CREATING PRESSURE TRAINING ENVIRONMENT FOR ELITE TENNIS PLAYERS

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ABSTRACT

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Pressure training has emerged as a novel approach to prepare athletes for the demands of high-pressure situations, fostering their ability to adapt and perform optimally. This study aimed to investigate the utilization and effectiveness of pressure training among professional tennis players through interviews conducted with coaches at a professional tennis academy in southern Europe. By examining the methods employed by these coaches, this research sought to shed light on the multifaceted application of pressure training, encompassing mental, tactical, and physical dimensions of athlete readiness for competition.

The study employed a qualitative research design, utilizing in-depth interviews to gather comprehensive insights from experienced coaches at the professional tennis academy in southern Europe. The interviews were conducted using a semi-structured format, allowing for a rich exploration of the coaches' perspectives, strategies, and experiences with pressure training.

Findings from the study revealed that pressure training is an integral component of the coaching approach employed at the academy. Results showed five major themes – Perception of pressure, Stakes in Training, Benefits of Pressure, Negatives of Pressure and Coach and Player relationships. Coaches utilized a diverse range of strategies to expose players to pressure and create a controlled environment for them to develop essential mental skills. These strategies encompassed both simulated high-pressure scenarios and real-life competition experiences, effectively enabling players to enhance their decision-making abilities, emotional regulation, focus, and resilience.

The outcomes of this study underscore the efficacy of pressure training as a means of enhancing performance and developing mental skills among competitive athletes. The findings demonstrate that pressure training, when implemented in a controlled environment and under the guidance of experienced coaches, can serve as a powerful tool for athletes to attain greater success in their respective sports.

This research provides valuable insights into the practical implementation and benefits of pressure training at the academy. By leveraging pressure as a training stimulus, coaches effectively equip athletes with the mental fortitude, tactical acumen, and physical resilience required to thrive in high-pressure situations. The study's outcomes contribute to the growing body of knowledge surrounding sports psychology and training methodologies, offering a foundation for future research and practical applications in the field of athletic development.

Key words: Pressure training, Tennis, Resilience, Mental Toughness, Anxiety, Stress

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1 INTRODUCTION

At the Tokyo Olympic games in 2020, there have been twenty-five new world records across multiple disciplines. At the Australian Open Rafael Nadal broke the previous record of 20 grand slams at the age of 35 years old. Cristiano Ronaldo surpassed the record for most international goals scored at the age of 36. Advancements in technology, recovery and new techniques of training are helping athletes improve their performance and longevity. Among other things, this has brought the mental aspects of performance forward and there is a growing interest in sport psychology and mental coaching. It is clear to most coaches and athletes that mental states impact performance and both physical and psychological aspects work hand in hand and need to be practiced. Therefore, the question arises as to how can coaches help athletes train their mindset? This study aims to find out about a specific aspect of mental preparation – pressure training. Therefore, the goal is to see how coaches understand pressure training. To what extent do they report using pressure training methods? How do they describe their use of pressure training and what are the benefits and negatives of pressure training from their perspective? Finally, whether they use pressure training in specific situations and if so, why do they utilize it.

This study will utilize a thematic analysis of professional tennis coaches and a sport psychologist/coach, all participants were recruited from a professional tennis academy in southern Europe. They were interviewed for this study and provided their takes on pressure training. Since, the sample consisted of experienced professional coaches working with full time athletes, it is expected that they will have knowledge and practice with pressure training to provide information how pressure training is used in a highly competitive environment. These coaches have all been working with a variety of different players and achieved much as tennis players and tennis coaches. The focus of this thesis is pressure training as a method to fortify athletes, strengthen their coping responses and familiarize them with pressure. It has been given a lot more attention in the past decade, showcasing how athletes can adapt to pressure and even welcome it.

2 LITERATURE REVIEW

There has been a growing interest in sport psychology both in research and in practice (Aoyagi et al., 2012). The advances in technology and a greater understanding of how sport psychology can enhance performance helped the field being implemented more widely and it is now part of every sport on elite level. It is no different in tennis, where top academies utilize sport psychologists daily. When it comes to pressure training, the field is rather new and while there have been new studies published, on field utilization of pressure training has been sparse. There is limited research that identifies most efficient strategies to elicit and implement pressure in training (Low et al., 2021).

2.1 Competitive Pressure

Pressure has several definitions and meanings across different contexts. In sports context, competitive pressure can be used to indicate athlete related adversity. Throughout this study competitive pressure will be used to indicate a combination of both personal and environmental factors that strain tennis players. It is important to understand that competitive pressure in elite tennis players is a persistent element and the way athletes respond it is based on their mental preparation and trait resilience (Sarkar & Fletcher, 2014). It is also important to note that competitive pressure can improve or decrease levels of performance depending on the athlete. For example, in a study from 2011, researchers examined the effects of competitive pressure on expert golfer's ability to put. Their results showed that participants differed in their perception of competitive pressure. They have also found that low and mild pressure contributed to better putting (Cooke et al., 2011). Athletes differ in their base mental resilience and learned coping responses; however, experience and mental training can help improve their responses to competitive pressure. Methods such as relaxation, routines and self-talk were shown to be effective in helping athletes cope and cope with negative emotions and thoughts (Nicholls et al., 2006). In professional sport mental trainings are a necessary part of developing and sustaining performance. In situations perceived as threats by the athlete, competitive pressure can also lead to choking (Gröpel & Mesagno, 2019). Choking was defined as an inability to perform up to the usual standards of the person (Vickers & Williams, 2007). Many methods have been identified to prevent choking and help athletes withstand pressure. For example, Guevarra & Hanton (2018), conducted a study on reducing anxiety and promoting relaxation by employing various breathing techniques. There is also evidence that mindfulness

training can be used to reduce choking potential and improve athlete's performance in pressure situations (Bühlmayer et al., 2020). Furthermore, mental preparation such as positive self-talk, emotional regulation, visualization and improving routines was shown to significantly impact performance and reduce risks related to choking (Mesagno & Hill, 2013).

2.2 Choking

Choking has been described as a distinct negative reaction to perceived pressure. It is not a random deterioration of performance, but a distinct reaction to a pressure situation (Beilock & Gray, 2007). Choking in sport is a concept that every athlete and coach is aware of. Many athletes when asked about their previous unsuccessful performances attribute their suboptimal performances to choking. Scott Boswell, who is a famous cricketer told the press his thoughts on choking: "I became so anxious I froze. I couldn't let go. It was a nightmare. How can I not be able to run up and bowl – something that I've done for so many years without even thinking about it? How can that happen? What's going on in my brain to stop me doing that, and to make me feel physically sick and anxious and that I can't do something that I've just done so naturally?", (Williams & Wigmore, 2020, p. 27). In a different definition, researchers described choking as a significant decline in the ability to perform and achieve one's usual standards of skill, caused by heightened anxiety and pressure, (Mesagno & Hill, 2013, p. 273). From above examples an increase in pressure/stress or anxiety, has caused the athlete's performance to deteriorate rapidly. Choking happens to all athletes both professional and amateur, however, is there a way to prevent the event from occurring? Also, are there benefits to experiencing choking and is there a way to learn from it? Some research suggests that there are athletes that benefit from experiencing choking in the long term by learning appropriate coping skills to prevent choking from occurring (Hill et al., 2019). These findings provide more evidence for pressure training as a useful tool to simulate pressure and help players prevent choking or knowing how to handle it in future performances. In different research, a dual-task paradigm was presented to alleviate pressure from participants and see whether choking can be prevented, and performance increased. Their results have shown that music helped athletes distract themselves and their free-throw execution improved (Mesagno & Marchant, 2009). This technique to alleviate pressure obviously cannot be done in all sport setting, but it can be a useful training tool for athletes and with enough practice music can be imagined and used as an imagery tool. Research also suggests that utilizing distraction-based interventions can help to lessen pressure (Gröpel & Mesagno, 2019). Similarly, a sport psychology intervention used

to improve concentration known as pre-performance routine (PPR) was utilized to help athletes prepare for action. Pre-performance routine is a precise sequential pattern of behavior that athletes use before matches (Moran, 2016). Pre-performance routine was also tested in an experimental study and showed that it is a useful tool that helped athletes improve performance compared to the control group that did not receive Pre-performance routine trainings (Mesagno & Mullano-Grant, 2010). Pre-performance routines are widely used in high level tennis, one of the best examples is the multiple slam champion Rafael Nadal who has a detailed plan of what needs to be done before every match. In tennis in-game rituals are also an important part of the game starting from how many times a ball should bounce before serving or how many seconds to take in-between points. Therefore, a lot of coaches emphasize learning and utilizing routines in players starting from a young age (Ayala et al., 2016). Nevertheless, choking can also lead to detrimental lasting effects on athletes if not handled appropriately. It can lead to burnout, lower self-confidence and quitting the sport all together (Beilock & Gray, 2007). The word choking has also become quite polarized, it is used incorrectly and carries an emotional affect with it that players do not want to associate with. In the 2023 Australian Open a WTA player Jessica Pegula shared her thoughts on the negative connotations of choking and the overuse of the concept: “Choking? It's very harsh. It's a harsh word. I think everyone kind of does to some extent. I think it's just because you get nervous. I think there is a little bit of a misconception, where I think people usually that haven't played the sport, sitting and watching it's very easy to say, Oh, they're choking, they're choking. When really I think it's more of a momentum shift and maybe more nerves and just how you're kind of handling those nerves”, (Mueller, 2023, p. 1). Choking has become a common concept referring to any player that shows signs of stress or anxiety. However, the term itself is referring to lasting effects throughout the match and should not be used for momentum swings as it is often used on social media, by journalists and public. At the professional tennis academy in southern Europe, the concept of choking was widely used by some coaches in pressure training sessions. It was provided as an explanation on why pressure training can be a useful tool in developing mental skills and sometimes as a trigger to evoke stress in players before the session even started. Resilience is also an important factor contributing to athlete’s ability to not choke and maintain an ideal state of performance.

2.3 Resilience

Resilience is a critical variable in athlete's performance under pressure (Beilock & Gray, 2006), (Fletcher & Sarkar, 2016). Base levels of resilience are one of the determining factors for athletes' reaction to stress. To better understand the mechanisms of pressure training and its effects, it is important to note that the effects of pressure training change according to the base levels of athlete's resilience (Galli & Gonzalez, 2015). Resilience was first described by Fletcher and Sarkar in their study of Olympic champions. They defined resilience as the ability to protect athlete from negative effects of stressors by promoting personal strengths and behaviors and bounce back from adversity (Fletcher & Sarkar, 2012). Resilience in sports has been a relatively new concept, therefore there is limited research, and the conceptualization of resilience is being heavily discussed (Galli & Gonzalez, 2015). However, Fletcher and Sarkar's definition of resilience is what this research will use and work with. Resilience is also closely related to other concepts such as mental toughness, coping or hardiness (Galli & Gonzalez, 2015), and in this research they will all be used simultaneously under the umbrella term resilience.

