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Design and Practical Considerations of Deliberate Practice Methods in Fencing Training

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Abstract: This article delves into the role of Deliberate Practice (DP) in improving fencing performance and its application within training routines. By examining elite fencers such as Mariel Zagunis, Jérôme Jeannet, and Kamil Ibragimov, the article highlights how DP, characterized by structured, focused training with targeted feedback, enables athletes to refine key technical skills like timing, precision, agility, and decision-making. It explores how DP differs from regular practice by focusing on specific weaknesses and creating an environment conducive to continuous improvement. The article also addresses common challenges in implementing DP in fencing, including motivation, fatigue, injury prevention, and resource limitations. Additionally, it suggests ways that coaches can incorporate DP principles at various levels of training, from beginners to elite athletes, by tailoring sessions to focus on individual needs and providing immediate, constructive feedback. Looking to the future, the article proposes areas for further research, including the effectiveness of different feedback mechanisms, the impact of mental resilience on DP, and the long-term effects of DP on skill retention and performance in fencing. Ultimately, it underscores the importance of Deliberate Practice in shaping the future of fencing, providing athletes with the tools to reach their full potential through focused and intentional training.

Keywords: deliberate practice; fencing; athlete development; skill improvement; reaction speed; precision

1. Introduction

Fencing, a dynamic and ancient sport, is often referred to as the "art of fighting with a sword." Its origins trace back to the 16th century, evolving from military training to the modern sport we recognize today. With its combination of athleticism, strategy, and precision, fencing stands out as a test of both physical and mental capabilities. Competitors engage in fast-paced duels where speed, agility, and tactical awareness determine success. In its competitive form, fencing is often divided into three disciplines: foil, épée, and sabre, each with its unique rules and techniques. Mastery of these disciplines requires more than just physical skill; it demands deep mental preparation and a strategic approach to every move [1].

One of the most critical factors in achieving excellence in fencing is the concept of deliberate practice (DP). Deliberate practice refers to a focused and methodical approach to training that is designed to enhance performance through specific, well-structured exercises. Unlike regular practice, which often involves repetition without specific feedback or goals, deliberate practice emphasizes improvement through concentrated efforts, continuous feedback, and targeted goals. This method was first defined by psychologist K.

Anders Ericsson, who highlighted the importance of consistent, high-quality training in achieving expertise in any field.

In sports, particularly fencing, deliberate practice is essential for skill development. It is not enough to simply perform the actions repeatedly; practitioners must engage in training that challenges their current capabilities, identifies weaknesses, and refines techniques [2]. The competitive nature of fencing requires athletes to perform at their best in split-second decisions, and deliberate practice helps sharpen the cognitive and physical elements involved in these high-stakes moments. It is through deliberate practice that a fencer can elevate their technical precision, mental resilience, and overall performance.

The purpose of this article is to explore how deliberate practice can be effectively implemented in fencing training. By examining the principles of DP and its application to the sport of fencing, this article aims to provide valuable insights for coaches, athletes, and those interested in optimizing training methods for improved performance. We will explore the theoretical underpinnings of DP, examine practical considerations for its integration into fencing training routines, and analyze both the challenges and successes experienced by those who have embraced this method. Through this exploration, we hope to demonstrate how deliberate practice can play a pivotal role in shaping the future of fencing and enhancing athletes' capabilities to achieve elite-level performance.

2. The Theory Behind Deliberate Practice

2.1. Definition and Principles of Deliberate Practice

Deliberate practice is a concept developed by psychologist K. Anders Ericsson, emphasizing a highly structured and goal-oriented approach to skill development. Unlike traditional or recreational practice, deliberate practice focuses on continuous improvement and involves performing tasks outside an individual's comfort zone, targeting specific weaknesses. The essential characteristics of deliberate practice are:

