THE ROLE OF TENNIS COACHES IN REGULATING THEIR PLAYERS' EMOTIONAL STATES: AN EXPLORATORY STUDY

Stephanie Müller

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ABSTRACT

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During the past few decades, the ability to perceive, understand, and regulate emotions efficiently has received widespread attention in sport settings (Hanin, 2000; 2004; Robazza, Pellizzari, & Hanin, 2004). Moreover, this line of research has mainly focused on the intrapersonal aspect of emotions. The aim of the present study was to examine the role of tennis coaches in regulating their players' emotional states. The present study explored (a) tennis players' emotional states related to their best and worst performances, (b) coaches' accuracy in assessing players' emotional experiences within these performances, and (c) self- and interpersonal emotional regulation strategies of tennis coaches and players.

The sample consisted of five tennis players living in Switzerland and their respective coaches. Players were all performing on a national and four out of five on an international level. Data about players' emotional states for best and worst performance were collected using the psychobiosocial state (PBS-S) scale. Additional qualitative information related to feeling states, and emotional (self- and interpersonal-) regulation was gathered through semi-structured interviews. Individual profiles were developed and differences in intensity and content overlap for four coach-player dyads were calculated. Results revealed relative high accuracy in coaches to assess the psychobiosocial states of their players in best and worst performances. Differences in intensity, assessed on the modified CR -10 scale, ranged from 0 to 8 across the state modalities with a higher accuracy found for functionally helpful descriptors. Results from the content overlap analysis between dyads revealed scores ranging from .35 to .59 (in best performances), and from .28 and .47 (worst performances). Higher accuracy was shown for functionally helpful descriptors. Interview data were analysed following the guidelines of interpretative phenomenological analysis (Auerbach & Silverston, 2003; Smith, Jarman & Osborn, 1999). Several behavioral and verbal cues to recognize emotional experiences were identified and specific emotion regulation strategies were reported including reappraisal, cognitive deployment, positive reinforcement, feedback, or relaxation techniques. Interestingly, both coaches and players emphasized the importance of coaches' characteristic traits such as calmness and empathy. The findings of the present study showed that coaches were able to assess accurately their players' emotional states and to provide efficient support in regulating players' emotional states. The study supported the importance of an interpersonal approach in emotion regulation. Future research exploring the association between athletes' psychobiosocial states and coaches' emotional intelligence as well as emotional expression is warranted.

Keywords: psychobiosocial state, emotions, emotional intelligence, emotional regulation, coach-athlete relationship, tennis

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1 INTRODUCTION

1.1 Tennis in Switzerland

Tennis is one of the most favourite and most practiced sports in Switzerland after soccer, ice hockey and downhill skiing. Roger Federer, Stanislas Wawrinka and Martina Hingis have moulded the picture of tennis in the last years and were mainly responsible for the growing interest in and passion for the sport. Nowadays there are over 900 tennis clubs with approximately 300'000 members of which more than 53'000 have been playing on a competitive level in 2012 (Swiss Tennis, 2013). Hence, the Swiss Tennis Association belongs to the three biggest sport institutions in Switzerland.

The tennis clubs and centres are grouped to overall 19 regional associations, covering whole Switzerland. Nevertheless, Swiss Tennis was aiming at providing a flat hierarchy and close cooperation with the clubs, wherefore they introduced the concept of partner academies. Based on specific criteria, maximal four clubs/centres are selected to national and 15 clubs/centres to regional partner academies by Swiss Tennis. The partner academies are supported by Swiss Tennis and host both talented regional players and the U14 national players. Besides the partner academies, also the Swiss Tennis Academy has a very strong and interactive cooperation with Swiss Tennis. The Swiss Tennis Academy is an independent academy, which hosts both national players and private players from all over the world. Both, partner academies and the Swiss Tennis academy are incorporated in the department of top-class sport of Swiss Tennis. Moreover, the department of top class sport is responsible for the Swiss Tennis national squads, which represent the highest level of tennis in Switzerland. The Swiss Tennis national squads are based in the top class performance centre of Swiss Tennis and are divided roughly into five squads, namely the upcoming talent squad, three national squads (A, B, and C) and the professionals. Currently, the national squad C encompasses 30 players, 19 players are in the national squad B, and only four players are in the highest national squad A (Swiss Tennis, 2013). In the present study, most participants either belonged to the national squad or were member of the Swiss Tennis Academy.

The Swiss Tennis Association has acknowledged the need for well-structured and optimal training facilities and different investments to improve training facilities, youth promotion, and coaching education have been undertaken. One of the fundamental aspects to support the tennis culture and success is the coaching education. In Switzerland, Swiss Tennis organizes the national coaching education within the programme of the national education institution Jugend und Sport. Specific coaching education in tennis involves mainly two different levels: basic education (incl. kids tennis) and specialisation. The coaching education is hierarchically structured and allows the acquisition of coaching levels C, B, A and the highest level called top-sport coach. Working on a professional basis and working for the national squads of Swiss Tennis and the Swiss Tennis Academy requires a specialisation and conclusively a coaching education B, A, or top sport. In order to provide optimal support for players, the education curriculum for coaches level B, A, and top-sport includes special training in business and health related aspects, as well as mental skills.

The acknowledgement of the importance of mental skills and so called soft skills, is in line with the actual research state (Chan & Mallet, 2011; Jowett, Yang, & Lorimer, 2012; Lorimer & Jowett, 2009). Nowadays, coaches are more than tactical and technical instructors, they take on different roles such as motivator, educator, consultant, friend, or father figure. Hence, the role of coaches in shaping the coach-athlete relationship, players' physical performance, and the mental and emotional states, should not be neglected.

1.2 Why Tennis?

"Only boxers can understand the loneliness of tennis players - and yet boxers have their corner men and managers. Even a boxer's opponent provides a kind of companionship, someone he can grapple with and grunt at. In tennis, you stand face-to-face with the enemy, trade blows with him, but never touch him or talk to him, or anyone else. The rules forbid a tennis player from even talking to his coach while on the court. People sometimes mention the track-and-field runner as a comparably lonely figure, but I have to laugh. At least the runner can feel and smell his opponents. They're inches away. In tennis you're on an island. Of all the games men and women play, tennis is the closest to solitary confinement." André Agassi (2009, p.8)

If André Agassi is right in his statement it might be questioned why the role of coaches in regulating players' emotional experiences should actually be explored in tennis. Or more upfront: what is the aim of the present study? Tennis is an unique sport in the way that coaches are not allowed to give any instructions to the player during a competition. Verbal and nonverbal coaching is forbidden in most cases. Moreover, in tennis there are no teammates, which might motivate or build up a player. Therefore, it can be assumed that tennis requires an essential amount of independence, meaning that players have to deal with technical, tactical, and mental challenges on their own. Playing for up to four hours, fighting for every single ball, and not being able to talk to someone is mentally and mainly emotionally very demanding. Hence, a player's ability to stay calm under pressure, to refocus on the next ball instead of getting angry about one's own mistake or the opponent's provoking gestures is decisive and also challenging at the same time. Obviously, besides technical and tactical skills, good tennis players need mental skills, such as emotion regulation, in term to exploit their potential. However, a closer look to the unique coach-athlete relationship in tennis reveals that a tennis player is not totally on his or her own on the court. Most tennis dyads are characterised by a high degree of closeness, since coach and athlete spend a lot of time together on and off the court, travelling, having breakfast, and sometimes even staying in the same hotel room together. Thus, they share great success and bad defeats on the court, and go through emotional highs and lows off the court. Therefore, it seems understandable why many athletes say that their coach is the closest and first contact person. So said Andy Murray about his coach Ivan Lendl; "Ivan's been very patient, as I'm not always easy to deal with. He's also honest with me. If I work hard he's happy, if I don't he's disappointed and he'll tell me. He has got me mentally slightly different going into these big matches" (The Telegraph Sport, 2014). In addition, as Anna Kurnikova once said about her coach Larisa Preobrazhenskaya, "She was like a second mother to us and that made us feel protected. Playing there at Spartak for nine hours a day, I saw more of her than I saw of my real mother." (The Tennis Space, 2012). In the end, tennis is hard work on and off the court, where a comfortable experienced relationship between coach and player can enhance a player's motivation, commitment, and self-confidence in his or her own performance. As Björn Borg said about the relationship to his coach, Lennart Bergelin, "It was hard work for both him and me, in combination with a lot of joy and laughter." (New York Times, 2008).