The ability to bounce back from adversity is key when it comes to high level of performance. Famous athletes all around the world have been quoted for their unique ability to perform exceptionally well under pressure. Since resilience is at the forefront of performing well, it begs the question of whether it can be learned. Is resilience a trait or a state or a process? In the case of Tiger Wood and his father, there is evidence supporting resilience as a process. From an early age Tiger Woods was trained by his father Earl. Many of the training techniques that Earl Woods used were referred to as psychological training (Starn, 2011). These techniques are quite literally what pressure training would look like in golf, only more severe and in some cases very unethical. However, both Tiger Woods and Earl Woods swear by these techniques and consider them one of the reasons why Tiger became one of the best athletes in the world.

In the early stages of research on resilience, it has been conceptualized as a trait (Galli & Gonzalez, 2015). However, through sport related research the concept of resilience evolved into seeing it as a process. In most conceptualizations resilience is also seen as a two-part process of facing hardship and positive adjustment to it (Fletcher & Sarkar, 2012). Hardship and adversity in these sporting situations are often seen as ultimately benefiting for the athletes, strengthening their motivation and upon overcoming the adversity leading to increased confidence. In a study from 2008, Galli and Vealey interviewed 10 athletes about resilience and adversity. In their research they found that adversity was seen as inevitable in some form

or another and that it led to strengthening their beliefs and performance (Galli & Vealey, 2008). Clearly, professional athletes encounter hardships many times throughout their career and performing at their best in front of spectators always bring pressure and anxiety. Therefore, resilience is an important part of athlete's success and training mental game needs to be part of daily practices.

In a study from 2013, researchers studied resilience in teams to see how teams adapt in the face of adversity compared to individual athletes (Morgan et al., 2013). In their study, they identified four main resilient characteristics in teams. These were: Social capital, Collective efficacy, Mastery approaches and Group structure. They also found that the quality of relationships emerged as critical to successfully creating and maintaining team resilience (Morgan et al., 2013). This research outlines some of the differences between team sports and individual sports when it comes to mental part of performance. In tennis especially, every athlete is on their own while playing a match. Quality of relationships remains a valid and important factor in individual resilience, however, athletes in individual sports cannot rely on others while performing.

How can resilience be trained? The US military has been using a programme called Master Resilience Training. This programme was developed as a four-step process to improve soldier's resilience. Soldiers first learn optimism and self-regulation as base protection. In the second step, mental toughness is developed through identification of negative thoughts and cognitive problem-solving. In third and fourth step of the programme soldiers learn to identify and boost their individual strengths and develop or improve reliable social relationships (Reivich et al., 2011). Even though this programme was designed for the military, all the steps are based on research and with little changes could be applied to high-performance athletes as well. Similarly, classroom-based resilience programme developed in 2003, teaches students relationship skills, improved decision-making and self-management, all skills that improve individual's ability to deal with adversities (Noble & McGrath, 2014). These examples show literature supported evidence-based programmes designed to improve resilience in military and schools. In sport, similar programme was developed called Mental Fortitude training. This training focused on enhancing athlete's mindset, creating a facilitative environment, and working on personal qualities. The effects of these three factors together should improve the individual's ability to bounce back from adversities (Fletcher & Sarkar, 2016). It is important to note that all three studies heavily considered environment as one of their factors to improve resilience. The support staff of athlete's team including coaches, friends and family are critical to athlete's success and ability to perform in pressure situations. However, the environment can

be a double-edged sword and many athletes train and work in a toxic environment under constant pressure from their parents, coaches, and others. In junior tennis, one of the main reasons for athletes to stop playing tennis is not being able to handle the pressure anymore (Mouelhi-Guizani et al., 2021). When discussing what sort of pressure, the athletes rarely consider the actual stress of competition, but are more likely to mention being pressured by others into performing (Casagrande et al., 2018), (Gould et al., 1996). Family involvement in tennis can often become stressful for players because parents put too many expectations on the children. This pressure can be detrimental to performance, it can affect proper development of juniors and cause burnout and other related issues. However, pressure by others can also be a great source of pressure training and if done on purpose by coaches in a controlled environment it can become a powerful tool to increase resistance to stress. In a study from 2021, researchers studied burnout in elite junior tennis players and their research showed a significant relationship between burnout and players that train more than 12 hours a week (Mouelhi-Guizani et al., 2021).

Currently, many elite juniors train around five hours a day (including practice, physio, and mental training). This was the case at the professional tennis academy in southern Europe, where athletes trained for one hour and thirty minutes every morning on court and one hour in the gym. In the afternoon after some rest, there was a two-hour session on court and after that mental training. Very often the schedule changed, and tactical work was added, or nutrition or other aspects according to the individual needs of the players. However, the schedule rarely involved less than five hours of physical activity for the athletes. Players in professional academies are living their junior years as “gladiators” (Agassi and all., 2011). The term gladiators was used by Andre Agassi, one of the all-time great tennis players, who has gone through an academy in his junior years. The amount of stress and expectations on these players can easily become overwhelming but it can also create incredibly resilient players that go on to have professional careers. There are players on the top level that have learned tennis from being in these academies, but there are also players having more of a “normal” life with a separate team that reach the top of the game.

2.4 Methods to improve performance under pressure

Resilience and mental toughness are important factors that determine players abilities to withstand pressure. We all have innate base levels of resilience (Cowden et al., 2014) however, they can be improved by methods such as visualization, positive self-talk, coping skills, goal

settings or relaxation exercises (Sarkar & Fletcher, 2014). The quiet eye method can also be used as a preventive method against choking and to improve performance under stress. Quiet eye helps improve visual focus and attention control (Vine & Wilson, 2010). This method is often utilized in football (penalty shootouts) and basketball (free-throws), but it can also be relevant in tennis to help players improve the accuracy of their serve. Similarly, athletes can be trained to improve their attention control to improve performance in difficult situations. Ducrocq et al. (2016) argue that using attention control training can enhance performance in cognitive and motor tasks by training athletes to better avoid distractions. Base levels of emotional intelligence and self-confidence also help to predict performance under pressure. As Laborde et al. (2014) showed, increasing pressure in-between serve exercises in tennis can affect players and it can be done in a variety of ways. Pressure training is the method discussed here to enhance performance under pressure and help players feel more comfortable in tight situations.

2.5 Pressure training

There is a relatively small body of literature that is concerned with pressure training. However, more recent attention has focused on the use of pressure training in professional sports. In 2010, Vine and Wilson carried out a study that focused on performance under pressure. As predicted, anxiety impaired performance in untrained participants, however, coping mechanisms (in this case the use of quiet eye) helped participants to stay calm and execute tasks better (Vine & Wilson, 2010). In elite sports environments, use of artificial adversity on athletes is known as pressure training.

Pressure training can also be described as regulatory exposure to adversity in practices (Kegelaers et al., 2021). It is also closely related to planned disruptions, which are structured exercises to expose athletes to increased requirements in a controlled environment (Kegelaers et al., 2020). Both techniques can be used to elicit a stress response and analyse athlete's performance under pressure. However, pressure training differs in applying a wider and consistent approach where athletes need to employ mental skills in situations that represent the mental demands of competition, (Low et al., 2022). The combination of stress and facing adversity helps individuals develop personal strategies to maintain an ideal performance state. This process is also called steeling. Rutter (2006) argues that steeling is underutilized in elite sports and that it can help athletes perform better compared to methods that focus on reducing stress and anxiety. In the literature on steeling, Hanton et al. (2004) found that the interpretation

of pressure and anxiety is key to a good performance, steeling helped athletes improve their self-confidence and become more comfortable in pressure situations. Additionally, Connaughton et al. (2010) identified mental toughness as an important component of steeling and that coaches and athletes need to utilize mental skills in training such as goal setting and concentration exercises to improve mental toughness and the process of steeling against adversity. Crust and Clough (2011) researched practical strategies to improve steeling in athletes. Their results indicated that deliberate practice, performance profiling and developing a strong team culture all contribute to steeling skills. Moreover, they emphasized that steeling is a process and therefore should be included in trainings regularly to see players progressing (Crust & Clough, 2011). There is also pressure inurement training (known also as stress inoculation training). In pressure inurement training individuals are taught coping skills to reduce pressure and afterwards are exposed to continuous progressive levels of stress by encountering challenging situations (Fletcher & Sarkar, 2016). In a recent study, van Rens et al. (2021) used pressure inurement training with a sample of high performing female cricket team. Their results indicate that pressure inurement helped athletes represent the stress of the competition better, allowed them to practice their mental skills and increased purpose in the training sessions (van Rens et al., 2021). Pressure inurement can be a useful method to build stress in athletes, however it is not as complex as pressure training, which has also been found as the most effective practice in building resilience against stress (Gröpel & Mesagno, 2019). Currently researchers agree that pressure inurement training, pressure training and planned disruption training can all be effective, however, pressure training delivered by trained coaches and sport psychology practitioners is the method with most results, (Low et al., 2022). Various examples of pressure training, planned disruption or steeling can be the introduction of a disturbing noise in the middle of practice, exercising while fatigued or challenging athletes to perform in uncomfortable environments (Sarkar & Fletcher, 2017).

A difference in attitude toward pressure can be caused by an athlete's cognitive appraisal of the situation. Cognitive appraisal involves individual's evaluation of current levels of stress, performance, and coping skills. Appraisal of a situation can then cause emotions in response (Lazarus & Folkman, 1984). Therefore, different pressure situations can cause different reactions and athletes view the situations differently. In his research, Lazarus (1991) identified primary appraisals, as a primary interpretation of a situation as positive, neutral, or negative and secondary appraisals as evaluations of whether the individual can manage the situation, control it, and analyse the outcomes. Additionally, Scherer et al. (2001) identified challenge and threat appraisals. If an individual viewed the situation as a challenge, challenge appraisals

were seen as a possibility for growth, compared to threat appraisals where the individual saw the situation as dangerous with possible negative outcomes. This relates to research by Moore et al. (2012), in which they found that athletes who appraised a situation as a challenge instead of a threat experienced less stress and overall were able to benefit from pressure situations. Therefore, cognitive appraisals play an important role in creating pressure training environment for athletes. It also indicates the need for a different individual approach whenever possible to find players' triggers to make pressure training the most effective.