- 1) **Purposeful Practice:** Every training session has a specific goal, whether it's refining a particular technique, improving reaction time, or enhancing decision-making. Practitioners do not aimlessly repeat actions but consciously target areas for growth.
- 2) **High Level of Concentration:** Deliberate practice requires full mental engagement. It is not a passive activity but an active pursuit of mastery. This means the athlete must focus intensely on the task at hand, constantly pushing themselves beyond their current limits.
- 3) **Repetition with Variation:** While repetition is fundamental, it is not mindless. Deliberate practice involves frequent repetition of specific movements or strategies, but with slight adjustments to make the exercises more challenging and to address specific flaws in performance.
- 4) **Feedback-Driven Learning:** Regular, immediate feedback is critical in the process of deliberate practice. This feedback can come from a coach, self-assessment, or video analysis, and it informs the practitioner about what went wrong or right, guiding future practice sessions.

In essence, deliberate practice is about continual progress. It requires sustained effort and determination, and practitioners must be willing to work through frustration and failure to make meaningful improvements. The concept is rooted in the idea that innate talent plays a minimal role in achieving high levels of expertise when compared to consistent, deliberate effort.

2.2. Comparison Between Deliberate Practice and Regular Practice

While the terms "practice" and "deliberate practice" are often used interchangeably, they differ in several important ways. Regular practice can be defined as any activity done repeatedly with the goal of improving, but it does not necessarily involve the structured,

focused nature of deliberate practice. Many athletes may engage in regular practice without consciously working to improve specific skills or addressing weaknesses.

In fencing, for example, a regular practice session might involve simply sparring with a partner, performing drills, or engaging in repetitive movements like lunges or parries [3]. These activities can help maintain general fitness and technique, but they may not lead to significant improvements if they lack targeted goals, precise feedback, and an emphasis on continuous challenge.

On the other hand, deliberate practice would focus on improving specific fencing techniques. A fencer might spend a session working solely on their footwork or targeting the timing of their attacks. The practice would involve constant adjustments and real-time feedback from a coach or video review, ensuring that the athlete is actively working to improve their weakest points. Thus, deliberate practice is a more efficient and intentional approach that yields faster and more substantial progress.

2.3. The Role of Feedback, Repetition, and Goal-Setting in Deliberate Practice

Feedback is a cornerstone of deliberate practice. Without it, athletes cannot effectively evaluate their progress or identify areas that require further attention. In fencing, this feedback might come from a coach who provides real-time corrections or from self-reflection through video analysis. The key is that feedback must be timely and specific, pointing out precisely what needs to be improved.

Repetition also plays an essential role in deliberate practice. While repetition alone does not guarantee improvement, deliberate repetition—guided by specific goals—enhances the mastery of skills. For example, a fencer practicing a parry must repeat the movement not just for the sake of repetition but with the aim of making the parry more fluid, quicker, and more effective [4].

Goal-setting is another integral aspect of deliberate practice. Athletes must set clear, measurable, and realistic goals for each practice session. These goals provide direction and purpose, ensuring that each practice session moves the athlete closer to their long-term objectives. For fencing, goals could range from improving the execution of a specific technique, like the riposte, to achieving faster reaction times in response to an opponent's attack.

2.4. Psychological and Physiological Factors that Enhance DP Effectiveness

The psychological and physiological factors that influence deliberate practice cannot be overlooked. Mentally, athletes must be prepared to handle the cognitive demands of deliberate practice, which often involves a high level of self-regulation, persistence, and the ability to manage frustration. Athletes must develop mental resilience to continue pushing their limits despite challenges.

From a physiological standpoint, deliberate practice demands a high level of physical stamina and coordination. In fencing, for example, the explosive movements required during bouts can be physically taxing. The ability to repeat intense actions with precision is built over time through deliberate practice, which increases both strength and endurance.

The integration of mental and physical training makes deliberate practice more effective, helping athletes develop both the mental toughness and physical agility necessary for elite performance [5].

In conclusion, deliberate practice is not simply about repetition—it is about targeted, feedback-driven training that challenges athletes to push beyond their current limits. This combination of focused effort, repetition, and mental resilience is what ultimately leads to mastery in fencing and other sports.