Hence, a coach in tennis takes on a crucial role for both a player's successful performance and for fostering the coach-athlete rapport. Nevertheless, what are key characteristics of tennis coaches? What do they need to be good at – aside from technical and tactical expertise - to support their players in the best optimal way and to support them in regulating their emotional experiences appropriately and efficiently? Nick Bollettieri, great and successful coach of big tennis names such as Boris Becker, Monica Seeles, Jim Courier, André Agassi, Martina Hingis, and the William sisters, pointed out in one of his interviews the importance of a coach's soft skill, a coach's ability to build up a good social bond between coach and athlete: "I hear coaches talking about kinetic change and biomechanics, and all that stuff. To tell you the truth, I don't know s***. I don't really know all those expressions, but what I do know is how to relate to people in a manner that fits into who they are. That's my thing." (The Tennis Space, 2012). So a coach's ability to read and understand their players' needs, desires, and psychological states might be a key characteristic of a successful coach? That coaches can have an influence on an athlete's emotional development and emotional experiences shows the story of Coach Lennart Bergelin and player Björn Borg. Lennart Bergelin, a great tennis player himself, was coach of Björn Borg for over 10 years and accompanied him for 11 Grand Slam titles. Björn Borg himself was one of the most successful players in men's tennis and very well known for his coolness. He almost never showed emotions on the court and his skill to stay calm helped him many times to exploit his full potential and turn many hopeless games around. However, Björn Borg was not always the calm and cool Swedish sportsman. When he was younger he was often losing his temper on the court, smashed rackets, and even got suspended from tournament that he participated. His coach, Lennart Bergelin, had a huge impact on Borg's development from an inner McEnroe to an Ice-Borg. He taught him how to regulate his passionate spirit on the court and to use it efficiently. "We were like father and son," Borg once said. "Lennart always got me in a good mood and that was a big thing."(The Tennis Space, 2012).

2 LITERATURE REVIEW

2.1 Emotions in Sport

The emotional highs and lows of athletes, coaches, and spectators in sport are probably one of the crucial ingredients to make sport an appealing, exciting, and interesting experience. Regardless of individual or team sport, elite athletes or novices, during competition or practice, emotions are ubiquitous companions. Athletes report that they experience both pleasant and unpleasant emotions prior, during, and after competition, such as anxiety, nervousness, anger or excitement (Hanin, 2000; Uphill, Lane, & Jones, 2012), enjoyment, sadness, guilt, and self-hostility (Cerin, 2003). Several studies have shown that they can harm, enhance or maintain the performance of athletes (Hanin, 2010; Lane, Beedie, Devonport, & Stanley, 2011; Robazza, Pellizzari, & Hanin, 2004). The way such emotions affect the performance is very individual because positive and negative emotions are not equally functional or dysfunctional for all people (Hanin, 2000, 2004). Therefore, it is not surprising that emotions, mainly the relationship between emotions and performance, have received widespread attention in the sport field. Several studies have outlined relevant associations between emotions and performance by measures such as the Profile of Mood States (Beedie, Terry, & Lane, 2000), the positive and negative Affect Schedule (PANAS; Watson & Tellegen, 1985), and the Competitive State Anxiety Inventory-2 (Craft, Magyar, Becker, & Feltz, 2003) as well as, several theoretical frameworks such as the Multidimensional Anxiety Theory (Martens, Vealey, & Burton, 1990) and the Individual Zone of Optimal Functioning (IZOF) model (Hanin, 2000). However, the latter one is probably the most used and approved approach in sport setting.

2.2 Theoretical frameworks

2.2.1 Intrapersonal approach of emotional experiences

The IZOF model is an idiosyncratic approach, which is aiming to "... identify an athlete's emotional state (in terms of individually relevant descriptors) and performance

characteristics (in terms of strengths and limitations)..." (Hanin, 2000, page 158). In other words, the IZOF framework serves as a tool for athletes to become aware of and reflect on their most important pleasant and unpleasant emotional experiences related to their best and worst performance (Hanin 2000, 2004; Robazza et al., 2004). As an idiographic approach, the IZOF framework focus on intraindividual differences of emotional experiences and the way they relate to successful or less successful performances (Hanin, 2000),although a comparison of emotional patterns with other athletes or within a team are possible. Important to mention, these emotional experiences are divided into three different experiences namely trait-like, state-like, and meta-experiences (Hanin, 2004). Trait-like experiences are relatively stable patterns of emotions and can be seen as a person's disposition. For example, an athlete, who is always a bit nervous, might feel anxious during every match. On the contrary, state-like experiences are less stable and reflect an athlete's emotional state in a specific situation. For instance, an athlete might be very worried about a performance because he or she is using the equipment for the first time. The third category of experiences is meta-experiences. Meta-experiences reflect athletes' feelings and beliefs about past, actual, or anticipated emotional experiences. For example, an athlete might interpret nervousness before a competition as helpful because he for him it is a sign of readiness. Whilst another athlete might associate nervousness with past performance experiences and in turn interpret them as harmful and not.

Clearly, emotional experiences are very complex and empirical evidences support the assumption of the IZOF model that emotions are a manifestation of multimodal performance related states (Hanin, 2000, 2004; Ruiz & Hanin, 2013). According to the IZOF framework, emotional experiences are part of performance-related psychobiosocial states, which include five interrelated dimensions, namely form, content, intensity, time, and context (Hanin, 2000, 2004). The first three dimensions (form, content, and intensity) encompass the structure of the subjective and meta-emotional experience of an individual. The latter two dimensions (time and context) stand for the dynamics of the individual's subjective experience (Hanin, 2004, p.741). The form dimension describes the complexity of the performance-related psychobiosocial states. The psychobiosocial state, which is defined as a manifestation of total human functioning (Hanin, 2004) consists of eight interrelated forms (modalities): cognitive, affective, motivational, and volitional (psychological), bodily-somatic and

motor-behavioral (biological) and operational and communicative (social) (Hanin, 2000; 2004; 2010). In other words, it is assumed that an athlete has not only emotional experiences during a performance but also cognitive, physical, and social experiences. All eight psychobiosocial states can be experienced as either pleasant or unpleasant (hedonic valence) and might have either a functional or dysfunctional (in terms of performance functionality) effect on the performance, what reflects the content of single states. The interaction between the two factors leads to four global emotion dimensions so called pleasant functional (P+), pleasant dysfunctional (P-), unpleasant functional (N+), and unpleasant dysfunctional (N-). However, not all pleasant emotions are necessarily functional (helpful), and not all unpleasant emotions are automatically dysfunctional (harmful). These assumptions are taken into consideration by the principle of zones within the IZOF model. The principle implies a specific relationship between the individual experienced intensity (high, moderate, low) of emotions and the performance outcome. In other words, IZOF claims that emotion-performance related experiences serve as information about an athlete's individual optimal and dysfunctional emotional zones (Hanin, 2000), where the third dimension, intensity, takes on crucial part. According to IZOF model, the level of intensity can shape the impact of an emotional experience on performances. Depending on whether emotion-performance related experiences are in or out of an individual's optimal zone, they can either have a helpful, harmful, or neutral effect on the performance. Studies have shown that both pleasant and unpleasant emotions are associated with successful and unsuccessful performances. However, to predict the relationship between emotions and performances, it is essential to consider the interactive and separate influence such emotional experiences can have. A maximum enhancing effect (high P+, N+) is only effective if the impairing effect (high P-, N-) is rather low or better said experienced within the optimal zone. In other words, when being in the optimal zone an athlete is experiencing more functional pleasant and unpleasant, and less dysfunctional pleasant and unpleasant emotions, and subsequently is more likely to perform successfully. Whilst being out of one's optimal zone is associated with experiencing more dysfunctional pleasant and unpleasant emotions and less functional pleasant and unpleasant emotions, which leads rather to less successful performance (Hanin, 2000; Robazza, Pellizzari, Bertollo, & Hanin, 2008; Robazza et al., 2004). Another important aspect regarding the principle of zone is the dimension of context. The context reflects

