using "flat pads" as a supplemental training method may inevitably lead to a decline in the athlete's independent thinking.

Unacceptable mistakes:

1. Allowing training with small gloves – is not permissible because training with "flat pads" must occur under conditions that closely resemble real combat scenarios.

2. Creating the illusion of power – it is essential to give the impression that a punch is delivered with great force, even if it is not actually strong. This occurs when the coach directs the "flat pads" toward the boxer's gloves, creating a false sense of impact.

3. Incorrect pad placement when practicing head punches – the "flat pads" should be placed close to the face, not at shoulder width. Otherwise, during a fight, the athlete will throw wide punches that may miss the target.

4. Always keeping the "flat pads" in a ready position – is not acceptable. The trainee must face unexpected tasks so they learn to land accurate strikes in unpredictable situations.

5. Spending excessive time on this training type – should be avoided. Training should also include other equipment.

To fully benefit from working with "flat pads," the coach must consistently move around the ring and correct the boxer's mistakes not only verbally but also by executing specific counteractions. If the boxer hesitates during an attack, the coach should signal a counterattack as if striking back, thereby "punishing" the boxer.

Moreover, for the athlete to learn to deliver timely and accurate single punches to the opponent, the coach must avoid holding the boxing "flat pads" in a constant ready position. While moving around the ring, the coach should assign new tasks to the boxer and open the "flat pads" only for a brief moment. The more varied the coach's tasks are and the less time is allotted to complete them, the greater the boxer's skill will become.

In training with boxers, the primary goal is not merely to "develop" the punch, but to refine it and master complex punch combinations in boxing—such as entering and exiting close-range combat and working at medium and long distances.

Undoubtedly, improving a boxer's skills requires the coach (or partner) to take a creative and personalized approach to the boxer, in addition to applying a comprehensive focus on technique and tactics using boxing equipment, including "flat pads."

2.2. Exercises with "flat pads"

Exercises with "flat pads" are utilized in both the initial training of boxers and their preparation for competitions. During training sessions, exercises with "flat pads" can serve several purposes:

1) to learn and reinforce technique;
2) to master boxing tactics;
3) to develop reaction speed, movement agility, and endurance;
4) to build coordination of movements;
5) to develop a sense of distance and timing;
6) to practice relaxation and muscle strength. These tasks cannot be addressed in isolation (for instance, while mastering technique or speed, a boxer must also develop the ability to relax the muscles, properly distribute muscular tension, and acquire a sense of distance). However, at times, a coach may isolate one of the objectives and concentrate fully on it, using the "flat pads" for one or several training sessions to achieve that specific goal.

2.2.1. The use of "flat pads" for learning and reinforcing boxing techniques.

"Flat pads" can be used from the very beginning of training to learn and reinforce boxing technique. Exercises with "flat pads" help boxers quickly master movements, punches, and defensive actions. These exercises are usually conducted at the end of the main part of the training session, after conditional and free sparring. The instructor, wearing the boxing "flat pads," first instructs the student to perform basic movements, punches, and defensive actions. During this time, the instructor monitors the correctness of the combat actions and their combinations, ensures that defensive and precautionary techniques are performed properly, observes the correct distribution of body weight, and checks if the initial positions for the next actions are assumed in a timely manner.

2.2.2. The use of boxing "flat pads" for learning ring movements.

While learning movements, the boxer must move accurately and maintain the required distance. For example, to practice moving forward or backward, the coach holds the "flat pads" in front of them and either retreats or advances (first slowly, then at varying speeds), while the student moves in the corresponding direction and delivers light straight punches with the left hand to the "flat pads," keeping the designated distance. To master lateral or circular movements, the instructor indicates the direction of movement with their hand, shifts to the left or right, or turns in different directions. The boxer, while moving, delivers light straight punches to the "flat pads" and stays alert for possible counterpunches from the coach. Forward-backward movements can be practiced by delivering a straight punch to the head with the left hand (or two straight punches to the head) in the form of an attack or counterattack, and then returning to the initial position after the punches. It is very important that the student learns to deliver different punches and their combinations while lightly moving in various directions without losing balance. To properly develop punches using boxing "flat pads," the coach must position the "flat pads" correctly—they should be placed close to each other and within the punching zone. In some cases, coaches extend the "flat pads" forward or to the sides, which hinders the boxer's ability to achieve punch accuracy and disrupts their sense of distance and target. Most importantly, the coach must absorb the impact of the boxer's punches without recoiling backward, without swinging the "flat pads" to the sides, and without pushing them against the punch. The right "flat pad" is used to absorb straight punches. At the moment of contact with the trainee's glove, the coach moves their hand from top to bottom, allowing the glove to slide along the surface of the "flat pad," which softens the impact of the punch. For side punches, both the right and left "flat pads" are used, corresponding to punches delivered from the right and left sides. However, for such punches, one "flat pad" can also be used, turned toward the moving left glove. For uppercuts, the right "flat pad" is used more often, positioned at head or body level. The softening movement for side punches and uppercuts is performed similarly to that for straight punches. When developing punch combinations, the position of the "flat pads" must constantly change, and the distance between them should remain small. This, firstly, simulates punching conditions closer to actual competition scenarios, and secondly, allows the coach to react more

quickly to the trainee's punch transitions and to position the "flat pads" more promptly under the punches. When the glove contacts the "flat pad," the hand must be clenched into a fist immediately, and after the punch, the hand should relax and quickly withdraw along a short path. When using "flat pads" to improve punches, the coach, especially during the initial training stage, focuses primarily on several important technical tasks rather than emphasizing tactical objectives. Such tasks include: developing coordination of specific movements, which is reflected in the correct interaction of hands, feet, and body; establishing proper initial positions and defensive readiness; regulating breathing properly; generating fast and sharp punches; developing the skill of relaxation, acquiring a sense of "distance awareness." Before starting a punch or a combination, the student must assume the correct initial stance. This allows effective use of the foot push-off when punching, proper utilization of body weight, and rotation toward the target. After completing the punch or combination, the boxer should return to a fighting stance, maneuver with the body, and move around the coach. During the punches, it is essential to closely monitor the transfer of body weight, rotational steps of the body, and proper defensive readiness.

Punching exercises with "flat pads" should help develop the skill of being cautious about potential counterpunches. After the student learns to deliver punches correctly, the coach begins to simulate attacks during "flat pad" drills by pretending to throw counterpunches. In response, the boxer performs various defensive movements to protect themselves. Later on, instead of simulated actions, the coach occasionally delivers light punches to the boxer using the "flat pads," thereby bringing the experience closer to real combat conditions. The coach can also use the "flat pads" to focus on a specific detail of the punch or to correct any emerging mistakes.

During the punch, attention must be paid to keeping the chin lowered toward the chest, the right shoulder covering the right side of the chin, and the left elbow pressed against the left side of the body.

Using Boxing "Flat Pads" to Improve Punch Combinations. "Flat pads" serve as a tool for mastering punch combinations. The boxer may deliver a combination of punches either from a stationary position or while moving forward (or to the side), launching an attack on the coach or while moving laterally.

When practicing punch combinations, it's advisable to first master the movement and muscle tension while standing in place. When delivering punch combinations during an attack, it's crucial to pay attention to foot

movement. The footwork must align with the hand movements and open just enough to maintain balance. If the feet are positioned too far apart, it can hinder the boxer's mobility and complicate rapid changes in body rotation during combinations. While retreating with counter combinations, coordinating the movements of the hands and feet becomes quite challenging. Consequently, starting with individual punches or double combinations within the series is often more effective before transitioning to the full combination.

As the boxer completes a series of punches against the "flat pads," they should also apply punches while stepping to the sides—either with or without body rotation. Such punches enable the boxer to escape the opponent's imaginary striking zone. To ensure the boxer can deliver combinations quickly and fluidly in a scenario resembling a real fight, the instructor must create appropriate conditions by holding the "flat pads" correctly and adjusting their position in a timely manner.

For example, the instructor might simulate an attack by signaling a straight punch to the head using the left "flat pad." In response, the student can defend by leaning to the right, delivering an uppercut to the body with both the right and left hands, and finishing the combination with a side punch to the head with the right hand, followed by a dodge. The instructor must be capable of receiving all these punches with the right "flat pad," which requires quickly shifting the pad from body level to head level.

Additionally, during an attack, the student could be asked to perform a three- or four-punch combination on the "flat pads" from a long distance. To assist with this, the coach should hold the "flat pads" in the correct position while retreating backward, and then unexpectedly begin moving forward toward the student. The student must react instantly to this movement and execute one of the combinations immediately—while moving backward. This method helps the boxer learn to deliver combinations while in motion and develop skills for maintaining balance and coordinating hand and foot movements effectively.

The coach may suggest that the boxer follow them with a series of punches -- for instance, all the way to the ropes of the ring—then pause to create conditions, using the "flat pads," for delivering combinations from medium or close range. Alternatively, after the attacking boxer delivers a combination to the "flat pads," the coach might step back or to the side to alter the distance, then propose attacking again with a single punch or a new series of punches (see Table 7).

Table 7

Model exercises to enhance offensive movements during individual "flat pad" sessions

Coach's Actions	Boxer's Actions
I. With the hands: Executes punch blocks with shoulders and forearms; Executes returns with hand blocks; Delivers a straight "left-right" punch to the head faster than the opponent.	**I. With the hands:** Delivers straight punches to the head and uppercuts to the body. Delivers several straight punches to the head and uppercuts to the body. Performs defensive actions with the hands and evasive torso movements to the side.
II. With the torso: Moves the torso left and right and delivers with the left.	**II. With the torso:**
Performs backward evasion with the torso.	Delivers straight punches to the head with the right and left hands; Performs single side and straight punches.
III. With the legs: Performs backward retreat using simple steps;	**III. With the legs:**
Performs backward jumping or side-step.	Maintains distance; Maintains distance and either approaches the opponent (coach) to limit offensive actions or performs defensive movements.

2.3. The use of boxing "flat pads" for learning defensive techniques continues to be effective.

There are many exercises with "flat pads" that help a boxer master various defensive techniques. In this case, the coach repeatedly performs different punching movements with the "flat pads," and the student applies the necessary defensive techniques. The punches delivered with "flat pads" should not be too strong or sharp, as this could endanger both

the coach and the trainee. "Flat pads" are considered convenient for learning defensive movements at medium and sometimes close distances. Here, it is effective to carry out a sequence of punches—either pre-planned or unexpected for the student—without stopping, so that the student can defend against them using slips, ducks, and blocks while also maintaining the proper fighting distance. Sometimes, to make the student's next movements more effective, it is useful to perform actions that mimic real combat situations. For example, making an arcing motion from right to left with the left "flat pad" while indicating a side punch to the head with the right hand, or moving to the right with the right "flat pad" while showing a side punch to the head with the left hand. In such cases, the boxer should execute a ducking defensive move and then have an opportunity to deliver counterattacks to the other, stationary "flat pad." In exercises with "flat pads," defensive movements can be combined with various types of response and counter punches, including punch combinations delivered as counterattacks. To help the boxer perform counterattacks more quickly, it is advisable for the coach not to deliver a fully completed punch with the "flat pads," but instead to use them to signal the beginning of an attack. While learning counter-response punches, the student must first apply a defensive move and then, in the next phase, deliver a punch or a combination of punches to the "flat pad." For example, in response to an attack indicated by a straight punch to the head with the left hand, the boxer leans backward, then moves forward and delivers two straight counterpunches with the left and right hands to the right "flat pad." Or, in response to an attack signaled by the right "flat pad" simulating a straight punch to the head, the boxer blocks with the left shoulder and delivers a straight punch with the right hand, followed by a side punch to the head with the left hand. When executing counterpunches, it is essential that students deliver them immediately as the movement of the "flat pad" begins while applying appropriate defensive techniques.

It is convenient to teach well-prepared, high-ranking boxers to deliver "cross"-type straight counterpunches to the head using the right hand during "flat pad" exercises. In an inside cross, in response to a straight punch to the head simulated with the left "flat pad," the boxer leans slightly to the left, steps forward to the left, and delivers a straight punch with the right hand to the "flat pad," passing the right hand inside the coach's left arm. In an outside counter-cross, in response to a straight punch to the head with the left "flat pad," the boxer steps forward to the

left and, while leaning to the left, simultaneously lifts the right elbow and delivers a straight punch with the right hand to the coach's right "flat pad." During this, the student should hold the "flat pad" at the left side of the chin.

It is advisable to perform side counter punches to the "flat pads" using slips and ducks. For example, when the coach attacks with straight and side punches to the head using the left hand, the boxer slips or ducks to the right and delivers a counter side punch to the head or body with the left hand. The coach receives the punches with the right "flat pad," which should be positioned next to the chin or the body.

In counter punches delivered with the right hand to the head or body from a slip or duck in response to a straight punch to the head with the right "flat pad," the coach places the left "flat pad" under the punch. Following the counterpunches, the boxer may continue the attack at medium and close range, striking the "flat pads" while staying alert to possible counterattacks from the coach. Then, using a retreat or ducking movement, the boxer increases the combat distance.

Delivering uppercut counterpunches to the head and body in response to straight attacks to the head using "flat pads," while simultaneously performing slips for defense, is considered quite effective. These uppercut counterpunches can be thrown either by extending the arm from the elbow or without fully extending it.

In each specific case, a tactical objective should be assigned to the boxer: when and at what distance a particular counterpunch can be delivered (see Table 8).

Table 8

Model exercises for improving the boxer's defensive movements during individual "flat pad" sessions

Opponent's (Coach's) Actions	Boxer's Actions
I. Attacks	**I. Attack**
a) Simple	**a) Simple**
Delivers a straight punch to the head with the left hand	Performs a left punch or torso slip to the right or left
Delivers a straight punch to the head with the right hand	Performs a left punch or torso slip to the left or right

Delivers a straight punch to the stomach with the left hand	Performs a block with the right and left hands or evasion with the torso
Delivers a straight punch to the stomach with the right hand	Performs a block with the left and right hands or evasion with the torso
Delivers a side punch to the head with the left hand	Performs a left punch to the right side or blocks the punch with the right forearm
Delivers a side punch to the head with the right hand	Performs a left punch to the left side or blocks the punch with the left forearm
Delivers straight punches to the head with both left and right hands	Performs a left punch in a right-to-left direction
Delivers straight punches to the head with both right and left hands	Performs a left punch in a left-to-right direction
Delivers a side punch to the head with the left hand, followed by a straight punch to the head with the right hand	Performs a duck to the right followed by a left punch
Delivers a straight jumping punch to the head with the left hand	Performs a backward jump
Delivers a straight jumping punch to the head with the right hand	Performs a left punch to the left followed by a duck to the right
Delivers a straight punch to the head with the right hand, followed by a side punch to the head with the left hand	Blocks with the right elbow and delivers a left punch
Delivers a straight punch to the body with the left hand, followed by a straight punch to the head with the right hand	Blocks with the left forearm and performs a backward jump; blocks with the hand and delivers a left punch to the right
Delivers a straight punch to the head with the right hand, followed by a side punch to the head with the left hand	
b) Complex	**b) Complex**
Delivers straight punches to the head in a "left–right–left" sequence	Blocks the punch with the left forearm and delivers a left punch from left to right
Delivers straight punches to the head in a "right–left–right" sequence	

Delivers a combination of four consecutive punches to the head	Delivers a "left–right–left" punch sequence, blocks punches with both hands, then delivers a left punch from right to left
Delivers: straight punch to the body with the left hand – straight punch to the head with the right hand – straight punch to the head with the left hand – straight punch to the body with the right hand	Blocks the punch with the right elbow
Performs a jumping straight punch to the head with the left hand – then delivers "left–right" straight punches to the head	Delivers a left-to-right punch while blocking with the left elbow
Performs a jumping straight punch to the head with the right hand – then delivers "left–right" straight punches to the head	Performs a backward jump and delivers a punch from right to left
	Performs a backward jump and delivers a punch from right to left
II. Counterattack	**II. Counterattack**
a) Simple	**a) Simple**
Launches a straight attack to the head with the left hand	After a defensive action, delivers a straight punch to the head with the right hand
Launches a straight attack to the head with the right hand	After a defensive action, delivers a straight punch to the head with the left hand
Launches a straight attack to the head in a "left–right" sequence	After a defensive action, delivers straight punches with the left and right hands
Launches a straight attack: to the body with the left hand, to the head with the right hand	After a defensive action, delivers a side punch with the left hand and a straight punch to the head with the right hand
b) Complex	**b) Complex**
Launches a straight attack to the head with the left hand	
Launches a straight attack to the head with the right hand	

Launches a straight attack to the head in a "left–right" sequence Launches: a straight punch to the body with the left hand, followed by a straight punch to the head with the right hand Launches a straight punch to the head while stepping to the left Launches a straight punch to the head with the right hand	Delivers a counterattack with straight punches to the head in a "right–left–right" sequence Delivers a counterattack with straight punches to the head in a "left–right–left" sequence After a defensive action, delivers two straight punches with the left hand and one side punch with the right hand to the head After a defensive action, delivers a jumping straight punch to the head with the left hand, followed by several straight punches to the head Delivers a straight counterpunch in a "left–right–left" sequence Delivers a counterpunch: straight to the head with the right hand – to the body with the left – to the head with the right – and again straight to the head with the left

2.4. The use of boxing "flat pads" to enhance combat techniques at various distances

Highly skilled boxers must effectively fight at all distances by transitioning smoothly from one range to another. To develop this skill, the coach can successfully use "flat pads" to train the boxer to attack, defend, or counterattack at varying distances. The coach continuously changes the distance—either by prior agreement or unexpectedly—while assigning tasks to the boxer, such as attacking, defending, or launching a counterattack at different ranges. This helps the boxer build adaptability and distance management skills during a fight.

When learning close-range combat techniques, the coach and the boxer stand at a short distance from each other, where their hands and bodies may come into contact. At this range, they practice short straight punches and uppercuts using "flat pads," while defensive techniques such as blocking, stopping, ducking, and slipping are applied more frequently and in combination.

To make punches more effective at close range, the boxer must first establish a firm balance, lower their shoulders, slightly bend their knees, rotate their torso, and assume the correct starting position before delivering any strikes.

When learning close-range combat, the coach holding the "flat pads" should maintain a crouched stance, keeping their shoulders lowered forward and downward, and position the "flat pads" as close together as possible.

The coach can create various conditions for entering close-range combat. For example, entering close-range combat can occur during the boxer's personal attack: the boxer performs a punch combination used in long-distance fighting on the "flat pads" while moving forward, and as they get closer, they begin to deliver short punches used in close-range combat. Alternatively, the boxer can enter close-range combat after the coach's attack, using ducking and slipping for defense combined with counterpunches, thus developing close-range offensive skills.

The coach presses the "flat pads" against the bend of the student's elbows and delivers shoulder-pushing strikes, forcing the student to defend using ducks, blocks, and slips, as well as to throw them off balance.

To escape close-range combat, the boxer can duck under the coach's left or right arm (either without throwing a punch or while delivering a punch to the right or left "flat pad"), or place their hands on the bend of the coach's elbows, take a step back, extend one or both hands forward, and then deliver punches to the "flat pads" from a fighting distance. They can also exit close range by stepping to the side, rotating the torso, and landing a punch on one of the "flat pads." In training, "flat pads" can also be used to help tactically develop the boxer.

When learning various punch variations, it is essential to remind the boxer of their tactical purpose and the possibilities for using them in different combat situations. The coach should use the "flat pads" to simulate situations repeatedly in which the student can effectively apply a particular tactical form of attack or defense.

For example, if the student has developed the skill of delivering a left hook in two steps, the coach must use the "flat pad" to help the boxer suddenly shift their body weight onto the left foot and create the initial

position needed to successfully execute the practiced punch. To do this, the coach delivers various punches using the left and right "flat pads," and the student defends against them by slipping or ducking to the left while shifting their weight onto the left foot. Alternatively, the coach lowers the right "flat pad" to body level so that the boxer can jump into the correct initial position to throw a punch with the left hand while delivering a straight punch with the right hand.

2.5. The use of boxing "flat pads" in learning and improving feint movements

Learning and improving feint movements can be practiced during "flat pad" exercises after the boxer has mastered basic punches and defensive actions. To do this, before delivering a punch to the "flat pads," the boxer must first prepare the attack using feint movements: utilizing ducks, slips (forward, sideways, or backward), and their combinations while moving around with steps in various directions, and performing different feint punches (either fast or slow), without hitting or only slightly touching the "flat pads." After all these distracting movements, the student should immediately launch an attack—delivering punches to the "flat pads" and simultaneously defending against the coach's punches. Feint punches can be performed either very quickly or, conversely, slowly in a way that dulls the opponent's alertness. When practicing combinations with "flat pads," the execution of punch series must always be analyzed from a tactical standpoint. It is important for the student to understand which punches in the combination are meant to distract the opponent and which ones are the main, effective strikes. Feint punches delivered quickly but without emphasis to the "flat pads" help create the initial setup for the main punches in the combination.

2.6. The use of boxing "flat pads" in preparing for fights against different types of opponents

Exercises performed with "flat pads" help boxers learn to respond to opponents with varying physical attributes and fighting styles. Using the "flat pads," the coach can simulate scenarios for dealing with aggressive attackers, counterpunchers who prefer reactive fighting, and opponents who favor close or long-distance combat, including left-handed, tall, or short boxers.

For instance, the coach holds the "flat pads" in front and simulates the style of an aggressively attacking opponent by pressing forward and

pursuing the student. In response, the boxer delivers single punches or combinations to the "flat pads" while retreating or moving sideways, selecting a comfortable distance. Conversely, the coach can mimic an opponent who constantly retreats. The boxer's task in this scenario is to restrict the coach's movement and, when the coach reaches an imaginary rope line or corner of the ring, deliver tactically appropriate punches to the "flat pads" (see Table 9).

When preparing the boxer to fight a southpaw opponent, the coach assumes a stance typical of a southpaw and holds the "flat pads" accordingly. The coach then simulates the main actions of a southpaw using cues and gestures, showing the boxer how to respond properly—by defending, attacking the "flat pads," and delivering counterpunches.

Table 9

Model exercises for improving the boxer's preparatory movements during individual training

Coach's Actions	Boxer's Actions
I. Probing (Reconnaissance)	**I. Probing (Reconnaissance)**
Moves around the ring to the left, right, backward, and forward;	Moves to the right, left, forward, and backward;
Indicates punches to the head and body with the left hand;	Parries the punch and responds with a left punch;
Encourages the trainee to attack using hand and foot movements;	Reacts passively without attacking;
Maintains a fighting stance.	Changes direction across the ring to the opposite side.
II. Feinting	**II. Feinting**
Simulates light punches to the head and body with the left hand: side, straight, and uppercuts;	Signals defensive actions (parries, left punches, stopping punches, pulling the torso backward);
Simulates light punches to the head and body with the right hand: side, straight, and uppercuts;	Signals defensive actions (parries, left punches, stopping punches, pulling the torso backward);
Pretends to throw a punch with the left hand; stops the punch and steps back or sideways.	Reacts passively without attacking;
III. Maneuvering	**III. Maneuvering**

Performs jumping movements forward, backward, left, right, and sideways; Moves forward with small steps; Simulates a side punch to the head and body with the left hand while moving forward.	Moves backward, forward, left, and right with jumps; Advances with small steps; Simulates a block with the right forearm and elbow, while stepping backward.

2.7. The Use of Boxing "Flat Mitts" to Develop Boxers' Specific Reaction Skills

The analysis of exercises using "flat mitts" to develop specific reaction skills in boxers has allowed for the conditional grouping of these skills into seven main subcategories. Figure 51 shows the quantitative proportions (in percentages) of exercise types used to develop specific reaction skills in individual training with "flat mitts."

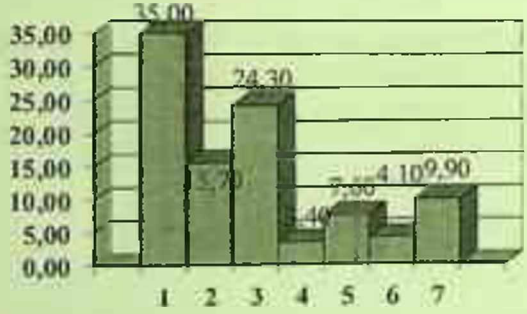

Figure 51. Volume ratios (in %) of exercise types used to identify and develop specific reaction skills in individual training with "flat mitts"

LEGEND (KEY): 1 – Identifying the attack sector and delivering a punch; 2 – Detecting the direction of the attack and neutralizing it; 3 – Distinguishing between simple and complex movements and countering them; 4 – Recognizing preparation for an attack and offensive actions, and responding accordingly; 5 – Transitioning from attack to defense; 6 – Switching from one type of attack to another; 7 – Transitioning from defense to attack.

From the provided data, it's clear that exercises aimed at developing the skill of identifying the attack sector are used most frequently (35.0%). These exercises include various single punches, such as side and straight

punches to the head, straight punches to the body from both the right and left sides, and other types of strikes.