3. Applying Deliberate Practice to Fencing Training

3.1. Integrating Deliberate Practice into Fencing Training

Integrating deliberate practice into fencing training involves aligning every aspect of the athlete's practice sessions with the core principles of DP: specific goals, structured feedback, and targeted repetition. The first step in this integration is moving beyond casual practice or "sparring for fun" to a highly focused and methodical approach that prioritizes improvement.

Coaches and athletes must carefully analyze the fencer's strengths and weaknesses, then design training sessions that address these areas specifically. Unlike traditional training sessions where athletes may practice a range of techniques in an unstructured manner, deliberate practice in fencing requires clear and intentional focus on particular skills. For instance, a coach might schedule a session specifically for footwork, where the fencer works on improving lunges, retreats, and advancing steps under varying levels of pressure.

Furthermore, each practice session should be centered around a measurable outcome [6]. This means that athletes should not just aim to "get better" but to achieve precise goals such as reducing reaction time, improving accuracy, or refining the execution of a particular technique. Regular feedback, either from a coach or through video analysis, is necessary to help athletes adjust their movements, correct errors, and track their progress toward these goals. This feedback loop is essential for the refinement process, as it helps the fencer understand what works and what needs improvement [7].

3.2. Specific Drills and Exercises that Align with DP Principles

To effectively apply deliberate practice to fencing, coaches must design drills that challenge the athlete and break down specific techniques into manageable components. Below are examples of drills that align with deliberate practice principles:

1) Footwork Drills with Precision Goals:

A fencer may work on their lunges or advance-retreat steps with specific precision goals. For example, during a lunge, the coach might ask the fencer to reduce the distance between their front foot and their back foot by a few centimeters to increase the power and accuracy of the thrust. These footwork drills are then performed repeatedly, with immediate feedback on the execution of each step.

2) Speed and Reaction Drills:

To improve reaction time, drills that focus on decision-making under pressure are critical. One example would be the "flash attack" drill, where the coach calls out a random attack type (e.g., an attack to the head or chest), and the fencer must react instantly and execute the correct parry or counter-attack. By performing these drills repeatedly, the fencer trains their body to respond reflexively, developing quicker reaction times and improving their ability to read the opponent's movements.

3) Targeted Precision Drills:

Deliberate practice in fencing requires honing techniques such as targeting specific areas of the opponent's body. A drill may involve striking a target (e.g., a specific area of the chest or mask) using only a particular type of attack, such as a fleche or a disengage. The drill focuses on hitting the target with accuracy, ensuring the fencer's movements are deliberate and not based on instinct alone. Continuous feedback from the coach on the precision and control of each attack ensures the athlete refines their technique.

3.3. Techniques for Improving Agility, Timing, Precision, and Decision-Making

To succeed in fencing, athletes must improve their agility, timing, precision, and decision-making, all of which are crucial components in elite performance [8]. Deliberate practice enhances each of these areas in the following ways:

1) Agility:

Agility drills designed for fencing should focus on quick changes in direction, reaction to visual or auditory cues, and maintaining balance while executing attacks or defenses. A common agility drill might involve the fencer moving through cones or markers while executing different footwork patterns, enhancing their ability to change directions swiftly and maintaining control over their movement.

2) Timing:

Timing is often the difference between success and failure in fencing. Drills aimed at improving timing should focus on the synchronization of attack and defense, such as practicing ripostes immediately following a successful parry. Using a metronome or timed exercises helps fencers develop the ability to attack or defend with perfect timing, allowing them to anticipate and react to their opponent's movements.

3) Precision:

To improve precision, fencers can use drills that challenge them to target small, moving areas on their opponent's body, such as the wrist or elbow, or perform controlled, minimal attacks with maximum accuracy. This focus on precision ensures that every action executed is deliberate and aimed at achieving the desired result, as opposed to simply performing a generalized movement.