A relationship exists between pressure training, planned disruptions, steeling, and other methods of eliciting stress in a controlled environment (Kegelaers & Oudejans, 2022). However, in the current study, pressure training will be used as the main term to describe various methods of eliciting stress in athletes. In 2021, Kegelaers and others investigated how pressure training can help develop resilience in basketball players. Their approach combined daily exposure to pressure, resilience workshop and guided reflection. Results showed that introducing pressure helped teammates to communicate more effectively, execute game strategy more efficiently and helped participants realize the importance of mental training. However, athletes also noted that the pressure was still not equivalent to the demands of real matches (Kegelaers et al., 2021). Strategic implementation of pressure training can help players get accustomed to negative aspects of pressure and perform with confidence. However, coaches must be familiar with their athletes and skilled in eliciting a stress response in a safe, controlled environment to not harm the athletes. They should also be able to teach athletes methods of coping with pressure, such as relaxation techniques, mantras, and visualization. Additionally, it is evident that pressure training interventions differ vastly across different sports and environments. For example, in tennis, pressure training can be very specific, such as forcing athletes to play with very old tennis balls or giving them only one serve in a practice match (Cowden et al., 2016).

Others have highlighted the relevance of planned disruptions in elite athletes from a coach's perspective (Kegelaers et al., 2020). Researchers utilized a thematic qualitative analysis to explore themes related to planned disruptions. Their aim was to investigate why coaches introduce planned disruptions in the first place and what kinds do they use. Their results showed four themes that illustrated why planned disruptions were used. Four themes emerged: familiarization with difficult situations, awareness of athlete's inner processes, development of personal resources (such as breathing exercises) and promotion of team success. Results also showed nine types of planned disruptions commonly used among high level coaches. Some of

these included a change of location, introduction of punishments and rewards, distractions, or communication restrictions (Kegelaers et al., 2020). Kegelaers study helps to see unique implementations of planned disruptions tailored to individual teams and players. Due to the exploratory nature of the study, more research is needed to validate how important planned disruptions and pressure training are in elite athlete's training regime. In a different study, Kent et al. (2021) conducted a mixed method study to see whether implementing a pressure training intervention will increase junior football player's performance. Kent et al. measured whether athletes' decision-making skills and skill execution improved upon receiving three pressure trainings and three cognitive behavioural workshops compared to a comparison group which only received pressure training. Additionally, they conducted a qualitative thematic analysis to gather feedback about the intervention process from players. Their results showed that there was a significant difference between groups in decision-making skills and both groups kept or increased their skill execution under pressure. Also, there were significant differences in the effectiveness of the intervention among different age groups, particularly in the 11-12 age group decision-making performance improved above researchers' expectation (Kent et al., 2021). This study lends more support to the effects of pressure training in a controlled environment. The use of punishments and rewards led to maximum effort from all participants and shows itself to be a powerful tool creating pressure. It is also beneficial that it was conducted with junior athletes because in the current study, coaches primarily work with junior athletes as well.

Pressure training interventions can also benefit junior players to develop their mental resilience and help them in their transition to professional sports (Fletcher, 2018). Another key aspect of pressure training is the process of effective delivery. Such a study was recently published, where researchers examined pressure training delivery from the perspective of athletes and sport psychologists. Qualitative thematic analysis was conducted to find out about participants' experience of conducting or participating in pressure training interventions. Four themes emerged in this study (Collaboration with athletes and coaches, Promotion of learning before and after intervention, Proper integration into training and Upfront transparency) to help future pressure training intervention in a more effective delivery (Low et al., 2022). Promotion of learning is an important factor to help athletes develop more effective coping strategies and enhance the benefits of a pressure training intervention. This article also shows the need for qualified sport psychologists to help coaches develop effective pressure training methods and work together with their athletes to maximize profits.

The question remains on how to create pressure training environments. This was addressed in a study from 2016, which focuses on systematic creation of pressure across sports environments. Researchers utilized a qualitative approach to interview coaches who deliberately use pressure with their athletes. Their findings showed concrete methods of eliciting stress, such as: Judgment stressors (creating pressure by bringing spectators to watch the athlete' s practice), Performer stressors (Fatiguing the athlete and then forcing them to play a practice match) or Environmental stressors (Adjusting heat, training in higher altitudes). It also divided pressure creation into two higher order themes – consequences and demands (Stoker et al., 2016). In further research, researchers found out that combination of consequences and demands created pressure, however, demands or consequences alone did not show significant results, (Stoker et al., 2017, 2019). The study from 2016 also indicates that it is important for pressure training to remain flexible and organize according to the understanding of the player, to find triggers and create meaningful pressure. Stoker's qualitative study helps to understand the variety of pressure training and adaptability to different athletes across other sports. It is also the source of current research, where the focus will be on tennis coaches creating pressure training in elite tennis athletes. It will offer a unique look into specific techniques utilized in tennis, where the player is truly alone when competing. Therefore, being used to pressure and developing mental resilience and skills is paramount because the coach cannot help during the match. It is also important to note that pressure training interventions can work without previous teaching of mental skills (Low et al., 2021). This means that players can still benefit from pressure training which is crucial for athletes without access to sport psychologists. Listed studies also brings forward the possible risks involving pressure training. Utilizing stressors to put an athlete into a very uncomfortable situation can be dangerous and coaches with sport psychologists need to consider whether the athletes can handle it. Careful planning and discussions should be done to maximize the effects of pressure training and eliminate possible risks to athlete's well-being.

2.6 Deliberate practice in pressure training

Deliberate practice was defined as performing activities constructed specifically to promote and enhance efficiency (Ericsson et al., 1993). According to this definition, pressure training can be seen as training to promote efficiency and enhance coping mechanisms in stressful situations. In Ericsson's famous study deliberate practice was used to indicate the number of

hours spent practicing by musicians directly correlated with the level of performance (Ericsson et al., 1993). However, there have been a lot of discussions about how relevant simple accumulation of hours is spent practicing compared to talent and all the other aspects important in performance. Ericsson and Pool argue that deliberate practice is essential for performance, and coaches need to engage in specific activities such as challenging players outside of their comfort zone, engaging them in mental practice such as visualization, and providing relevant feedback to improve performance (Ericsson & Pool, 2016). Pressure training can be a method to deliberately practice all these skills and engage athletes in a wide array to promote their development.

There is also the question of early specialization compared to early diversity. Researchers explored whether early specialization vs early diversity made a difference in the number of athletes reaching professional football. Their results support early diversity in junior athletes to promote the play aspect of sports and faster development of football specific intelligence (Ford et al., 2009). In the past, coaches in tennis used to focus on early specialization and often claimed other sports can be a hindrance to develop good tennis technique. However, recent research suggests otherwise and promotes basketball, handball or football for key aspects that are similar in these sports to tennis. For example, dynamic warm-up before tennis competition often utilizes football practice or throwing to prepare a player for a match (Ayala et al., 2016). Deliberate practice can also be understood in terms of keeping trainings new and fresh. It can become exhausting to continue training every day with similar drills for the same goals. Taking advantage of other sports and including them in tennis practice can bring elements of play and allow players to think about their sport in a new, different way. This ties directly to pressure training, where players can practice playing under stress while competing in a different sport. A surprise pressure training can also bring a fresh aspect to their training and teach them something new.

2.7 Imagery, Biofeedback, and their use in pressure training

Imagery is a commonly used technique among sport psychologists, coaches, and athletes alike that can serve many purposes. According to Martin et al., there are five imagery types – Motivational Specific, Motivational Mastery, Motivational Arousal, Cognitive specific and cognitive general, (Martin et al., 1999). In tennis, imagery is often utilized by coaches to develop a better understanding of the serve motion (combination of cognitive specific and cognitive general imagery). Serve is perceived to be the most technical and hardest aspect of

tennis with its many varieties (Mouelhi-Guizani et al., 2021) and imagery can help players understand the key differences to develop a good flat serve, spin serve, and kick serve. Players also use it to motivate themselves before matches, imagining their own and their opponent's tactics and to get into an ideal competitive spirit before matches. According to research, imagery and visualization skills can be taught and improved in junior athletes from the age of seven (Parker & Lovell, 2009). It is important to note here, that athletes should be taught to practice imagery deliberately to increase the benefits and create their own preparation scenarios or uses for imagery. Athletes can also use imagery to increase their heartbeat and imagine pressurized situations. Researchers showed that athletes with vivid imagery can use it to create pressure situations and imagine the best responses to said pressure, (Stoker et al., 2019). Coaches and sport psychologists also utilize imagery in pressure training situations with elite athletes to enhance demands on the athletes (Kent et al., 2021). Creating different scenarios for players to adapt their strategy is a common practice among coaches in tennis. Utilizing imagery ideally through experienced sport psychologists can complement these drills and make the situations more realistic for the players. In recent years, biofeedback method which uses imagery has gained a lot of traction for its application in military and sport's setting. Biofeedback training utilizes imagery to test individual's capability to visualize scenarios of pressure and the ability to raise one's heart rate. Subsequently, it also tests the capability to reduce stress and the amount of time it takes for an individual to regulate themselves (Blumenstein & Hung, 2016). Biofeedback measurements monitor heart rate, breathing, skin temperature, brain waves and muscle tension. Through these measurements it can identify individual's responses to stress, what parts of the body are under most duress and what should be improved to manage these situations. It is also a very useful tool to provide athletes with a visual representation of their body's functioning in different situations. In 2010, researchers utilized biofeedback to help a male athlete improve his performance and get to the Olympic games. Their results show that the athlete has improved in his relaxation, lowered his heart rate, and managed to control the sympathetic activation (Pop-Jordanova & Demerdzieva, 2010). A review from 2017, lends further support to the use of Biofeedback technologies in sport to improve regulation, relaxation, and muscle tension (Jimenez Morgan & Molina Mora, 2017). Currently, technologies such as smart watches, heart-rate monitors and other tools are used to track athlete's performance, however, their use can be even greater by utilizing biofeedback to gather knowledge about athlete's heart rate in different situations. Presently in pressure training, there has been no research utilizing the combination of biofeedback technologies with pressure training.

2.8 Performance

Focus of the current study is to better understand what factors affect performance and find strategies and techniques that enhance performance. Therefore, it is important to understand performance as a concept. In a sports context, research indicates that performance is composed of a behavioural and outcome aspect (Kegelaers & Wylleman, 2020). The behavioural aspect refers to the athlete's performance during the event from their perspective, the outcome aspect applies to consequences and concrete results of these behaviours (Kegelaers & Wylleman, 2020). The outcome performance can be easily measured based on the success or failure to achieve results. However, the behavioural aspect covers a multitude of factors that can affect the athletes in any given moment. Performance can be enhanced by physical training, tactical training, or mental training. Physical training can help athlete's agility, strength or endure leading to more efficiency (Haff & Triplett, 2015) and most training is devoted to this aspect of performance. Tactical training can involve specific match drills, situation exercises, and practice matches against different opponents to prepare tennis players for a wide array of opponents (Cowden et al., 2016). When it comes to psychological preparation, coaches and sport psychologists can include goal setting, relaxation exercises, self-talk, or visualization to help athletes perform and stay composed under pressure (Galli & Vealey, 2008). Similarly, biofeedback can be a useful tool to help players perform. Pressure training can also be considered as mental training to enhance performance under pressure.