Special attention is also devoted to exercises that enhance the boxer's ability to distinguish between simple and complex movements and to counter them (24.3%). For example, a straight punch from the left followed by a side punch from the right to the head, counterattacks to the head, and various feint movements.

Exercises focused on developing the skills to recognize the direction of an attack and counteract it account for 15.7%. These include punches directed towards various sectors (to the head and body). Exercises aimed at improving the boxer's ability to transition from defense to attack are utilized less frequently (9.9%), such as slipping to the right, leaning left, and delivering a counterpunch, etc.

In individual sessions with the coach using flat mitts, slightly less emphasis is placed on the boxer's ability to switch from attack to defense (7.6%) and to transition from one type of attack to another (4.1%). Very little attention is given to developing the boxer's capacity to recognize an opponent's attack preparation versus actual offensive actions, and to respond effectively to them (3.4%).

Thus, based on analyzing data concerning the types of exercises used to develop special reaction skills in individual training with flat mitts, the following conclusion can be made: The primary focus is on improving the skills of identifying the attack sector and delivering punches; recognizing the direction of the attack and countering it; distinguishing between simple and complex movements and responding appropriately; and recognizing attack preparation and offensive actions and reacting accordingly. These exercises comprise 78.4% of the total (see Figure 52). Exercises aimed at developing the ability to transition from defense to attack, attack to defense, and from one type of attack to another account for 21.6%. However, the analysis of boxers' performance in competitions shows that success in combat often stems from precisely these latter types of transitions. Therefore, the current quantitative distribution of exercises cannot be regarded as optimal.

Consequently, in individual sessions utilizing flat mitts, there is a need to increase the volume of exercises designed to enhance the boxer's capability to transition from one type of action to another. An analysis of combat practice reveals that a boxer's reaction speed during encounters varies among offensive, defensive, and counteroffensive actions and is context-specific. It should also be highlighted that a boxer exhibits

different types and levels of reaction speed in attack, defense, and counterattack scenarios.

A complex reaction occurs in an athlete when they are uncertain about the type of punch the opponent will deliver, the distance from which it will be thrown, or when the attack or counterattack will occur. If a boxer anticipates a specific punch from the opponent, deliberately exposes a target area, and then defends effectively, this defensive behavior represents a simple reaction.

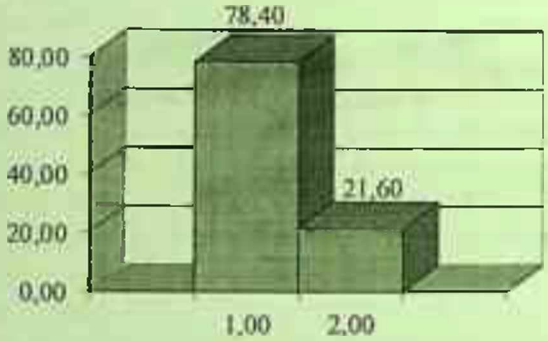

Figure 52. Ratio of exercise volumes aimed at improving the skills of distinguishing between types of attack and defense (1) and transitioning from one to another (2) (%).

In many of the boxer s intricate offensive and counteroffensive maneuvers, the speed of response is defined by how quickly they react to a moving target. The complex reaction process involves perceiving several of the opponent's actions, interpreting them, and executing a specific response. Based on these observations, it is possible to determine the indicators of exercises aimed at improving motor reactions during defensive, offensive, and counteroffensive actions in individual flat mitt sessions (see Table 10).

Table 10

Volume of exercises used to improve motor reactions in offensive, defensive, and counteroffensive actions during individual flat mitt sessions

No.	Type of Boxer's Activity	Reaction Types (%)	
		simple	complex
1.	Defense	44,0	56,0
2.	Attack	74,9	25,1
3.	Counterattack	-	100

In individual flat mitt sessions between the coach and the athlete, the coach primarily uses exercises aimed at developing complex motor reactions to enhance the boxer's defensive movements—these account for 56% of the total training volume. When the athlete performs pre-agreed defensive actions, the coach's simulation of situations comprises 44% of the total.

In individual flat mitt sessions, when the coach acts cautiously out of fear of injury, it often leads the athlete to engage mainly in pre-agreed and simple reaction-type attack exercises, which constitute 74.9% of the total volume. Only about a quarter of attack-related exercises (25.1%) focus on developing complex motor reactions.

It should also be emphasized that complex motor reactions are present in 100% of all counterattack exercises. This means that when executing a counterattack, the boxer must be capable of recognizing and creating new situations, using deceptive attack movements, waiting for the right moment, provoking the opponent into attacking, and immediately responding with counter and return punches.

2.8. The use of boxing flat mitts in addressing the tasks of a boxer's physical preparation

Using flat mitts, various physical preparation tasks for a boxer can be addressed, such as developing speed and endurance. Regularly performing fast, multi-punch combinations and defensive movements in response to various punches with flat mitts at maximum speed helps enhance both single-punch and combination speed, along with reaction speed. Progressive movement drills involving single attacks and counterattacks also contribute to increasing movement speed. During these drills, the coach delivers familiar punches while providing feedback on the boxer's quickness and highlighting any weaknesses that may hinder speed development. To improve the boxer's reaction speed during flat mitt exercises, the coach presents various striking targets by holding the mitts in different positions and instructing the boxer to deliver different types of punches. For enhancing punching speed during flat mitt drills, it is advisable for the boxer to wear lightweight boxing gloves (or gloves designed for mitt/speed work). To build upper shoulder girdle strength, it is recommended to use heavier gloves (12–14 ounces) during flat mitt exercises. High-intensity flat mitt drills performed with short breaks can serve as additional physical loads to aid in developing a boxer's specific

endurance. In some cases, flat mitts can also teach proper movement coordination in trainees. In these scenarios, boxers must perform combinations they find challenging or that impede their mastery of correct technique, pushing them to improve through repetition and correction. For instance, many beginner boxers struggle with cross-coordination of hand and foot movements when throwing punches or retreating. Their ability to coordinate intersecting movements is often underdeveloped. To cultivate proper (cross-body) movement coordination, the coach should hold the flat mitts at head level, with the striking surfaces facing each other. The boxer should deliver side punches to the mitts, and with each punch, step forward with the leg opposite the punching hand. Alternatively, the boxer can take two steps without punching, then step with the opposite leg and deliver a punch with the other hand. To develop correct hand–foot coordination, the boxer must learn to throw punches to the flat mitts while stepping forward with the left foot—placing the foot either slightly before, slightly after, or simultaneously with the punch.

2.9. The use of flat mitts in preparing a boxer for competition

During the competition preparation phase, flat mitts provide significant benefits to boxers. If the opponent is known, the coach can use flat mitts to simulate the opponent's fighting style, helping the boxer adapt during training. If the opponent is unknown, the coach can simulate various fighting styles with flat mitts—such as aggressive, counterattacking, close-range combat, or fighting against a southpaw. This way, the boxer focuses on improving techniques they struggle to apply effectively in a real match and polishes their preferred combinations and strategies.

During the pre-competition period, it is crucial that trainees finish each round of flat mitt exercises by delivering punches rapidly and at a high tempo. At the same time, attention must be paid to maintaining proper movement coordination and protective awareness throughout the final moments of each round.

Flat mitts can be effectively used during on-site training sessions. These exercises are typically performed after walking, running, gymnastic drills, or shadowboxing and aim to improve technique, reaction speed, and overall movement coordination in the boxer.

The advantages of using flat mitts for punching technique development are well established: sparring is a highly effective tool in a

boxer's training. However, training with flat mitts serves as a crucial preparatory step before a boxer is introduced to sparring. Flat mitt drills lay the technical and tactical foundation needed for effective sparring by refining punching accuracy, timing, and situational awareness.

Working with flat mitts is considered one of the most effective methods for developing both defensive techniques and punch execution. Exercises performed with flat mitts are conducted with progressively increasing dynamics and tempo during movement, making them an integral part of every boxer's training. However, despite their significant advantages, this technique also has potential drawbacks. Specifically, flat mitt work must always be done with a partner, which can sometimes be inconvenient; learning to hold flat mitts properly takes considerable time and is regarded as a complex skill. In conclusion, while flat mitts offer tremendous benefits in boxing training, their effectiveness depends on correct technique and consistent practice.

Self-Assessment Questions

1. What are the main objectives of using flat mitts during boxing training?
2. What types of flat mitts are available?
3. What kinds of fighting stances can be utilized in boxing?
4. How many fighting distances exist in boxing?
5. What are the guidelines for working with flat mitts?
6. What types of punches are there in boxing?
7. What types of defensive techniques are employed in boxing?
8. What common mistakes occur during training with flat mitts?

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CHAPTER III. INDIVIDUAL FLAT MITT TRAINING AS A FORM AND METHOD OF PREPARING BOXERS

3.1. The role and significance of individual training within the overall system of boxer preparation

In modern boxing, unlike in previous years, the primary method of conducting training is the group session, with individual training serving as a methodological tool within the overall training process. It plays different roles and holds varying degrees of importance at different stages of teaching and practice.

Individual training with flat mitts is recognized as one of the most significant methods for teaching and improving the technico-tactical skills of boxers. Historically, individual sessions conducted in the form of conditional-combat interaction with students have been employed to deliver essential knowledge—primarily tactical knowledge. Furthermore, the direct interaction between the coach and boxer during these sessions creates a supportive environment for psychological preparation, helping the athlete mentally gear up for upcoming competitions or specific opponents through targeted communication and guided instruction.

When training young athletes, especially during the process of achieving First Class (I razryad), relying solely on paired drills to master complex material often proves insufficient. Thus, the higher the athlete's qualification, the more they need individual technical-tactical refinement.

A distinctive feature of individual training is the active role of the coach, who acts as a practical opponent throughout each session. Consequently, both teaching and practice reflect the true nature of boxing, occurring in one-on-one scenarios and sometimes under conditions that closely mimic real combat situations.

Only individual training allows the coach to creatively simulate a range of situations with various spatial and temporal characteristics and to imitate challenging opponents with differing fighting styles.

During individual sessions, long-term interaction provides genuine conditions for: Studying the boxer's strengths and weaknesses; selecting suitable teaching tools and methods to correct mistakes; and enhancing tactical techniques through realistic tactical scenarios. Unlike other training formats, individual lessons give the coach a unique chance to immediately correct technical errors in the boxer's actions while simultaneously providing tactical guidance during instruction.

In individual training, the coach teaches the boxer interactive movements typical of actual combat situations. Depending on the athlete's level of preparation, the focus of pedagogical scenarios within these sessions can vary between technical and tactical development.

In fact, for technically focused individual training, it involves refining techniques and movements and identifying and correcting common mistakes made during sparring and competition. On the other hand, the tactical focus primarily aims at developing the skills necessary to defeat an opponent, cultivating rapid tactical thinking, and fostering the ability to achieve tactical superiority in the ring. During conditional sparring, various types of movement reactions are refined, including: reactions to a moving target; inhibitory (braking) reactions; and transitions from one movement to another.

Two pedagogical approaches can be observed in individual training. The first seeks to develop the physical and psychological qualities specific to boxing and certain aspects of character—essentially cultivating combat attributes. This approach can be termed the developmental–educational method. The second approach is instructional, aimed at equipping the boxer with technical-tactical skills, combat abilities, and knowledge of boxing principles and rules governing all aspects of the sport.

In modern boxing, individual training and sparring are deeply interconnected. During a sparring session, the athlete begins to grasp the psychological nature of one-on-one combat, its emotional landscape, and the mental and will-based confrontations that define its essence. However, if the impact of sparring is not harmonized with the guiding and formative influence of individual training, a young athlete's full potential in the sport may remain unfulfilled.

Individual training shapes the boxer, organizing and refining their movements and thought processes, whereas sparring develops the "sense of combat" and encourages independence in the athlete's self-improvement efforts. The integration of these two aspects is vital for nurturing high-level athletes.

The improvement of specific tactical qualities, skills, and abilities is achieved through sparring and targeted exercises during individual training sessions. These exercises are provided in simplified or modified forms, allowing athletes to master tactical tasks assigned by the coach either collectively or individually.

Depending on the lesson objective and the athletes' level of preparation, the coach creates various combat situations in which the

boxer must fully utilize their physical, technical, and tactical abilities. It is both possible and essential for the coach to conduct this work with the student in a focused and goal-oriented manner.

The content of individual training has also evolved: when applied to high-level boxers, it becomes a comprehensive tool for developing technical-tactical preparation, enhancing necessary physical and psychological qualities, and shaping a fighter with a distinct and decisive personality.

During individual sessions, the coach carefully observes the student's performance in both training and competition bouts while developing their technical-tactical skills. Based on these observations and discussions with the athlete, the coach defines the specific content and focus of upcoming individual lessons.

In the training of highly ranked boxers, the individual session becomes the primary form of training. Through it, the coach addresses the complex task of refining the athlete's sports mastery.

Consequently, the psychological aspect of training gains greater significance and begins to influence the content of the individual session. By this point, the coach must have thoroughly studied the athlete—clearly understanding both their strengths and weaknesses—and should have a well-formed vision of how to work effectively with that specific boxer. The coach must know how to leverage the athlete's strengths and, if certain mistakes cannot be fully corrected, how to compensate for or minimize their impact.

Our top coaches use individual sessions to build a psychological and technical bridge to sparring, and through that, to actual competition bouts. The coach leading the individual session must maintain a psychological presence that, in some ways, resembles the mindset of a boxer in a real fight. This is primarily achieved by the coach motivating the student through combat-like actions, gradually encouraging the boxer to respond and engage, thereby fostering the fighting mentality needed in the ring.

During a fight, the student must fully comprehend the situations practiced in training and be able to transition from conditional to real combat scenarios without delay – acting swiftly and effectively without wasting extra time.

While maintaining the group boxing lesson as the primary organizational form for conducting training and educational work, many experts have increasingly begun to emphasize training with flat mitts.

They now view it as one of the leading methods and forms in the entire boxing training process.

Thus, individual training with flat mitts currently holds a prominent position in the training process of highly skilled boxers. Unlike in the past – when individual flat mitt sessions were regarded solely as a means of technical improvement – at this stage, they now serve to address a complex set of tasks related to the boxer's specialized preparation. This versatility of individual flat mitt training clearly distinguishes it from the training methods used by many foreign experts and provides Uzbek coaches a strategic advantage when combined with sparring to help prepare high-level, internationally ranked boxers

3.2. Classification of individual flat mitt sessions in boxing

Despite the significant importance and widespread use of individual flat mitt sessions in the practical work of athletes and coaches, modern boxing literature does not yet provide a sufficiently well-founded classification of these training sessions.

V.A. Oskolkov, while explaining methodological concepts and terms, writes: "Individual flat mitt sessions are conducted in the form of: assessment lessons, instructional lessons, practice lessons, and combat lessons." Similarly, N.F. Agaev, when discussing the types of individual flat mitt training, repeats the categories proposed by the earlier author: instructional lesson, assessment lesson, practice lesson, combat lesson. Additionally, both authors acknowledge one more type – the pre-fight warm-up lesson, specifically designed to prepare the boxer immediately before a match.

V.I. Filimonov, addressing this issue, writes that an individual flat mitt session may have a technical, tactical, or competitive focus, and that free sparring lessons are also suitable for these purposes.

In the 2010 boxing textbook designed for physical education institutes, K.V. Gradapolov offers a slightly different definition of the individual flat mitt lesson. He states that the individual method can be conducted in the following forms: assessment lesson, instructional and improvement lesson; coach's directive and action-based lesson; commentary-based lesson; combat (sparring-like) lesson. This shows the evolving understanding and classification of individual sessions with flat mitts in both theory and practice.

From the summarized literature, it becomes clear that although the aforementioned authors—recognized as leading theorists and experienced practitioners in boxing—share some similarities in their classification of individual flat mitt lessons, there are also notable inconsistencies and contradictions in their views. In our opinion, the main shortcoming of the lesson types described in the literature is the lack of a unified approach to the classification of individual training. There are no clearly defined criteria or parameters for categorizing the lessons. For example, instructional lessons, "silent" lessons, and free sparring lessons are often placed on the same level, even though the latter two could reasonably be considered subtypes of instructional lessons.

Research conducted by M. Usmonov shows that, despite the wide application and importance of individual flat mitt sessions in the practical work of athletes and coaches, modern boxing literature still lacks a well-substantiated classification of these lessons.

Interviews conducted between 2019 and 2021 with leading coaches in our country reveal that most of them lack a clear and unified approach to this issue. Besides the lesson types listed in the literature, the coaches also mentioned other forms, types, and styles of individual training – such as theoretical analysis sessions, demonstration-based lessons, and more. All of this indicates that the forms of individual flat mitt sessions used in practice have not yet been fully systematized or provided with a sufficiently grounded classification.

In addition to analyzing the literature and conducting surveys among coaches, M. Usmonov also carried out pedagogical observations of individual flat mitt sessions conducted by various coaches. This allowed for a broader understanding of the typical groups of individual flat mitt sessions used in boxing practice and presented a more structured classification of these sessions.

It is important to recognize that individual flat mitt training can serve two roles in a boxer's training process: as a teaching and improvement method within group lessons, and as an independent form of organizing training. In the first case, the methodological techniques of individual instruction serve a supportive role and can be effectively applied with beginner boxers who are just starting their training.

With ranked (razryadli) athletes, the role of individual methods increases significantly. In this context, individual training becomes an equal, and often a dominant, method among other specialized teaching techniques used in group training. However, it is important to note that

not all individual flat mitt sessions are independent in terms of content or duration—they are often linked to group training, aligning with its overall and specific objectives.

Individual flat mitt sessions, when employed as an independent form of training, are most commonly applied with athletes who have reached a higher level of sports mastery. By scheduling these sessions at different times for each student, the coach works individually with each athlete. In this structured pedagogical process, there are only two participants: the coach and the athlete.

However, individual flat mitt sessions—when applied as an independent training format—are rarely conducted in a "pure" form. More often, they are combined with self-directed work assigned by the coach. These sessions typically do not occur separately from the team; rather, they take place within an organized training schedule.

The main difference between this mixed organizational form of training and a typical group boxing session is that the coach addresses individual, personalized tasks for each athlete, strictly following individual training plans. In contrast, during a group training session, the content and workload are determined for the entire group as a whole, although this does not exclude individual approaches towards students within the group setting.

In the mixed form of organizing training, the coach addresses the assigned objectives not only through individual flat mitt sessions but also by providing personal tasks to promote the athletes' independent creative activity. These may include heavy bag drills, coach-assisted exercises, training, and competitive sparring, as well as other related tasks. Throughout the entire training process, the coach maintains their role as the personal guide and supervisor. This organizational form—combining individual sessions with independently completed tasks based on the coach's instructions—has become the primary method for developing the sports mastery of highly skilled boxers.

Thus, individual flat mitt sessions are utilized in the overall system of boxer training in the following ways:

1. As a specialized method within group lessons. Here, individual training with flat mitts is integrated in both content and timing with the objectives of the group session.

2. As an independent form of training organization. In this case, the flat mitt session functions as a completely individual instructional-

practice session, where the coach works with one athlete at a time to address specific tasks.

3. As a mixed form of training organization. This combines individual instruction with independent athlete activity based on the coach's guidance, incorporated within a broader training session.

In the process of individual flat mitt training, it is customary to distinguish between two types of activity: on the one hand, the coach's actions, on the other, the student's actions. These two types of activity are interconnected during the session but differ in their specific roles and objectives. In any flat mitt session, the student responds to the coach's instructions, tasks, or non-verbal signals—some are predefined, while others are improvised and based on the situation. Thus, an individual flat mitt lesson is a multifaceted, creative process of close interaction between the student and the coach. For this reason, the classification of flat mitt lessons should be developed with full consideration of both the content and the methods used in delivering the session (see Figure 53).

The content of individual flat mitt lessons depends on the general and specific objectives set for the session. These objectives reflect the dominant focus of the lesson, which typically aligns with one of the key aspects of specialized preparation, such as technical preparation, tactical preparation, physical preparation, volitional (willpower) preparation, and psychological preparation. These aspects of a boxer's training are always addressed during individual sessions, but the degree of emphasis on each varies depending on factors like the training period, the athlete's skill level, and the current stage of preparation. Therefore, when classifying individual flat mitt lessons, it is crucial to determine whether the session primarily focuses on one leading area of preparation or has a combined (mixed) orientation.

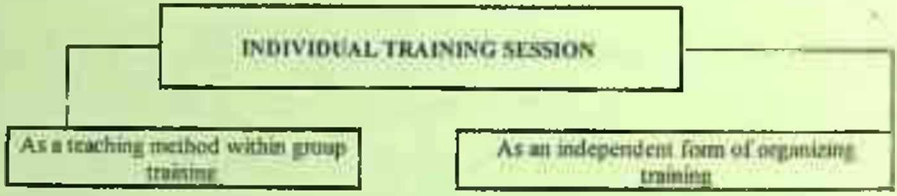
In boxing practice, individual flat mitt sessions can also aim to develop the athlete's professional pedagogical preparation. These sessions are designed to cultivate specialized knowledge, skills, and competencies in the technical aspects of individual coaching and to help athletes learn and practice designing and implementing tactical scenarios during training. Such sessions prepare athletes not only as performers but also as future coaches or instructors.

Such training sessions are commonly found in specialized programs at physical education and sports universities, during coaching seminars, and in other professional development settings.

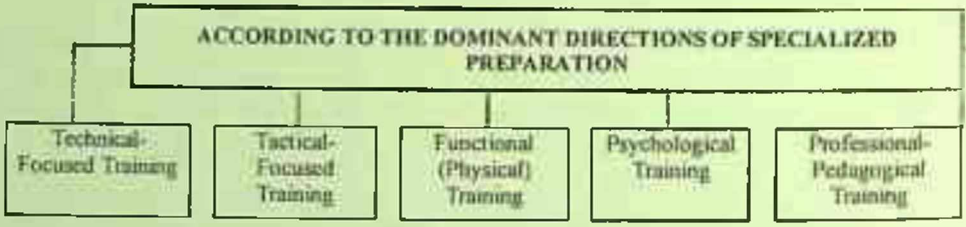
Thus, we have grouped all individual flat mitt lessons primarily according to which aspect of the boxer's specialized preparation they predominantly aim to develop.

In advancing individual flat mitt training methodology, we have also identified other approaches to classifying these sessions. One of these classification approaches is based on the pedagogical orientation of the individual flat mitt session. This principle is closely linked to the stages of teaching and improving a boxer throughout their athletic development. Based on this approach, individual flat mitt lessons can be categorized as follows: instructional lessons, assessment (checking) lessons, practice lessons, combined instructional and improvement lessons, and demonstrative (model) lessons.

Studying and generalizing advanced practices allows for systematically organizing the objectively existing and widely used variants of individual flat mitt lessons in boxing according to uniform principles. This classification approach prevents the use of unnecessary terms and concepts, ensuring clarity and practical applicability in the boxing field.



FIRST CRITERION



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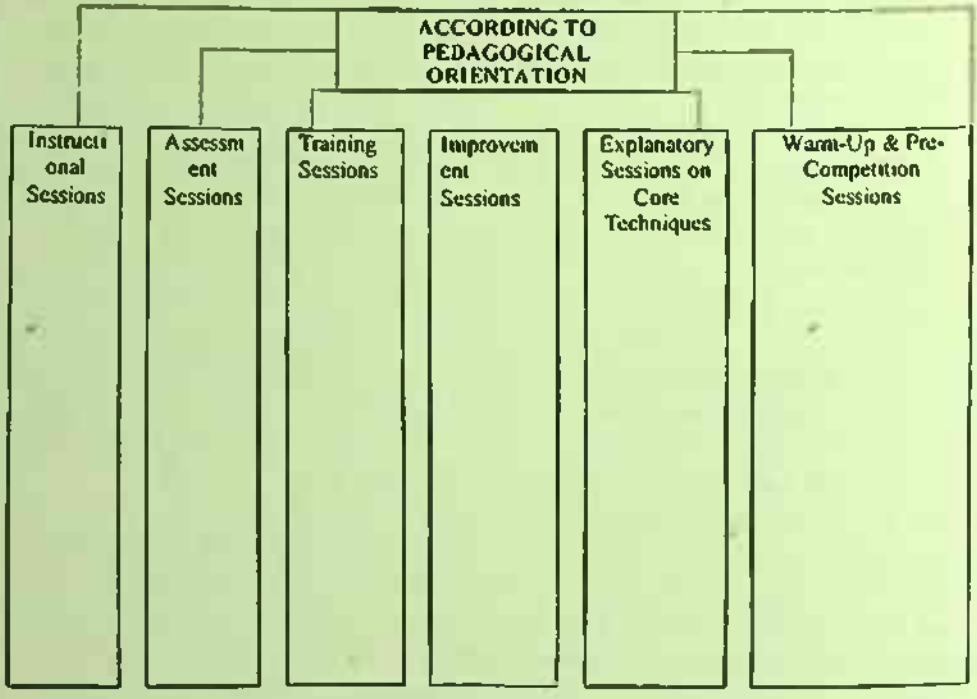

THIRD CRITERION

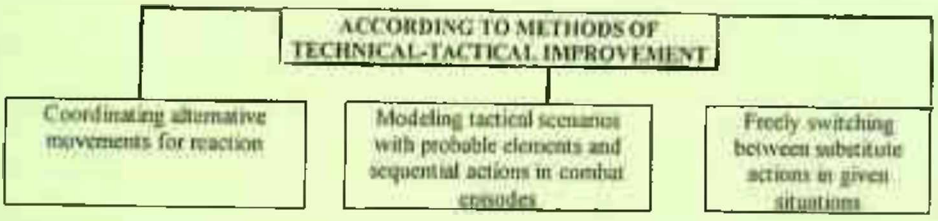

Figure 53. Classification of individual lessons with flat mitts in boxing

It is advisable to categorize individual lessons with flat mitts based on the methods used to conduct them, specifically considering the nature of guidance provided to the student during the training process. Accordingly, individual lessons with flat mitts may be conducted through commands, assignments, cues and signals, or tactical and psychological reasoning.