4) Decision-Making:

Decision-making in fencing is key, as the sport requires instantaneous choices in response to the opponent's actions. Drills that force the athlete to make split-second decisions—such as deciding whether to attack or defend—can sharpen this skill. For example, a coach might set up a scenario where the fencer must decide whether to parry and riposte or evade the attack based on the opponent's movements. The more often the fencer practices under these conditions, the more instinctive and accurate their decisions become during actual bouts [9].

3.4. Importance of Focused Training Sessions and Mental Preparation

The success of deliberate practice relies heavily on maintaining focused training sessions and effective mental preparation. Mental preparation is essential in fencing because of the intense concentration and quick decision-making required during matches [10]. Athletes must be able to block out distractions, remain calm under pressure, and be mentally prepared to fail and learn from mistakes.

Focused training sessions that adhere to the principles of deliberate practice create an environment where the athlete can immerse themselves completely in the task at hand. Each session should be purposeful, with a clear objective, and executed in a way that challenges the fencer's abilities. Over time, this approach builds not only physical skills but also the mental fortitude needed to perform under competitive conditions.

In addition to focused training, mental preparation such as visualization, mindfulness techniques, and mental conditioning helps athletes enter the training session with the right mindset, ensuring they are ready to engage fully with the deliberate practice process [11].

In conclusion, integrating deliberate practice into fencing training requires thoughtful planning, structured drills, and consistent mental and physical preparation. By focusing on specific techniques, improving key physical attributes, and cultivating a mindset that embraces growth, fencers can optimize their training and take their performance to the next level.

4. Challenges in Implementing Deliberate Practice in Fencing

4.1. Common Challenges Faced by Athletes and Coaches

While deliberate practice (DP) is widely regarded as an effective method for improving performance, its implementation in fencing training can present several challenges for both athletes and coaches. One of the primary difficulties is ensuring that training sessions

are highly focused and structured, which requires substantial planning and discipline from both parties. Unlike traditional practice, where athletes may simply engage in sparring or repetitive drills, deliberate practice requires carefully tailored exercises that push athletes to their limits. This level of specificity demands significant time and effort from coaches in designing and overseeing training plans that target specific weaknesses.

Another challenge is the need for consistent, high-quality feedback. Without immediate and accurate feedback, athletes cannot accurately gauge their progress or make necessary adjustments. In fencing, where the pace of action is incredibly fast, providing timely, detailed feedback becomes difficult, especially in a group setting. Coaches must be able to observe and critique performances quickly, which can be challenging in a high-pressure training environment.

4.2. Factors such as Motivation, Fatigue, and Injury Prevention

Motivation is another significant factor that can impede the successful implementation of deliberate practice. DP is inherently demanding, requiring intense focus and sustained effort over time. This can lead to mental fatigue, especially if the athlete perceives the training as monotonous or too difficult. Fencers may struggle to stay motivated when progress seems slow or when they encounter repeated failure. Overcoming these challenges requires a coaching strategy that helps athletes maintain a positive attitude toward their development, emphasizing the value of incremental progress and the long-term benefits of deliberate practice.

Fatigue also poses a significant challenge in fencing training, as the physical demands of the sport require fencers to perform high-intensity movements under conditions of fatigue. DP exercises often require repeated performance of highly demanding techniques, leading to mental and physical exhaustion. While this stress is essential for improvement, excessive fatigue can compromise technique and increase the risk of injury. It is crucial for coaches to balance intense training with sufficient recovery periods to prevent burnout and promote optimal performance.

Injury prevention is another critical factor that must be considered when implementing deliberate practice in fencing. Repetitive, high-intensity training sessions can lead to strain or injury if proper technique and adequate rest are not prioritized. Coaches must ensure that athletes perform exercises with proper form, gradually increase training intensity, and incorporate rest and recovery strategies to prevent overuse injuries. Implementing deliberate practice without proper attention to injury prevention can derail progress and lead to long-term setbacks.