Peak performance is a related concept that refers to athlete's experience of incredible display (Kegelaers & Wylleman, 2021). When asked, athletes can often remember these stand out performances, describing them as being in the zone, playing with no interfering thoughts and reacting instantly. These descriptions are related to the feeling of flow which has been defined as a state of absolute concentration and engagement in the task at hand (Landhäußer & Keller, 2012). The feeling of flow and peak performance can often feel elusive and unreal to many athletes. One famous tennis player describes the feeling as: "*It felt like I was in a cage and someone decided to unlock the cage and I suddenly felt free. And every decision I went for, felt like it was absolutely the right decision at the right time. It's what I like to call flow*", (Richardson, 2023, p. 3). Mental training can help players achieve this state of flow and peak performance on a more consistent basis and enhance performance. It is an often-overlooked factor in sports, that coaches often do not practice with the players either because of lack of experiences or because they do not believe in it. In the current study, participants are all familiar

with mental training as it has been a part of the professional tennis academy in southern Europe from the beginning. Coaches are also utilizing pressure training to prepare athletes for stress at the highest level of tennis, doing so in a safe and controlled environment.

3 PURPOSE OF THE STUDY

This study utilized a qualitative approach using semi-structured interviews with several tennis coaches from a professional tennis academy in southern Europe and the academy's sport psychologist. This study has investigated the concept of pressure training by exploring various questions. Firstly, the aim was to understand participants' perspective on what pressure training entails. Secondly, the study examined the extent to which participants utilize pressure training methods. Thirdly, the research focused on participants' descriptions of their use of pressure training. Additionally, the study sought to identify the benefits and drawbacks of pressure training as perceived by the participants. Finally, the research explored the reasons and situations in which participants utilize pressure training.

4 METHODOLOGY

4.1 Participants

Selection criteria for the participants was to have at least five years of experiences working in a professional tennis environment. The sample of participants consisted of 1 sport psychologist and 4 coaches aged between 23 and 55, all working at the professional tennis academy in southern Europe. First participant is a former professional tennis player working with the highest-level academy players and professional players. Second participant is the youngest working as a tennis coach and fitness coach for primarily junior athletes. Third participant is the current head coach responsible for day-to-day operations and management of all the players. Fourth participant is a coach and the owner of the academy and responsible for development of the training methodology. Fifth participant is the academy's sport psychologist, responsible for developing a system of mental training and performance reviews of both coaches and players. The method for gathering participants was non-probability purposive sampling chosen specifically to reflect an environment of an elite, famous tennis academy. All the participants have more than 15 years of experience playing, coaching, or working in professional tennis environments. The academy's main sport psychologist was added into the study to provide invaluable information from outside's perspective on pressure training performed by coaches and practical information regarding pressure training sessions conducted cooperatively by him and the coaches, he is also a tennis coach. Participants have been given abbreviations to help the reader, (see Table 1). As can be seen from the figure, there were no female participants in this study. At the time of the data collection, there were no female coaches working for the academy.

TABLE 1: Participants information

Participants	Focus	Age
Coach 1	Professional Players	28
Coach 2	Junior Players	24
Coach 3	Head Coach	51
Coach 4	Academy Owner	44
Coach 5	Sport Psychologist	39

4.2 Researcher's positioning

The primary researcher in the current study is already familiar with qualitative approach and thematic analysis and conducting interviews from a bachelor thesis done on resilience in Czech tennis players. The researcher also has more than 15 years of experience playing and coaching tennis similarly to the participants. Personal background in tennis can be considered as a significant strength in conducting an effective interview with tennis professionals as well as experience conducting pressure training sessions at the professional tennis academy in southern Europe. As a tennis coach and sport psychologist in the academy, I was part of the inside circle including the tennis coaches, fitness coaches, head sport psychologist and the owner of the academy. My position allowed me to gain a lot of information from both the players side and the working side. It was also beneficial that these dual roles made for a strong position within the team of coaches and eventually trust between me and the other coaches. Therefore, when I informed them about the topic of my research, close to the end of my internship, the team was excited to participate and explain their coaching philosophy. I think that the insider status and trust between me and the team at the academy is one of the strongest points of this thesis because it provided information on many personal stories within the academy, their valued coaching methodologies, and the overall structure of a well-known tennis academy. Furthermore, the data and results in this thesis were analysed by two other students in the same programme to help balance and challenge my interpretations of the data.

4.3 Rationale for Qualitative Design

The basis of current research was to find out detailed practices of tennis coaches and sport psychologists on creating pressure training environment, their experiences with pressure training with different players and any other relevant ideas and thoughts related to pressure training. Therefore, it was expected that there will be a vast amount of data from participants. Qualitative approach in the form of semi-structured interviews offers freedom to both researchers and participants to convey all their knowledge without the limitations of a quantitative research. It provides a deeper understanding of a certain phenomenon (Fossey et al., 2002), and allows for practical applicability of the findings (Price et al., 2014). In this study, semi-structured interviews were also chosen to not limit participants in their answers and allow them to provide numerous examples.

4.4 Procedure and Data Collection

To better understand the nature of a qualitative thematic analysis a pilot interview was run to gain experience and information needed to conduct a good interview (Braun & Clarke, 2006). Therefore, a pilot interview was conducted with a Czech tennis coach experienced in pressure training to gain valuable feedback on the content and to check the approximate length of the interview. The interviews were conducted at a time convenient for the participants and all took place in person. Before the interviews, participants were familiarized with the topic of the study and how it relates to their working experience. All the interviews were recorded and saved on a safe portal. Gathering data began by distributing a letter of consent, contact for the primary researcher and supervisor, basic information about the research topic and estimated time for the interview. After all the participants agreed, they were invited to a quiet room provided by the academy management. All the interviews were conducted in English which is commonly used by all the participants due to the international nature of the academy. Participants were then asked to introduce themselves, provide a background to their tennis career and anything they deemed relevant to the study. This has shown to be the right approach because all five participants went over the estimated time (one hour) for these interviews. During the interviews participants were asked open-ended questions related to pressure, tennis and their experience with coaching and utilizing pressure training. Four out of the five participants followed up in the weeks after their interview adding more information to the subject of pressure training, their own experience with it and generated more ideas on how to improve pressure training in professional tennis environments. The nature of the interview process is time-consuming, and thus the number of interviews was limited to five participants.

4.5 Data Analysis

All interviews were transcribed and stored online in a password protected portal for subsequent analysis. Thematic analysis was chosen for analysis of the data. Thematic analysis is a common practice in qualitative research that focuses on finding out the essential nature of the research questions (Braun & Clarke, 2006). In thematic analysis, researchers aim to find patterns in collected data that are later grouped into themes according to their importance to the study (Fossey et al., 2002). Current study has used the same approach as previously used by researchers across multiple sport psychology studies (Fletcher & Sarkar, 2012, Stoker et al.,

2016). The purpose of the analysis was to create a systematized database of themes that provide the reader with an understanding of elite tennis coaching and utilization of pressure. Braun and Clarke outline other advantages of using thematic analysis which are relevant to the current study – Utilizing participants as collaborators, generating unexpected observations and flexibility providing rich and detailed data (Braun & Clarke, 2006). Treating participants as collaborators is essential in the current study, because data was collected while the primary research was a member of the coaching and psychology team at the professional tennis academy in southern Europe. This approach yielded positive results because participants were deeply familiar with the researcher and therefore also with what the study is trying to achieve. Flexibility in this case allowed for easy follow-up to gather more data and talk extensively about pressure training. The questions used in the study were taken from previous research by Stoker et al., (2016) where the researchers used a semi-structured interview form. Stoker has given the permission to use their developed interview form in the current study. Here is an example of a question used in the interviews: "Can you tell me what you do to create pressure training environments" (Stoker et al., 2016). The interview was slightly adapted for tennis specific environments by modifying the participant probes (see Appendix 1). After asking all the interview questions (meetings lasted from 30 minutes to 2 hours), participants were given the possibility to ask for more information about the study, provide more information and feedback to the researcher, before the interview concluded. It is important to note that due to the primary researcher being very familiar with the environment at the academy and how the academy operates (due to internship taking place at that time), participants felt more relaxed and eager to share. This can be considered both a strength and weakness of the study. Strength in knowing the participants and creating a friendly atmosphere, but also a weakness because of the possibility of bias. As mentioned beforehand, participants (three out of the five) continued to give more information over a period of two weeks after the initial interviews. The interview consisted of six parts: 1) Informed consent and background information about the current study, 2) Establishing rapport with coaches and learning about their background in tennis, 3) Coaches view and understanding of pressure and if they use it, 4) How do coaches create pressure, 5) When to use pressure training and who should pressure train, 6) Final review and additional notes.

The process of subsequent data analysis started by reading and rereading through the transcriptions to familiarize with the available data. From this data, codes were created by finding key phrases and examples used by the participants and labelling them. This approach is based on inductive coding and theme development which is one the methods recommended

in thematic analysis (Terry et al., 2017). These codes were later clustered into themes. After multiple analyses of the data were done and initial themes were created, analysis was done by two other student researchers. This feedback helped the primary researcher to update the created themes and one more analysis was done to assess the quality of the inquiry. The themes were created within the guidelines and framework of the method as described by Braun and Clarke (2006). Themes were created with the aim to understand more about how to create well-developed pressure training environment. Each of the five main themes was split into sub-themes to understand the impact of sub-themes on the overarching theme. Each of the themes is provided with numerous examples outlining the reasoning of the primary researcher. All the themes have a number in the bracket next to them indicating how many participants talked about this theme and the overall prevalence of the themes. Themes were named and identified semantically on surface; however, latent coding is used with some of the sub-themes (Terry et al., 2017).

4.6 Ethical Issues and Trustworthiness

According to Braun & Clarke (2006), the process in qualitative research needs to be thoroughly explained to show that the findings are relevant and applicable. This study followed the ethical guidelines given by the ethics committee of the University of Jyväskylä. All the participants were informed that this study is anonymous, but that based on the nature of the study and information provided readers might be able to identify the coaches despite using the abbreviations. All participants signed the consent with knowledge of possible identification. As previously mentioned, all interviews were conducted in English, despite all participants having English as their second or third language. After the information from the interviews was transcribed, a copy was sent to the coaches to see whether they wanted to make any changes and to verify the accuracy of their statements.