3.3. Main directions in the development of modern methodology of individual lessons with flat mitts

In the process of developing individual lessons with flat mitts as a specialized form and method of boxing training, certain instructional approaches have emerged. At this stage, the methodology is founded on general principles of didactics and sports training. It comprises a system of various tools, rules, methods, and techniques specific to this sport. The analysis of literature on boxing produced by both domestic and international scholars allows us to conclude that the methodology for individual lessons with flat mitts has evolved along several primary directions. Before briefly analyzing these directions, it is essential to note that this division is conditional, as these directions are interconnected and collectively represent the overall system of boxing training. The first direction mainly pertains to the examination of theoretical principles, which include the types of individual lessons with flat mitts, their structure and organization, the relationship between individual lessons and other training forms, and related issues. These developments are briefly delineated in educational and methodological literature and are primarily presented in the theoretical sections of methodology. Many of these authors also emphasize the educational impact of individual lessons with flat mitts on trainees. A.N. Abdiyev acknowledges that individual lessons with flat mitts enable the coach to exert consistent and broad influence on the student, helping in the development of both general and

specialized intelligence, as well as promoting a positive attitude toward sports activities. The second direction in developing the methodology for individual lessons with flat mitts pertains to how educational material is presented—that is, the exposition of specialized training methods used by the boxer to achieve the technical, tactical, and other objectives set during the lesson. This methodology is often described in the literature through schematized exercises that outline the coach's sequential actions and the boxer's movements when executing specific combat techniques. This method of conducting individual lessons is widely employed. Despite the similarity in the form of presenting exercises, the content of both the coach's and the boxer's actions has varied based on the distinct challenges faced by boxing during different periods. Several authors have adopted a different format to present the content of tools used in individual sessions with "flat mitts." Rather than using a schematic format (coach's actions – student's actions), they have chosen textual descriptions. This method of explaining combat movements in the lesson is clearer and more easily understood by students. The third direction—the development and systematization of methodological techniques for individual instruction—began to advance after Uzbek boxers emerged onto the prestigious international stage. In this context, individual sessions with "flat mitts" took a central role in the overall boxing training system. This methodological direction was developed by specialists from the Uzbekistan State University of Physical Education and Sport, A.N. Abdiyev and F.K. Turdiyev. In their work, they systematized the core methodological techniques of individual boxing sessions to enhance the trainees' technical and tactical abilities. From this standpoint, F.K. Turdiyev's work is particularly noteworthy, illustrating the methodological techniques of individual sessions with "flat mitts" by demonstrating and practicing specific combat movements in boxing. The fourth direction in the methodology for individual sessions with "flat mitts" pertains to the coach's ability to imitate movements using the mitts. In boxing practice, this individual skill of the coach is commonly referred to as the coach's technique. Therefore, conducting individual sessions with "flat mitts" requires the coach not only to have general theoretical knowledge but also specialized skills and competencies. Many experts in boxing emphasize the significance of the coach's technique during the implementation of individual sessions with "flat mitts."

Self-Assessment Questions

1. What is the significance and role of individual lessons in the overall training system for boxers?
2. Classify the types of individual lessons conducted with "flat mitts."
3. What are the main directions in the development of modern methodology for individual lessons with "flat mitts"?
4. What are the criteria for individual lessons?
5. What types of lessons exist based on the pedagogical orientation of individual sessions?
6. What specific mistakes can occur during training with "flat mitts"?
7. What exercises performed with "flat mitts" are you familiar with?
8. Provide information on using boxing "flat mitts" to develop a boxer's specific reaction skills.

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CHAPTER IV. METHODOLOGY FOR DEVELOPING A COACH'S SKILLS AND COMPETENCIES

4.1. The coach's professional and pedagogical activities in individual flat mitt training.

In the sport of boxing, individualizing technical and tactical development is considered a distinctive feature of training. This requires the coach to ensure appropriate interaction with trainees during the instructional process and places strict demands on the coach, particularly regarding their skills and professional competencies.

It is well known that teaching motor actions consists of three stages: Initial instruction, during which the fundamentals of technique are acquired; Deepened learning, which involves reinforcing those fundamentals and learning finer details; and Improvement, which continues throughout the athlete's competitive activity. If the objectives of instruction differ at each stage, then the methodological approaches to using flat mitts with boxers should also vary accordingly. As competitions approach, the process of technical improvement during one-on-one training must occur under conditions of resistance provided by the coach.

During the initial stage of training, when mastering the basic techniques, the time a coach can dedicate to working with each trainee using flat mitts is very limited due to the large number of trainees in the group (15–20 people). In the later stages of instruction, when the focus shifts to individualizing technique and developing variations, the number of trainees per group is reduced, and the number of training hours increases, allowing the coach to work more closely with trainees using flat mitts. At this stage, training is usually conducted under ideal, simplified conditions where nearly every strike lands successfully. If this approach is utilized well before competition—aimed at reinforcing techniques in a low-pressure environment—it can be beneficial. However, in real competition conditions, most punches do not land accurately. The paradox is that, as competitions approach, the nature of training itself remains unchanged—only the training volume increases. Why does this happen? In our opinion, the reason is psychological. The coach believes that the closer the competition, the more attention the athlete requires. This attention is most clearly expressed through time spent working with the athlete using flat mitts, as it is the most direct and personal form of engagement.

When practicing series of punches or combinations of punches and defensive movements, the coach often positions the flat mitts right under the punches (i.e., "feeds" them), creating a comfortable environment where the athlete has no choice but to deliver continuous punches. From the outside, this may appear as if the boxer has perfectly mastered the technique. Later, however, when the athlete attempts to reproduce this memorized combination during a match, under the resistance of an opponent, they often struggle to execute part of the whole movement, leading to the breakdown of the entire combination. This occurs because, in real match conditions, the efficiency coefficient of attack usually does not exceed 15–20%, and resistance from the opponent (blocks, counters) can arise at any moment and disrupt the movement. What conclusion can we draw from this? There are two main approaches: First, adjust the timing: shift the main volume of work with flat mitts to the pre-competition mesocycle, and then gradually reduce that volume while replacing it with more specific exercises (like conditional and free sparring). In this context, selecting appropriate sparring partners before the competition becomes critically important.

Second, which complements the first, is to modify the method of using flat mitts as the competition approaches:

a) Introduce elements of unpredictability, such as not always placing the mitt under the punch to demonstrate that punches can miss, provide unusual starting positions for attacks or defensive moves. However, this method increases the risk of injury for both the athlete and coach and must be used with caution.

b) Simulate the specific opponent on the mitts (if the opponent is known) to prepare the athlete for that style.

To fully utilize the potential of working with flat mitts, the coach must move around the ring and correct the boxer's mistakes not only verbally but also through counter-movements during the drill.

From the very first opportunity, it is necessary to take advantage of the mistake of a boxer who attacks unnecessarily and forgets about defense by simulating a counterattack.

Finally, for the boxer to learn how to deliver accurate and timely punches to the opponent, the coach does not always need to keep the flat mitts ready and stationary. While moving around the ring, the coach should give the boxer unexpected tasks and expose the flat mitts for only a brief moment.

The more diverse these tasks are, and the shorter the time allowed to complete them, the more a boxer's skills improve.

The presence of mistakes during boxing training suggests that some skilled boxers, despite showing excellent qualities while working with flat mitts, seem significantly weaker in actual combat situations.

In training with ranked or master-level boxers, the most important aspect is not just developing punches but also refining them, mastering more complex punches and exits (without missing punches), and working at close, mid, or long range. However, success here also depends on how the coach uses the flat mitts and how effectively they are applied.

The continuous improvement of a boxer's level requires the coach to apply an individual and creative approach to the athlete, as well as to comprehensively refine both the technique and tactics of working with equipment, including the flat mitts.

Individual training in boxing is characterized by a large number of complex, coordination-demanding techniques and movements specific to this sport, along with challenges in executing them with speed and precision in one-on-one combat situations against various types of opponents.

When one-on-one combat is structured based on methodological conditions, the coach in individual lessons has the opportunity to establish the most optimal spatial and operational interaction with the athlete. Thus, during an individual lesson, the coach acts as both teacher and partner, creating various scenarios for the technical and tactical improvement of the trainees through their own actions.

In such a lesson, the coach not only continuously monitors the athlete's movements, including their various phases and final positions, but also has the ability to complicate or simplify the beginning or end of an exercise, as well as to modify the distance, movement amplitude, and speed, when necessary.

Lessons conducted using the flat mitt are, in a certain sense, a clearly expressed form of creative work. In this context, the coach and the student gradually increase the demands on executing refined offensive and defensive actions, contrasting with other methods of organizing a lesson. Meanwhile, the coach ensures the athlete's broadly specialized movement techniques while allowing for rapid adjustments to the level of the material being studied.

Training with the flat mitt enables the coach and the student, within a certain time frame and depending on their efforts, to teach a greater

number of athletes, improve movements, and address various pedagogical tasks related to skill development and training.

In training with the flat mitt, the effectiveness of the tools and methods used to achieve technical and tactical improvement relies on several methodological components. These include the coach's movement technique, the precision of their responses, adherence to optimal distance and positioning of the hands and body, and virtually all elements that reflect the athletes' level of preparation.

Success in teaching boxing often depends on the coach's pedagogical competence, consisting of their knowledge, skills, and abilities. With these, the coach can influence the student, ensuring the transmission, reinforcement, and improvement of technique and tactics. This also encourages the student's active participation, fosters key qualities, and supports their functional preparedness.

The coach's specialized movement technique when training with flat mitts typically differs from the athlete's own sport technique. In this regard, the quality of the coach's movement plays a crucial role in promoting the boxer's technical development. Moreover, the coach's actions possess both conditional and unique characteristics.

A boxing coach's ability to act pedagogically and realistically—simulating actual fight conditions—ensures the student's safety, supports proper mastery of technical fundamentals, and enhances the ability to apply tactical variations. It also accelerates the development and specialization of key athletic qualities.

The coach's specialized competencies in individual boxer instruction include: demonstrating techniques and movements tailored to different opponents; executing preparatory actions for attack using hands, feet, and body; performing attack and defense movements and their combinations; creating a variety of situational scenarios that help the student practice specific movements or combinations in a given or hypothetical sequence to solve tactical tasks.

Many situations arising from the coach's interaction with the student—whether relating to refining techniques or creating conditions for applying movements—tend to become more complex during pair drills. This complexity arises because, in such exercises, the partner (or opponent) is typically trained to provide more 'resistance.' Additionally, the coach requires a certain level of knowledge and practical experience to simulate competitive scenarios using their own movements. By employing preparatory attack and defense actions, adjusting between

medium and long distances, alternating initial and final positions, deflecting attacks (or counterattacks), and applying straight, semi-circular, and circular defensive techniques, the coach generates a variety of realistic tactical situations.

During bouts, the coach counters attacks (or responses), performs return (counter-return) actions, and adjusts the intensity to that of a real match.

In boxing training, the process of working with the coach using flat mitts adheres to widely accepted principles for individual instruction and improvement.

Although group instruction offers several advantages—such as providing favorable conditions for mastering specific techniques and ensuring consistent monitoring of all trainees by the coach—it also has distinct drawbacks. The primary issue is that, while coaching groups, the coach cannot effectively manage the process of mastering technique execution.

It is during one-on-one work with a boxer that the coach can quickly assess the quality of technique execution and give specific, immediate feedback regarding shortcomings in skill acquisition.

When a coach teaches a boxer technique directly using mitts, the results can be even more effective. However, this method is usually suitable for relatively young coaches who have recently participated in competitions. Generally, using flat mitts for individual instruction in boxing requires several conditions, such as the coach's age, physical mobility, and ability to control the intensity of the trainee's movements. The successful development of a boxer's technique and tactics also heavily depends on their psychological traits and specialized senses, including distance awareness, spatial orientation in the ring, timing, tactical thinking, and reaction speed.

These qualities are nurtured in the athlete via specific pedagogical techniques during training sessions. When using flat mitts, the coach places the boxer in particular scenarios that serve as signals for delivering punches or combinations. The coach utilizes the flat mitts to indicate incoming punches from opponents, prompting the athlete to respond with defensive moves (or counter-defensive punches). Drills where the boxer first delivers combinations to the flat mitts, then, at the coach's command, quickly shifts distance and transitions to defense, and ultimately resumes attacking, are among the most effective.

While developing athletes' response speed, the coach instills in them the ability to differentiate between cues—such as commands, gestures, punches, and openings. The exercises are characterized by sudden changes in conditions and differ from actual movements of opponents in terms of size and intensity since the coach is physically unable to provide full resistance to the athlete. Furthermore, when simulating opponent actions through signals, the coach must also prioritize injury prevention. Therefore, the coach's methods, reflecting their level of preparation, possess an objective nature and necessitate systematization to improve training methods and the professional development of specialists in individual combat sports.

4.2. Specialized skills of a boxing coach in conducting individual training with flat mitts

The success of individual combat athletes in competitions largely depends on the effectiveness of efforts aimed at consistently improving the training system. Within this training framework, individual lessons occupy one of the most critical positions. The coach's role in individual training represents a unique form of pedagogical practice that distinguishes it from other formats within the training process. This role necessitates acquiring specialized skills and competencies, as they enable direct interaction with the athlete and simulate competitive situations.

Analysis of data from a questionnaire conducted by F.K. Tuvliyev among highly qualified boxing coaches confirms that individual training plays a leading role in developing boxers and enhancing their technical-tactical proficiency.

It is essential to emphasize that as a boxer's skill level increases, the proportion of individual lessons in their training regimen also rises. This is supported by the fact that 75.4% of highly qualified coaches believe individual lessons to be pivotal in athlete preparation. Moreover, the higher the athlete's training level, the greater the importance of individual sessions becomes.

As competitions approach, the proportion of individual flat mitt training in the weekly training cycle nearly doubles. This increase is due to the fact that, as competitions near, individual flat mitt sessions emerge as the most effective method—alongside other teaching techniques—for refining technical execution and honing tactical movements.

In individual lesson practice, there are two main options for finishing attack movements:

a) to the head

b) to the body. Most coaches responded to the given question by stating that they require their trainees to finish attacks with a punch to the head. In an individual session with athletes of different skill levels, a boxing coach must demonstrate a wide range of movements and strive to realistically and accurately recreate one-on-one combat situations against potential opponents. Therefore, coaches find it reasonable to prioritize pre-planned movements in the organization of technical-tactical training types. Subsequently, spontaneous (improvised) movements take their place in training.

Coaches' responses regarding modeling unexpected situations during different parts of the lesson show that only a small portion of those surveyed support this approach. In the middle and at the end of the lesson, such situations are modeled at low rates by 42% and 51% of coaches, respectively.

In individual training sessions using flat mitts, the initiative during the enhancement of attacks plays a significant role in training the athlete. If the initiative lies with the student, then the improvement of attacks makes up 90% of actions during the flat mitt session. If the initiative is with the coach, this figure drops to only 10%. This can be explained by the fact that the coach's movement technique has its own specific characteristics and does not always fully correspond to the boxer's movement technique. This is due to specific objective reasons limiting the coach's ability to perform attacking actions.

In individual training, the process of teaching and improving boxers' technical and tactical movements involves alternating between attack and defense actions. Boxers' competitive activity is characterized by performing defensive and attacking actions at close, mid, and long range. In practice, most coaches teach and refine defensive actions primarily from close and mid-range distances. For 87% of specialists, conducting individual sessions using flat mitts during training is a standard method for teaching and enhancing attack actions at mid and long range.

An analysis of the methods employed to create unexpected situations during individual flat mitt sessions indicates that coaches utilize the following techniques for this purpose:

a) unexpected approaches – 91%

b) retreats – 98%

c) body bending and twisting – 44%

Consequently, during an individual session, the coach's ability to create varying conditions that mimic competition scenarios is essential for technical and tactical preparation. It is clear that coaches implement unexpected movements and alternate between different types of actions. This practice cultivates a constant state of readiness in boxers to respond effectively in unforeseen situations.

A notable characteristic of a boxing coach conducting individual sessions with flat mitts is the need to maintain a combat stance and technical precision in specific movements over several hours of training.

Therefore, according to 58% of experts, the most suitable initial stance for trainers is standing upright; 33% prefer the classic combat stance, while 9% of coaches favor a starting position with slightly bent knees. Individual training with flat mitts is regarded as a complex process for teaching and enhancing various technical-tactical movements in athletes. Alongside basic single punches, advanced offensive and defensive combinations are also employed. According to 39% of coaches, the most effective combinations are direct punches to the head with a right–left hand sequence. 21% of coaches find the combination of direct right–left punches to the head and counter punches effective. 17% of experts prefer a right-hand hook to the head followed by a left uppercut to the body. 12% consider right–left uppercuts to the body effective, while 5% assert that right–left uppercuts to the head are the most effective. Only 6% of coaches implement complex offensive movements that involve transitioning to defense and then resuming the attack. This imposes high demands on both the coach's and athlete's technical and physical readiness.

Thus, during individual sessions, the coach's movements—when compared to those of the athlete—are marked by displacement and specific movement techniques with flat mitts, as well as by common errors that can hinder the development of sports mastery.

Acknowledging the critical role of individual sessions in the technical-tactical advancement of high-level boxers, the foundation of the coach's movements comprises model-based quantitative ratios between generally accepted positions of the torso and legs, range of motion, levels of preparedness for executing these movements, the creation of spatial barriers, and methods for modeling unexpected situations.

4.3. Means and methods of technical-tactical improvement of boxers in individual sessions

Depending on the specific objectives, stage of preparation, and composition of the group of athletes, training sessions can focus on instruction, practice, or competition simulation. Instructional sessions typically aim to master the structure of offensive and defensive movements under relatively simple conditions. Practice-oriented sessions focus on enhancing movement skills and tactical abilities, as well as developing the physical and psychological qualities necessary for effective performance in bouts. These sessions usually emphasize technical aspects, where various techniques and their combinations are repeated many times. However, they also have a tactical orientation, with the main focus on refining the ability to act in a variety of situations. In training bouts, the following tasks are addressed: developing tactical thinking, enhancing the ability to quickly assess emerging situations, creating advantageous tactical scenarios, and improving the skills necessary to effectively utilize those scenarios through appropriate actions. During the individual training process, the coach collaborates with the athlete to tackle various tasks related to improving technique and tactics. In doing so, the coach employs different methodological approaches, which may emphasize mastering technique or enhancing tactical skills and competencies. Additionally, in the practice of teaching combat sports, a single methodological approach can simultaneously address the development of technique, tactics, and the interconnected manifestation of motor and psychological qualities. Depending on the specific tasks during different training phases or individual lessons, a particular aspect of athletic development may be prioritized and better assimilated by the athlete. Initiating an exchange (attack) significantly shapes the combat situation; it can both simplify and complicate the execution of techniques and movements, and it holds independent tactical importance for all combat tools. However, executing punches, movements, and attacks at the athlete's own initiative is generally much easier than performing those same techniques in response to a coach's signal. The analysis of training practice indicates that the pedagogical tasks aimed at improving conditioned movements focus primarily on refining the characteristics of hand and foot movements: the initial and final positions of the hands, torso, and legs during mutual actions in sparring; eliminating unnecessary movements; and achieving specific spatio-temporal parameters such as speed, rhythm, amplitude, direction,

and penetration. Athletes' ability to perform movements, especially selecting actions and transitioning between movements, depends on their individual movement speed and initial distance. Therefore, movements should be executed at such a speed and from distances that allow timely interaction with the coach and help maintain the quality of hand movements and footwork coordination. The best results arise from increasing movement speed and decreasing distance during sparring. These results develop alongside improved accuracy of complex reactions and higher technical mastery of movement patterns. As technical skills and combat actions are progressively mastered, training becomes increasingly complex, with greater demands for maneuvering and deepening attacks. The coach's movements concerning spatial-temporal dimensions must create conditions that closely resemble combat situations. Therefore, both simple and complex attacks should be executed quickly, with forward penetration, and in unexpected directions. Feint movements, in particular, must be performed with noticeable and high speed. The duration of hand movements should consist of at least three to four tempos. Preparatory approaches should involve more penetrating movements, and hand-based preparatory actions must have a large amplitude and a clearly noticeable initiation. Approaches and retreats must be executed distinctly concerning speed and degree of forward movement. The coach's movement amplitude, speed, and frequency with the flat mitts, along with the pace and depth of shifts, must align with the objectives of enhancing movements and the conditions in which those movements are utilized during actual fights. During a bout, boxers may respond inappropriately to unexpected moves or subtle details of the opponent's actions, even when there's no real risk of defeat. Such tendencies result in variations in the structure and characteristics of the movements being performed.

The defender's unexpected approaches, retreats, dodges, torso twists, and changes in the depth and speed of retreats all act as obstacles that complicate the selection of appropriate defensive actions. These movements create uncertainty in the spatial and temporal dimensions of responses. Approaches, attacks, tactical tasks, and preparatory or actual offensive actions that do not align with the expected spatial and timing characteristics of movements hinder the delivery of precise counteractions during execution.

Developing endurance against obstacles occurs in individual lessons using situations and movements that feature incompatible spatial and

temporal characteristics. These are achieved through the coach's exaggerated, broad movements with flat mitts and deep advancements.

The coach's actions limit the athlete's ability to respond quickly and accurately, either shortening or extending the available time for successful execution. Therefore, the coach's movements must meet specific requirements.

During the athlete training process, the coach employs a wide range of tools and methods in individual lessons to create various external and internal "obstacles" or barriers. These include competitive drills and lesson scenarios in which the coach actively resists the athlete's movements and creates barriers through interactions with the hands. All of these aim at technical-tactical improvement and developing the willpower qualities essential for elevating mastery levels.

In boxers' technical training, it is advisable to combine two or more movements into a single drill or to complicate the refinement of specific techniques by unexpectedly continuing the exchange. Combinations consist of combat attacks, counter-defenses, direct offensive responses, and interconnected counterattacks.

Typically, these are structured as triple or quadruple drills. However, combinations can also include a larger number of conditioned movements. What matters most is to avoid uniformity in movement selection.

In one-on-one combat, the ability to foresee the course of the upcoming bout within a limited time, identify the tactical meaning of movements, plans, and situations, make decisions, and monitor the appropriateness of the applied actions—this defines the athlete's tactical thinking in individual combat—is considered crucial.

An athlete must be able to independently analyze the opponent's movements, understand their purpose and the intent behind each action, and accurately identify mistakes and ways to counter them. Such exercises include attack drills that are independently selected and tailored based on the opponent's defensive readiness.

Imagination is a quality essential for every boxer. In the process of sports training, developing and improving imagination occurs in parallel with increasing the complexity of pedagogical tasks, extending the duration of combat bouts, and technically complicating techniques during lessons. For example, the more challenging the task, the more precisely the boxer must envision the path of their fists while performing it. Otherwise, unintended collisions with the opponent may arise, resulting

in the failure to achieve the desired outcome of the technique. Well-developed imagination significantly broadens a fighter's tactical outlook during a bout, enabling quick selection of the most appropriate technique for the situation and its technically correct execution (deceiving the opponent's complex movement system).

In conclusion to the analysis of methods for improving boxers' technical and tactical skills during individual lessons, common pedagogical tasks for conducting exercises in such sessions can be identified. The most prevalent among them are:

- Improvement of individual techniques and the sequential execution of conditioned movements;
- Refinement of movement techniques, conditioned attacks and counterattacks, as well as combinations involving impromptu defenses executed through selected direct responses (or counter-responses);
- Enhancement of actions that require selecting and transitioning from one movement to another, alongside increasing resilience against visual obstructions;
- Improvement of tactical scenarios that start with the athlete's preparatory actions (attack, defense, response, counter-response) and conclude with a transition to another action based on the opponent's (coach's) possible sequence of responses during the bout;
- Development of integrated drills that involve two or more alternating actions performed within a single exercise under typical combat conditions;
- Refinement of action selection and assessment of the adequacy of their execution technique based on the coach's verbal instructions or tactical reconnaissance cues, utilizing imagination and visualization skills during individual boxing lessons.