the environmental aspect, such as situational and interpersonal triggers for emotional experiences. For example, certain emotions might be very helpful during practice in a high intensity, whereas during competition the same emotions need to be low in intensity to enhance successful performance. Therefore it is essential to keep in mind that optimal emotions are not necessarily only pleasant emotions but rather, as defined in the IZOF framework, the ones that are "... most relevant and appropriate for a particular athlete performing a specific task..." (Hanin, 2004, p. 740). Finally, the time dimension represents the degree of how often the performance-related states are experienced (i.e. duration, frequency).

Taking this into account, the IZOF framework approves several assumptions regarding the emotion-performance relationship (Hanin, 2000). First, individual's cognitive perception of achieving a specific goal or task evokes certain emotions. Secondly, because sport activities and associated emotional experiences are mostly recurring, it can be assumed that specific patterns for the relationship between performance and emotions emerge. Thirdly, emotional experiences depend highly on an individual, situations, and task, and manifest in so called psychobiosocial states that include both relevant emotional and non-emotional states for performance quality. Moreover, the IZOF model points out that every individual has its' own optimal recipe of emotional experiences. Fourthly, emotions do not only shape the quality of performances, but also the performance has an important impact on emotion intensity and content. Hence, the relationship is considered as bi-directional. Finally yet importantly, emotions can be helpful, harmful, or depending on their interaction being helpful and harmful at the same time.

Several research has been conducted under the scope of the IZOF framework to get a better understanding about how and which emotions influence the performance quality, because the model allows an investigation of the emotional experiences rather than the behavior of a certain emotions. So far, the focus of the research state has been on the emotions of anxiety and anger. Traditionally, anxiety and anger have been seen as negative and harmful emotions for performances. However, as proposed by the IZOF model and revealed by several studies, they can have both a beneficial and impairing effect on the performance. In a study of Ruiz and Hanin (2011), they investigated the impact of anger on the performance of karate athletes. Results showed that athletes experienced anger prior to their best and worst performance, although a high inter-

individual variability in intensity was found. Most athletes had a lower intensity level of anger during their best and worst game, others reported to have a higher intensity of anger in their worst performances and a few athletes experienced a mix of high and moderate, or moderate and low intensity of anger. Overall, results supported the assumptions of the IZOF model that unpleasant emotions can have a beneficial impact on performances depending on time and intensity, and that intra- and inter-individual differences in emotional experiences are found across and within performance quality. Similar findings were found by Rathschlag and Memmert (2013). In their study they tested the finger muscular strength under different emotional conditions. Results indicated that emotions such as anger, hope, and happiness were beneficial and increased an athlete's performance. Interestingly, participants who were exposed to the anger conditions showed significant better performance than participants in the neutral, anxiety or sadness condition. In another study, Robazza et al. (2008) explored the impact of several different psychobiosocial experiences, such as anxiety, self-confidence, idiosyncratic emotions, and bodily symptoms, on the performance quality. Results supported that the intensities for the psychobiosocial experiences were closer to the optimal zone in good performances and more distant in poor performances. Besides, findings revealed that athletes, who experienced the intensity level of anxiety and other idiosyncratic emotions close to or within their optimal zone, perceived these emotions as more helpful and less harmful for the performance. Contrary to the findings of Robazza et al. (2008), Covassin and Pero (2004) found that tennis players who lost their matches in contrast to those who won experienced anger more intensely. While successful players reported a higher level of self-confidence and a lower level of anxiety than unsuccessful players did. Thus, the ability to know and to get into the right emotional state prior to a competition can be crucial to perform successfully on the tennis court.

More recently, research in youth sport and physical education, has investigated the association between the specific psychobiosocial states (based on the IZOF model, Hanin 2000, 2004) and performance. Bortoli, Bertollo and Robazza (2009) examined the relationship between motivational variables and psychobiosocial states. Results have showed that task-oriented participants, whose physical education lessons were mastery-oriented, experienced more functional pleasant and less dysfunctional unpleasant psychobiosocial states. Therefore, it can be suggested that coaches can positively

influence athletes' psychobiosocial states by creating a more task-involving atmosphere. In a task-involving atmosphere (i.e. mastery climate) coaches emphasize the learning processes, personal improvement, and acceptance towards mistakes. On the contrary, a performance-involving atmosphere is created when coaches focus on high competitive situations, rivalry, using mistakes as punishment, and evaluate and reward only based on results. Hence, coaches' ability to build up a respectful and well-balanced relationship might influence players' psychobiosocial states essentially.

To conclude, the IZOF framework shows that unpleasant emotions, such as anger, are not always negative or harmful but can enhance performance and psychological states. Simultaneously positively toned emotions, such as self-confidence or happiness, are not always beneficial but can debilitate an athlete's performance. Therefore, the ability to be aware of one's emotional experiences (meta-experiences) and to have an understanding what is one's optimal and dysfunctional zone is essential and can have a determining influence on successful or less successful performance outcome. The IZOF model provides a framework for assessing athlete's optimal and dysfunctional psychobiosocial states, and assumes that individualized emotional regulation strategies are necessary to reach the zone of optimal functioning.

2.2.2 Interpersonal aspect of emotional experiences

Although the focus of research in emotional experiences has been so far on the intrapersonal perspective of an athlete, social psychology highlights the importance of the interpersonal aspect of emotional experiences and emotion regulation processes. In sport setting, no matter if in individual or team sport, an athlete interacts and influences other individuals. Hence, it seems coherent to assume that athletes' emotional experiences and subsequently their performance can be affected by others. Van Kleef developed the model of emotion as social information (EASI; Kleef, 2009), which specifically takes into consideration the interpersonal relevance of emotional experiences. The model claims that emotions are used as information within interpersonal relationships and that the expression of emotions can strengthen the social bond between two parties. In other words, an individual's emotional expressions can trigger or motivate conformable or adverse emotional experiences and behaviors in others (van Kleef, 2009). Findings of van Kleef, De Dreu, and Manstead's study (2004)

revealed that employees used the emotional expression of their leaders to evaluate their performance quality. For example, when the leader expressed anger, employees had the feeling that their performance was poor, however when the leader expressed happiness, the group remarked a good performance. A similar study was hold in the sport context by Vargas-Tonsing, Myers, and Feltz (2004). They explored the effect of emotional enhancing techniques of coaches on athletes' self-efficacy, the so-called inferential process. Findings showed that athletes' perceived their coaches, among other things, as an important source of confidence. Coaches who were more confident had athletes with a higher level of self-efficacy. Possible explanation for the association was seen in the fact that athletes might interpret their coaches' confidence as an indicator of their chances to succeed. Based on the findings it can be claimed that coaches, who show insecurity before a match, frustration during a match, and anger after match, influence players' personal emotional state negatively. While coaches who exude self-confidence and keep calm and positive, might trigger positive reactions in players and subsequently bring coaches' and athletes' emotional states in line. Thus, coaches can induce unpleasant or pleasant feelings to their athletes based on their own emotional expression. For example, a tennis coach who smiles or shows positive gestures during performances can enhance a player's positive emotional experience, while shaking head of frustration might increase player's insecurity or nervousness. These ideas call for the need to investigate specific strategies, which are used to read and regulate emotional states in others.