As previously mentioned, the interviews lasted from thirty minutes up to two hours which is partly because of the ability to raise additional questions to provide more detail into the subject of pressure training. However, during analysis of the data it is the researcher's responsibility to avoid bias and remain neutral (Braun & Clarke, 2006). This was achieved by multiple re-reading of the data and a separate analysis of the data and themes by two independent student researchers also studying sport psychology. The separate coders arrived at the same themes (except one) which was discussed to reach an agreement and subsequent change. Preventing bias and subjectivity in thematic analysis is achieved by acknowledging researcher's own

assumptions and mitigating bias (Terry et al., 2017). However, qualitative research consists of researcher's own attitude and every individual comprehends and analyses data from their own perspective which can naturally lead to possible misunderstandings regarding dependability. In the current study, the primary researcher took steps to avoid it by consulting with the academy frequently on their views regarding pressure training and newest updates on training policies.

5 RESULTS

In this chapter, results of this qualitative study on pressure training will be presented. Therefore, a lot of coaches' expressions are presented in this section and all of them are *italicized*. Thematic data analysis of interviews revealed five major themes and several sub-themes. Numbers in the parenthesis indicate the number of participants that talked about the theme in their interview, (see Table 2). Additionally, all five participants have recognized pressure as instrumental in training to help develop athletes.

TABLE 2: Themes and subthemes

Major Themes	Sub-themes
Background	
Perceptions of pressure training by players and coaches (5)	Coaches' knowledge of the players for pressure training Pressure training to help players understand match pressure Distractions Creating pressure training situations in tennis
Stakes in training (5)	Competition as incentive Reward & Punishment as incentive Money as incentive
Benefits of pressure training (5)	Confidence Consolidation of mental skills Familiarity with pressure
Negatives of pressure training (4)	Ethical considerations in relation to player's mental health Overtraining in pressure training situations Dissatisfaction with pressure training
Coach and player relationships (4)	Trust Feedback

5.1 Background

In the first part of the interview, participants were asked about their background in tennis and anything they would like to say to describe themselves. The first participant talked about his career as a former professional player:

> *"I used to play professionally, until I had a career ending injury. It still hurts, but luckily, I have been able to transfer to coaching and realized that itis my passion as well. Now, I want to make sure players do not make some of the mistakes I did and that they are taken care off"*, (Coach 1).

Second participant talked about why he is coaching:

> *"Ever since I was a little kid, I had great coaches. And it inspired me to become one as well. I want the kids to look at me, the same way I did at my coaches. Also, it is a very special feeling when you can share the joy of a player learning something new and achieving their goal"*, (Coach 2).

Third participant talked about his past experiences as a player in an academy and how it motivated him:

> *"I was an academy player myself so I went through this system and that gives me a good understanding of what is good about it and what can be improved. Here at the academy we get the chance to make the academy the best in the world and that is why I started working here and accepted the position of a head coach"*, (Coach 3).

Fourth participant talked about his academy: "*My proudest achievement is being able to open an academy. It's like having a baby. It's a lot of work. I started with nothing, and it evolved into something that's working well with a great team behind me*", (Coach 4). And the fifth participant explained why he focuses on tennis as a sport psychologist:

> *"I was a tennis player myself and it's one of the main reasons why I became a sport psychologist. To me it is the greatest sport in the world but also the most challenging mentally. Sport psychology is now used across many sports, but I believe tennis can still implement so much more. This is why I am here, I get to meet a lot of players and introduce them to mental training"*, (Coach 5).

5.2 Perception of pressure training by players and coaches

The first main theme of the study refers to coach and athlete's understanding of pressure training situations. It explains what coaches need to know and do to perform good in pressure training and to achieve the goal of the training. It is also about what athletes perceive as important to evoke stress. All five participants agreed that perception has a huge impact on pressure training. One coach when asked about his pressure training drills said:

> *"I have a large variety of drills just because they can be understood differently by any one of the players. If I have a player that I know has a big ego, it gives me an advantage in creating pressure that threatens the ego"*, (Coach 1).

Another coach shared how he introduces pressure in two ways: *"For me there is two kinds of pressure training. Match situations or training situations. In training you create it by having targets and objectives. In matches you create it by making players compete with different level of players"*, (Coach 4).

5.2.1 Coaches' knowledge of the players for pressure trainings

This subtheme emerged based on data from all five coaches, specifying how important it is to have a good understanding of the player they are working with. One coach gave an example:

> *"I made it clear with all the coaches that we start pressure training after we get a sense of the player's personality and can assess what works on him/her. I demonstrated this on a long-term player I work with where I know he struggles on his serve facing breakpoints. Therefore, I can tailor my pressure training to that specific situation, and we can work on a this aspect very closely to improve"*, (Coach 4).

Another coach remembered a past mistake in one of his coaching sessions:

"It was not in this academy, but around five years ago I did a pressure training session with a junior where I tried to annoy her. We practiced with slow balls, I made her change her racquet throughout and then in a practice match I made wrong calls on purpose against her. It backfired because she got so mad that she did not want to work with me anymore. I think I should have explained it beforehand to her and also our relationship was not yet strong enough, so I could have waited", (Coach 2).

Another coach added why this knowledge is so important:

"For the past two years I am working mainly with our long-term annual players that are at the highest level of the academy. This gives me a big advantage in doing pressure trainings because I know what works on them individually and how to create a situation where they feel under pressure", (Coach 1).

5.2.2 Pressure training to help players understand match pressure

This subtheme was identified as crucial by the coaches for development of high-level athletes. It refers to how players perceive pressure, how they can manage pressure and adapt to it. One coach illustrated this point in an example:

"Most of the players still have no idea what true pressure is. How difficult it is to play in front of a crowd and that first round and second round matches make the difference for the whole year in terms of money to survive a year on tour. We cannot fully replicate these situations of course, but we need to prepare them and pressure training can help us do that", (Coach 1).

Another coach also emphasized the importance of pressure training to help players cope with stressful situations:

"Pressure training is super helpful to see whether they adapt to pressure well. In many cases I start to see them rushing, ignoring their routines, sometimes not even drinking water in breaks. When I bring this issue up after practice, they often do not even realize how much impact the situation had on them. This is also why I like to use video to

record pressure trainings and practice matches. It also provides an additional element of pressure on some of them", (Coach 5).

5.2.3 Distractions

This subtheme in the Perception of pressure theme was coded as Distractions. The idea came from one coach, who when asked on what does he think is the main source of pressure, said: *"The pressure comes a lot from thoughts about the future. I must win because otherwise my parents will be disappointed. It comes from thinking what might happen. All these thoughts bring pressure"*, (Coach 4). Another coach agreed and shared a way he uses the pressure of future to his benefit:

> *"I like to schedule practice matches and then invite both players parents. I often bring people to watch and wait to see whether the players are affected by it. When I ask them the next day, they usually say it created more pressure on them, often saying their thoughts were related to the people and not just the match"*, (Coach 2).

Similar example was mentioned by the head coach as well, but in his case, he referred it to instilling confidence. Another coach used physical exhaustion to distract the players and see whether they can keep their composure:

> *"I call it the punisher. This is a pressure training the players are not particularly fond of, but it has proven to be so useful. I tire them out to their limits and then make them play a practice set. It is much harder for them to focus and put in the effort, they get frustrated, and emotions come out"*, (Coach 1).

5.2.4 Creating pressure training situations in tennis

This subtheme refers to various pressure training drills used by coaches at the professional tennis academy in southern Europe. It was included to illustrate how to create pressure for many kinds of individuals in a high-level tennis academy. One coach explained how he perceives pressure training: *"For me there is two kinds of pressure training. Match situations or training situations. In training you create it by having targets and objectives. In matches*

you create it by making players compete with different level of players." He continued with a specific example of pressure training with a match situation:

> *"This drill involves playing points where one player is trying to break serve, and the other player is trying to hold serve. The pressure comes from the fact that the player trying to hold serve is under pressure to avoid getting broken, while the player trying to break serve is under pressure to win the point and break serve"*, (Coach 4).

Another coach shared a popular drill in the academy:

> *"We call it up and down and try to do it once a week. It requires a group of players on a similar level and a few tennis courts. You split the players in pairs, and they play a tiebreak, loser stays on the same court and winner goes up a court. We do this for about a half an hour or more if the quality is good and it is an easy way to bring pressure, competition, and variety into their trainings. They need to adapt to different playstyles in a short time and focus on every point"*, (Coach 3).

On the other hand, a coach shared a unique pressure training:

> *"Sometimes I use video analysis with a group of players. We all watch a video of one player doing serve, or a forehand drill. It is a lot of pressure for the one on the video, they feel like they are being judged by so many other players and coaches. We then combine the feedback and go practice that on court, while the others watch. I have excellent results with this, because they always try their hardest to not disappoint, implement what was talked about and it is also hard to keep composure in these situations"*, (Coach 5).

Additionally, imagery was used to create pressure as well:

> *"Imagery is a very important part of our mental trainings and I make sure all our players know about it and practice it. Sometimes we do a guided visualization session together, where we run over a specific part of the game, facing match points or other high-pressure situations and I want them to imagine how they would prepare themselves, to go over their routines and also visualize the points itself. It is of course*

very abstract, and some players have a hard time to imagine this well, but I think it can be very helpful to familiarize themselves with match pressure even more", (Coach 5).

5.3 Stakes in training

Stakes in training were the second major theme featured across all the interviews. When asked how they plan for pressure training, all participants talked about the importance of competition, or other stakes such as fatigue to put the players under pressure: *"Introducing stakes to training is a natural way to increase pressure"*, (Coach 4). Another coach talked about his way to bring out pressure: *"I like to tire them out by physically demanding drills and then putting them under pressure, emotions come out then. Even better when I add pressure by making the loser work extra"*, (Coach 1). An international tennis academy is a naturally competitive environment which coaches use to their advantage: *"I make it a point to find out what players don't like each other and make them play a match to see who crumbles"*, (Coach 3). There is also a unified methodology on developing players in the academy which helps coaches utilize pressure: *"Every Friday morning we play up and down tiebreaks across all courts. Players run into different tactics and need to adapt quickly which can stress them out"*, (Coach 4).