The analysis of specialized literature regarding the improvement of boxers' movements reveals that the main principles of the individual training method are primarily developed from the generalization of prior experience and practice. Furthermore, these principles are often constrained to mere descriptions of training types and methodological techniques for enhancing combat movements.

4.4. The structure and direction of methods and movements used by boxers during individual training with the coach using "flat mitts"

The boxing coach' s role encompasses unique and specific characteristics, one of which is the ability to model combat (competition) situations in line with specific training objectives. In this process, the coach' s motor activity displays a limited range of operational components. An analysis of specialized scientific and methodological literature indicates that the movements executed by coaches during individual training using "flat mitts" have not been systematically classified or fully categorized. Nevertheless, the coach' s capacity to anticipate and manage competitive scenarios is directly influenced by the extent and quality of individual work with the athlete.

The examination of the structure and direction of movements performed by highly skilled boxers during individual training with the coach using "flat mitts" reveals that these movements comprise three primary components:

1- Preparatory movements;

2- Offensive (attacking) movements;

3- Defensive (protective) movements (see Figure 54).

The provided data clearly demonstrate that during individual training sessions with the athlete using "flat mitts," the coach' s actions are primarily aimed at enhancing offensive (attacking) movements, which represent approximately 53.5. 5% of the overall volume of movements performed.

The effectiveness of a boxer' s competitive performance predominantly relies on the execution of active offensive movements. The data presented also correlate with the outcomes observed in boxers' actual competitive performances.

It was found that the volumes of preparatory and defensive movements during training sessions do not vary significantly, as these types of movements hold roughly equal importance in boxers' competitive performance. Furthermore, during individual training sessions with "flat mitts," the movements focused on enhancing the boxer' s preparatory actions for attack account for 24. 9%. Meanwhile, the volume of defensive movements executed by the athlete, contingent upon the coach' s activity, constitutes 21. 6%. This does not entirely match the results of the analysis of competitive performance in highly skilled boxers.

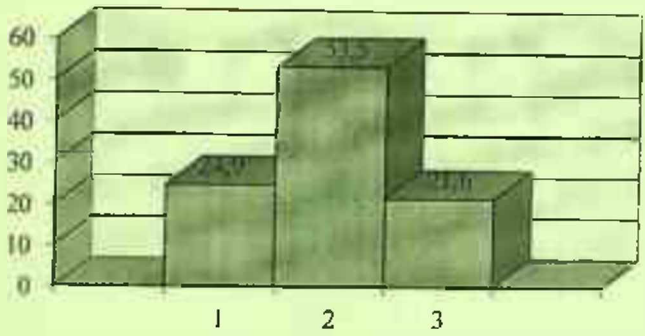

Figure 54. Volume of movement types used by highly skilled boxers during individual sessions with the coach using "flat mitts"

Legend: 1 – Preparatory movements for attack; 2 – Offensive movements; 3- Defensive movements.

It should be emphasized that defensive movements in a boxer's competitive performance are crucial. However, the limited volume of operational movements performed by the coach does not allow for a comprehensive modeling of competitive situations; the relatively low number of these movements is directly related to this limitation.

Research conducted by F.K. Turdiyev has shown that a boxing coach, during individual sessions with "flat mitts," should focus more on enhancing the athlete's movements related to defense and preparation for attack. The more frequent use of preparatory movements for attack compared to defensive movements can be attributed to the fact that the effectiveness of offensive actions is closely tied to the preceding preparatory movements.

The data suggests that a key aspect of a boxing coach's activity during individual training sessions with the athlete is activating the boxer's offensive (attacking) movements.

Preparatory movements for attack occur directly before offensive or defensive actions. These include reconnaissance, feinting, and maneuvering movements. The data obtained from analyzing athletes' movements during individual training with the coach using "flat mitts" are presented in Figure 55.

It is evident that movements with a deceptive nature make up a large proportion — 79.7%. This can be explained by the significant role that deceptive actions play in assessing the effectiveness of conducting a bout.

Deceptive movements include feints (which provoke the opponent to strike or open up space deceptively) and fake (light) punches.

Deceptive strikes serve two main purposes:

a) to provoke the opponent into active movement in order to identify their fighting style;

b) to distract the opponent and divert their attention from the boxer's actual offensive and counter-offensive tactics.

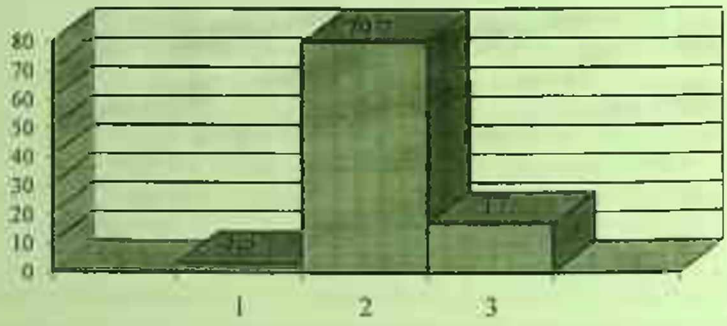

Figure 55. Volume of preparatory movement activities for attack performed by highly skilled boxers during individual sessions with the coach using "flat mitts"

Legend: 1 – Reconnaissance movements; 2 – Deceptive movements; 3 – Movements with maneuvering characteristics.

In the total volume of preparatory movements, dodging (bending to the right and left) accounted for the largest share—63.6%. Next were ducking movements—16.3%, which are often combined with other techniques, followed by deceptive punches—10.5%. Other types of deceptive movements made up 9.6%. The volume of maneuvering movements represented 17.0%. These movements are performed using shifts and defensive techniques to select a favorable starting position and the right moment for active movement. Depending on tactical objectives, they are classified into distance-based, positional, broad, and flank maneuvers. It was found that long-distance maneuvering movements, which involve defending and attacking from a distance through retreating (to the sides and backward) and stepping sideways while turning backward, left, or right, account for 48.8% of the total volume of maneuvering movements. Notably, backward movements by the athlete make up the largest portion—43.4%. The next most frequent were side-steps (side-stepping) and backward retreats, comprising 20.6% and 17.0%, respectively. Other types of long-distance maneuvering

movements accounted for less than 20%. Flank maneuvering movements made up 29.0%. These include driving the moving opponent (in this case, the coach simulating the opponent) toward the ropes and corners of the ring, limiting their movement by combining forward and lateral steps with the threat of punches. It's worth emphasizing that movements such as shifting and retreating to the side are frequently used in practice, accounting for 52.7% and 27.5% of the total volume of flank maneuvering movements, respectively. The volume of maneuvering movements constitutes 22.6% of all movements with maneuvering characteristics. Among forward maneuvering actions, performed with defensive techniques such as blocking, bending (dodging), ducking, and combined defenses to close the distance or push back an aggressively advancing opponent, forward shifts are the most commonly observed, comprising 75.2%. Reconnaissance movements represent 3.3% of total preparatory movements for attack. These movements are crucial in a bout, as they identify the opponent's preferred combinations, effective striking distance, individual fighting style, physical preparedness, and more. Reconnaissance is carried out through feinting and active engagement during the bout. However, as noted earlier, the nature of individual training sessions with "flat mitts" between the coach and the athlete does not allow for fully modeling real competitive situations. Therefore, it was determined that during individual training sessions with the coach using "flat mitts," movements aimed at improving deceptive techniques are very important among the preparatory actions performed by highly skilled boxers. The data obtained from the analysis of the explosive offensive movements of highly skilled boxers during individual training with the coach using "flat mitts" are presented in Figure 56. It is clear that these movements include both simple and complex attacks. In boxing, attack is one of the primary combat tools serving various tactical purposes. Attacks form the foundation of a boxer's fighting style and serve as the main means within offensive actions. They are conventionally divided into simple and complex attacks. Simple attacks consist of single or double punches, while complex attacks comprise a series of successive punches.

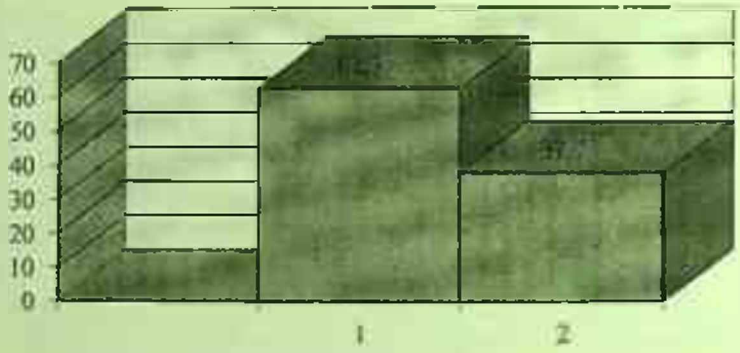

Figure 56. The volume (%) of offensive movement activities performed by highly skilled boxers during individual training with the coach using "flat mitts".

Legend: 1 – Simple attack; 2 – Complex attack.

Complex attacks are utilized nearly half as frequently as simple ones, comprising 37.7% of the total volume. It is important to note that while complex attacks are twice as numerous in type compared to simple ones, they generally start from medium range and finish at close range. However, coaches face considerable challenges in creating suitable conditions during individual training with "flat mitts" to enable athletes to execute complex attacks effectively. All complex attacks were traditionally classified into combinations of successive straight and side punches, along with uppercuts. Moreover, combinations such as straight and side punches, side punches and uppercuts, and other variations were studied separately in practice.

During individual training sessions with the coach using "flat mitts," it was observed that boxers predominantly employ series of straight punches (e.g., straight punches to the head with the left and right hand, straight punches to the body with the right (or left) hand, or combinations like "left-right-left" straight punches to the head, etc.). These punches account for 39.4% of the total volume. Following in frequency are combinations of straight (left-right) and side (left-right) punches — 21.9%. Side punches and uppercuts are utilized in nearly equal volumes, comprising 15.2% and 15.7%, respectively. The data on the volumes of defensive movements are illustrated in Figure 57.

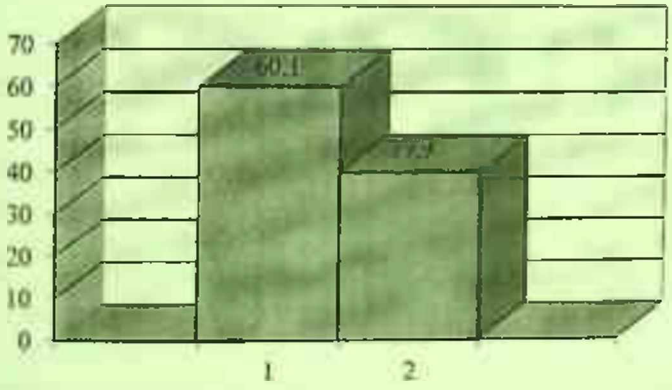

Figure 57. Volume (%) of defensive movement activities performed by highly skilled boxers during individual training with the coach using "flat mitts"
Legend: 1 – Defensive movements; 2 – Counterattack movements.

In this case, the movements were conditionally divided into purely defensive and counterattack actions. It is important to note that defensive movements include not only blocking, parrying, dodging, bending (slipping), and ducking, but also distinct counter and response punches—provided they do not escalate into a full counterattack and are used solely to halt the opponent's advance or to exhaust them. Counterattacks performed during long-distance maneuvering also fall under a boxer's core combat actions and serve as a form of defense.

It is evident that during individual training sessions with "flat mitts," defensive movements account for 60.1% of the total volume of actions performed by boxers. Special scientific-methodological literature recommends distinguishing three main types of defense: 1 – using the body, 2 – using the hands, 3 – using the legs.

It was determined that during individual training with the coach using "flat mitts," a boxer's defensive movements are predominantly executed using the body (52.7%). Defense utilizing the hands accounts for 37.8% of the total number of movements, while leg-based defense is rarely employed—only 9.5%. These indicators do not fully correspond to the results observed in actual competitive performance. According to competition data, leg-based defensive movements are utilized much more frequently, reaching up to 40.7%. This discrepancy was identified through the analysis of movement types executed by boxers during individual training sessions with "flat mitts." In such sessions, offensive actions are significantly more prevalent among athletes (as illustrated in Figure 57)

The volume of counterattack movements during individual "flat mitt" training sessions was 39.9%.

Thus, analyzing data obtained from examining the volume of different types of movements performed by boxers during individual training sessions with their coach using "flat mitts" allows us to conclude that offensive movements dominate in these sessions. It was also revealed that insufficient attention is given to developing complex and combination attacks within the coach's activities. According to F.K. Turdiyev, in addition to conducting individual "flat mitt" sessions, the coach should broaden the range of offensive and complex movement sets by utilizing other training forms. It was also found that reconnaissance-type movements within preparatory actions are used very infrequently, despite the fact that a boxer's success in competitive performance largely depends on their ability to identify the opponent's strengths and weaknesses.

Thus, when planning individual training sessions using "flat mitts," the boxing coach must carry out their activities considering the identified characteristics, with the aim of increasing the athlete's level of specialized preparedness.

4.5. Objective conditions contributing to errors in the specialized activities of coaches and methods for their elimination

In sports practice, the term "error" refers to the unintentional violation of the rules of a given sport by a participant during competition, or a deviation from the conditions set forth in the competition regulations and the program for performing specific sports exercises.

According to biomechanical criteria, errors can be classified as local or chain errors. Local errors refer to disruptions in a specific segment of a motor act, without compromising the integrity of the entire movement. However, such errors affect the speed and smoothness of the movement, may become ingrained over time, and negatively influence the assessment of the athlete's technical and tactical level. Therefore, they must be gradually and necessarily eliminated. An action is considered erroneous when it exceeds certain predefined limits or constraints, even if it remains within an overall acceptable performance range. In such cases, the specific deviation is recognized as an error within that particular movement. Deviations that disrupt the programmed mechanism of movement, its structure, goal orientation, and timely execution can also

be considered errors. These errors may vary in significance: some are minor errors that do not disrupt the movement, while others are fundamental errors that affect the core structure of the movement. Such errors, whether large or small, inevitably occur within various elements of the entire motor act.

The concepts of "movement structure integrity" and "spatial accuracy of movement" are relative. In general, any error in one phase of a movement causes a chain of interconnected changes throughout the action. Although this interdependence is not always visually apparent, it exists. Experts categorize errors based on their nature into technical, tactical, and psychological errors.

Technical errors are coordination-related mistakes that disrupt the fundamental structure of a movement and severely hinder the athlete's subsequent performance.

Tactical errors occur in the athlete's actions during sports combat and are usually the result of underdeveloped quick-thinking abilities, as well as mistakes in assessing one's own and the opponent's movements, and in choosing appropriate means of interaction. These may include poor judgment of fighting distance, incorrect timing or method of movement, misjudging the opponent's strengths and weaknesses, and executing the wrong actions, among others.

Psychological errors refer to mistakes in perceiving one's own and the opponent's actions during a bout, as well as in the expression of psychological qualities. These include shortcomings in self-regulation and self-control, low resistance to psychological "barriers," attention-related issues, deficiencies in combat readiness, and lack of goal-directed focus.

Permissible deviations (errors) during the performance of exercises can also be classified into three types:

1. Major (critical) errors – these significantly affect sports performance results;

2. Typical errors – these are the most commonly made mistakes;

3. Specific (minor) errors – these usually occur as a consequence of major errors.

The factors mentioned above can be fully justified as reasons for errors manifesting in a coach's professional activity.

Considering coaching as a complex process that involves the integration of knowledge, skills, and competencies, it should be emphasized that the deviations (errors) observed in coaching practice are

primarily caused by insufficient specialized training at the higher education level. The thinking style of many physical education and sports training specialists often relies on empirical methods (trial and error). Meanwhile, the complexity of developing professional competencies is influenced by various factors. Failing to consider the importance of these factors inevitably negatively impacts the effectiveness of the training process.

When only the positive aspects and advantages of professional activity are presented to students, without analyzing potential problems and relevant mistakes, there arises the risk of training specialists with a limited worldview, who lack a clear understanding of their future professional roles.

Among the most common shortcomings and difficulties faced by young coaches (with 1–3 years of experience), the following are identified:

1. Insufficient volume of theoretical knowledge in the field of personality development;
2. Inadequate methodological preparation;
3. Weak career orientation during physical education classes;
4. Lack of general pedagogical training;
5. Limited professional-pedagogical preparation in the specialization course.

The absence of clearly defined, stage-by-stage objectives in training and educational sessions, the vague implementation of didactic principles, and the lack of a clearly specified range of technical and tactical skills to be mastered within a set timeframe are also linked to the aforementioned issues.

A coach must consistently rely on the practical experience of the trainees, regularly monitor their own professional activity, and strive for continuous self-improvement. The inability to accurately assess the current situation often leads to typical errors in the learning process. The absence of a strict program that examines every detail of standard situations, along with the complexity of personalized interaction with students, creates conditions for shortcomings in the coach's specialized activity during individual instruction. This is understandable, as individual training requires the coach to consider variations in distance and timing and to align their own movement amplitude, speed, accuracy, and length with those of the trainee.

The technique of each movement must be tactically justified and should stem from the need to solve a set of tasks aimed at automating skills and developing their variability.

The diversity of interaction characteristics with each athlete makes it difficult for the coach to identify the causes of movement-related errors, as the same mistake can arise from different reasons. Moreover, working with several athletes simultaneously often leads to fatigue, which in turn contributes to the emergence of errors in the coach's actions.

By generalizing the causes of errors in a coach's specialized activities, it should be emphasized that the following factors can be identified as primary contributors:

- Insufficient professional training and lack of coaching experience;
- Personal characteristics of the coach (such as impulsiveness in thinking and generalization, subjectivity in evaluating information, and refusal to accept well-established principles);
- Low levels of creative activity;
- Difficulties in building effective relationships with athletes;
- Fatigue or illness;
- Social factors.

In modern sports pedagogy, great attention is given to preventing errors during the learning of various types of exercises. Therefore, no technical tool can fully replace the role of the coach in identifying and analyzing different types of errors. This is because the coach plays a key role in anticipating the difficulties that students may encounter while mastering movement techniques and in selecting appropriate tools and methods to address them. It is assumed that the coach's professional-pedagogical activity is optimal. However, such an ideal situation does not always exist in practice. This highlights the need to define the range of specialized skills that enable the coach to correct errors in their own activity and eliminate shortcomings. It is also important to consider that various coaching competencies are interrelated, and this interconnection often holds great significance. Thus, the level of development of one skill can indirectly reflect the level of another, and this principle allows for a more accurate assessment of a coach's capabilities in preventing professional errors of various types.

In various types of professional activities, if the sequence of specialized operations follows a certain logical system, it can lead to greater effectiveness in preventing errors. This is especially evident in training sessions involving different athletes. In this context, optimizing

the error-correction process in physical exercise performance includes the coach identifying specific shortcomings in movement dimensions, determining the causes of these errors, and finally, selecting the appropriate tools and methods for their elimination. The recommended methodological set includes explanations, visual demonstrations, practical exercises, breaking down the demonstration into elements, performing movements in slow motion, and using reverse direction exercises based on the actions' speed and trajectory.

First and foremost, major errors must be eliminated—initially by emphasizing the positive aspects of techniques and movements, followed by identifying and pointing out the errors within them. As soon as signs of fatigue or decreased attention appear, it is necessary to pause interaction with the student.

Analyzing the causes of errors in athlete training—especially by grouping similar errors—leads to the conclusion that a coach's inability to assess the proper acquisition of pedagogical and professional techniques, as well as neglecting personal shortcomings even after repeated practice, contributes to the reinforcement of errors. These errors can later develop into technical-tactical deficiencies in the athletes.

Self-assessment questions

1. What is the significance of the coach's professional-pedagogical activity during individual training with "flat mitts"?
2. What potential options exist for completing offensive movements during individual practice?
3. What tools and methods are utilized to enhance boxers' technique and tactics in individual training?
4. What techniques and movements do boxers employ during individual training with the coach using "flat mitts"?
5. What are the distinct features of individualization in the technical-tactical improvement of boxing?
6. How many primary types of defensive actions are suggested in specialized scientific-methodological literature?
7. Into how many categories can permissible errors (deviations) during exercise execution be classified?
8. During individual training with "flat mitts," which type of preparatory movements should a boxing coach prioritize for the most improvement?

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CHAPTER V. TRAINING LOADS OF BOXERS IN INDIVIDUAL SESSIONS AND COMPETITIONS

5.1. Physical work capacity as a component of an athlete's readiness

Physical work capacity has several definitions: it is the human ability to perform certain physical activities. S.B. Tikhvinsky and S.V. Khrushchev (1991) suggest that physical work capacity should be understood as the multifaceted expression of a person's functional capabilities. It depends on body structure, the intensity and mechanisms of energy production, neuro-muscular coordination, and the condition of the musculoskeletal system. In a narrower sense, the authors consider physical work capacity to be closely related to the functional state of the cardiorespiratory system. N.I. Volkov, S.P. Semenov, and A.A. Bekreev propose distinguishing the energetic component of physical work capacity (aerobic and anaerobic systems) and emphasize its special role in exercises requiring a high level of endurance. The most important indicator of the body's aerobic potential is widely accepted to be the maximal oxygen consumption (VO_2 max), which reflects the functional state of the cardiorespiratory system.

To indirectly assess aerobic performance, the intensity of physical activity is measured—specifically, the level at which the heart rate reaches 170 beats per minute. This approach has been extensively developed in the works of V.L. Karpman, Z.B. Belotserkovsky, and I.A. Gudkov. These authors propose that physical work capacity should be understood as a person's ability to carry out professional activities under given parameters and specific conditions. They distinguish between direct and indirect indicators of work capacity. According to the authors, direct indicators of work capacity are those that allow for the evaluation of an athlete's sports abilities, both: quantitatively (e.g., meters, seconds, kilograms, points, etc.) and qualitatively (e.g., the precise and reliable execution of specific physical exercises).

For this reason, all methods aimed at assessing direct indicators of physical work capacity are divided into quantitative, qualitative, and combined indicators. Combined methods make it possible to evaluate the efficiency, reliability, and accuracy of sports performance.

According to the authors, indirect indicators of work capacity reflect the body's physiological response to a given load, showing how demanding the work is for the individual. Additionally, the authors correctly note that indirect indicators of work capacity tend to decline

much earlier during activity than direct indicators, making them invaluable for predictive information. Currently, such indicators are widely used to study adaptation mechanisms to specific sports activities and evaluate the development of fatigue. The principles and methods of testing physical work capacity are thoroughly explained in the works of V.A. Karpman, Z.B. Belotserkovsky, and I.A. Gudkov.

In sports medicine practice, testing physical work capacity based on heart rate (HR) is widely used. This choice is due, on one hand, to the ease of recording this physiological parameter, and on the other hand, to the direct correlation between heart rate, the intensity of mechanical work performed, and the amount of oxygen consumed during the load.

Numerous studies have shown similar trends in physiological changes, but among athletes from different sports within the same intensity zone, there are significant differences across many indicators. These include oxygen demand, oxygen uptake, cardiac output per minute, oxygen debt, stroke volume, heart rate (HR), blood pressure, biochemical indicators, and more.

Athletes from varying sports demonstrate distinct dominant physical qualities such as strength, speed, and agility, as well as combinations like speed-strength, strength-endurance, and speed-strength endurance. The relative importance of each physical quality or combination varies depending on the specific sport discipline.

A classification of sports has been proposed based on the dominant expression of leading physical qualities. These include speed-strength sports, cyclic endurance-dominant sports, sports requiring complex coordination, combat sports, and team sports. For speed-strength sports, athletes are characterized by maximum movement intensity, requiring the ability to exert force explosively, perform movements at high speed, react quickly within a short period, and initiate actions at maximum acceleration.

However, even within the same group of sports, alongside shared qualities, certain differences can also be acknowledged. These primarily relate to the structural model of specific physical preparedness. For example, according to V.V. Kuznetsov and B.N. Shustin, the structural model of a sprinter differs from that of throwers or jumpers, while these groups also differ from weightlifters, they all share a leading physical quality — the goal of developing maximum intensity.

Cyclic sports that require endurance include track and field events such as the 800m, 1500m, 10,000m, and 42,196m (marathon), as well as

the 3000m steeplechase; rowing and canoeing (kayak and canoe); cycling (especially the 1000m pursuit and mass-start races); biathlon; swimming (200m, 400m, 800m, and 1500m distances); and speed skating (1800m, 3000m, 5000m, and 10,000m events).

Complex coordination sports include artistic and sport gymnastics, figure skating, diving, skiing, and sailing. The combat sports group consists of wrestling disciplines, boxing, and fencing. These sports are characterized by the integrated manifestation of multiple physical qualities.