Moreover, the assumption that coaches can highly influence a players' psychobiosocial state highlight the importance of the quality of interpersonal relationships in sport, and the crucial role of coaches for their athletes' performances. A better understanding about the social bond between coaches and athletes, as well as what factors might be relevant for a successful partnership, seems to be crucial for the current study.

2.2.3 Interpersonal relationship

Coaches and athletes work closely together, spend hours on and off the field, and experience emotional highs and lows together. Therefore, it is not surprising that the coach-athlete relationship is often seen as the most important one in sport setting and

the most influential one for an athlete's physical and mental performance. Presumably, the manner in which a coach and an athlete interact, communicate, and relate with each other has a crucial impact on the quality of the training sessions and in turn on a player's success. During the past decades, the interpersonal relationship between coaches and athletes has been investigated with different frameworks, i.e. the business and leadership approach (i.e. Smith & Smoll, 1989 as cited in Jowett et al., 2012), or the relationship perspective (i.e. Jowett, 2007; Poczwardowksi, Barott, Jowett, 2006). Overall, the underlying concepts all highlight the importance of the coach-athlete dyad for an individual's performance, satisfaction, enjoyment, and physical and mental well-being. In line with the frameworks, several studies have highlighted the essential impact of coaches' behavior on athletes' performance, behavior (Horn 2002), psychological (Lafrenière, Jowett, Vallerand, & Carbonneau, 2011), and emotional states (Vargas-Tonsing 2004). However, most of the research so far has been investigating the impact of coaches' behaviour, although there are still many unknown factors that facilitate a positive and successful coach-athlete relationship.

During the past decades, growing attention was put on the meta-perspective and emotional component within a dyad. Recently, Jowett and Ntoumanis (2004) proposed a framework, which considers the interdependency as well as the emotional and social component of a coach-athlete dyad. They define the coach-athlete relationship as "... the situation in which coaches' and athletes' emotions, thoughts, and behaviors are mutually and causally inter-connected" (p.245). Jowett and colleagues assume that the interpersonal relationship is a multi-dimensional construct, in which affective, cognitive, and behavioral components influence and shape a successful rapport. Furthermore, the relationship is seen as bi-directional in the way that a coach's emotions, thoughts, and reactions affect an athlete's psychobiosocial state and vice-versa. Jowett (2007) defines the quality of the coach athlete relationship with 3+1 interrelated components; namely; closeness, commitment, complementary, and additionally co-operation. *Closeness* is defined as the affective component and represents the social bond between coaches and athletes in terms of feelings, such as trust, respect, and liking for each other. The cognitive component is conceptualized as *commitment,* which refers to the motivation and intention of both parties to sustain the interpersonal relationship over time. *Complementary* stands for the behavioral component and includes the co-operative and aligned interaction between both

members, which are reflected in actions of readiness or easiness. The fourth component is *co-orientation* which is seen as a +1 because it is part of the other three components. Co-orientation reports the degree to which coaches and athletes actually match in perceiving the other person's feelings, thoughts, and behaviors. Thus, it incorporates two different perspectives, namely the direct perspective (player's perception of the coach or coach's perception of the player; i.e. "I trust my athlete/coach") and the meta-perspective (player's/coach's perception of how coach/player perceives player/coach: i.e. "My coach/athlete trusts me"). Additionally, a qualitative study by Jowett and Cockerill (2003) has highlighted that if coaches and athletes believe that the other person has feelings of trust, thoughts of commitment, and behaviors of complementarity for the relationship, they are more successful. Besides, based on these different perspectives, three essential interpersonal perceptions can be highlighted: assumed similarity, actual similarity, and the empathetic understanding. Empathetic understanding implies the match between an individual's meta-perspective (i.e. "my coach trusts me") and the partner's direct perspective (i.e. "I trust my athlete").

Thus, empathetic understanding is proposed to be an essential aspect of the quality of the coach-athlete relationship. Empathy is seen as a dimension of communication and several studies have highlighted the relevance of communication within interpersonal relationships. For example, La Voi (2007) assumed that coaches' ability to give appropriate feedback, express expectations and goals, and provide a platform for athletes to share their feelings, thoughts, and concerns, strengthen the bond between a coach and his or her athlete. In the study of Jowett and Cockerill (2003), results indicated that athletes were more satisfied in the relationship when they felt understood and respected by their coaches. While coaches, who were rather distant and did not show interest in their athlete, were not able to build up a close and good relationship to their athletes (Gearity & Murray, 2011). The notion of empathy was also highlighted in studies by Jones, Armour and Potrac (2004) and Côte, Young, North, and Duffy (2007). Jones et al. (2004) claimed: "…the coaches were well aware that they must, among other things, understand the athletes, care for them inside and outside the sporting environment and possess a set of technical and tactical ideals that they can clearly implement in a competitive situation…" (cited in Cassidy, Jones, & Potrac. 2004, p. 48). In their definition of coaching excellence, Côté and colleagues (2007) acknowledged that excellent coaches "know how to align their own competences such

that they are congruent with the needs of their athletes and the context in which they work" (Côté et al., 2007, p.6). Both point out the importance of great coaches in adapting their behaviors and actions to their athletes' needs and desires, which nicely reflects the term of empathy. In the study of Lorimer and Jowett (2009) the association between empathetic accuracy and satisfaction level within dyads was explored. Results indicated that coaches and players' meta-perspective was positively associated with empathetic accuracy. In other words, if coaches and athletes feel both well understood and respected by their partner, they are more satisfied with their relationship. Similar ideas to Cassidy et al., (2004), Côté et al., (2007), and Lorimer and Jowett (2009), can already be found in the work of Mayer and Salovey (1990), although they approached the importance of coaches' empathy and understanding about athletes' emotional states for the coach-athlete quality and an athlete's performance from a different perspective, so called emotional intelligence.

2.2.4 Emotional intelligence

According to Mayer and Salovey (1990), emotional intelligence involves the ability to recognize the meanings of emotions and their relationships, as well as the ability to use emotions for cognitive activities (e.g. problem solving, reasoning) (Mayer, Salovey, Caruso,& Sitarenios, 2003).They assume that emotional intelligence is defined by four different skills or branches (Mayer et al. 2003). The first branch, *perception and expression of emotions*, encompasses the ability to recognize and express feelings, thoughts, and physical states of emotions in oneself and others. People tend to recognize emotions in others based on facial expressions, verbalizations, and body movements. Branch two, *using emotions,* is the ability to use emotions to prioritize thoughts, to aid judgment, to change perspective, and to be open for different problem solving perspectives. The third branch, *understanding of emotions*, includes the abilities to label emotions and complex feelings and to understand the related cognitions and outcomes. This branch is highly associated with the development of people wherefore it is expected to improve with age and experiences. Branch four, *managing emotions*, focuses on the abilities to regulate emotions in oneself and others efficiently even in very emotional situations, and the ability to keep emotional awareness in different emotion-related situations (Wranik, Barrett, and Salovey, in Gross, 2007). Although the

branches are conceptualised independently, they form an integrated, hierarchical structure, in which recognizing emotions is the most basic skill and regulation of emotions the most complex one. Conclusively, the ability to anticipate and regulate emotional experiences intelligently and effectively can be seen as a decisive skill because it encompasses all three underlying aspects.