5.3.1 Competition as incentive

In the academy settings, players compete in tournaments on a weekly basis, playing against players from other academies as well as non-academy players. Therefore, competition is deeply embedded into the system of Spanish tennis academies: *"Around [redacted] there is a tournament every week. It gives our players plenty of opportunities to see how they improve"*, (Coach 2). This means that competition in practice settings needed to be carefully managed: *"I always implore the coaches to not go overboard with players competing every practice. They get enough of that with the tournaments, so in practices I want competition only used to induce pressure"*, (Coach 5). Other coach shared how they use competition in training to familiarize the players with the pressure of tournament matches:

> *"They must play a lot of matches in training to create the situations of being up or down in a set. I think it's important in training so that these match situations become less intimidating, they have encountered them in training so it's easier"* (Coach 1).

Another coach used score manipulation to bring match situations in practice: *"If you win a game, you start the next 0:15 down, if you win again it's 0:30, the pressure mounts up on them"*, (Coach 2). Using competition is a common way to train athletes and induce pressure to prepare them for matches. The academy owner also specified that it is his intention to provide a lot of competition inside the academy:

> *"I think it's a huge benefit to many players that come for a short period of time to be able to play with many players and try themselves against stronger and weaker opponents. I believe it makes them stronger and more adaptable"*, (Coach 4).

5.3.2 Reward & Punishment as incentive

When a coach was asked on how does he consider difficulty of training to evoke pressure: *"I don't necessarily make the trainings hard. Sometimes I just say that we will finish with a tiebreak and the loser cleans both halves of the court"*, (Coach 3). The junior coach tried to avoid using punishments in his work with younger players to avoid negative consequences: *"They are so young, tennis needs to be mainly fun for them. I am always working on promoting enjoyment so I use rewards instead of punishments as often as I can"*, (Coach 2). When asked about specific pressure trainings, one coach talked about a consequence drill:

> *"I sometimes do practice matches where players agree to consequences for losing points. So, for example, when they lose a point I make them run a lap around the court or make them hit a serve into volley on the next point as punishment"*, (Coach 3).

A unique approach to pressure training was taken by the junior players coach, who uses what he calls a Mario Brothers game:

> *"I now have about 500 different levels for players to go through. The idea is that just like in the video game, you have the levels and on the last level you need to beat the boss, here the boss is the coach. So, on the last level you need to win a point against a coach. The kids go crazy for it. The difficulty of levels will increase, and we start simple. For example, first level is forehand, you must put ten in the court. Third level can be five backhands cross courts. On fifth level you have a checkpoint. We also play with*

three lives and if you lose you go to a previous checkpoint or if you did not reach a checkpoint, you go back to level one. It creates a fun kind of pressure, and it is relatable especially to the younger players. Later in the game I also don't tell the players the rules, just like in the game you must figure it out on your own, no tutorial", (Coach 2).

Reward and punishment was a subtheme present through all the interviews with coaches, with the sport psychologist often supervising the coaches during these sessions, " *I was often asked by the coaches to watch the pressure training sessions, to see how they can be improved and if the pressure was not too high or too low"*, (Coach 5).

5.3.3 Money as incentive

This section refers to money as incentive, money being a reward or punishment depending on winning. Therefore it is related to reward/punishment. This subtheme emerged from the data as a very polarizing issue due to the participants being split on the usefulness of it and using it as an external motivation source. Two coaches believe it is the single most useful tool to induce pressure:

> *"When I was coaching on my own, I was using bets that increased periodically. I have never seen something work so well as money. Coaches did this in a top American academy,* (name redacted to protect the confidential information), *that every match was monetized, it created such a competitive environment, it's a very good way to put pressure on players and manipulate their dopamine levels. Here I only use money as incentive sparingly because we have so many juniors"*, (Coach 1).

Another coach simply adds: *"The strongest but maybe not the most ethical way to increase pressure is* money", (Coach 2). Overall, coaches agreed it is a technique limited to older players, that can be highly unethical, but has always brought results, *"Money or the equivalent in buying something for losing a match for the opponent brought so much competitiveness. It is such a good way to train tactical and mental aspects of tennis, that it cannot be overlooked"*, (Coach 3). However, coaches also agreed with the perspective of the sport psychologist, that it can affect player's motivation:

> *"It does have to be kept in moderation. With some players I noticed they did not try as hard if there was not a bet or other incentive. It's almost as if the intrinsic motivation and enjoyment was not there anymore. I think we need to promote both and in juniors' intrinsic motivation is key"*, (Coach 5).

It is important to note, that all five participants were aware of the risks of adding significant extrinsic motivation rewards, but they also deemed it necessary:

> *"Well let's put it this way, they are playing tennis to eventually make money from it. This pressure will always be there and professional tennis is cutthroat. The way I see it, we are preparing them for this harsh reality by adding stakes"*, (Coach 4).

5.4 Benefits of pressure training

The third identified major theme of this study was named benefits of pressure training. All five participants have agreed that pressure training is beneficial for athletes. One coach shared what he thinks pressure can improve: *"Using pressure in training is so good for many things. I think it helps players improve their focus, confidence, patience, and emotions"*, (Coach 3). In another example, the sport psychologist described why he thinks pressure training is so important:

> *"If done well, it can be essential to player's development. They need to familiarize themselves with the pressure of competition. On this level, in this academy we train them to go pro and make a living out of tennis. Pressure will always inevitably be part of their tennis journey"*, (Coach 5).

Another coach believed that the diversity pressure training offers is critical to develop players: *"The way I look at it is that using stress and generating pressure can be done in so many unique ways that it will also bring something unexpected to the players and challenge them in a new way"*, (Coach 2).

5.4.1 Confidence

The first subtheme that emerged from the data is confidence. In this context it refers to pressure training giving players confidence to handle future stressful and pressurized situations. One participant believed that is the main purpose of pressure training:

> "*The way I use pressure is to induce self-belief. There's of course plenty of varieties but one of my favourite drills to use is to use a frying pan or an equivalent instead of a racquet. At the beginning it is so hard for them to hit the ball, but they get better and better. It induces self-confidence and shows them what they are truly capable of. And then I put a player with a pan against a player with a racquet, which immediately introduces pressure for both players but in a different context"*, (Coach 1).

Another participant also advocates for pressure training to build confidence:

> " *In an international academy with such a good name, we get a lot of new players very often. I noticed that a lot of them have lower confidence from suddenly being in such a professional environment and facing off with so many incredible players. Using pressure in practice matches is a good strategy to boost their confidence"*, (Coach 5).

Two coaches maintained that the pressure situations need to be kept as realistic as possible, which then in turns help boost confidence:

> *"Me and JC often organize practice matches that closely resemble tournaments with fans. Playing under these circumstances creates a lot of pressure on the players but when we discuss it the next day players always feel more confident about handling these situations in real life"*, (Coach 3).

Another participant when asked what the biggest outcome of pressure training is, responded*:*

> *" I think that our goal as coaches is to create success. We want our players to feel successful to feel like they are performing well, positive and confident. We need to adapt change the situation. If the pressure situation is too hard for players, they cannot do it.*

We need to change it, tweak it. But leaving it out completely I don't think is right for any kind of a player, (Coach 4).

5.4.2 Consolidation of mental skills

Second subtheme that emerged from the data is consolidation of mental skills. This subtheme is related to mental training off court and subsequent practicing of these mental skills in training. As one participant put it:

> *"They train every day, pretty much from morning to evening they are working on some part of their game. The natural next step is to consolidate what they have learned. This does not simply mean playing matches but playing under pressure. Because that is when we see whether the changes we make and the things they have learned truly impacted them and what we need to work on. Pressure training really helps us see what the player needs and whether the approach we chose is correct"*, (Coach 3).

Another participant supported his view:

> *"A lot of the mental training may seem too theoretical to the players, so when we talk about relaxation, visualization or any other mental skill if I can, I schedule a practical training where I often use pressure to see how or if they implement what we have talked about"*, (Coach 5).

Similarly, one coach specified how important pressure training is for technical adjustments:

> *"Making a big change in a player´s technique can be devastating especially at a high level of performance. It takes a lot of time and only way to really see if they are not reverting to their previous stroke is to put them under pressure in a practice match and see how they do. This gives me a better idea of how long the process will still take"*, (Coach 1).

Another coach shared how he uses specific drills to help players consolidate:

"I ask the players to rally thirty times over the net with me. When we reach 15 or 20 you can already see how they might start to constrain themselves, not wanting to lose the progress, do they secure the victory? Or we do situations where you are 40:0 up, can you confirm the break, similarly we can reverse the scoring and they need to fight off that situation", (Coach 4).

5.4.3 Familiarity with pressure

The final subtheme is familiarity, which refers to becoming used to pressure. One coach praised the use of pressure situations on junior players:

"Tennis is such a big sport that players can now be scouted and put under external pressure from a very young age. And they don´t know how to deal with that because despite being really good this is a new situation for them. So, I often try to recreate this external pressure to better prepare them. I schedule a practice match with a much weaker opponent and tell the player that they need to win convincingly, to imagine this is a match that decides whether they get a sponsorship", (Coach 2).

Similarly, a different coach agrees and shared how he uses pressure to help players stay positive in stressful situations:

"I use an on court exercise for four players. Two play a tiebreak and the other two do the maximum to annoy them. I explain to them after that this can happen when they are not the fan favourites or playing in the Davis cup, so it helps them adapt to pressure", (Coach 5).

Another participant also outlined a different reason why familiarization is so important:

"I think it´s also important to understand that we work with the players every day for a large number of hours. Therefore, we can implement different trainings and not focus on only the technical aspects of the game. This is why we put so much effort into developing our players mentally as well. It´s also good that even if they do not make it to the highest level, they will still know how to handle stress because they were exposed to us and hopefully, they learned how to deal with it", (Coach 4).

5.5 Negatives of pressure training

Another major theme that emerged from the data was coded as negatives of pressure training. It refers to any perceived negatives of pressure training that can occur, situations to avoid or ethical issues that can arise with pressure training, *"It can drain players mentally. I have seen players being pushed too much and they can develop the yips, it's not something you want out of it of course"*, (Coach 3). One coach outlined the negatives in a personal example:

> *"I was coached by my dad. He saw how Tiger Woods became a superstar and similarly how the Williams sisters made it to the top, so he wanted to do the same with me. It was really hard because I think he put too much pressure on me and especially off the court, when I was younger, I never really felt safe, for him everything was about tennis"*, (Coach 2).

Similarly, a different participant shared his concerns:

> *"I am often afraid the parents will come to see their kid and they seem distressed or put under too much pressure. We try to notify them, how pressure is integral and that we monitor everyone closely, but you never know. I have had problems with this before"*, (Coach 4).

When asked: "*When a skill breaks down under pressure, how do you know whether the skill needs to be embedded more, or if the athlete needs to learn how to cope with pressure better*", (Stoker et al., 2016), coaches differed in their opinions based on concerns for player's confidence, possible overtraining, or dissatisfaction with the training or even with the academy.