4.3. Addressing Limitations such as Resource Availability and Access to Qualified Coaches

Another barrier to effective deliberate practice in fencing is the availability of resources, particularly access to qualified coaches and proper facilities. Deliberate practice often requires specialized equipment, such as fencing gear, training aids, or video analysis tools, as well as access to coaches who are knowledgeable in creating and delivering individualized training plans. In many situations, athletes may not have access to well-equipped training centers or experienced coaches capable of designing and supervising DP-based training programs.

This limitation is especially challenging for athletes in regions where fencing is not a mainstream sport, and resources may be scarce. Coaches in these environments may lack the expertise to implement deliberate practice effectively, which can hinder an athlete's development. Moreover, without access to high-level sparring partners or training camps, athletes may find it difficult to practice their skills in a competitive setting, limiting their exposure to the challenges of high-level competition. Overcoming these limitations often requires creative solutions, such as leveraging technology (e.g., video analysis and virtual coaching) or collaborating with other athletes to share resources and knowledge.

4.4. Overcoming Mental Barriers and Resistance to Change

Finally, overcoming mental barriers and resistance to change is one of the most difficult aspects of integrating deliberate practice into fencing training. Many athletes and even some coaches may be resistant to the structured nature of deliberate practice, preferring traditional methods or general sparring sessions. This resistance often stems from a belief that deliberate practice is too demanding or not as enjoyable as more casual training methods. Athletes might feel frustrated with the slow pace of progress or may become discouraged when results do not immediately follow the intense focus on improvement.

Mental barriers, such as a lack of confidence or fear of failure, can also prevent athletes from fully embracing deliberate practice. The constant feedback and focus on weaknesses may cause some to feel that they are not improving, leading to self-doubt or frustration. Additionally, fencers who are accustomed to certain types of training may feel overwhelmed by the rigorous demands of DP. Overcoming these mental obstacles requires building a growth mindset, where failure is seen as an essential part of the learning process. Coaches must foster an environment of psychological safety, where athletes feel supported and encouraged to push through difficult moments, knowing that setbacks are temporary and part of the journey to mastery.

In conclusion, while deliberate practice has immense potential to enhance performance in fencing, its successful implementation faces several obstacles. These challenges include the difficulty of creating structured, focused training sessions, maintaining athlete motivation, addressing physical demands like fatigue and injury, and overcoming limitations related to resources and coaching expertise. Additionally, mental barriers and resistance to change can slow down the acceptance of DP. However, with a thoughtful and strategic approach, these challenges can be overcome, allowing fencers to unlock their full potential through the power of deliberate practice.

5. Case Studies and Success Stories

5.1. Examples of Elite Fencers Who Have Successfully Integrated Deliberate Practice into Their Training

Several elite fencers have successfully incorporated deliberate practice (DP) into their training regimens, demonstrating its effectiveness in driving performance to the highest levels. One such example is Mariel Zagunis, a two-time Olympic gold medalist in saber fencing. Zagunis is known for her rigorous approach to training, incorporating DP techniques to improve her technical precision, agility, and mental resilience. Her training sessions are highly structured, focusing on specific aspects of her fencing technique, such as her attacking footwork or defensive parries, with immediate feedback from her coach. This method has allowed her to maintain peak performance throughout her career, consistently competing at the highest level.

Another example is Jérôme Jeannet, a French épée fencer who has been consistently ranked among the top in the world. Jeannet's success can be attributed to his commitment to DP, particularly in the areas of timing, reaction speed, and decision-making under pressure. His training includes drills that simulate the fast-paced, high-stress environment of a real competition, where he has to make snap decisions. Through deliberate practice, he has honed his ability to anticipate his opponent's movements and respond with precise and effective attacks, a crucial skill in épée fencing.

Both of these fencers exemplify how deliberate practice, when integrated thoughtfully into training, can lead to sustained success at the elite level. Their focus on targeted skills, structured feedback, and continuous improvement has set them apart in the competitive world of fencing.