Emotion regulation is defined by Eisenberg, Fabes, Guthrie and Reiser (2002) as "the process of initiating, maintaining, modulating, or changing the occurrence, intensity, or duration of internal feeling states and emotion-related physiological processes, often in the service of accomplishing one's goals" (p. 137). Hence, if an experienced emotional state differs from the favourable one, the regulation strategies become important to close this discrepancy. The aim of emotion regulation is often seen as either hedonic (i.e. increase happiness and excitement and decrease anger or frustration) or instrumental (i.e. regulate emotions in order to achieve set goals successfully; Lane et al., 2011). For example, hedonic emotion regulation is when an individual feels angry or upset and goes for a run to feel better. However, if an individual knows from experience that she performs best when she feels a bit angry or upset, she can try to up-regulate her anger (i.e. with imagery or self-talk) before a competition. The instrumental emotion regulation is a common mechanism in competitive sports, and goes hand in hand with the claim of the IZOF model (Hanin, 2000) that unpleasant emotions are not necessarily harmful and pleasant emotions are not always helpful. Even though different emotion regulation strategies are known, up to now there is no clear evidence favouring one or the other.

Subsequently, actual research state in sport setting has highlighted and acknowledged the importance of intrapersonal emotional experiences and interpersonal relationships on an athlete's performance. However, so far the research regarding coaches' role in recognizing and regulating intelligently their athletes' emotional experiences is still in its infancy. Therefore, the current study was interested in learning more about how coaches' read their athletes' individual emotional experiences (Hanin, 2000, 2004; Robazza et al., 2004) and how they can provide functional helpful support to their athletes in regulating the experienced emotions (Mayer et al., 2003).

3 PURPOSE OF THE STUDY

The purpose of this study was to explore the emotional experiences associated with best and worst performances in high-level tennis players and the role of their coaches in recognizing and regulating these emotional experiences.

- Aim 1: To explore the emotional experiences associated with best and worst performances in high level tennis players.
  - It was assumed that tennis players experienced more functionally helpful and less functionally harmful emotions prior to their best performance, while they experienced more functionally harmful than functionally helpful emotions prior to their worst performance.
- Aim 2: To examine the accuracy of coaches in assessing their players' emotional experiences within the same performances (best/worst).
  - To examine differences in intensity in emotional experiences for each modality between coaches and players within the same performances.
  - To examine content overlap in emotional experiences for each modality between coaches and players within the same performances.
  - To explore specific cues coaches' use to recognize the emotional experiences of their players. A positive association between the modality of emotional cues and the accuracy in intensity and content for this modality was expected (i.e. coaches reporting of using bodily cues to recognize player's emotional state is positively associated with accuracy in bodily modality in the PBS).
- Aim 3: To identify emotion regulation processes and strategies of coaches and tennis players.
  - To investigate specific strategies players use to regulate their emotional experiences (emotional self-regulation).
  - To examine coaches' perception of their players' emotion self-regulation strategies (perceived player's emotional self-regulation).
  - To explore specific strategies coaches use intentionally and unintentionally to help regulating their players' emotional states.
  - To investigate the efficiency of coaches' provided emotional support in regulating emotional experiences of players. Is the coaches' provided support

perceived as helpful by players or is there a discrepancy between players' and coaches' expectations and functionality of emotional regulation processes.

o To investigate the role of coach-athlete relationship and coaches' characteristic on emotional regulation processes.

4 METHODS

The selection of the participants was purposive based on the aim of the current study. Criteria for the inclusion in the present study were (a) that the coach-athlete dyad had worked together at least for one year, (b) that the coach of the dyad was the main coach of the player, and (c) that he or she had a national Swiss coaching education level top sport, A or B. Moreover, the player of the dyad was (d) between 16-24 years of age, and (e) competed on a high national or international level.

4.1 Participants

In the present study, five coach-athlete dyads participated of which four were drawn from the department of top class sport of Swiss Tennis and one dyad came from a private tennis academy. The sample represented, except for one player, the highest level of tennis youth and coaches in Switzerland. Two coaches had a Swiss coaching licence level B, one coach was working with a Swiss coaching licence A, and two had a Swiss coaching licence level top sport. Two players were in the national squad B and A, two players were members of the Swiss Tennis Academy, and one player was from a private Tennis Academy. Over all, the cooperation of the dyads was between one year and ten years ($M = 2$ years), and coaches' practical experience ranged from one year to 25 years ($M = 12.2$ years). The players were between 16 and 22 years of age ($M = 19.6$). All coaches were the main coach of their players. In four out of five dyads, coach and player did not have the same nationality. Participants were from Switzerland, Germany, Finland, Netherlands, Bosnia-Herzegovina, and Russia. However, all participants were fluent in either German or English and currently living in Switzerland.

The first dyad, a male coach and a female player, had been working together for one and a half years. The coach had a coaching experience of 21 years, and the player was member of the Swiss national squad. The second dyad, a male coach and a female player, had been working together for three and a half years. The coach was coaching since six years and the player was part of the Swiss Tennis Academy team. The third dyad, a female coach and a female player, had been working together for one year. The coach was working as a coach for one and a half years, and the player was member of

the Swiss Tennis Academy team. The fourth dyad, a male coach and a male player, had been working together for three years. The coach had been coaching since seven years, and the player was in the Swiss national squad. The fifth dyad, a male coach and a female player, had been working together since ten years. The coach had a coaching experience of 25 years, and the player was part of a private tennis academy team.

4.2 Procedures

For the main study, several emails were send to Swiss Tennis, nine partner academies, and nine other tennis institutions across the country. Four academies showed their interest and three were finally willing to take part in the study. The data collection was conducted during December 2013 in Switzerland. All the interviews were held individually at the academies with time and place set according to each participant's preference. Every interview lasted for approximately one hour and was audio-recorded to facilitate the interaction between researcher and participants, as well as to provide a complete and unbiased set of data. Seven interviews were conducted in German and three interviews in English, whereby English was not the mother tongue of the researcher nor of any of the three participants.

At the beginning of the interview, participants were asked to read and sign the consent form. The researcher stressed the voluntariness and anonymity of the participation (again verbally) and all questions or uncertainties were resolved prior to the interview. One participant was under age what required parents approval. The researcher was concerned to ask the questions according to the order of the interview guide, although prompts helped to maintain flexibility by dwelling more efficiently on the answers of participants. First, players were interviewed and asked to fill in the PBS-S scale for their best and worst performances. Then coaches were interviewed and asked to fill in the PBS-S scale for their players. To provide comparability between players' and coaches' PBS-S profile, the players were asked to recall their most successful and unsuccessful performances which they had experienced together with their coach. In the present study, both versions the English and German PBS-S scale were used.

4.3 Instruments

The study was under the scope of a mixed method approach; thus, (a) the psychobiosocial state scale (PBS-S scale; Ruiz & Hanin, 2013; Ruiz, Hanin, & Robazza, 2011) was used and (b) an interview guide was developed.