5.5.1 Ethical considerations in relation to player's mental health

Ethical considerations were mentioned by four out of the five participants for use of pressure training methods. One participant shared how he ran into an issue with a coach and player:

> *"It was a problem between a former coach here and one long-term player. The player has clearly become very distressed, so I stepped in to inquire about the problem. After*

an independent discussion with the coach and the player I decided to end the practice session to avoid any more problems", (Coach 5).

Another coach shared a mistake that has caused problems between two players:

> *"I knew they did not like each other very much and I used that to my advantage. I made the players compete against each other more in order to make the practice matches more emotional. What I did not expect is that it would cause one player to leave the academy. When I talked to another coach about it, he told me that she felt isolated by the end of her stay here at the academy and she eventually left"*, (Coach 3).

5.5.2 Overtraining in pressure training situations

Overtraining is a subtheme that emerged from the data in relation to coaches pushing players over the limit. Burnout, physical and mental exhaustion can often happen in elite sports and coaches need to be aware and closely monitor player states. Pressure training exercises can if done in inappropriate times highlight these issues, as described by one coach:

> *"It can drain players mentally. I have seen players being pushed too much and they can develop the yips, it's not something you want out of it of course. There is already a lot of pressure associated with their lives as tennis professionals, so we need to be careful to not put too much on their plates"*, (Coach 4).

Another coach also mentioned how too much pressure training can affect the players mental states:

> *"I have noticed that I apply pressure in too many situations if I am not careful. I feel like I thrive under pressure, and it adds the spice to practices, making it more fun to me and to the players. However, it comes down to knowing the players well and how they feel at the given moment. In one case, a player was recovering after a tough tournament, but I did not know about it. The training did not go over well, because of that"*, (Coach 3).

5.5.3 Dissatisfaction with pressure training

The final subtheme is Dissatisfaction with pressure training. It refers to any disapproval or discomfort that players feel regarding pressure training situations done by their coaches. One coach provided an example:

> *"A player came to me after practice complaining that she did not see the point in having extra stakes in practice. Said that it made her feel uncomfortable and doubt herself too much when I added a punishment stressor for losing a practice match"*, (Coach 2).

Despite being an elite academy focused on developing high level players, coaches need to be able to find balance between comfort and a challenging environment. One coach described this is more detail:

> *"I tell the coaches to analyse their training methodology in regard to players as a challenge or threat. We need to make sure that the overall atmosphere and player development is done so they feel challenged but not threatened by the situation"*, (Coach 5).

Additionally, players' needs need to always be at the forefront:

> *"At the end of the day we want the players to want to come back to our academy. If they are not long-term annual players, we need to be careful about doing pressure training. The players first need to know they are in a safe environment to develop their skills before we proceed to push them", (Coach 4).*

5.6 Coach and player relationships

Coach and player relationships was the final major theme identified in the current study. Four out of the five participants talked about the importance of relationships in pressure trainings. Fifth participant did not consider them essential to effective pressure training delivery. In this context, relationships refer to the bond between a player and coach or the primary deliverer of the pressure training. *"A good bond is everything. Without a good bond you might as well be*

doing what everyone else is" (Coach 1). What was clearly expressed in the interviews is the importance of a deeper understanding between coaches and athletes. In an international academy where many players are without their families and struggle with the stress of juggling schools and tennis, coaches emphasized the need for support:

> *"Here it already is a high-pressure environment. Players are competing and aware of how much it takes for them to make it to professional tennis. It might sound like a cliché, but we like to think of our academy as one big family because of that"*, (Coach 3).

Another coach that focuses on younger tennis players in the academy shared his views on the importance of relationships:

> *"Coaching for me is about the possibility to make a difference in a kid's life. You get to see them grow as people as individuals. It's really special to see them look up to you and trust you. Hopefully they will always remember us as people who helped improve their tennis but also their lives"*, (Coach 2).

Two sub-themes were identified that further explore the major theme and explain the context of relationships in elite tennis environments.

5.6.1 Trust

The first subtheme that emerged from the data was trust. Coaches were talking about the importance of responsibility and belief they need to feel for themselves and their athletes. One participant exemplified the importance of trust in a coach player relationship:

> *"First, I need the player to trust me. I don't do any pressure training before we become closer, so that they know what I am doing is to help them. Otherwise, applying pressure could destroy everything we worked so hard on until that point" (Coach 2).*

Without trust in the process and the other person, training with pressure will have no impact or even negative impact on performance: "*In the beginning of my career I had made the*

mistake of pushing players a little too much" (Coach 3). Another coach agreed and shared how trust impacts his coaching: *"I have had the most success with pressure training after I got to know the players and they trusted me to know my stuff",* (Coach 5). When a coach was asked for additional feedback regarding pressure training and anything he might want to add, he immediately began discussing the processes that go into building trust with players from a coach's perspective:

> *"I am very careful with creating pressure because it can impact the relationship so much. And I have spent so much time just getting the players to trust me. I also mainly train juniors so I introduce pressure only after making sure, they can handle it"* (Coach 2).

5.6.2 Feedback

Feedback refers to the player's perspective on pressure training, indicating what worked for him/her and how to structure future sessions. Coaches have specified how much feedback helped in creating pressure training sessions. "*I think that feedback is super important, because I want the player to have an active communication with me so I know what makes them tick, what are they afraid of and what to avoid"* (Coach 5). One coach highlighted the importance of feedback on his pressure training:

> "*I did a simple pressure training drill with a junior player which consisted of hitting targets in increasing speed. I asked him to tell me what he thinks after the training finished and he told me that the drill did not put him under any pressure. Next time we trained, I did the same drill, but made it a bet and he liked it a lot more"* (Coach 3).

Acknowledging player's thoughts and opinions is important not only in the context of pressure training but in coaching overall. Since, all the coaches are coaching on the highest level, it is expected from them to structure trainings according to individual player's weaknesses and strengths.

6 DISCUSSION

The aim of this study was to describe pressure training and what it means to elite coaches. It was also to understand if and how pressure training is used in an elite tennis academy. Additionally, it was important to find out what coaches see as main benefits of doing pressure training and what should be avoided or can negatively impact players when pressure training is applied. The findings are discussed considering previous research. At the end of the chapter, limitations to the current study and suggestions for future research in pressure training are discussed.

6.1 Perception of pressure training

Throughout the interviews coaches shared many different ideas on how to include pressure training in tennis, what is important in pressure training and how different individuals can perceive pressure and thus reacting to it differently. Good knowledge of the players emerged as an important factor to consider when structuring pressure training session. However, it is important to mention that these results are in a highly individual sport and compared to a team sport, in tennis the training can be tailored more flexibly according to the athlete. Knowledge of athletes is also important to determine how much pressure should the athletes feel in the practice. Research shows that moderate levels of stress can improve performance, motivation and focus in athletes (Nicholls et al., 2012). On the other hand, too much pressure can also lead to overwhelming of the athlete, lack of focus and anxiety (Beilock & Gray, 2007). Athletes can also benefit from pressure training to understand how to perceive pressure as a controllable element, instead of source of frustration (Lazarus et al., 1991).

6.2 Stakes in training

Stakes in training was the second theme that emerged from the data, and it was supported by all five coaches as critical toward developing a functioning pressure training environment. Previous research describes pressure training as regulatory exposure to adversity (Kegelaers et al., 2021). Adversity can take many forms and coaches in this study provided many examples of using stakes to achieve this adversity. Results of this study suggest that altering the rules, creating new goals in the training, enforcing discipline, and creating pressure by adding stakes can help athletes to adapt to pressure. Manipulating stakes in training was also seen as a way

for deliberate practice of match tactics, utilizing competition to apply pressure on athletes. Previous research suggests that competition can be used to motivate players and increase performance (Kent et al., 2021). Utilizing reward or punishment in training can also be used to increase performance. Examples of using a different point system or otherwise handicapping a player are in line with research that shows that competition can induce stress and increase heart rate and cortisol levels (Standage et al., 2005) Furthermore, the individual appraisal of the situation can have a significant outcome on the effect of pressure training. A continuous exposure to deliberate pressure training should improve an athlete's appraisal of the situation. Competition in various forms in training was also seen as crucial to athlete's development. Previous research indicates that competition in practice such as penalty shootouts (Kent et al., 2021) or the equivalent such as basketball free throws (Kegelaers et al., 2021) can be used to induce pressure. In the current study, drills such as first to ten serves wide were used to induce this pressure. Research suggests that an athlete's appraisal of the situation as a challenge or threat is based on various factors such as self-esteem and control over the situation (Meijen et al., 2013), therefore building self-esteem through regular exposure to adversity can help players feel more in control in stressful situations.

Rewards and punishments are a common technique that coaches employ across a wide range of sports (Moldovanu et al., 2012). Results of the current study support this view and some examples were shown how to motivate players both externally and internally. However, it is important to note that some practices may be seen as an unethical while effective. Overreliance on external motivation might cause a decrease in intrinsic motivation if left unchecked. Previous research on the relationship between intrinsic and extrinsic motivation in a business environment shows that intrinsic motivation has a larger effect on performance compared to extrinsic motivation, (Kuvaas et al., 2017). In sport, task and ego climates that promote motivation are often discussed and recent research shows that task climate was positively associated with psychological needs while ego climate was positively associated with competence (Sheehan et al., 2018). Results of the current study also indicate that money was seen as a powerful pressure training tool and motivational force. However, it can also lead to short-term thinking and a lack of commitment to the long-term goals set up by the player and the coach. Additionally, money in this context can create an environment and culture of toxic competition where players can feel less safe. Given the nature of the environment, the academy should be seen as a safe space first to help players perform and money can be a wrong incentive. A multitude of drills and varieties emerged from the data showcasing how different stakes can change the training and provide athletes with new ways to train and improve.

6.3 Benefits of pressure training

Pressure training was seen as highly beneficial and highly utilized at a professional tennis academy in southern Europe as was expected. Pressure, anxiety, and stress in competition is a common occurrence across sports and in an international academy that focuses on elite tennis players, it was a phenomenon that all players and coaches have experienced. Therefore, a lot of focus is put into preparing the athletes physically but also tactically and mentally. According to previous research on the benefits of pressure training, it shows that mental skills can be developed in pressure situations (Connaughton et al., 2010), or that facing adversity can improve performance (Galli & Vealey, 2008). In the current study coaches used pressure training together with mental skills education by their sport psychologist.

Pressure training is still a concept used sparingly and the research is limited. However, in elite sports it can be a useful tool to improve performance, when developed by coaches and sport psychologists (Low et al., 2022). The results of this study show various benefits the coaches identified such as improving confidence by handling difficult tasks, consolidation of mental skills learned off skills and practiced in pressure training sessions and teaching players to accept stress, anxiety, and pressure as an unavoidable part of performing.