All combat sports are marked by constantly changing situations, leading to variable intensity and energy expenditure. Boxers engage in dynamic speed-strength work of varying intensity, with an acyclic nature. This requires special endurance, high excitability of nervous processes, and distributed attention for programming coordinated movements. The effectiveness of a fight depends on information received from proprioceptors in the musculoskeletal system and from retinal receptors in the eyes. Maintaining balance and executing precise movements demands a high level of functional stability in the vestibular system. Due to regular impacts on various body parts, boxers typically experience reduced pain sensitivity and tactile perception in areas frequently subjected to punches. Boxing training fosters the development of strength, speed, and specific endurance.

Boxers display a high mobility of nervous processes and functional stability of the vestibular system. The increased demand for oxygen promotes the development of respiratory muscles. In boxers, vital lung capacity reaches approximately 4500 ml, with maximum pulmonary ventilation ranging from 80 to 100 liters per minute. The average maximal oxygen consumption (VO_2 max) is around 45 liters per minute, although in highly skilled boxers, it can reach up to 6.5 liters per minute. During a bout, energy expenditure may reach 15–20 kcal per minute, with the total energy expenditure during a round averaging 200–250 kcal. At rest, boxers often exhibit mild bradycardia, while under load, heart rates can exceed 200 beats per minute. Emotional arousal before and during competition causes significant changes in the functional state of all body systems. After a match, there is an increase in lactic acid accumulation and a reduction in the body's alkaline reserve.

Other combat sport athletes, including those in hand-to-hand combat, Greco-Roman wrestling, freestyle wrestling, and judo, exhibit similar physiological changes. During training, wrestlers' muscles primarily

adapt to function under anaerobic conditions, despite maximal oxygen consumption (VO_2 max) remaining an important factor. A defining characteristic of combat sports is the intense, direct physical contact with the opponent during competition. This demands much from the athlete's personality, nervous system, and their ability to manage emotions. Additionally, athletes must be prepared to cope with unfair decisions by referees and unsportsmanlike behavior from opponents, requiring a high level of mental resilience.

When examining this issue, it is important to note that difficulties often arise due to varying interpretations of the term "physical work capacity." In this area, V.A. Karpman, Z.B. Belotserkovsky, and I.A. Gudkov have conducted fundamental research, defining physical work capacity as the body's ability to perform at its maximum potential. Other researchers describe physical work capacity as the readiness to perform purposeful movements, the ability of the body to undertake any form of maximal physical work, or the capacity to generate maximum energy and use it efficiently to achieve a set goal. According to A.S. Solodkov, physical work capacity is defined as the ability to perform heavy and prolonged physical work without rapidly developing fatigue or causing deep physiological disturbances in the body, as well as the ability to quickly restore homeostasis after the work is completed. The author emphasizes that when discussing the effectiveness of performed work, one must also consider the "physiological cost" the body expends to achieve high results. The higher the work capacity, the lower this physiological cost will be. For example, during physical exertion, the less the increase in heart rate and breathing rate, the higher the individual's work capacity.

Physical work capacity is considered an integrated reflection of a person's functional capabilities, expressed through several objective factors. These include:

- body structure and anthropometric indicators,
- the intensity, capacity, and efficiency of energy production mechanisms through aerobic and anaerobic pathways,
- muscle strength and endurance,
- neuromuscular coordination,
- the condition of the musculoskeletal system (including flexibility),
- and the state of the endocrine system.

In a narrower sense, physical work capacity refers to the functional state of the cardiorespiratory system. Physical work capacity is assessed

through both ergometric and medical indicators, including physiological, biochemical, and hematological parameters. During long-duration testing, the evaluation relies on the combined results of the performed physical work (intensity, duration, force, etc.) and the extent to which various body systems adapt to the applied load. In mass assessments, evaluation is often limited to determining maximum aerobic power or oxygen consumption, which can be considered a primary factor of work capacity. However, it is incorrect to judge overall physical work capacity based solely on individual indicators. A comprehensive assessment of its components is required. The more factors that are taken into account, the more accurate the understanding of an individual's physical work capacity becomes. When testing healthy individuals engaged in physical education, at least three measures should be included: anthropometry, maximum aerobic power, and muscle strength. Therefore, assessing physical work capacity based on a single indicator, such as VO_2 max or PWC170 (W170), is not considered valid on its own.

To assess the ability to perform different types of loads and movements (the fourth direction), numerous test batteries have been proposed. These tests reflect various components of physical work capacity, such as strength, local muscular endurance, general endurance, speed, and the ability to maintain speed while changing movement direction. Sometimes, instead of using standard test batteries, exercises taken from various sports are applied, referred to as control tests.

The issue of physical work capacity holds a special place in sports, as every physical exercise reflects an athlete's working potential. Physical work capacity is manifested through general physical preparedness, resulting from the athlete's level of physical, technical, tactical, and psychological training. This preparedness enables the athlete to achieve specific results during competition. Depending on the characteristics of the sport, physical training—whether to a greater or lesser extent—affects the athlete's level of fitness and, thus, sports performance. Therefore, athletes must possess a certain level of physical work capacity in accordance with the demands of their chosen sport. In addition to data obtained from sports performance and sports-pedagogical assessments, determining physical work capacity is essential for evaluating an athlete's state of readiness and effectively managing the training process.

In general, high physical work capacity is a reflection of good training status, serving as a guarantee of the ability to achieve high results in a chosen sport.

Currently, in the field of sports theory and methodology, research aimed at addressing significant issues related to the monitoring and evaluation of athletes' specific work capacity is gaining considerable importance. The relevance of this issue is clear, as modern theories concerning the body's adaptation to specific motor activities necessitate the development of new methods that provide objective information about the processes occurring in an athlete's body.

In expanding knowledge about adaptation under competitive conditions, both domestic and international scientists have made meaningful contributions. They view sport as a remarkable sphere of human activity, in which the body's functional systems operate at their highest reactive levels.

In boxing, monitoring and evaluating the level of specific work capacity is particularly challenging due to the unique characteristics of the sport itself. These specific features include:

1. In boxing matches, there is always the risk of a knockout punch, which is a key factor that can determine the final outcome of a bout.

2. The presence of external and internal stressors, distinct from natural conditions(such as cutting weight, taking powerful punches to the head or body, psychological pressure from opponents, audience reactions, match regulations, etc.), may lead to physical activity occurring in a non-adaptive state.

3. The boxer almost always operates under strict time constraints, and typically, a single action does not fully resolve the confrontation, but rather changes it or creates a new situation.

4. The boxer's body engages in a complex interaction between specific (sport-related) and non-specific (daily or routine) stimuli. To achieve optimal performance, specific factors must take precedence.

5. In matches between equally skilled opponents, both victory and defeat often come with physical and psychological fatigue as well as serious injuries, which negatively impact subsequent performances in the tournament.

Under these circumstances, victory in a tournament is often claimed by the athlete with the strongest phenotypic adaptation indicators. In this regard, the adaptation of energy supply mechanisms to intense muscular work holds particular and primary importance.

In specialized scientific-methodological literature, many studies aim at optimizing boxers' preparation through proper planning of the training

process. These works generally view the volume and intensity of exercises as key criteria for designing training sessions.

Efforts have been made to quantify training loads in boxing using a special scale, which allows the intensity of a training day or microcycle to be evaluated in points. However, so far, pedagogical methods capable of providing objective and real-time information on the level of specific work capacity during various forms of specialized activity in boxing—including individual training sessions with flat mitts—have not yet been implemented in practice.

5.2. General conditions and real-time information methods for increasing a boxer's work capacity during individual training

In the boxing school of our country, individual sessions using "flat mitts," along with training sparring sessions in various directions, are considered the most effective methods for preparing highly skilled athletes. In past practices, the "individual session" was used solely as a technique for improvement. Currently, however, it addresses a range of complex tasks—including developing movement quality, as well as the boxer's technical, tactical, and psychological preparedness. Accordingly, the content and duration of individual sessions have changed: the active training time, overall difficulty, and intensity of the training load have significantly increased.

In individual training, the training load of a boxer refers to the combined effect of the technical techniques and tactical actions performed by the athlete on their body, along with the influence of environmental, emotional, and other factors. The magnitude of the training load depends on the volume of work, intensity of motor activity, and degree of psychological stress. These three parameters are interconnected and collectively elicit a corresponding physiological response from the athlete's body. The coach's pedagogical skill during training lies in the ability to properly adjust the load, finding the optimal balance between these three parameters. Depending on the stage of preparation, general and specific objectives, the athlete's qualification and fitness level, as well as the training conditions, available time, and other factors, the ratio between volume, intensity, and psychological stress must be adapted, giving priority to one component of the load as necessary.

During individual training sessions, a boxer performs high-volume and high-intensity work under extreme conditions. The extreme speed and

precision required for executing combat movements, the need for fine motor coordination, highly developed muscular sensitivity, and intense concentration—all demand a high level of work capacity and significant psychological strain from the athlete. Therefore, one of the coach's key responsibilities during individual sessions with a highly skilled boxer is to rationally organize the athlete's movement regime to ensure the active engagement of the boxer's physical and psychological functions.

An important means of improving work capacity during individual sessions lies in optimizing the conditions of the athlete's activity. To achieve this, three main factors must be considered.

The first factor is the direct organization of the session and proper management of training loads according to the athlete's functional state and objectives. This requires consideration of the physiological principles that govern the transition from one stage of work capacity to another, as well as psychological factors that affect the timely processing of incoming information during training. Pedagogical mastery plays a crucial role in successfully implementing these tasks.

The second factor is the boxer's creative attitude toward individual training—that is, the presence of deep creative interaction between the athlete and the coach. The athlete's high level of interest and conscious engagement in the exercises create favorable conditions for effective session management and positively influence their work capacity.

The third factor involves general measures aimed at improving the overall training environment. These include enhancing the sanitary and hygienic conditions of the training setting—such as ensuring that the number of participants matches the gym size, providing adequate lighting, maintaining an appropriate air temperature, and so on.

The main factor determining the management of training load during an individual session is the boxer's current physical and psychological condition. In addition, the coach must always consider the residual effects of previous training sessions and the specific exercises performed beforehand (such as warm-up routines, punching drills with auxiliary equipment, work with the coach, sparring, etc.). If the athlete begins the individual session immediately after specially designed warm-up exercises, that creates one type of condition. However, if the boxer starts the individual session after a longer independent training session (e.g., one or two hours), this presents a completely different condition. It must be kept in mind that exercises exceeding the athlete's capacity or loads

that are poorly timed or improperly applied will either fail to provide additional benefit or may even lead to performance deterioration.

In the practical activities of a boxing coach, a crucial issue is the effective transfer of the skills and competencies acquired during individual training sessions to training bouts and, most importantly, real competition settings. The development of a boxer's sports mastery largely depends on how successfully this transfer is achieved. One of the key methods to increase the effectiveness of this transfer is by modeling training loads during individual sessions to closely reflect the demands of actual competition. Such modeling positively influences the mechanism of transferring specific skills and abilities from the training context to real combat situations and also enhances the athlete's functional readiness for upcoming competitions.

Research in the field of sports physiology has shown that, in the course of sports activity, alongside the development of motor action stereotypes, stereotypes of autonomic functions also form. These adapt over time through regular training and change according to the nature of exercises and the intensity of the load. Therefore, if a boxer regularly performs low to moderate loads during training—including individual sessions—but then competes in events with high demands on the body, this mismatch can disrupt the established autonomic function stereotype developed during training. Consequently, selecting a physiological function that can serve as an indicator to assess the boxer's current work capacity becomes a critical task. Heart rate (HR) is widely used as an indicator for daily physiological monitoring of a boxer's training load because measuring heart rate during sessions is methodologically simple, and its informative value under physical and psychological stress has been well established. Comparing heart rate levels across different types of combat activities in the same athlete can help reflect the magnitude of training load.

When describing heart rate levels during an individual session or bout, one can use either the absolute heart rate values or the magnitude of change in heart rate during activity compared to resting levels. Given that a boxer often begins an individual session, training bout, or competition with an already elevated heart rate, it is more appropriate to compare working heart rate values to measurements taken immediately before the activity starts, rather than to resting values alone.

During individual competitive bouts, a boxer's heart rate can reach 190–195 beats per minute, indicating an increase of 100% or more

compared to the pre-start level. Based on this, it can be concluded that during tactically focused individual sessions, it is advisable to model training loads that incorporate certain standards of high physical—and especially psychological—intensity. This approach helps to improve the boxer's adaptation to competitive conditions, fosters the development of specialized qualities and skills under challenging circumstances, and positively impacts the athlete's high-level work capacity.

Enriching training loads during individual sessions with competition-like elements can be achieved through the following tools and methods:

a) Increasing movement intensity by raising the speed and pace of actions;

b) Performing technically and tactically complex combat movements that involve varied coordination difficulty while simultaneously raising the quality standards for execution;

c) Raising the amount of incoming information under complex, conflict-based (competitive) situations, for example, by modeling combat episodes during selective training exercises;

d) Ensuring combined stimulation of various sensory systems (visual, tactile, motor, auditory) through signals given by the coach, aimed at activating interactions between sensory analyzers;

e) Introducing distracting stimuli during the individual session, such as unfamiliar observers in the gym, simultaneous sparring matches in neighboring rings, or unexpected remarks shouted by peers directed at the boxer under training.

In implementing these principles, it is essential to ensure an individualized approach, considering the boxer's type of higher nervous activity as well as their specific psychological and physical capabilities.

Thus, creating combat-like (extreme) situations during individual sessions, where heart rate can serve as an indicator of the training load's complex impact on the athlete's body, is one of the key measures that facilitate the transfer of specialized qualities and skills from the training environment to actual competition conditions. Different types of free sparring bouts, which vary in importance for the boxer, produce different physiological effects on the body. According to averaged data, the highest heart rate levels (up to 195 beats per minute) are recorded during official competition bouts, followed by training (free) sparring sessions, where heart rates can reach up to 169 beats per minute. The lowest heart rates are observed during non-evaluated sparring sessions where no final outcome is considered. Interestingly, despite the volume and intensity of

activity sometimes being greater than in official or training bouts, the heart rate remains lower, typically around 163 beats per minute. This suggests that in competition bouts, the significantly higher heart rate is likely due to emotional factors, particularly psychological stress.

During an individual training session, the boxer's physiological response to the workload—especially heart rate levels during rest intervals between activity sets—provides real-time feedback that allows the coach to quickly adjust certain training load parameters based on the athlete's capabilities and session objectives. However, regardless of the coach's experience and expertise, it is often impossible to have a precise, quantitative understanding of the athlete's actual load during the session. Therefore, the coach must rely on additional data that allows for an effective assessment of how combat actions affect the boxer's functional state. One of the simplest and most accessible methods for such assessment includes a combination of: Pedagogical observation (e.g., tracking the number and type of punches delivered by the boxer), Chronometry of the session (number and duration of continuous activity sets, and rest intervals between them), and Monitoring the cardiovascular response (e.g., heart rate). Based on the collected and analyzed data, the coach can effectively adjust the boxer's next individual session, such as modifying the work-rest schedule or changing the volume and intensity of the training load.

Thus, comparing pedagogical and timing observations with physiological indicators is recommended as a method for assessing the magnitude of training load and its impact on the boxer's body. This comprehensive approach allows the coach to manage not only the quality but also the quantity of combat actions performed by the boxer during individual sessions.

5.3. Organizing optimal work and rest regimens in individual training sessions

In recent years, the practice of conducting individual sessions has increasingly involved applying high physical and psychological loads to effectively improve the quality of a boxer's motor performance and enhance their technical-tactical proficiency. However, increasing training load cannot be limitless or without consequences. The development of an athlete's functional capacity, along with their qualities and skills, should not depend solely on increasing load volume, intensity, or stress. Instead, it must also be achieved through organizing optimal work-rest regimens

during individual sessions. These regimens should aim to maximize the mobilization of the athlete's various functional systems, ensuring both effective performance development and safe progression.

An important method for maintaining a high level of work capacity in a boxer during individual training sessions is to develop rational regimens that alternate training loads with rest intervals. A boxer cannot continuously perform combat actions at the required speed, precision, and timing throughout an entire session—especially when the session may last 25–30 minutes or more. Therefore, periodic rest is essential. These breaks help to prevent early fatigue in the peripheral neuromuscular system, the autonomic nervous system, and the central nervous system. However, prolonged rest intervals between continuous work segments in an individual session can cause the athlete's body to drift out of a stable working state, leading to a temporary drop in work capacity. Research has confirmed that even short pauses can result in a decrease in a boxer's work efficiency.

Summarizing practical experience shows that, in many cases, coaches approach the organization of work and rest regimens during individual sessions empirically. There have been instances where certain coaches, relying on the widespread belief in boxing practice that high sports performance requires heavy training loads, conducted individual sessions with excessively dense active periods, high intensity of motor activity, and significant psychological stress—all without considering the athletes' functional capabilities. Such situations have sometimes been observed during special pre-competition training camps. When these kinds of sessions are conducted regularly, they can lead to fatigue or even overtraining, resulting in reduced fitness and, in some cases, the complete withdrawal of the boxer from training or competition. On the other hand, analysis of research data shows that some coaches conduct individual sessions that do not place sufficient demands on the athlete's body. Under such conditions—low work density, low intensity, and minimal physiological stress—the training fails to stimulate high-level physical or vegetative functions, thereby not contributing to the development of fitness. In such sessions, the boxer does not fully demonstrate their physical, technical-tactical, and volitional capabilities, which negatively affects their ability to adapt to competitive conditions. All of this leads to a decrease in the effectiveness of both individual training and the overall training process.

Thus, developing the most effective regimens for alternating training loads with rest intervals during individual sessions creates essential conditions for ensuring the boxer's high level of fitness and for strengthening their health.

The issue of determining the optimal work-rest regimen for a boxer during an individual session should be addressed based on the athlete's adaptation to the prescribed training load. It is important to consider that a boxer's stable condition—that is, their high level of work capacity—in an individual session is defined by the well-coordinated functioning of both vegetative and somatic systems.

Typical regimens for individual sessions using "flat mitts" were studied by M. Usmanov with highly skilled boxers, who categorized typical training sessions based on various work and rest regimens. Specifically, the sessions were divided into three main groups (regimens).

1. Nearly Continuous Work Regimen (Figure 58)

This type of session involves a high density of work time and intense motor activity, where the boxer trains under considerable physical and psychological stress. During these sessions, continuous activity segments are occasionally interrupted by brief breaks, typically used to explain or assign new tasks. The average duration of these sessions ranges from 25 to 35 minutes. In this work regimen, the maximum heart rate reaches 180–196 beats per minute or more, while the minimum heart rate (during brief rest intervals) is 144–156 beats per minute.

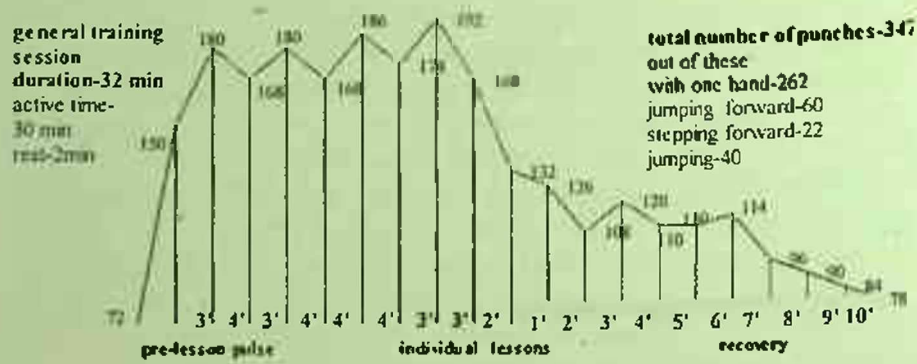


Figure 58. Nearly continuous work and rest regimen in individual training with "flat mitts"

If we consider the total number of analyzed sessions as 100%, this regimen represents 27% of all sessions.

2. Double-Phase Work Regimen (Figure 59). In this regimen, the individual training session consists of two, and sometimes three, distinct parts that are connected by shared goals. Each part typically lasts about 10 to 15 minutes, with rest intervals of 5 to 10 minutes in between. Each segment comprises continuous work periods lasting approximately 2 to 4 minutes, alternated with brief rest breaks of 30 seconds to 1 to 1.5 minutes. This type of session organization is sometimes utilized during the pre-competition phase to prepare the athlete's body for the specific demands of competition. In such scenarios, the boxer's intense neuromuscular and emotional activity is consistently accompanied by longer recovery intervals. However, this method of structuring individual sessions has not yet been widely implemented in practice and accounts for only 12% of all regimens used in training highly skilled boxers.

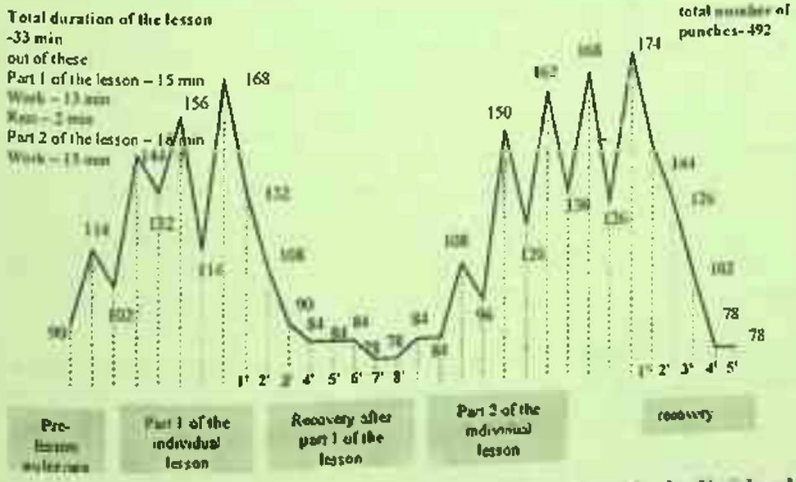


Figure 59. Double-phase work and rest regimen in individual training with "flat mitts" and the dynamics of heart rate changes (Athlete – Master of Sport)

In this regimen, short continuous work segments (each lasting up to five minutes) are alternated with brief rest intervals (ranging from thirty seconds to three minutes). The intermittent–repetitive regimen is considered standard practice for 61% of coaches in our country; therefore, we will examine its variations in more detail depending on the training period and focus of the lesson.

All of the above data indicate that various work and rest regimens are employed during individual sessions. For high-level athletes, the intermittent–repetitive regimen should be the primary method in individual boxing training. In this model, short segments of continuous work are consistently alternated with brief rest intervals. This principle is grounded in the best coaching practices, as well as findings from sports and labor physiology, engineering psychology, and other scientific fields.

These disciplines underscore the necessity of short work periods and rest intervals in tasks that demand high levels of reaction speed, concentration, and fine motor coordination.

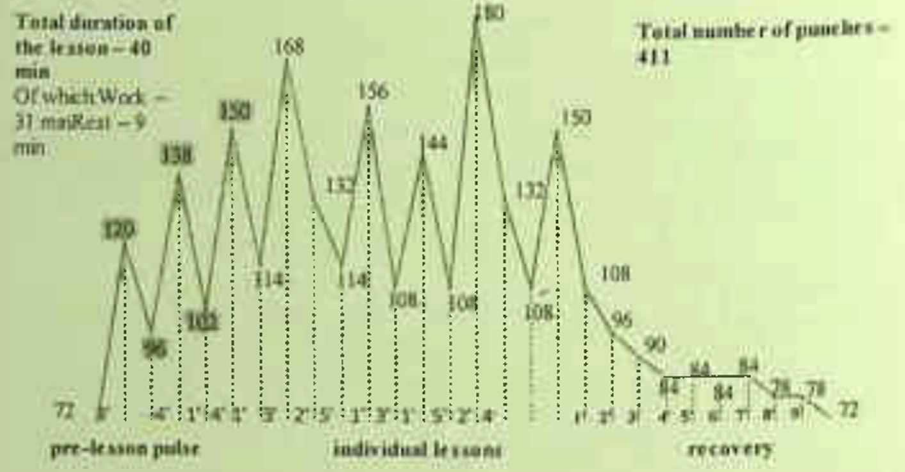


Figure 60. Intermittent work and rest regimen during individual training with "flat mitts" and the dynamics of heart rate changes (Athlete – candidate for Master of Sport)

Naturally, the duration of continuous work segments, as well as the length and frequency of rest intervals and their placement within each individual session, depend on a variety of factors, including the stage of preparation, the athlete's level of fitness, the focus of the session (technical, tactical, etc.), the training goals, work volume, intensity, load

stress, the athlete's current functional state, the conditions in which the session is conducted, and more. For this reason, it is not possible to define a single universal (absolute) regimen.

Therefore, the recommendations outlined below will present only the general (approximate) principles of work and rest regimens during individual sessions, tailored to the training period and lesson focus.

5.4. Organizing individual sessions with a predominantly technical-tactical focus

During the preparation period of the annual training cycle, the following main tasks are addressed in a typical individual session with a qualified boxer, focusing on technical-tactical development:

a) Further improve boxing technique and, based on the growth of movement quality characteristics, renew and slightly individualize the boxer's technique (revealing the boxer's technical potential),

b) Mentally prepare the boxer for certain new movement objectives and help them understand their alignment with tactical purposes.