Psychobiosocial states scale. The psychobiosocial state scale was used to assess the individual emotion profile of participants to gain deeper insight into functionally helpful and harmful emotional states prior to an athlete's best and worst performances. The psychobiosocial state scale (PBS-S scale, Ruiz et al., 2011) was developed to assess the performance-related emotional state by eight modalities; (1) cognitive, (2) affective, (3) motivational, (4) volitional, (5) bodily, (6) motor-behavioral, (7) operational, and (8) communicative. The PBS scale consists of a list of 75 multimodal descriptors that are presented in 20 rows. Each modality is represented by two rows of synonym items (3-4 items per row) as functionally helpful and functionally harmful for the performance, except for the affective modality. After a revision of the scale by Ruiz and Hanin in 2013, the modality of affective is now assessed by six rows of items (helpful and harmful) for affective pleasant (affective P), anxiety-related, and anger-related (Ruiz and Hanin 2013). An additional category identifies if the emotional descriptors is experienced as positive or negative toned. Thus, each emotional modality is assessed by positive-helpful (P+), positive-harmful (P-), negative-helpful (N+) and negative-harmful (N-) descriptors. Participants are asked to choose one descriptor per row that best describes their emotional state before their most successful and unsuccessful performances. Additionally, participants need to rate the experienced intensity of the chosen emotional descriptor on the modified CR-10 scale ranging from 0 (nothing at all) to • (maximal possible) and define the impact of the descriptor on the performance in terms of being helpful (+), hard to say (?) and harmful (-). Examples of items for descriptors regarding each modalities are; focused (cognitive), confident (affective pleasant), nervous (anxiety), aggressive (anger), uninterested (motivational), persistent (volitional), physically-charged (bodily-somatic), uncoordinated (motor-behavioral), inconsistent task execution (performance), sociable (communication).

Back translation procedures and expert review were used to develop a German version of the PBS scale. In a first step, the English version was translated into German by the researcher. In a second step, the first draft of the translated version and the

original version were send to four sport-psychology students, whose first language was German, who were competent in both spoken and written English, and familiar with the aim of the scale. Each member of the panel evaluated the translation individually according to a scale from one (no change), two (change in wording), three (retranslation). Additionally, they had the possibility to mention suggestions for the translation. Thirdly, the suggestions were discussed and only minor changes were conducted to keep up the meaning of the descriptors. In a fourth step, the German scale was back-translated into English by a German-speaking Swiss academic, who was studying English language. In a last step, the back translated English version was compared to the original version to ensure that the meanings of the items were maintained. In addition, the back translated scale was send to one of the author of the original PBS scale for competent feedback and approval. Minor adjustments were undertaken for the affective modality regarding the words discontent, dissatisfied, and annoyed.

Interview guide: Two semi-structure interview guides – one for coaches and one for players - were developed (*see Appendix A*). The questions were based on the four branch model of emotional intelligence of Mayer and Salovey (1990). The interview guide was constructed to gain a deeper understanding about the emotional state of participants and the impact of the coach-athlete relationship on the emotion regulation of players. The semi-structure of the interview gave the possibility to adjust to participants' individual responses and experiences. Nevertheless, the main questions served as a structure and sub-questions helped keeping track if participants elaborated beyond the scope of the study. The interview guide of the coaches consisted of altogether four different parts. The first part asked questions related to demographics such as age, gender, club, coaching level, years of experience as a coach, language, and coaching career. The aim was to facilitate the start of the interview process and to gather some basic information about coaches' personal experiences, philosophy and key characteristics of being a coach. An example of a question was, "Which is the most challenging aspect in coaching for you personally?" The second part explored the coach-athlete relationship. Questions were asked to get a better understanding about the general arrangements and specific dynamics between the coach and the player. An example of a question was "How would you describe your relationship with your player?" In the third part, the role of emotions in coaching was investigated. An

example of a question was "How do emotions influence the coaching performance?" The fourth part of the interview guide focused on the emotion regulation, comprised three subparts. In the first subpart, coaches' awareness of their own and their players' emotions were explored. An example of a question was "What are the signals you use to get an understanding about your player's emotional state?" The second subpart was under the scope of exploring coaches' own emotion regulation strategies for their individual emotional state. An example of question was "how do you regulate your emotions in successful and less successful situations?" In the third subpart coaches' approaches to players' emotion regulation strategies were explored to find out more about how coaches perceive their players' emotional state and what strategies they use to support them in regulating these functional and dysfunctional emotions. An example of the question was "Can you describe me how you support your athlete to deal with victory and defeat?" This subpart provided the link between a coach's ability to regulate his or her own emotions and a coach's ability to read and react appropriately on the player's emotions. At the end of the interview, coaches' could add comments or further ideas. The interview guide of the players consisted of the same parts, and the questions were the same questions asked from the coaches, except the word "coach" was changed into the word "player". Additionally, the fourth part of emotion regulation had one additional subpart regarding the potential expectations of players towards their coaches in term of supportive emotion regulation strategies. The question was "What could the coach do that you can regulate your emotions more efficiently". Before the data collection, two pilot interviews – one with a player and one with a coach - were done to test the understanding of the questions and the quality of the interview guide. Participants were from the researcher's environment; however, they did not fulfil the complete characteristics of the target group in order to avoid a loss of qualified participants. Based on the results of the pilot interview, some prompts were deleted and small changes were made for the questions in relation to emotion regulation. It became apparent during the pilot interviews that the coach might tend to talk mostly about players' emotion regulation process, and less likely elaborate his or her own strategies to help players regulating their emotions. Therefore, prompts were added such as "What are doing to get her/him motivated again?" The complete interview guide can be found in *Appendix A*.

4.4 Data Analysis

Players' experiences and coaches' perception of their athletes' experiences in their most successful and unsuccessful performances were measured with the psychobiosocial states scale (PBS-S scale; Ruiz & Hanin, 2013; Ruiz et al., 2011). Individual profiles for the most successful and unsuccessful performance, indicating intensity and content of experiences, were computed for each athlete and each coach individually. Players' psychobiosocial states profile helped raising their awareness of performance related experiences and identifying their individual emotional pattern. While coaches' profiles helped to explore in more detail the ability and accuracy of coaches in reading their players' emotional states. In a latter step, the profiles of the coach and his or her player were compared regarding differences in intensity ratings and content overlap for each modality. Dyad 01 had to be excluded from the analysis due to an incomplete profile. The differences in intensity between coach and player were described with the differential value, which was calculated by a subtraction of the coach's and player's raw score of intensity of the descriptor state. Differential values were calculated for each descriptor state and each modality. In addition, the sum of each modality's differential values was computed in order to compare the accuracy of coaches' perception among all modalities. The content overlap analysis by Krahé (1986) was used in order to analyze the magnitude of the similarity vs. dissimilarity between coaches' and players psychobiosocial states regarding content of emotional experiences. The content overlap was carried out for each dyad separately and distinguished between the most successful and most unsuccessful performance. Following, content overlap scores and the selected descriptor states of the modalities were compared across all four dyads. The overlap scores range from 0 (all features are different) to 1.0 (all features are shared). In the present study, features stand for descriptors. The analysis has been used in previous studies to compare individual perceptions of emotions.

The interviews were transcribed verbatim in German and English as Word documents, whereby the analysis of seven out of ten interviews was conducted in German with relevant quotes translated to English. The data analysis of the present study was conducted according to the guidelines of the approach of Auerbach and Silverston (2003) and the integrative phenomenological approach (Smith et al, 1999; see Smith, Flowers, & Larkin, 2009 for a detailed review). Thus, each interview was

analyzed separately for each step before moving on to the next interview. In a first step, the raw data of each interview was read through and relevant text was marked. Additionally, descriptive summaries were placed on the transcript. The relevant text for each interview was saved separately in a new file, page numbers were indicated and the descriptive summaries were added as comments. In a second step, the relevant text of each interview was organized into repeating ideas, whereas the repeating ideas were identified in each interview separately. Following, the repeating ideas were compared across all ten interviews and the repeated statements were clustered to themes. At this stage of analysis, a first comparison within each dyad was made. In a third step, relationships between themes were explored and grouped together to nine sub-categories, namely *player's emotional experiences, coaches' appraisal, emotional cues, players' emotion self-regulation, coaches' perception, interpersonal emotion regulation, coaches' characteristics, coach-player relationship, and intra-individuality*. Finally, the nine sub-categories were grouped to three coherent and bigger categories, namely *emotional experiences, emotion regulation, and influential factors*. Additionally, to provide the trustworthiness, second coders, who were familiar with the research methodology, independently assessed the coding system in order to achieve consensus at all stages of the analysis. After the comparison, the codes were optimized and finalized. In addition, the researcher held a research diary in order to note down important aspects which came up during the analysis and were seen as essential to discuss or mention as limitations.