6.4 Negatives of pressure training

An important part of the current study was to analyse pressure training from both the positive and negative perspective. Previous research clearly shows that well-constructed pressure training can bring many benefits and should be implemented in high level coaching (Low et al., 2021). However, results of the current study also show that a great amount of consideration and experience needs to go into pressure training to be successful. One of the issues that was previously mentioned is the relationship between intrinsic and extrinsic motivation that can come into play, especially when utilizing money as a motivational tool. Research shows that over justification effect can occur when an individual is motivated by external reward while already being intrinsically motivated and external rewards can lessen the individual's intrinsic motivation (Tang & Hall, 1995), which can decrease performance. Additionally, external motivators can also affect long-term goal setting (Deci et al., 1999). Pressure training can if not thoroughly explained and done by experienced practitioners harm player's well-being and impact their confidence, or cause choking. Previous research shows that choking can emerge

when an individual is under pressure (Beilock & Gray, 2007). It is also important to consider burnout and overtraining and closely monitor players. Pressure training can enhance the symptoms of emotional exhaustion and contribute to burnout if it is done without sufficient time for recover (Raedeke & Smith, 2001).

6.5 Coach and player relationships

Previous research indicates the importance of relationships to build and maintain resilience (Morgan et al., 2013), (Reivich et al., 2011), additionally a positive and supporting relationship between a coach and player is instrumental in improving performance and developing skills (Jowett, 2017). Two subthemes were identified as instrumental to developing good pressure training – Trust and Feedback. Establishing trust is an important step in coaching (Jowett, 2017), and pressure training can significantly impact the relationship between a player and coach without this trust, as evidenced by the coaches. Feedback is also important to assess the impact of pressure training on the individual. As previous research shows pressure can lead to choking (Gröpel & Mesagno, 2019) and individual cognitive appraisals can impact performance (Lazarus & Folkman, 1984), simulated pressure can help players deal with choking and develop coping mechanisms to help them in competitive pressure. Establishing a good coach and player relationship should be on the forefront of coaching not only for pressure trainings but to help foster motivation and improve performance. Previous research shows that low and mild amounts of pressure can increase performance (Cooke et al., 2011), therefore understanding what causes players to feel under pressure and understanding the amount necessary is needed for pressure training to be beneficial. Results of the current study suggest that relationships are crucial for not only pressure training but overall development of players, instilling them with confidence and to promote enjoyment of the sport.

6.6 Practical implications of the study

Pressure training in sport has recently gained a lot of attention in research (Low et al., 2021), this study aimed to contribute by providing a deep and specific analysis of pressure training in tennis. The purpose was to analyse concrete practices used by coaches and generate a basis for future use not only in tennis but other sports. Ideally, athletes, coaches and sport psychologists can gain deeper knowledge on specific pressure training practices and use them in multiple sport environments. Some pressure trainings can also be adapted to the world of business

coaching. This is a practical study that relied on detailed input from participants and their experience with creating pressurized situations.

6.7 Limitations and future research

Current study has applied a qualitative approach as a method to understand and interpret pressure training in an elite high performance tennis academy. The data was collected during an internship as a working member of the academy which have impacted the study. This can be seen as a limitation but also a strength for data collection. Despite possible biases it has also allowed the primary researcher to build a good rapport with all the participants and they shared a rich amount of data, contributed with personal stories, and included trademark pressure training drills done in the academy.

As with most qualitative research, current study also does not provide any numerical data which means the findings are not quantifiable. However, it is a practical study with concrete drills and practices applied at the highest level of tennis. These practices can also be adapted into other sports with relative ease.

Another limitation of the study is a relatively small sample. Because of the nature of the study and extensive amounts of data, it was not possible to add more participants. Furthermore, regarding the sample there were no female participants. At the time of data collection there were no female coaches at the academy (this was mentioned sometimes by the female players that they would welcome it) and there was no female sport psychologist or female fitness coach at the entire academy. It would be interesting to see how an experienced professional female coach could interpret pressure training and it is a limitation to the study.

For future research in pressure training, it would be interesting to conduct a more widespread study across high level academies to find out if and how pressure training is developed. Also, the current study focused on coaches understanding of pressure training, their views and drills that promote development of mental skills. Understanding the players perspective on pressure training, how effective they think it is and what experiences they have with it, would help further the research on pressure training. Additionally, there is not much quantitative research regarding pressure training and gathering quantifiable data on the effects of pressure training on resilience, choking, imagery or performance is critical to solidify pressure training as a technique to develop athletes. Future research should also focus on a broader analysis of pressure training in different sporting contexts to see the differences across sports. As was

mentioned before, current research on pressure training is limited and yet as evidenced in this study it is a widely used technique for many different purposes. A broader analysis of pressure training in different sports could also help to as a useful database for coaches to better understand pressure, how to create it and specific examples that can be applied in a wide variety of sports. Future research should also identify the differences in pressure training regarding individual and team sports.

6.8 Conclusion

Pressure training from a coach's perspective was seen as a complex, long-term process that requires careful planning, attention to detail and a deep understanding of the players. By creating a supportive environment, giving constructive feedback, and tailoring training to individual needs, coaches can help their players build the skills and confidence they need to succeed under pressure. Current study showed concrete exercises used with elite athletes to practice performing under pressure and improve athlete's capability to deal with stress. It also showed that pressure training is an essential tool in a high-level academy to improve performance but also provide variety to their training. Current study also showed that a deep understanding and a good relationship needs to be formed between coaches and athletes for pressure training to be effective. Overall, pressure training was seen as an essential tool to improve performance.

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APPENDIX 1: Interview guide

Exploring elite coaches experiences of pressure in training

Pilot participant number:

Name:

Age:

Gender:

Address:

Telephone number(s):

E-mail(s):

Sport(s) you coach:

Years coaching in current sport:

Years coaching in elite sport:

Current coaching level:

Major achievements:

Interview date:

Time begun:

Time ended:

Duration of interview:

Section One[1]

Hello, I'm Michal Šimeček from Psychology of Physical Activity, Health and Well-being at The University of Jyväskylä. Thank you for choosing to participate in this interview study. In this project I am talking to elite coaches in tennis about their experiences of using pressure in training. Broadly speaking, *pressure training* (PT) is a method of creating stressful training environments for athletes, in order to teach them how to perform in the face of the stress encountered in high performance sport.

The purpose of this study is to gain an insight into coaches' beliefs, perceptions and methods of bringing pressure into training. During the following discussions I am interested in your experiences of coaching tennis, and in hearing about if you think it's possible to create pressure, and if so, how. I'm also interested to see if you think pressure training works, and what your opinion on how athletes learn to cope with pressure.

The information from this study will be used in a number of ways:

1. To contribute towards my master degree.
2. The information that arises from this study may be presented anonymously at workshops, conferences, or other such events.
3. To improve the quality of my applied consultancy with athletes.

I would like to emphasise that all the information you provide me with will remain completely confidential unless you give permission otherwise. In the presentation of the results I may want to use selected quotes from our discussions in order to illustrate important ideas. These will be strictly anonymous and I will ensure your identity is protected. I will be using a digital recording device to get complete and accurate information and to make the research process more efficient. This procedure is also necessary so that I will be able to make a typed transcript for later scrutiny and reference.

As a participant in this study you have several rights. Your participation is entirely voluntary and you are free to decline to answer any questions I will be asking or stop the discussions at any point. There are no right or wrong answers to the questions I will be asking. I want to learn and benefit from your experience and expertise so that I can better understand how pressure training works in elite sport. I hope, therefore, that you will answer the questions in a candid and straightforward way. If there are any questions that you are not comfortable answering, I would rather you decline to comment than tell me what you think I, or others, might want to hear. So if you would prefer not to answer a question, simply state "no comment" and I will move straight onto the next question. Since you will have to think back in time, you might not be able to immediately remember some things. Take your time as you try to recall the past; pauses are fine. If you cannot remember after trying to think back, then just let me know.

Do you have any questions about what I have talked about so far? If you have any questions as we go along please ask them. Okay, I just need you to sign this written informed consent and then we can begin.

The interview contains several sections covering various issues associated with your views on pressure. At the end of each section there will be an opportunity for you to add anything that you felt was important and not covered in the questions asked.

Written Informed Consent

I fully understand all of the above and willingly volunteer to participate in this study.

Signature:
Print name:
Date:

Section Two[2] - Preliminary Rapport Questions

I'd like to start off and ease into this interview by initially asking you some general questions on your sport.

	Interview questions NOT LONG
2.1	What do you enjoy most about coaching tennis?
2.2	What coaching accomplishment are you most proud of?

Section Three – Broad Experience of Pressure Training

Now I'd like to ask you some questions on you're your opinion of what pressure is and where it comes into your sport and training.

	Interview questions NOT LONG	Participant probes
3.1	What do you think pressure is?	• What has informed this definition?
3.2	Do you personally use pressure in training sessions?	• For what reasons?

Section Four – Creating Pressure

I'd like to now ask you some questions on your experience of using pressure in training.

[2] All following sections recorded on tape.

4.1	Can you tell me what you do to create pressure training environments?	• Individual • Task • Environment • Overall, what are we trying to manipulate?
4.2	Can you explain how do you go about designing and producing these things?	•
4.3	How does pressure training impact on performance?	•
4.4	Can you discuss that training has to be of a certain difficulty in order for there to be pressure?	•
4.5	Can you discuss how athletes must desire to perform their best in order to feel pressure?	•
4.6	Before proceeding to the next section, are there any other ways you create pressure that we haven't spoken about?	•

Section Five – Structuring Pressure Training for Development

In this section of the interview and I would like to ask you some questions on how you've structured sessions where you used pressure.

	Interview questions	Participant probes
5.1	Does pressure in training have to be exactly the same as it is in competition?	• Why?
5.2	Who should pressure train?	• Gender, age, personality type? • Can it be bad?
5.3	Can you discuss how you plan for pressure training?	• How is it informer by previous pressure training?
5.4	When in a cycle do you pressure train?	• For how long? One day?
5.5	Can you discuss how you review pressure sessions?	• How does it inform future pressure training?
5.7	When a skill breaks down under pressure, how do you know whether the skill needs to be embedded more, or if	•

	the athlete needs to learn how to cope with pressure better?	

Section Six - Review

	Interview questions
6.1	Did I lead you or influence your responses in any way?
6.2	Is there anything that we haven't talked about that you think is important?
6.3	Have you any comments or suggestions about the interview itself?

Thank you for participating in this study.