The lesson's content and the methodological techniques used are determined by the specific nature of the objectives to be addressed. The main principles of conducting these sessions include the following.

Firstly, the volume of the training load should exceed the intensity of motor activity and psychological stress (i.e., large volume, moderate intensity, low mental strain);

Secondly, the training load should be distributed relatively evenly throughout the session, alternating between short, active work segments and rest intervals of approximately equal duration.

The first principle is linked to the lesson's main goals (primarily improving technique) and the general trend of load dynamics during the preparation periods within the qualified boxer's annual cycle. It involves a predominant increase in training volume, with a gradual rise in both volume and intensity. The increase in movement intensity should occur within limits that do not prevent further increases in total workload.

The second principle requires more explanation. Specifically, the relatively even distribution of training load in an individual session creates optimal conditions for rapidly developing stable work capacity in the boxer. This condition is characterized by more refined coordination and movement accuracy, as well as optimal synchronization between the musculoskeletal system and internal organs. This interconnection creates favorable conditions for mastering the dynamic structure of boxing

technique, which is continually refined during consistent training. At the same time, the qualitative aspects of the boxer's motor activity continue to develop.

During the session, the structure of the boxer's stable state—that is, performance under intensified or "heavy" conditions—can negatively affect the development of motor stereotypes required to master certain techniques and achieve automatic execution. Alternating similar, short-duration training segments allows for sustained performance of combat actions over a longer period without significant fatigue, enabling the athlete to maintain a stable level of work capacity throughout most of the session. Additionally, the frequent repetition of technical actions—along with the necessity of executing their combinations and variations at different speeds and rhythms—requires the work portion of the session to be very dense. Achieving this often involves reducing both the number and duration of rest intervals between continuous work segments while increasing the number of micro-breaks within those segments. However, this does not always directly correlate with the intensity of movement or the boxer's heart rate.

Based on this, an approximate (typical) model illustrating certain training load parameters and their alternation with rest intervals can be presented as follows.

The average duration of the session is approximately 20 ± 5 minutes, depending on the combination of numerous factors involved in each specific training situation. The lesson consists of separate work segments, each of which should not exceed 2 minutes in duration and must include short intra-segment breaks lasting 10 to 12 seconds. The number of these segments is determined by the total lesson duration. Studies have confirmed that as the duration of continuous activity increases, performance indicators for multiple qualities and skills begin to decline, leading to a decrease in the overall effectiveness of the individual session.

The rest intervals between individual work segments typically last around 0.3 to 0.5 minutes. Thus, the overall rest-to-active time ratio in the session is approximately 1:4. For example, if the total duration of the session is 20 minutes, 4 minutes are allocated for rest and 16 minutes for active work. During work segments, the movement intensity and psychological stress, measured by heart rate, reach 150–170 beats per minute (excluding the warm-up phase); during rest intervals, as partial recovery occurs, the heart rate drops to around 120–130 beats per minute.

5.5. Individual sessions with different focus areas

In modern sports practice, during the preparation period of the annual cycle, the intermittent–repetitive work regimen is primarily used in individual sessions with a technical-tactical focus. Additionally, in the pre-competition phase, sessions with a tactical-combat emphasis are commonly implemented.

During the preparation phase of the annual cycle, individual sessions centered on technical-tactical objectives last between 20 and 35 minutes, depending on the timing within the season (beginning, middle, or end). Each session consists of separate continuous work segments, the number of which ranges from 4 to 6, predominantly determined by the total duration of the lesson. Each of these segments typically lasts 2 to 3 minutes, with rest intervals between segments ranging from 30 seconds to 1 minute. Within the continuous work segments, numerous micro-breaks (MBs) are taken, with rest periods lasting at least 15 seconds. Most of these micro-breaks are initiated voluntarily by the athlete, while a smaller number are intentionally incorporated by the coach, averaging around 6 seconds in length. Observations indicate that spontaneous MBs initiated by the athlete tend to be shorter in total duration (6 to 9 seconds) than those specifically structured by the coach (8 to 12 seconds).

Consequently, the total time spent on both types of micro-breaks (MBs), spontaneous and coach-induced, is nearly identical: approximately 1 minute 12 seconds and 1 minute, respectively (based on average data). The total number of MBs occurring in a session (including both types) ranges from 6 to about 15, with a combined duration of 2 to 3 minutes. Therefore, the total rest time during the session (including both longer breaks and MBs) varies between 6 and 8 minutes, while the active (working) time ranges from 14 to 17 minutes. The intensity (density) of such sessions is approximately 64% to 78%.

Shifting to the characteristics of motor activity during the session (specifically referring to the quantity and methods of strikes delivered), it should be noted that the largest number of strikes occurs during regular step-and-punch combinations, ranging from 194 to 210 strikes. Meanwhile, punches delivered while taking small steps amount to around 40 to 59 strikes.

The number of punches delivered with the right and left hands ranges from 110 to 123. Punches thrown using crossover steps vary from

36 to 47, punches delivered with a forward lunge range from 100 to 120, and jumping punches occur 9 to 16 times.

The total number of punches thrown by the boxer during the session ranges from 490 to 540, which equals approximately 32 to 36 punches per minute (based on average data).

This final indicator also indirectly reflects the boxer's level of motor activity during the session.

An analysis of heart rate, which reflects the overall impact of the training load on the athlete's body, reveals that this autonomic function fluctuates constantly throughout the session and can vary significantly among boxers. For instance, during specific work segments, the heart rate ranges from 108 to 190 beats per minute, while during rest intervals, it can range from 96 to 168 beats per minute.

All of the above information, summarized from advanced coaching practices and our research, indicates that there is considerable variability in the work and rest regimens used in individual sessions, as well as in the training loads applied during those sessions. If we take these average data and use them to structure a model (typical) session for highly skilled boxers during the preparation period, with a predominantly technical-tactical focus, the session would appear as follows (see Table 11).

The model session consists of 6 work segments, each lasting approximately 3 minutes, with 4 rest intervals in between (each lasting slightly over 30 seconds). During the work segments, there are a total of 15 micro-breaks (MBs), including: 6 coach-induced MBs, each lasting about 10 seconds; 9 spontaneous MBs, each lasting about 8 seconds. The total rest time from all MBs amounts to slightly more than 2 minutes and 12 seconds. Thus, the total duration of the session is 21 minutes, consisting of: Active work time: 17 minutes; Rest time (including rest intervals and MBs): 4 minutes.

This results in a session density of 78.47%. In this session, the total number of punches delivered is 538, broken down as follows: 194 punches during regular step movements; 154 punches with crossover steps and forward lunges; 114 punches with right and left hands; 44 punches using small steps; 20 punches using side-steps ("slide-step"); and 12 punches while jumping. Given that the actual work time is 15 minutes, the boxer's movement activity is calculated to be 36 punches per minute. The heart rate during activity reaches 154 beats per minute, while during rest periods, it drops to 124 beats per minute.

When analyzing individual sessions with a tactical-combat focus (conducted by the same coaches and with the same athletes, but during the pre-competition preparation period), the following conclusions can be drawn. For comparison, only averaged indicators were considered, as they accurately reflect the typical nature of individual data.

Table 11

Description of individual sessions with a predominant technical-tactical and tactical-combat focus using flat mitts

No	Description of Work and Rest Regimen			Technical Session	Tactical Session	No.	Description of Workload and Movement Activity Volume		Technical Session	Tactical Session
1.	Total session duration			21'	21'		Number of punches	Punches with right and left hands	114	119
2	Continuous work		Segment count	5	4			With regular steps	194	168
			Total duration	18' 42''	16' 52''			With small lateral steps	44	43
3	Rest intervals		Count	4	3			With crossover steps	41	59
			Total duration	4' 53''	5' 40''			With forward lunges	113	139
4	Micro-breaks	Coach-induced	Count	5	8			With "side-step"	20	25
			Total duration	0' 45''	1' 21''			While jumping	12	16
		Spontaneous	Count	9	15			Total number	538	569
			Total duration	0' 55''	1' 32''			Punches per minute	36	39.8
	Total count			14	24		HR (heart rate) beats/min	During work segments	154	166
	Total duration			1' 40''	2' 53''					
5	Total rest time			6' 33''	7' 11''			During rest intervals	124	126
6	Active session time			15' 07''	14'29					
7	Session density (%)			71.8	68.0			Average level	139	143

The session lasts 21 minutes, with 14 minutes of active time and 7 minutes of rest, which includes rest intervals and micro-breaks (MBs), resulting in a session density of 64.1%. The session chronometry indicates that out of the 7 total minutes of rest, approximately 2.5 minutes are spent on longer rest intervals between work segments, while about 4.5 minutes

are taken as micro-breaks, distributed as follows: 10 coach-induced MBs with a total duration of 2 minutes; 15 spontaneous MBs with a total duration of 2 minutes and 32 seconds. During the session, a total of 569 punches were thrown, categorized as follows: 198 punches with crossover steps and forward lunges; 168 punches with regular steps; 119 punches with right and left hands; 43 punches with small steps; 25 punches with side-steps; 16 punches while jumping. As a result, the boxer achieved a movement activity rate of 39.8 punches per minute. The heart rate during work segments averaged 166 beats per minute, compared to 126 beats per minute during rest intervals.

Based on the data above, the analysis and comparison of technical and tactical sessions (Table 11) indicates that the duration of these two types of individual sessions is nearly identical, averaging 21 minutes. This can be attributed to the fact that the total time allotted by the coach for a specific individual session with a given athlete depends on numerous factors beyond our control, such as the boxer's condition at the time of the session, prior training load, the overall planning of the weekly and monthly training cycle, and the coach's own condition. Therefore, no clearly defined differences were found in the duration of the sessions analyzed.

A similar pattern was observed in the number and length of continuous work segments and the rest intervals between them. In both session types, typical work segments and their corresponding longer rest intervals ranged from 2 to 4 minutes (averaging around 3 minutes), while rest intervals lasted from 30 seconds to 2 minutes (averaging slightly over 1 minute). However, it is important to note that in sessions with a predominant tactical focus, the duration of rest intervals tends to be slightly longer than in those focused on technical skills. This trend is also reflected in the number and duration of micro-breaks (MBs) taken during the sessions. For instance, in technical sessions, 15 MBs were recorded, with a total duration of just over 2 minutes. In contrast, tactical sessions recorded 25 MBs, lasting about 4 minutes in total. Thus, the total rest time (including both rest intervals and MBs) in tactical-combat sessions exceeds that in technical sessions: Tactical: more than 7 minutes, Technical: just over 4 minutes. Consequently, the session density in tactical sessions is lower than in technical ones: Technical: 78.47%, Tactical: 64.19%. This trend was consistently observed across nearly all the sessions we analyzed.

When comparing the boxer' s motor activity based on the number and method of punches delivered, it is important to note that the total number of punches in tactical- combat sessions (569) is somewhat higher than in technical sessions (538). To assess the average number of punches per minute, we divided the total number of punches by the active (working) time of each session. This yielded specific comparative indicators. In tactical sessions, the average punch rate was 39. 8 punches per minute, while in technical sessions, it was 36 punches per minute.

Examining the heart rate observations of the same boxers across sessions with different focuses allows us to conclude that, despite nearly identical pre- exercise heart rates, the heart rate during activity is higher in tactical sessions compared to technical ones. Thus, for the same athlete, a higher heart rate in tactical sessions primarily indicates greater intensity of motor activity. In cases where the number of punches is lower, yet the heart rate is higher, this can be attributed to increased psychological stress, a factor genuinely present in combat- oriented sessions.

Our analysis shows that often there is a negative correlation between lesson density and heart rate level: lower session density is typically accompanied by a higher heart rate (as seen in combat- focused sessions), while higher density corresponds to a lower heart rate (as seen in technically focused sessions). As illustrated in Table 2, during technical sessions, when the active time density reached 78. 47%, the average heart rate during the session was 154 beats per minute. In contrast, during tactical sessions, where the density was lower at 64. 64.19%, the heart rate rose to 166 6pm. These average figures reflect the individual data patterns observed during the study. This apparent contradiction can be explained by the fact that in technical sessions, although work density is high, the intensity of physical activity is lower than in tactical sessions. In tactical sessions, despite lower work density, the intensity of activity and psychological stress are significantly higher. This variation determines the average heart rate level during the boxer' s sessions with different emphases in "flat mitt" individual training.

5.6. Organizing individually focused sessions with a predominant tactical-combat orientation

During the pre-competition preparation period of the annual training cycle, individually focused sessions with a predominant tactical-combat orientation for highly skilled boxers aim to address the following objectives:

a) Further improve technical-tactical actions in various typical match scenarios, considering the individual abilities and tendencies of the boxer in preparation for competition;

b) Bring the athlete to peak performance by synthesizing their physical, technical, tactical, and emotional-volitional capabilities, focusing on achieving optimal psychological readiness for competitive events.

The lesson repertoire includes a wide range of combat actions, their combinations, and sequences, all reflecting the nature of competitive combat scenarios. The main principles of conducting such sessions are as follows:

Firstly, reduce the total workload volume while increasing the intensity of actions and, most importantly, the level of psychological stress—this involves enhancing the emotional atmosphere of the session while increasing the complexity of technical and tactical tasks;

Secondly, repeatedly alternate continuous work segments (of varying intensity and duration) with rest intervals of different lengths, tailored to the size and time of the load.

The first principle aligns with the general trend of training load dynamics across the phases of the preparation period. Its practical implementation involves a slight reduction in lesson duration and the application of high-intensity, competition-like loads during specific work segments. The volume, intensity, and level of exertion in the session must be quantitatively defined for each boxer, managed based on the "foundation" of their current sport form, developed during the previous preparation phase and the boxer's actual condition at the time of the individual session.

The second principle arises from the necessity to create conditions during the lesson where the boxer's repeated activity begins during the partial (very minimal) or complete recovery phase of their vegetative and somatic functions. Variation in the duration of training and rest intervals, alongside the alternation of maximum physical exertion and emotional strain with slight relief, provides the best conditions for adapting the athlete's body to the demands of actual competition.

Despite the increased intensity and exertion of the load (which results in an elevated heart rate for the boxer), the overall density of the session is somewhat lower compared to technical-tactical oriented lessons. This situation is linked to the longer duration of rest and short breaks observed in the sessions under analysis.

The strict rules outlined above must be considered when conducting individual sessions with a predominant tactical-combat focus during the pre-competition period. Their typical structure is as follows.

The average session duration is 20±5 minutes, and between rest intervals, the training loads should consist of work segments that vary in length. The alternation of these work periods should range between 2 and 3 minutes, but it is essential to include short breaks. The number of these work segments depends on the overall duration of the session, the nature of the combat actions performed, and the specific objectives set for the session.

The rest intervals between individual segments depend on the level of the workload just completed and to be repeated, and are recommended to range from 1 to 2.5 minutes. The overall ratio of rest to active (working) time in the session is approximately 1:3. For example, if the session duration is 20 minutes, then 5 minutes are allocated for rest and 15 minutes for active work.

The intensity of motor activity and psychological stress (determined based on heart rate) during working periods ranges from 160 to 180 beats per minute, and during rest intervals, it ranges from 100 to 150 beats per minute.

The numerical descriptions of work and rest regimes for boxers in the two lessons analyzed should be viewed as guidelines; they reflect only general trends in organizing and regulating training loads.

It is well known that a boxer's working capacity does not remain constant during activity but undergoes certain changes. In the process of regular training, the athlete's body adapts to new conditions, and adaptive systems are mobilized, leading to the development of qualitative aspects of motor performance. Therefore, it would be incorrect to consider the time parameters of uninterrupted work intervals and rest pauses presented in the individual lessons as fixed or universally applicable, regardless of the athlete's qualification level.

However, findings from several studies indicate that for a group of highly qualified athletes with approximately the same level of physical conditioning, there are optimal intervals of continuous work during which their specialized qualities and skills are comprehensively manifested. Therefore, to increase a boxer's working capacity during an individual session, it is necessary to pursue a more rational organization of the athlete's activity regime.

5.7. The importance of micro-breaks during individual training sessions

The data collected during the chronometry of training sessions regarding micro-breaks generates considerable interest. Observations conducted under natural training conditions indicate that the so-called "continuous work intervals" in an individual session actually alternate with micro-breaks. These short-term pauses vary in nature and duration depending on the athlete's activity.

Firstly, these are planned micro-breaks organized by the coach, specifically designed to allow the athlete's arm and leg muscles to rest and relax while setting new specific tasks during training.

Secondly, these are spontaneous micro-breaks that occur unintentionally during the athlete's activity. Often, such pauses are subtle; they may manifest as the athlete adjusting their stance, slowly re-entering the combat position, or fixing their form. These actions can be seen as indicators of emerging fatigue or a temporary decline in work capacity.

Spontaneous short breaks during a lesson account for 3 to 12% of its working time and often exceed the total number of short breaks intentionally created by the trainer (see Table 2).

At the beginning of the session (during the warm-up phase), the number and duration of spontaneous micro-breaks are relatively high. Later, as signs of fatigue begin to manifest (toward the end of the session), the number of these micro-breaks increases again. This pattern has been consistently observed across other sessions as well. It can be hypothesized that the number and duration of voluntarily occurring micro-breaks during an individual session are closely linked to the athlete s functional state, acting as a protective response of the body to the onset of fatigue.

In developing recommendations for determining optimal work-rest regimes in individual training sessions for a boxer, it is crucial to structure micro-regimes within each specific segment of the training load.

The analysis of materials from various studies has revealed that during individual training sessions, the number of spontaneously occurring micro-breaks increases, reflecting changes in the athlete's functional state, specifically indicating a decline in their working capacity. Therefore, during relatively long working intervals, the coach must incorporate planned short rest pauses to help maintain the boxer's stable performance and prevent early fatigue. In this context, it is extremely important to determine the placement, number, and duration of such micro-breaks. This issue must be addressed in a differentiated manner, depending on the athlete's level of conditioning and other influencing

factors. Nevertheless, the coach must base decisions on some form of optimal continuous work interval, after which a short rest should be introduced. This working interval must be long enough to maintain a high level of activity, yet short enough to avoid fatigue. As a rough guideline, it is recommended that a boxer's active working segment lasts about one minute, followed by a short rest. During this time, combat movements should be performed at moderate intensity. If the athlete is subjected to high or maximal intensity workloads, then micro-breaks may need to be introduced sooner. Thus, the effect of micro-breaks on the dynamics of changes in the athlete's physiological functions and specialized skills is of particular importance.

In the case of a skilled boxer, considering that the initial activation phase of specialized activity typically completes within approximately 2 to 3 minutes, it is not advisable to include rest breaks during this period. This is because, during this time segment, the nervous processes responsible for developing coordinated motor actions are actively mobilized. Introducing relatively long rest intervals at this stage may hinder the transition of the vegetative and motor functions to their appropriate working levels. Therefore, to achieve faster activation and reach an optimal level of working capacity, it is necessary to include very short micro-breaks, lasting no more than 8–10 seconds, after every 20–30 seconds of exercise load.

It is well established from numerous studies that during intense muscular activity, the activation of vegetative systems occurs more slowly compared to motor functions. In the first few minutes of an individual training session, the short breaks proposed are essential for ensuring proper initiation of activity and preventing early local fatigue in the athlete's peripheral neuromuscular system. At the same time, these micro-breaks are not long enough to disrupt or delay the activation of vegetative functions to the required level, making them an effective component of the training structure.

During the transition to a relatively stable level of working capacity, when the activation of vegetative functions has been completed and synchronized with motor functions, it becomes necessary to gradually reduce both the number and duration of micro-breaks within continuous work segments. However, complete elimination is not advisable.

Instead, during the peak phase of a boxer's working capacity in an individual session, the reduction of micro-breaks should be compensated by increasing the number and duration of structured rest pauses. This ensures sustained performance without compromising the athlete's physiological balance.

At the final stage of the training session, when signs of fatigue begin to appear in the athlete, it is necessary to increase the number and duration of micro-breaks within continuous work segments to 10–15 seconds. This is because, during this period, shorter micro-breaks lose their effectiveness due to only partial recovery of motor and vegetative functions. Using such micro-breaks in the initial phase of fatigue helps the athlete's body adapt to the imposed training load, facilitates the self-regulation of both motor and vegetative functions, and allows the boxer to maintain working capacity at a relatively stable level for a longer period.

5.8. Physical activity and training load volume

To gain a comprehensive understanding of a boxer's motor activity during individual sessions with flat mitts, we should examine data collected from a pedometer. This device records the distance covered by the athlete during the session (in meters), including steps, jumps, lunges, and side-steps, while also tracking the number of punches thrown. Additionally, training session timing (chronometry) and heart rate data are recorded using the Polar H10 M-XXL sensor. These combined metrics allow for a more detailed analysis of the training load, how it is distributed throughout the session, and its overall impact on the boxer's body. This integrated approach helps coaches better understand the total volume and intensity of physical exertion and guides them in adjusting sessions to maximize performance and prevent overtraining.

The data presented in Tables 12 and 13 reflect the magnitude of two individual training sessions conducted with a master-level boxer. The first session had a predominantly technical focus, while the second was oriented towards tactics, and both were conducted using the methodologies described earlier. Analyzing and comparing this data shows that the distance covered by the boxer (in meters) and the number of punches thrown during individual sessions are key indicators for determining the overall training load. Comparing these indicators with the time spent performing the activity allows us to assess the intensity of the boxer's footwork during the session. Notably, footwork activity during tactical sessions is significantly higher than in technical sessions (in our example: 21 m/min vs. 11 m/min). This pattern was consistently observed in other analyzed sessions as well.

The number of punches thrown (recorded via video analysis), along with the corresponding intensity of the boxer's hand activity, falls within the intensity ranges previously mentioned. Specifically, in the technical session, 518 punches were delivered, which equals 36 punches per minute

(see Table 12). In the tactical session, 545 punches were recorded, equating to 39 punches per minute (see Table 13).

Data obtained from the Polar H10 M-XXL heart rate monitor revealed that the boxer's heart rate fluctuates continuously, and it quickly and relatively accurately reflects the level of physical activity during various segments of the session.

Table 12

Individual session with a master boxer (focused on technical-tactical direction)

Indicators		Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Total in Lesson	
													Total Amounts	Pauses
													Total in Lesson	
Total duration		3'20''	30''	2'55	31''	2'45''	35''	3'10''	45''	2'32''	40''	3'15''	17'57''	3'01''
Number and duration of micro-pauses	Coach-induced	2-10''		-		-		2-25''		1-10''		2-18''	7	1'3''
	Self-initiated	2-18''		2-14''		1-8''		1-7''		2-20''		1-8''	9	1'15''
	Total	4-28''		2-14''		1-8''		3-32''		3-30''		3-26''	16	2'18''
Work time / Active time		2'52''		2'41''		2'37''		2'38''		2'2''		2'49''	15'39''	
Number of punches		91		87		85		86		79		90	518	
Punches per minute		36		36		35		36		35		37	36	
Distance in meters		26		38		31		26		23		23	167	
Meters per minute		10		15		12		10		11		9	11	
Average level (heart rate per minute)		101		109		148		143		153		110	127	

Note: The total lesson duration is 20 minutes; active time – 15 minutes and 39 seconds; rest time (pauses and micro-pauses) – 5 minutes and 19 seconds; lesson density – 74.8%.

Table 13

Individual lesson with a sports master focused on a priority technical-combat direction

Indicators		Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Rest Intervals	Continuous Work Volume	Total in Lesson	
													Total Amounts	Pause
													Total in Lesson	
Total duration		3 10	0 35	3'00	45	3 05	55	3 25	40	3 30	30	3 15	19 25	3 25'
Number and duration of micro-pauses	Coach-induced	1-12		2-18		2-21		1-8		2-16"		2-20	10	1 35
	Self-initiated	3-20		5-40		3-18		-		1-8		2-28	14	1 54
	Total	4-32		7-58		5 39'		1-8		3-24		4-48	24	3 29'
Work time / Active time		2 38		2'02		2 26		3 17		3 06'		2 27	15 56'	
Number of punches		89		86		85		98		94		93	545	
Punches per minutesoni		38		42		40		39		31		40	39	
Distance in meters		24		48		106		83		54		77	392	
Meters per minute.		13		16		34		26		14		19	21	
Average level (heart rate per minute)		135		161		164		165		176		171	162	

Note: Total lesson time - 22 ' 50 " ; working time - 15 ' 56 " ; rest time (pauses and micro-pauses) - 6 ' 54 " ; lesson intensity - 69.2%.