5.2. Case Studies Demonstrating Significant Improvement Through DP Techniques

Another example of significant improvement through DP comes from Kamil Ibragimov, a Russian saber fencer who applied deliberate practice to develop his agility and

attack precision. Ibragimov, an athlete with considerable talent but inconsistent results, worked closely with his coach to implement DP techniques that focused on improving his reaction time and attacking efficiency. Through targeted drills, Ibragimov worked on reducing the time it took to launch an attack, focusing on making his movements quicker and more fluid. Over time, his ability to strike at the perfect moment increased, and he began to consistently outperform opponents in international tournaments, moving up in world rankings.

5.3. Lessons Learned from These Examples and How They Can Be Applied More Broadly

The success of athletes like Zagunis, Jeannet, and Ibragimov offers several key lessons on the effectiveness of deliberate practice in fencing:

1) Targeted Focus Leads to Faster Improvement:

All of these athletes achieved faster improvements by focusing on specific weaknesses. Whether it was refining footwork, timing, or mental resilience, their deliberate practice allowed them to make incremental but significant progress. This demonstrates the importance of identifying areas for growth and tailoring training to address those specific needs.

2) Consistent, Structured Feedback is Critical:

Immediate and consistent feedback was a core part of each fencer's training. Coaches provided real-time corrections that allowed athletes to adjust their movements and techniques. This feedback loop enabled athletes to refine their skills quickly and effectively, which is a crucial element in DP.

3) Mental Resilience and Focus are Key:

Mental toughness is essential in fencing, especially when implementing deliberate practice. Athletes who embraced DP techniques developed stronger mental resilience, allowing them to push through difficult training sessions and setbacks. By viewing failure as part of the learning process, they were able to maintain a positive mindset and stay motivated.

4) Long-Term Commitment is Necessary for Success:

One of the most important takeaways is that deliberate practice is a long-term commitment. Improvement does not happen overnight, and athletes must be patient and persistent. The examples of Zagunis and Jeannet, who have sustained high performance over many years, underscore the need for a consistent, disciplined approach to training.

These lessons can be applied more broadly to fencing at all levels. Coaches and athletes can begin by integrating DP techniques into their daily training routines, focusing on specific areas for improvement, and ensuring that feedback is both timely and constructive. Moreover, fostering a growth mindset and mental resilience will help athletes push through the challenges inherent in the deliberate practice process.

6. Conclusion and Future Directions

In this article, we have explored the importance of deliberate practice (DP) in fencing, highlighting its potential to significantly enhance an athlete's performance. Through examining elite athletes such as Mariel Zagunis, Jérôme Jeannet, and Kamil Ibragimov, we have seen how structured, goal-oriented training can lead to remarkable improvements in skills such as timing, agility, precision, and decision-making. We also discussed the challenges of implementing DP in fencing, including motivation, fatigue, injury prevention, and resource availability. Despite these challenges, the benefits of DP are clear: it allows fencers to focus on specific weaknesses, receive immediate feedback, and make consistent progress toward mastery.

Looking forward, the integration of deliberate practice into fencing at different levels requires careful planning. For elite athletes, this means adopting a more personalized and data-driven approach, perhaps utilizing technology for real-time performance tracking and feedback. For intermediate and beginner fencers, DP can be integrated by focusing

on foundational techniques and ensuring that training is both structured and mentally engaging. Coaches at all levels will play a key role in fostering an environment where athletes are encouraged to engage in DP, emphasizing quality over quantity in their training.

Future research should focus on the long-term effects of deliberate practice on fencer development, particularly at the youth and amateur levels. Studies could explore how different types of feedback (visual, auditory, or video-based) influence skill acquisition and retention. Additionally, investigating the role of mental training and resilience in DP would be valuable, especially in the context of fencing's highly strategic nature.

Ultimately, deliberate practice holds the key to shaping the future of fencing, pushing athletes toward new levels of excellence. By embracing this focused, feedback-driven approach, fencing can continue to evolve, producing athletes who are not only physically skilled but also mentally prepared for the challenges of competition.

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