5 RESULTS

5.1 Players' Psychobiosocial States

As expected, in most cases higher intensities were reported for functionally helpful than functionally harmful states in the best performance, and the opposite for the worst performance. *Figure 1* represents the raw intensities scores of the PBS-S states associated with the most successful and unsuccessful performances for a tennis player (02).

Figure 1: PBS profile of a tennis player for most successful and most unsuccessful performance
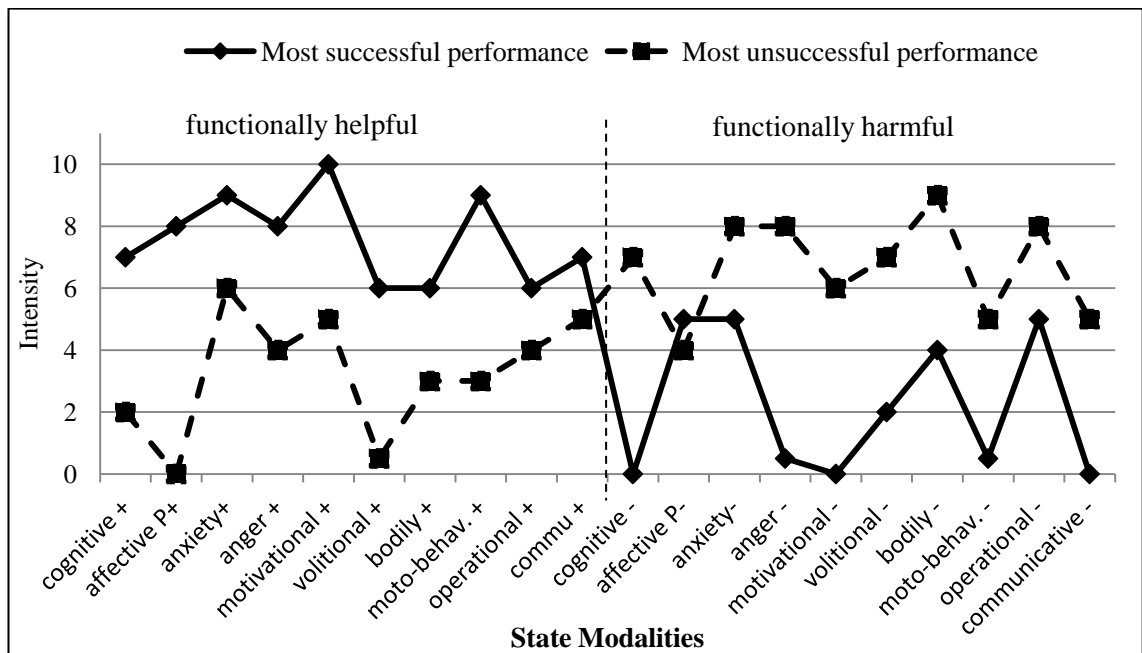
As expected, the player reported generally higher intensities of functionally helpful than harmful in the best performance, and higher intensities for functionally harmful than helpful states in the worst performance. In line with expectations for intensity scores in best and worst performances were also the profiles of player 01 and 05*(see Appendix B).* Noteworthy, both players indicated a very low intensity level for functionally harmful affective states in the worst performance, what is contrary to expectations. For the other two profiles, some deviations of the expected intensity distribution were found. The PBS-S profile of player 03 indicated similar intensity

levels for both functionally helpful and harmful states in the best and worst performance. In the worst performance functionally helpful descriptor states of affective pleasant, anger, and motor-behavior were substantially lower in intensity compared to all other descriptor states. For player 04, the intensity scores for functionally helpful states were generally higher than functionally harmful states in the best performance. For the worst performance no clear discrepancy between functionally helpful and harmful states was revealed for intensity. The player experienced most functionally helpful and harmful states in a moderate intensity. Interestingly, the player experienced functionally helpful states of anxiety, anger, and bodily in moderate to high intensity in the worst performance. Moreover, the intensity of the modality affective pleasant and communicative were low intensity for both best and worst performance. See *Appendix B* for more information.

Additionally, results indicated some similarities in content. In the most successful performance, a high intensity (≥ 8) was reported for functionally helpful descriptors of the modalities motivational by all players, and for affective anxiety and anger by four out of five players, as well as a moderate intensity (≥ 7) for motor-behavioral for all players. For the functionally harmful states no pattern stood out although three out of five players reported moderate intensity for the modality affective pleasant. In the most unsuccessful performance a moderate till high intensity (≥ 6) was established for the functionally helpful modality of anxiety by four out of five players and a low intensity (≤ 2) for functionally helpful affective P+ by all players. For the functionally harmful states, a moderate till high intensity (≥ 7) for cognitive and anxiety modality was reported by all players, and three players reported low intensity for affective pleasant. Besides, regardless of performance, a moderate intensity (≥ 6) for the modality anxiety+ was reported by four out of five players, what might be a special characteristic for tennis. In sum, findings stressed that the impact and functionality of descriptors is associated with the successfulness of performances.

5.1.1 Analysis of Differences in Intensity for the Psychobiosocial State between Coach and Player

Coaches' accuracy in intensity of the psychobiosocial states of their player was established with the difference between players' and coaches' raw intensity score for the

descriptor states (differential Value = DV). Analyses for four dyads were computed, dyad 01 was not taken into account due to an incomplete profile.

Figure 2 shows the PBS profile for the most successful performance of the coach-player dyad 02, which had the highest accuracy in intensity. Differences ranged among all eight modalities from 0 to 4 on a scale from 0 to 11. In seven modalities (cognitive-, affective P+, anger-, motivational-, motor-behavioral-, communicative+, and communicative-) a complete accuracy with a differential value of 0 (*DV* = 0) was revealed. The highest dissimilarity was found for functionally harmful state of anxiety with a differential value of 4. Moreover, the graphs indicated a higher accuracy for functionally helpful than for functionally harmful states, see also *table 1*.