As acknowledged, this function (heart rate response) reacts more strongly to the intensity of the boxer's lower body activity (rapid movements, jumps, lunges, and side-steps) and to a lesser extent to the activity of the hands. However, a higher level of motor activity does not always correspond to a higher heart rate. For instance, during the fifth working segment of the tactical-focused lesson (Table 13), the highest absolute heart rate (188 beats/min) and the average rate (176 beats/min) were recorded, even though the intensity of the boxer's arm and leg movements was lower than in the previous and following segments (14 m/min and 34 m/min, respectively). This mismatch between the two indicators reflects a high level of emotional-volitional stress in the boxer during that specific segment. The nature of the learning material and the complexity of the task being addressed at that moment further confirm this. Specifically, the athlete was performing complex technical-tactical exercises involving decision-making, where high demands were placed on the quality of execution (i.e., disjunctive reactions). In such a situation, perceiving and processing information and forming a motor response require considerable mental effort. At the same time, when the student performed the combat actions correctly, the coach reinforced this behavior with positive verbal feedback ("Good!", "Well done!", "Exactly right!", etc.). All these factors together led to an increase in heart rate, even though the intensity of physical movements remained relatively low. The research data obtained by measuring heart rate using the "Polar H10 M-XXL" (including lesson chronometry) once again confirms the previously mentioned principle: there is no direct correlation between lesson intensity and the boxer's heart rate during specialized activity. These findings also demonstrate that the response of this vegetative function (heart rate) reflects the entire complex of stimuli associated with the individual lesson conditions for the athlete.

5.9. Optimal duration of continuous work segments in individual sessions using flat mitts

The primary objective of the pedagogical experiment was to clarify and substantiate the core principles that a coach must follow when structuring a boxer's training regimen during individual sessions with flat mitts, specifically in the technical-tactical and tactical-combat aspects. In other words, it was essential to address the following issue: which durations of repeated work segments (whether relatively long or short) are

more effective for prioritizing the improvement of boxing technique, and which are better suited for developing technical skills and competencies?

The pedagogical experiment relied on a comparative study method to evaluate test variants of a boxer's work during individual lessons. To determine the duration of continuous work segments in the experiment, standard indicators derived from the generalization of advanced practical experience were utilized.

Based on this, it was decided to conduct a study under natural sport conditions (in a boxing gym) using 8 different work-rest regimes while working with flat mitts. In all variants, the total duration of flat mitt training was 30 ± 2.5 minutes, of which 20 ± 1.5 minutes were allocated to active work and about 4 minutes to rest periods.

To maintain a uniform ratio between work and rest times across all tested regimes, minor adjustments (adding seconds) were made to individual work and rest intervals. The work and rest alternations were organized as follows:

a) 0.5-minute work + 15-second rest
→ 40 repetitions, 16 rest intervals;
b) 1-minute work + 20-second rest
→ 20 repetitions, 12 rest intervals;
c) 1.5-minute work + 30-second rest
→ 13 repetitions, 8 rest intervals;
d) 2-minute work + 35-second rest
→ 10 repetitions, 7 rest intervals;
e) 2.5-minute work (+21 seconds) + 40-second rest
→ 8 repetitions, 6 rest intervals;
f) 3-minute work (+20 seconds) + 50-second rest
→ 7 repetitions, 5 rest intervals;
g) 3.5-minute work + 1-minute rest;
→ 6 repetitions, 4 rest intervals
h) 4-minute work + 1.5-minute rest;
→ 5 repetitions, 3 rest intervals.

The primary indicator for determining the specific variant of continuous work, considering the activity type, is the highest level of a boxer's specialized working capacity. This level can be assessed based on various factors. First, these include indicators of vegetative functions, which may exhibit a stable level or deviations either above or below this level (heart rate, respiratory rate, etc.). Second, this includes the

effectiveness of motor activity, referring to the quality of executing technical techniques and tactical actions (speed, accuracy, and timeliness of movements, correctness of selection in challenging situations, etc.).

Each factor that contributes to a high level of specialized working capacity depends on several other factors: the conditions under which work with "flat mitts" is conducted, the athlete's training level and overall functional condition, the complexity of the tasks performed, and so on. In natural training environments (boxing gym), it is challenging to account for all this data during practice with "flat mitts." The interrelationship of various pedagogical, physiological, psychological, and other factors complicates the development of complete and entirely reliable criteria for determining a boxer's specialized working capacity. Therefore, discussing the effectiveness of the work variants under investigation must be done strictly concerning the specific type of activity of the athlete.

Based on these considerations, a decision was made to conduct a study focusing on the most general factors reflecting the quality of a boxer's specialized activity during work with "flat mitts." The following indicators were chosen as these factors: the speed of executing motor actions, the accuracy of delivering punches, and the correctness of action selection in challenging situations (combat decision-making). Reaction time is an indicator of the speed of nervous processes and can be regarded as one of the main quantitative characteristics for evaluating a boxer's activity.

Zarbalar berish aniqligi sportchi tomonidan yo'l qo'yiladigan xatolar hajmini aniqlash uchun asos, ya'ni texnik-taktik usullarni bajarish jarayonida ko'rish–harakatlanish koordinatsiyasi nuqsoni ko'rsatkichi bo'lib xizmat qiladi.

The correctness of selecting technical-tactical actions within short time intervals reflects a boxer's ability to make immediate and accurate decisions in problematic situations (such as during competition bouts) based on previously acquired experience.

Even analyzing just these three factors has both practical and theoretical importance for evaluating a boxer's specialized work capacity.

The pedagogical experiment was conducted at the Specialized Youth Sports School of Olympic Reserve in Termez. The research involved a group of six boxers aged 18–20, all of whom held the title of "Master of Sport of Uzbekistan" in boxing (each athlete was a member of the Surkhandarya regional team).

To study the temporal characteristics of a boxer's motor (special) reaction, a reaction timer was employed that allows the reaction time to be recorded directly while working with the flat mitts. Strike accuracy (SA), determined by whether the strike hits or misses the target, and the correctness of movement selection in challenging situations (CMS) were recorded visually and expressed as a percentage of the total number of strikes attempted. For comparative evaluation, it is more convenient to use the relative value of movement time, calculated by dividing the minimum movement time by the average time. In our conditions, the minimum movement time is defined as a constant value of 500 milliseconds (the time to take a step forward and deliver a strike). Relative movement time (RMT) decreases as the average movement time increases

Each participant underwent 16 individual training sessions using the flat mitts; 8 sessions emphasized a predominantly technical-tactical focus, while 8 sessions emphasized a predominantly tactical-combat focus. In other words, each of the 8 developed training modes was tested twice for each participant. In the first case, training content focused on improving boxing techniques amid various tactical situations. In the second case, training simulated the boxer's activity during an approximately competitive match. For this purpose, two typical (standard) variants of working with flat mitts were developed. As a result, a total of 96 hours of individual work using flat mitts was completed.

Before working with the flat mitts, each boxer performed a specially designed complex coordination (chigalyozdi) drill lasting 10 minutes. This was done to ensure that all athletes began from approximately the same pre-exercise condition. After the drill, a 5-minute rest break was provided, followed by the start of the work on the flat mitts. During individual practice with the flat mitts, at the end of each training mode (its duration was precisely recorded using a stopwatch), a combined exercise aimed at executing technical-tactical actions was performed. The essence of this task was as follows:

Starting from mid-range distance, the boxer was asked to throw a series of five straight punches (left straight, right straight, left straight, etc.) as quickly and accurately as possible while aiming at the circle-target marked in the center of the flat mitt. The boxer needed to synchronize their techniques with the coach's movements (three decision-based drills).

Each measured parameter that indirectly determines the effectiveness of a boxer's specialized activity can vary within a range—from a

maximum value indicating excellent execution of a technical-tactical action to a minimum value reflecting significant errors.

The analysis and generalization of practice, along with the statistical processing of the obtained data, allowed for the establishment of tolerance thresholds for the studied parameters. Within these boundaries, the performance of technical-tactical actions can be considered sufficiently effective. When indicators fall below these thresholds, the boxer's actions no longer meet the required task demands, indicating a partial loss of work capacity. Accordingly, the following target threshold ranges were identified for the key parameters: Punch Accuracy (ZA): 80% $\leq$ ZA $\leq$ 100%; Correctness of Tactical Choice (TT): 90% $\leq$ TT $\leq$ 100%; Relative Reaction Time (HNV): 65 $\leq$ HNV $\leq$ 100%.

The tolerance thresholds mentioned above were introduced specifically for this test and applied under certain conditions to a defined group of athletes. In our case, the values obtained were used solely to comparatively assess the impact of continuous work with flat mitts on the specialized qualities of a boxer holding the "Master of Sport" title.

Figure 61 (a, b, c) presents diagrams of the studied parameters (Punch Accuracy – ZA, Tactical Decision Accuracy – TT, Relative Reaction Time – HNV) in relation to the duration of continuous work with flat mitts conducted under two modes: technical-tactical priority and tactical-combat priority. Each curve shown in these diagrams represents the expression of certain variables, primarily depending on the boxer's individual attributes and skills. Averaging these curves of the studied parameters helps eliminate the influence of individual fluctuations, making it possible to identify general patterns among a group of boxers with approximately the same training level.

Let's examine the data on the relationship between punch accuracy (ZA) and the duration of continuous work. As seen in the figure, the curve shows that the percentage of punches landing on target declines as the duration of continuous work increases. For example, during flat mitt sessions with a technical focus, the accuracy rates by training regime are as follows: Regime I – 96%; Regime II – 88%; Regime III – 83%, Regime IV – 76%; Regime V – 70%; Regime VI – 58%; Regime VII – 45%; Regime VIII – 30%.

In combat-oriented sessions (dotted curve), the percentage of punches landing on target was distributed as follows: Regime I – 87%; Regime II – 81%; Regime III – 75%; Regime IV – 67%; Regime V – 61%;

Regime VI – 53%; Regime VII – 40%; Regime VIII – 36%. The effectiveness of the first regime (0.5-minute workload) stands out clearly. At the same time, the lowest performance in the eighth regime (4-minute workload) should not be surprising, as many participants gave up after the third minute, which was directly related to visible fatigue.

The lower boundary for punch accuracy (ZA) falls within the acceptable range at approximately 80%, indicating that in technical flat mitt sessions, continuous work should not exceed 2. 2.5–3 minutes, and in combat- focused sessions, it should not exceed 2 minutes. In these time frames, punch accuracy remains most effective. As the duration of uninterrupted work increases, effectiveness declines, which means the boxer fails to meet training objectives.

When examining the next indicator, Decision- Making Accuracy (TT), a similar pattern emerges: as the duration of continuous work increases, the measured parameter deteriorates. Comparing the distribution of values above and below the threshold level of 90%, it becomes evident that continuing beyond 2. 5 minutes in technical flat mitt sessions and over 3 minutes in combat- oriented sessions results in a decline in tactical targeting effectiveness, as the values fall below the acceptable threshold.

In this group of participants, the execution speed of combat actions (HNV) follows a similar trend to the previous indicators. The time a boxer needs to perform a combat action (e. g., a straight punch) decreases during short- term work and increases during longer- duration activity. The defined norm (65%) sets the following upper limits: for technical flat mitt training, continuous work should not exceed 2. 2.5 minutes, and for combat- oriented sessions, it should not exceed 2 minutes.

When analyzing the curves for the studied parameter, we must emphasize the importance of the compatibility of the physical qualities and skills required for this sport.

The characteristics of a boxing match demand that the athlete perform several well- developed functions at an automatic level- simultaneously or nearly so- such as accuracy, speed, timing, distance control, moment selection, reaction precision, and others. In real combat conditions, a decline in the effectiveness of some of these components may occur, or errors might arise—and sometimes both. As a result, some athletes choose the most optimal version of their combat performance based on their individual abilities and limitations. In other words, a decrease in the performance of one function is often compensated by the high

development of another. For example, a boxer who lacks high execution speed in combat movements may compensate with a strong sense of timing and moment selection, allowing them to perform well and achieve strong results. However, if the drop in performance of certain functions exceeds acceptable limits, it can lead to a decline in the boxer' s overall sporting performance.

Based on the points discussed above, to provide a simultaneous and comprehensive evaluation of the studied parameters, the concept of a Boxer's Special Work Capacity Composite Index (IQKK) is introduced. It can be calculated using the following formula:

IQKK=10−6 ×ZA×TT×HNV

Where:

IQKK - Integrated Quantitative Composite Indicator of Work Capacity (0 ≤ IQKK ≤ 1)

ZA – Strike Accuracy (% of successful strikes)

TT – Correct Tactical Decision Rate (% of correct action choices)

HNV – Relative Movement Time (an indicator of reaction and execution speed).

This formula enables objective comparison and evaluation of a boxer's performance efficiency by combining three critical parameters into a single, standardized index;

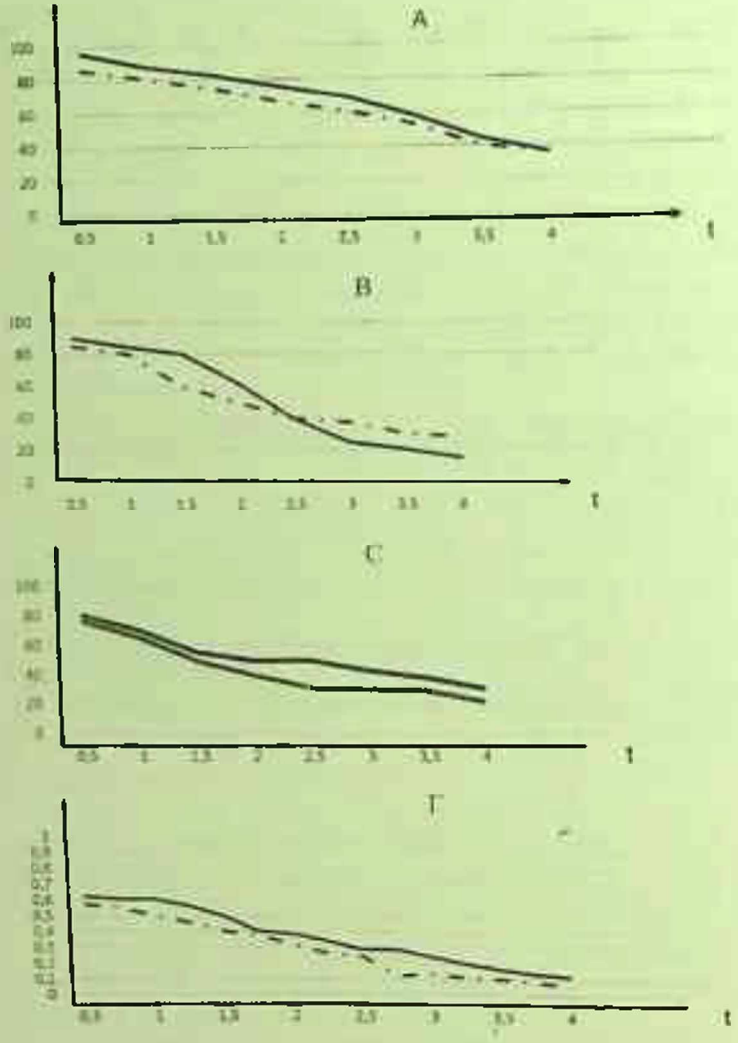


Figure 61. Graph showing the changes in ZA, TT, HNV, and IQKK depending on the duration of work: ZA – Strike Accuracy (in %); TT Accuracy of Decision-Making (in %); HNV – Relative Movement Time (in %); IQKK – Integrated Indicator of Work Capacity.

10^{-6} - normalization coefficient; ZA – strike accuracy, in %; TT – accuracy of decision-making (correct choice), in %; HNV – relative time of (combat) movements, in %.

By inserting the separately obtained data for each indicator into this formula, we obtain the Integrated Indicator of Special Work Capacity for the boxer during work with flat mitts in technical and tactical training modes, depending on the specific work regime under analysis.

Taking into account that IQKK (Integrated Indicator of Special Work Capacity) varies approximately from 0 to 1, the lower threshold of the acceptable range for this indicator is set at 0.47. This value is determined based on the minimum acceptable levels of the analyzed parameters — ZA, TT, and HNV — calculated as: $10^{-6} \times 80\% \times 90\% \times 65\% = 0.47$. When determining IQKK (with a value not lower than 0.47), specific minimum standards were established for each of the tested functions: ZA (Strike Accuracy): not less than 64%; TT (Decision Accuracy): not less than 72%; HNV (Relative Movement Time): not less than 52%. If any of these indicators fall below their respective threshold, even if the other two are relatively high, the overall complex test result was excluded from consideration in this experiment.

Figure 61 illustrates the correlation between average IQKK values (Integrated Indicator of Special Work Capacity) and the duration of continuous work in technical and tactical sessions using flat mitts. As shown in the figure, the best performance (in both technical and tactical flat mitt variants) is observed in short-duration work sessions. For example, in the technical session, with a short 0.5-minute workload, the IQKK is 0.62. In the tactical session, under the same condition, it is 0.57. However, at 2.5 minutes of activity, these values drop significantly: Technical: 0.29; Tactical: 0.24. Work periods exceeding 2.5 minutes are often associated with low performance efficiency and, more critically, severe fatigue, which can lead to a complete abandonment of the assigned tasks due to reduced combat efficiency. When comparing these two curves, we see that, for technical-tactical priority sessions, the optimal activity zone is around 3 minutes. For tactical-combat sessions, the optimal performance duration is around 2 minutes.

Thus, the conducted research determined that continuous work variations of different durations using flat mitts significantly affect the effectiveness of how a boxer's specialized qualities and skills are expressed. Additionally, the combined test we developed can be used for comparative analysis of the development of motor qualities and skills

across different training stages and academic years. To ensure its applicability, it should be based on the coach's practical experience. The lower acceptable limits of the studied parameters should be adjusted depending on:

- the boxer's skill level,
- their training phase,
- the assigned tasks, and
- the conditions under which the test is administered.

5.10. Load characteristics of boxers in matches of different importance

At this stage of the study, the following task was set — to examine the dynamics of heart rate (HR) in skilled boxers before and after training and competition matches. By comparing absolute and average levels, as well as the variability of the obtained data, it becomes possible to assess the body's complex reactions and determine the threshold at which changes occur in the studied function during these types of boxing activities. Heart rate (HR) was used as an indicator of the boxer's functional state during the bout because it responds clearly to the intensity of physical activity, changes under the influence of neuro-emotional factors, and is considered the most practical metric to evaluate under conditions of real opponent resistance.

It is well known that during the pre-start period, athletes experience an increase in heart rate, which can be explained by their neuro-emotional state and the readiness of physiological functions for the upcoming activity. Therefore, we found it appropriate to record heart rate indicators during the rest periods between bouts. Our main interest lies in the changes in heart rate (HR) that occur exclusively during the process of combat activity, starting from the moment the boxer enters the ring.

The research was conducted during training sessions and official competitions. Heart rate (HR) was recorded in both individual and average formats using a computer program specifically developed for the "Polar H10 V-XXL" heart rate monitor. A total of 46 boxers were examined — 12 masters of sport and 34 first-class athletes, including champions and prize-winners of national and international tournaments.

First and foremost, we will focus on the heart rate data recorded during sparring sessions, which play a critical role in a boxer's specialized training activities.

In sports practice, there are various types of sparring sessions for boxers, and the choice of a particular type depends on several factors such as the training goal, training period, athlete's qualification, and other variables. In our research, we concentrated on observing two widely used types of sparring:

a) training (free) sparring without official scoring of results;

b) training (free) sparring with officially recorded results.

In training (free) sparring without officially recorded final results (Table 14), the heart rate (HR) levels of boxers (Masters of Sport and first-rank athletes) were as follows: Before entering the ring: average HR was 92.4 ± 0.8 bpm. After the sparring match: average HR increased to 152.5 ± 0.99 bpm. This means, before the match, their HR was on average 32% higher than their resting heart rate (ranging between 19% to 54%), after the match, it was on average 117.5% higher than at rest (ranging between 100% to 139%).

While waiting for the next bout, especially when the athlete enters the boxing ring, a conditioned reflex readiness is observed, accompanied by emotional arousal related to the upcoming combat. The increase in heart rate before matches, compared to resting levels, can be attributed to two main factors. On one hand, it results from the intense muscle work performed during the previous warm-up and bouts, where the heart rate has not yet returned to its baseline level. On the other hand, it stems from heightened anticipation and increased arousal during the waiting period.

Analyzing the obtained data allowed us to determine that the average difference was 60.1 beats per minute, indicating that heart rate increased by 65%. It is noteworthy that the heart rate variability coefficient before the matches averaged 12.2% for all participants, while after the matches, it decreased to 5.5%. This suggests that individual differences among boxers became somewhat more balanced following the exertion caused by the match.

Table 14

Average heart rate of boxers in a relatively resting state, before and after training (sparring) matches

Athlete	Heart Rate (Pulse)	Number of	Without taking results and time into account												Increase compared to resting state			
			Before the fights					After the fights					Difference		Before the fights		After the fights	
			Min	Max	M+m	σ	v	min	max	M+m	σ	v	Mut-laq	%	Mut-laq	%	Mut-laq	%
X.Nyev	72	32	78	114	95±1.5	8.7	9.2	126	162	146±1,5	8,7	5,9	51	53,6	23	31,9	74	102,7
D.A ov	66	6	72	120	120±7.2	18	17,6	126	156	143±7,4	11,8	8,2	41	40,2	36	54,4	77	116,6
F.Kov	72	15	72	114	88±3,1	12.1		120	162	144±3,1	12,1	8,4	56	63,6	16	22,2	72	100,0
Sh.Mov	66	6	66	120	90±8,5	21,3	23,6	150	168	158±2,8	7,1	4,5	68	75,5	24	36,3	92	139,3
M.Rov	72	18	72	96	89±1,6	6.6	7.4	132	168	154±2,3	9.8	6,3	65	73.0	17	23,6	82	113,8
A.G'ov	72	21	78	108	89±1.7	7,9	7,3	138	168	157±1,7	7.9	5.0	6,8	76,6	17	23.6	85	118,0
B.Rov	66	7	72	108	91±5,0	13,3	12.4	150	168	153±2,5	6,7	4,4	62	68,1	25	37,8	87	131,8
X.Jev	78	18	78	108	93±2.0	8.2	8.8	150	186	163±2,3	9,9	6,1	70	75,2	15	19,2	85	08,9
N.Aov	72	24	66	108	90±2.2	10,8	12,0	150	174	163±1,2	6,1	3,7	73	81,1	18	25,0	91	126.3
A.Rov	66	10	78	10	97±3,0	9,7	10,0	132	156	144±2,4	7,8	5,4	47	48,4	31	46,9	78	118,1
X averag e	70,2				92,4±0.81					152,5±0,9					22,2	32,0	32,3	107,5
Considering both the outcomes and the time																		
X.Nyev	72	32	84	114	93±1,3	7,2	7,7	138	162	152±1.0	5.8	3,8	52	55,8	21	29,1	80	111,1
D.A ov	66	6	72	126	96±8.5	21,3	22,2	132	174	149±6.6	16,6	11,1	53	55,2	30	45,4	83	125,7
F.Kov	72	15	84	102	97±1.3	5,2	5,4	156	180	168±1.8	6,9	4,1	71	73,1	25	34,7	96	113,3
Sh.Mov	66	6	66	102	82±5,8	14,6	17,8	150	168	156±2,8	7,1	4,5	74	90,2	16	24,3	90	136,3
M.Rov	72	18	96	120	105±1.6	6.6	6,3	156	186	171±2.0	8.2	4,8	66	62,8	33	45,8	99	137,5
A.G'ov	72	21	84	120	102±2,1	9,5	9.3	138	180	165±2,4	11,1	6,7	63	61,7	30	41,7	93	129,1
B.Rov	66	7	102	120	111±2.5	6,7	6,0	150	174	162±3,4	8.9	5,5	51	45,0	45	68,2	96	145,2
X.Jev	78	18	84	114	110±2,0	8.2	7,4	144	162	147±1,2	4,9	3,3	47	47,0	32	41,0	69	88,4
N.Aov	72	24	78	114	97±1,9	9.2	6.5	156	180	169±1,2	6.1	3,6	72	74,2	25	34,7	97	134,4
A.Rov	66	10	78	114	94±3.7	11,7	12,5	144	174	158±3,0	9,7	6,1	64	68,0	28	42,5	92	139,4
X o'rtacha					97±09					159±0,8			61	63,3	28,5	40,6	89,5	128,0

Similar heart rate response tests were conducted on the same boxers during training bouts. The data obtained showed that immediately before the fights began, the heart rate averaged 97±0.90 beats per minute, and after the bouts, it reached 159±0.81 beats per minute, which is 40.6% and 128% higher than the resting heart rate, respectively. The difference in heart rate between the beginning and the end of the bout averaged 61 beats per minute, indicating a 63.3% increase.

An analysis of heart rate changes reveals that, as in the case where results were not recorded, there was a decrease (5.3%) in heart rate after the bout compared to before it began (10.1%), indicating partial recovery.

A comparison of heart rate response characteristics in the same athletes (before and after training bouts where results were not recorded) showed that the latter bouts were accompanied by a relatively higher level of emotional excitement.

We now turn to the analysis of data obtained during official competition bouts among youth boxers in the national championship (see Table 15.

Table 15

Comparison of the average level of heart rate variability in boxers before and after competition bouts

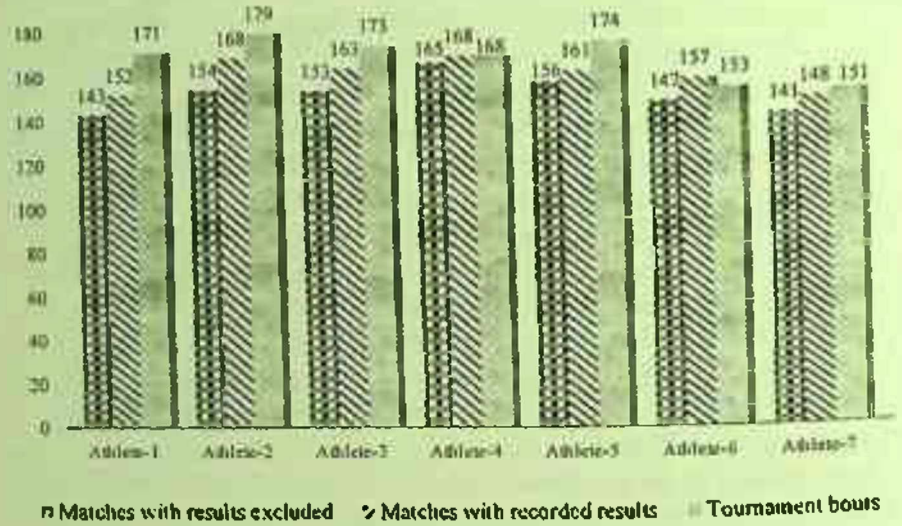
N	Athletes	Age	Average indicator						Differ.
			Afther the fight			Before the fight			
			M+m	σ	V	M+m	σ	V	M1-M2
1	D.Aov	22	111±4,4	12,62	11,57	154±8,9	25,6	16,40	43
2	A.G'ov	23	109±2,2	6,31	5,78	159±7,4	21,05	21,05	50
3	D.Jov	20	116±1,5	4,21	3,62	170±1,5	4,21	2,47	54
4	N.Aov	20	104±4,5	12,62	12,13	156±6,7	18,94	12,14	52
5	B Rov	22	110±2,2	6,31	5,73	167±2,2	6,31	3,77	57
6	X.Nev	19	108±2,2	6,31	5,84	158±3,7	10,52	6,65	50
7	A.Rov	19	108±3,0	8,42	7,79	166±5,2	14,73	8,97	58
8	F.Kov	23	110±3,0	8,42	7,65	176±2,2	6,31	3,58	66
9	Sh.Mov	22	112±2,2	6,31	5,64	171±3,0	8,42	4,93	59
X sr.			109±3,1		8,78	8,05	164±5,8	16,31	9,94	55

Let us first analyze the heart rate indicators before the start of the bouts (pre-start phase). For example, the heart rate of the Master of Sports Sh-v before the matches ranged from 90 to 146 beats per minute, while the heart rate of the first-class athlete 0000 ranged from 102 to 120 beats

per minute. During the competition, in the four bouts they participated in, the average heart rate before the match was 111 ± 4.4 beats/min for the first bout and 110 ± 2.2 beats/min for the second. However, despite the nearly identical average heart rates for both boxers, the coefficient of variation was significantly higher for the Master of Sports (11.37%) compared to the first-class boxer (5.73%). This indicates that the heart rate before each match was much more stable for the first-class athlete, i.e., the range of fluctuations was narrower than that of the Master of Sports. For all finalists, the heart rate just before entering the boxing ring averaged 109 ± 3.1 beats/min (ranging from 96 to 126), with a variability of around 8.05% (ranging from 12.13% to 3.62%)).

Now let us examine the heart rate (HR) indicators of the same finalists after their matches. The highest absolute heart rate was recorded in first-class boxer A-v, reaching 186 beats per minute. This same athlete also showed the largest difference between pre- and post-match heart rates - from 102 to 180 bpm, a difference of 78 beats per minute. The smallest difference was observed in Master of Sports Sh-v during the final match (from 96 to 108 bpm), meaning his heart rate increased by only 12 beats. On average, for all finalists, the heart rate increased by 55 beats per minute after the matches.

The analysis of heart rate levels immediately following matches of varying importance—particularly those where results are officially recorded—conducted during final training camps and official competitions revealed the following. The lowest average heart rate was recorded after sparring sessions conducted independently by the athletes themselves (ranging from 141 to 165 beats per minute). Next in intensity were the training matches where results were recorded, with heart rates ranging from 148 to 168 bpm. The highest average heart rate was noted after the first official match (151 to 179 bpm), while the second match was at a similar functional level. However, the third match showed post-fight heart rate results that were slightly lower than those of the recorded training matches. This decreased level of exertion can be explained by the reduced importance of the third match in team selection: the outcomes of the first two matches had essentially finalized the lineup, making the third match less intense both physically and psychologically. Observations of elite boxers across matches of varying significance indicate that the increase in heart rate is directly related to the competitive task at hand (see Figure 62).



Pulse rate – number of punches delivered per minute

Figure 62. Average heart rate after bouts of varying significance among boxers of the Surkhandarya regional team

These findings confirm once again that an increase in heart rate is linked not only to the physical strain but also to the psychological strain experienced by athletes. This connection becomes especially evident during official boxing matches, where high-intensity physical activity is accompanied by strong emotional arousal.

Interestingly, training bouts in which the results are officially recorded (i.e., protocol bouts) are comparable in intensity and stress levels to those of official competition matches. This conclusion should be considered when planning a boxer's training load individually.

Self-assessment questions

1. 1. What general conditions and rapid information methods do you know for improving a boxer's working capacity during individual lessons?
2. How are optimal work and rest regimes organized in individual boxing lessons?

3. What types of individual lessons in different areas do you know?
4. What is the significance of short breaks during individual lessons?
5. What do you know about the most effective durations of continuous work during individual lessons using flat mitts?
6. What types of individual lessons in various areas can you name?
7. How are individual lessons with a dominant tactical-combat focus organized?
8. What can you tell us about the loads experienced by boxers during bouts of varying importance?

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CHAPTER VI. RECOMMENDATIONS ON THE USE OF CHOICE-BASED EXERCISES AND IMPROVING THE MOTOR STRUCTURES OF SPECIAL REACTIONS IN BOXERS

6.1. Utilizing choice-based exercises

Choice-based exercises, widely used in individual training sessions, can positively impact only if certain methodological conditions are met. These include aligning the task volume and direction the coach sets with the boxer's skill level and physical conditioning.

The task volume, or the number of choices offered to the athlete, should not exceed their ability to perceive and process incoming sensory information at maximum speed and form a timely motor response. At the same time, the volume must be sufficient to keep the athlete engaged at a high level. In other words, when using choice-based exercises, the coach must determine the optimal number of task options presented to the boxer; if the load is either excessive or insufficient, it can result in negative changes in performance—such as increased reaction time, execution delays, or incorrect movement execution.

The orientation of the tasks can take two forms. On one hand, conditional tasks may be used (where the coach performs a series of familiar, pre-learned movements, and the boxer must respond with a specific, appropriate action to each while ignoring others). On the other hand, non-conditional movements are implied (which are executed by the boxer based on previously acquired experience).

To conduct choice-based exercises, both the volume and orientation of the task must be interrelated in the individual lesson, and any changes to one component will inevitably require adjustments to the other.

Numerous studies have shown that during regular training, reaction times, both simple and choice-based, improve, indicating that the maximum speed of receiving and processing information depends on the athlete's qualification level and degree of training. Therefore, to determine the maximum permissible and optimal number of action choices offered to a boxer, it is essential to consider the boxer's individual abilities and capacities, as well as the nature of the tasks being addressed in the lesson, among other relevant factors.

However, generalizing data from several studies has allowed for the identification of fundamental principles and patterns that reflect the issue at hand.

Analysis of the collected data leads to the conclusion that during individual lessons, when a coach presents a large number of strictly conditioned choices—such as eight or more signals (e.g., movements with "flat mitts" and others)—these exceed the boxer's processing capabilities. This can be explained by the fact that as the number of conditioned choices increases (from eight onwards), the latency period of the boxer's specialized reaction remains unchanged. In other words, the curve illustrating the relationship between reaction time and the number of incoming signals reaches its limit and becomes horizontal. This phenomenon can be attributed to the need for the athlete to continuously remember how to respond to each specific signal provided by the coach during exercises involving strictly conditioned actions. As a result, this slows down the problem-solving speed and negatively affects the expression of reaction speed.

In the actual conditions of conducting individual training sessions, exercises involving eight or more strictly conditioned choices are rarely utilized, as this number is generally much lower. Therefore, it should be recognized that using tasks with six strictly conditioned options, while they may not exceed the boxer's capabilities, is unwise. In such cases, the latency period of the specialized reaction exceeds the duration of the motor component, meaning the brain requires more time to process the signal than to initiate the motor response. Such delays in reaction adversely affect key qualities, such as the timeliness of the response action and the risk of missing repeated actions from the opponent.

Tasks involving two to four conditioned choices produce an acceptable reaction time and can be recommended for practical use in the individual training process aimed at developing timely reaction capabilities.

During a sparring session, a boxer often has to react to a wide range of movements actually performed by the opponent, while also ignoring deceptive ones. In other words, throughout combat activity, the athlete needs to receive and process a high volume of information with maximum speed and accuracy. Sometimes, this amount of information may greatly exceed the previously mentioned range of 2 to 4 choices. To develop and enhance such skills and competencies during individual sessions, choice-based exercises should continue to be used; however, in this case, the

direction of the task assigned by the coach is modified. The focus shifts to executing combat actions based on an unexpected signal from the coach, requiring the athlete to adjust the task in real-time. These conditioned tasks involving selection are carried out by the boxer based on intuition and prior experience. In this scenario, the coach's preliminary instructions prepare the athlete to execute combat movements according to the tactical situation that arises. This method of applying exercises allows the coach to significantly increase the number of choices presented to the athlete without compromising performance speed and accuracy. As such, this approach is considered one of the most effective in individual training sessions. Consequently, as a boxer's skill level increases, a greater number of choice-based exercises should be included in training. In the early stages of athletic development, these exercises should involve predefined tasks with 2–3–4 choices. Later, when the athlete develops the capacity to perceive the coach's signals and generate motor responses based on anticipation, training should shift to tasks that necessitate intuitive decision-making. Such tasks stimulate the athlete's predictive abilities and enhance their reaction speed and differentiated accuracy in competitive combat situations, which are critical for high-level boxers.

Therefore, it is essential to emphasize the significance of "pre-signals," that is, cues that precede a boxer's or opponent's combat action. Recognizing such signals enables a skilled athlete to respond accurately and promptly during competitive scenarios. In this case, the boxer senses the opponent's (or coach's) intent to attack, interprets it as a signal, and constructs their technical-tactical response accordingly, considering the expected movements of the opponent. One of the "secrets" of high-level boxing mastery seems to lie in intuition, which, according to B.M. Teplov, is closely associated with the advanced development of spatial and temporal perception.

6.2. Enhancing the motor components of boxers' specialized reactions

During a boxer's activity, they must process incoming information at very high speed and execute the corresponding motor response. The motor component of a boxer's specialized reaction is characterized by complex, coordinated movements, which often require the athlete to instantly "reposition" or modify an initiated action. In such challenging or rapidly changing situations, the athlete must be able to perceive and assess the

situation as quickly as possible and align their response speed and quality with the coach's (or opponent's) actions. In other words, the motor component of a reaction should be evaluated based on the criterion of timely execution, which reflects the optimal balance between response speed and accuracy.

Technical mastery as an expression of movement speed. The duration of a boxer's simple reaction (a basic combat action performed in response to a previously known but suddenly appearing signal) primarily depends on the speed of the working organs—in this case, the speed of the hands and feet—and, to a lesser extent, on the latency period of the reaction. This principle has been confirmed by experimental research, including the correlation between total reaction time and its motor component. Therefore, the task of constantly improving the execution technique of boxing movements—comprising techniques, combinations, and their sequences—holds special significance.

It should be noted that, under equal conditions, properly acquired and automated technique positively impacts the speed of individual movements, which, in turn, helps reduce the total reaction time in the boxer's response. Moreover, the speed of the motor component of the reaction, when developed as a complex skill, depends on several other physical qualities. Among them, endurance should be regarded as one of the most important factors.

Thus, in boxing, a sport where motor actions are structurally complex, technical mastery based on specialized physical preparation plays a major role in developing movement speed and, therefore, in increasing the effectiveness of combat actions. This is essential because the main task in a boxing match is to act ahead of the opponent, both in attack and defense.

Considering the link between the latent period of reaction and the structure of the motor response. There is a clear connection between the latent period of reaction (the delay before movement begins) and the structure of its motor component. As the complexity of a motor action increases, meaning when the coordination difficulty of a combat movement rises, the latent period tends to lengthen, and its variability expands. It can be hypothesized that an athlete's subjective readiness to perform different combat movements based on their difficulty level influences reaction speed.

Thus, it is advisable to determine the magnitude of the latent (hidden) period of boxers' specific reactions, considering the structure of their motor response.

Based on these conclusions, we can formulate several principles to consider during individual training sessions, namely:

1. To develop and improve reaction speed, reducing the latent (hidden) period of a boxer's specific reaction, it is essential to focus on selecting very simple combat actions. These reactions should be based on motor components with simple structures, adhering to the principle of single-tempo actions, where movement complexity and fragmentation are minimized, and control over individual elements of the action is slightly relaxed. Such fundamental combat movements can include simple attacks, counterattacks, and defensive maneuvers that do not require complex coordination. In these cases, slight adjustments to the amplitude of the movement may be necessary. Notably, the latent period tends to shorten and stabilize when executing strikes that primarily involve hand movements (with minimal leg involvement), such as executing a punch while stepping backward from an approaching coach, where the hands act before the legs. In contrast, when the action involves more dynamic footwork, like delivering a punch while jumping toward a retreating coach, the latent period lengthens, and variability increases. This increase is likely due to the larger movement amplitude, the need to calculate distance accurately, and the influence of spatial-motor targeting, necessitating more cognitive processing.

Meanwhile, during certain training stages—once a boxer's latent reaction period has stabilized at a certain level (through simple movement execution)—it becomes appropriate to introduce more complex motor actions. Responding with coordinated movements to unexpected signals (like the coach's actions) assists the athlete in overcoming subjective (psychological) challenges that occur when addressing advanced tasks. By frequently and consistently repeating such exercises, the motor control system restructures, leading to changes in how the movement is mentally programmed and executed.

However, it's crucial to remember that developing reaction speed through complex coordination-based combat actions will only be effective if those movements are performed with a high level of technical mastery. If the technique is underdeveloped, such exercises won t yield the desired outcome, as the boxer's attention will be split between the need to react quickly and execute the movement accurately. This divided focus ultimately reduces neural responsiveness, resulting in a longer latent reaction time.

2. During the individual lesson, the coach must ensure that the boxer consistently demonstrates a high level of reaction speed throughout the session. One effective tool to maintain quickness in performing combat actions is alternating relatively simple motor actions with more complex ones. This alternation of activity methods during the lesson allows the boxer to sustain work capacity for a longer duration and achieve stability in their quick reaction indicators. In this case, the central nervous system slightly equalizes the mobilization level of various muscle groups in the athlete, thereby reducing the onset of fatigue.

An effective method for maintaining the required level of reaction speed in a boxer during individual lessons involves reconstructing the tactical reasons for performing combat actions. This means transitioning from reflexive compulsory responses (where all initial actions of the student begin based on the coach's signal) to actions performed through anticipation (where the initiative to begin movement belongs to the student). The terms "compulsory response actions" and "anticipatory movements" are considered conditional. They are based on the psychological characteristics of combat actions accepted in boxing.

In the practice of conducting individual lessons, tasks for executing offensive combat actions typically dominate, and their initiation is tactically triggered by the coach's unexpected signals. The boxer is constantly required to react to these signals with maximum speed. As a result of this activity, fatigue begins to accumulate throughout the lesson, associated with a decline in the function of the central link in the reflex chain – the latent period of the reaction increases, differentiation is disrupted, and signals begin to be missed. Therefore, the method of alternating reflexive compulsory actions with anticipatory actions is considered justified. In this case, the need for an immediate response to the coach's movements is removed during the execution of the action, which slightly lessens the load on the central nervous system without halting the exercise. This enables the boxer to distribute their working capacity more evenly throughout the entire individual session.

6.3. Suggestions for addressing the complexity of combat movement structures

It is well known from sports physiology that, during training and competitive loads, autonomic (vegetative) functions largely depend on the athlete's functional state. Additionally, several studies have revealed that when combat movements of a more complex structure are performed—

even under the same workload intensity and duration—they provoke a greater cardiovascular response in the boxer. For example, throwing a simple straight punch typically results in a heart rate of 96 beats per minute in a sport master-level boxer. However, when a punch is thrown with a step forward, the heart rate increases to 126 bpm. When the punch is delivered with a step forward and a jump, the rate rises to 138 bpm. This increase in heart rate during the execution of more complex combat actions is primarily due to the engagement of additional and newer muscle groups in the boxer's activity, which consequently leads to an increase in the body's overall energy expenditure.

Moreover, a noticeable difference was observed in heart rate levels between sport masters and first-rank athletes. For instance, first-rank athletes generally exhibited slightly higher heart rates compared to sport masters. This can be explained by considering that more experienced and technically specialized boxers, those with a greater training background, perform combat movements with less muscular and neuro-emotional strain than first-rank athletes. This indicates a more economical physiological response in highly trained athletes, which, in this case, is reflected in a lower heart rate.

Compared to first-rank athletes, sport masters reach the required working heart rate level to sustain activity more quickly. This can be explained by their well-developed control of autonomic functions and coordination with other motor functions, enabling faster engagement and the establishment of a more distinct and stable working state in sport masters.

The data mentioned above allow us to provide the following conclusions and recommendations:

1. When planning training loads for boxers, a significantly differentiated approach should be applied to sport masters and first-rank athletes. Their level of specialized preparation varies, and therefore, the body's response to the same load differs. This must be taken into account.

2. In practice, the commonly applied sequence of starting an individual lesson with simple hand punches and gradually moving to punches combined with footwork has proven effective. This order ensures that the principle of progressively increasing training load is followed.

3. A key factor in managing the boxer's motor activity during individual sessions is to vary the method of delivering punches (e.g., only with hands, stepping forward, backward, left, right, jumping). This alters the volume of muscular work. Understanding the functional changes that

each type of strike brings allows the coach to adjust the load in real time by increasing or decreasing its intensity.

4. At each stage of continuous work in an individual session, it becomes possible to determine the optimal rest duration based on the type of strikes performed and their physiological impact on the athlete. For instance, combinations involving jumps or forward-leap punches require longer recovery periods than punches executed from a stationary position or just stepping.

By utilizing these descriptions, it becomes feasible to manage the individual training session more effectively by considering the boxer's personal characteristics, as well as the intensity and duration of the workload.

6.4. Guidelines for novice coaches

The consistent improvement of a boxer's level and skill requires the coach to take a creative, individualized approach and ensure the comprehensive development of technique and tactics.

1. When working on the skill of delivering punches, the correct positioning of the boxing flat mitts is crucial. The flat mitts should be placed close to each other and in the target area for punches.

2. Extending the flat mitts to the sides or too far forward interferes with the boxer's ability to develop punch accuracy, as well as their sense of distance and target recognition. It is essential for the coach to help the boxer master proper punch absorption skills, avoiding pulling backward, swinging the mitts to the sides, and thrusting the mitts into incoming punches.

3. Proper punch absorption prevents various hand injuries for both the coach and boxer. It also helps boxers accurately assess the effectiveness of their punches. For example, the right flat mitt is used to absorb straight punches. The coach makes a top-down movement with the palm as the punch lands, allowing the glove to slide along the surface of the mitt, thus softening the impact.

4. In hook punches, both the right and left flat mitts are used, respectively, to receive right and left hook punches. A single flat mitt can also be used, which should be turned toward the moving glove.

5. In uppercut punches, the right flat mitt is used more frequently and is positioned at head or body level. When the glove makes contact with the flat mitt, a gliding effect should be created—similar to that in straight

punches, which also results in a softening movement in both hook and uppercut punches.

6. If the task is to develop punch combinations, the position of the flat mitts must constantly change. The distance between the mitts should remain narrow, as this helps create conditions that are closer to real combat and allows the coach to react faster to the boxer's punches and quickly position the mitts for the next shot.

7. Upon impact between the glove and the flat mitt, the boxer must immediately form a tight fist, and after the punch, relax the hands and quickly return them along a short path.

8. Other equipment for complex training should not be overlooked; they are also important—but when it comes to working on technically correct punches, training with flat mitts offers greater benefits.

- There are several important rules for coaches when working with flat mitts. These rules ensure high-quality training organization for boxers at all stages of preparation:
- The flat mitts must be held at a precise angle relative to the punch: for uppercuts, the target point should be directed downward; for hooks, it should be held at the center; for straight punches, it should be positioned forward.
- Pushing the mitt toward the punch is not allowed, as this may create a false impression of the force and accuracy of the boxer's punch.
- To develop the power and accuracy of counterpunches, one mitt should be used for practicing the boxer's attack punch while the other should be positioned under the expected counterpunch.
- While teaching combination punches (offensive or counter-offensive), it is necessary to predefine the sequence, direction, and number of punches, and guide the boxer's attention to open sectors based on their intention during the punches.
- To simulate real competition scenarios, the coach must place the mitts under the boxer's punches, then quickly move backward or attack, change movement directions, simulate punches, and thus force the boxer to use a variety of defensive techniques at different combat distances before proceeding to counterattack.

Self-assessment questions

1. What general conditions and prompt information methods do you know for enhancing a boxer's efficiency during individual training sessions?
2. How are optimal work and rest schedules organized for boxers during individual lessons?
3. What types of individual lessons with various orientations are you aware of?
4. What is the importance of short breaks during individual lessons?
5. What can you tell me about the most effective duration norms for continuous work in individual training sessions using "flat mitts"?
6. What types of individual lessons with different focuses can you identify?
7. How are individual lessons with a primary tactical-combat orientation structured?
8. Provide information about the training loads of boxers during matches of varying significance.

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GLOSSARY

ESSENCE OF CONCEPTS AND TERMS

IBA	Xalqaro boks Assotsiatsiyasi	Международная ассоциация бокса	The International Boxing Association	
MOQ	Milliy Olimpiya qo'mitasi	National Olympic Committees (NOC)	National Olympic Committees (NOC)	
DJEB	Boshga to'g'ridan to'satdan zarba	короткий резкий удар прямой рукой в голову	Per sudden shock	

ZOLOTO	Oltin	золотая	gold	
KLINCH	Jang vaqtida bokschilarning ikki tomonlama yaqin olishuvi. Raqibga nisbatan ta'qiqlangan harakatlarni amalga oshirish	взаимный захват боксеров в ходе боя. Запрещенный прием, к которому прибегают для короткой передышки, для сковывания атакующих действий противника	Boxers during a fight two-way fight. Opponent is not allowed to carry out actions	
KROSS	Raqibga qo'l orasidan kutib oluvchi zarba	встречный удар через руку соперника	opponent waiting to blow	

NOKAUT	Bokschi zarba o'tkazgandan so'ng, 10 soniya oralig'ida jangni davom ettira olmaslik holati	положение боксера после пропущенного удара, когда он не в состоянии продолжить бой в течение 10 секунд и больше	Boxer shot after 10 seconds between the state can not continue to fight. Referee "on" and "out" words, and then the battle has been completed and the knockout success on the decision	
OLYMPIC GAMES	Olimpiada o'yinlari	Олимпийские игры	Olympic Games	
SVING –	O'qtanib yondan zarba berish	боковой удар с замахом	to strike the side	

SLIPING	Og'ish	уклон	Deviation	
STRET	To'g'ridan zarba	прямой удар	direct blow	
STEPING-BREK	Ortga qadam	шаг назад	step back	

SEKUN-DANT	Murabbiy, jang oldidan jangdan so'ng, har bir raund orasidan bokschiga yordam va maslahat beruvchi shaxs. Har bir bokschi ikkita sekundant olish huquqiga ega	тренер, имеющий право находится на ринге до боя, после боя и в перерывах между раундами, оказывая помощь боксеру. Каждый боксер может иметь двух секундантов	coach after the battle before the fight, each round boxer who provide help and advice. Each boxer is entitled to two sekundant	
SPARING	Kuchli bokschilarni terma jamoaga saralash bo'yicha o'tkaziladigan o'zaro musobaqalashuv jarayoni hisoblanadi	отборочный поединок между кандидатами на место в команде для отбора сильнейшего	strong boxers consist of team selection process go on to compete with each other	
XUK	Yondan zarbalar	короткий боковой удар	passing shots	

SOP -	Olimpiada tayyorgarlik markazi	Центр олимпийской подготовки	Olympic training center	
CHE -	Yevropa chempionati	Чемпионат Европы	European Chainpionship	EUBC EUROPEAN BOXING CONFEDERATION

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