Figure 2: Accuracy in intensity of psychobiosocial states between coach and player for the most successful performance, dyad 02.
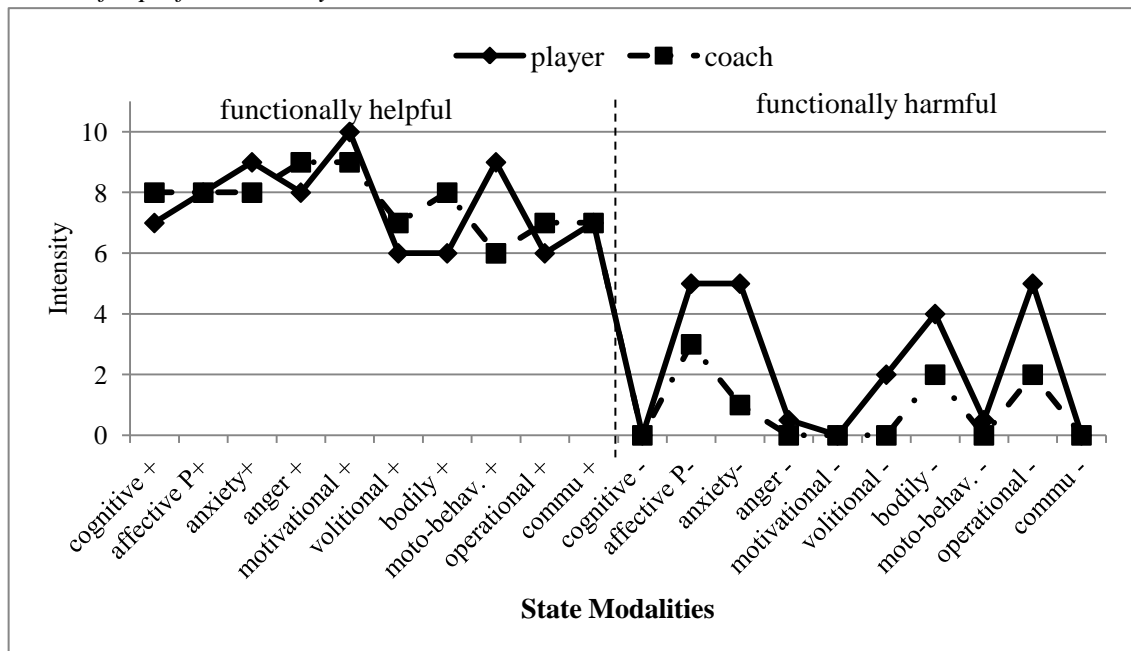
Similar accuracy scores in intensity were found for the other three dyads. The differential values for the dyads ranged from 0 to 3 in dyad 03, 0 to 8 in dyad 04, and 0 to 7 in dyad 05. As for the most accurate dyad, all three dyads had a higher accuracy level for functionally helpful than functionally harmful states; see also *table 1*. Accuracy in intensity for specific modalities varied across dyads strongly, although some similarities were identified. As shown in *table 1*, the modality of bodily+ had the highest accuracy in intensity with a differential value ranged from 0 to 2 across all dyads. The modality affective P+ and motivational + revealed also a high accuracy with differential values of 1for all dyads. The highest discrepancy in intensity across all

dyads was established for the modality volitional+ with a differential value ranged from 2 to 8, and anxiety+ with a differential value range from 0 to 6. More information about the differences within and across dyads for each modality is shown in *table 1*.

Table 1: Differences in intensities between coaches and athletes in the most successful performance; grouped for N=4 dyads

State modalities	Dyad 02 DV	Dyad 03 DV	Dyad 04 DV	Dyad 05 DV	All Dyads DV	Sum of +/- modalities
cognitive+	0	3	1	3	7	13
cognitive-	1	1	2	2	6	
affective P+	0	2	4	0	6	10
affective P-	1	1	1	1	**4***	
anxiety+	1	1	0	7	9	24
anxiety-	2	7	3	3	**15****	
anger+	4	2	0	6	**12***	19
anger-	0	0	0	7	7	
motivational+	0	3	0	2	5.	9
motivational-	1	1	1	1	**4***	
volitional+	1	3	2	2	8	23
volitional-	2	2	8	3	**15****	
bodily+	2	0	0	1	**3****	9
bodily-	2	0	2	2	6	
motor-behavioral+	3	2	0	1	6	13
motor-behavioral-	0	2	2	3	7	
operational+	1	2	1	2	6	16
operational-	3	5	2	0	10	
communicative+	0	3	5	2	10	17
communicative-	0	0	4	3	7	
Sum DV Dyads	**24****	40	38	51		

* second highest similarity/dissimilarity, ** highest similarity/dissimilarity
DV = differential value; descr. = descriptors

For the most unsuccessful performance, best match in intensity was computed for dyad 03, however to provide a better understanding about the findings and to allow a comparison between a coach's accuracy in intensity of best and worst performance, *figure 3* shows the PBS profile of the dyad 02. The differential value for dyad 02 ranged from 0 till 4 on a scale from 0 to 11. In six out of 20 dimensions, coach and player had a complete match in intensity (affective P+, anxiety -, anger-, motivational -, volitional+, and volitional-). The highest dissimilarity in dyad 02 was found for the modalities of anger+, bodily+, and operational- with a differential value of 4. The graphs indicated a

lower accuracy for functionally helpful than harmful states, for more details see also *table 2*.

Figure 3: Accuracy in intensity of psychobiosocial states between coach and player for the most unsuccessful performance
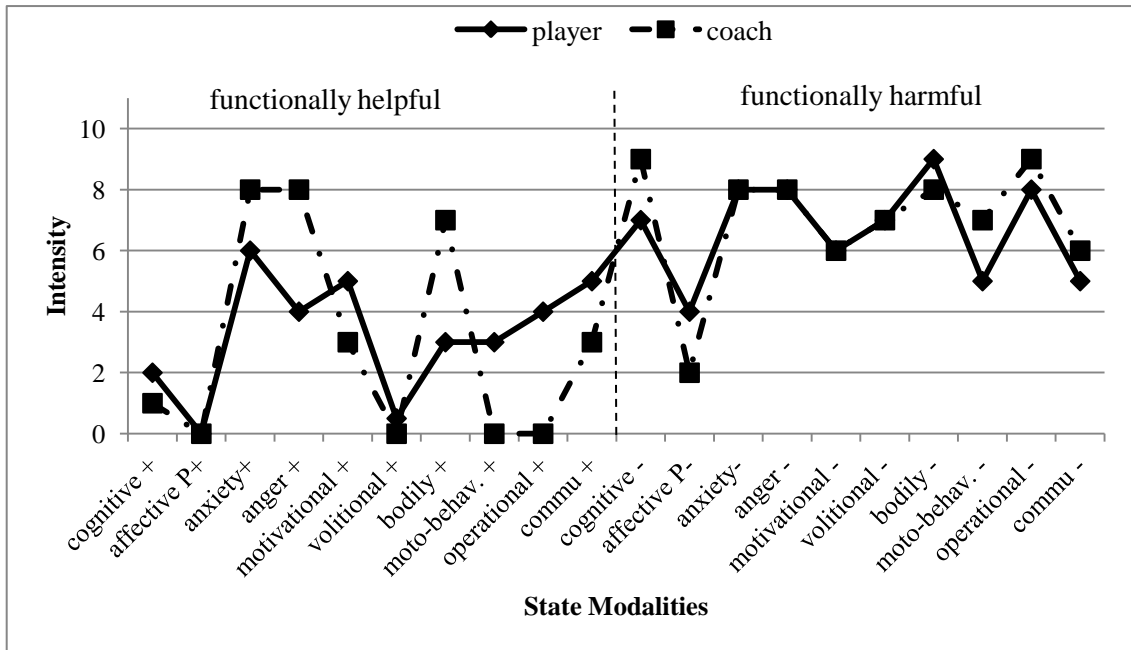
Similar findings for differences in intensity were calculated for the other three dyads. Differential values ranged from 0 to 5 in dyad 03, 0 to 7 in dyad 04, and 0 to 6 in dyad 05. As for dyad 02, dyad 04 showed a higher accuracy in intensity for functionally harmful states than helpful. For the other two dyads 03 and 05, a higher match for functionally helpful than functionally harmful states was established, see also *table 2*. As reported in *table 2*, the highest accuracy in intensity across all dyads was found for the modality affective P+ with a differential value ranged from 0 to 1. Moreover, a good match was found for the modality anger- and operational+ with a differential value ranged from 0 to 1 across all dyads. The highest discrepancy in intensity was revealed for the modality anger+ with differences between 0 and 6, and for communicative- with a differential value ranged from 1 to 7. More information about the differences within and across dyads for each modality is shown in *table 2*.

Table 2: Differences in intensities between coaches and athlete in the most unsuccessful performance for all modalities; grouped by N=4 dyads

Modalities	Dyad 02 DV	Dyad 03 DV	Dyad 04 DV	Dyad 05 DV	All Dyads DV	SUM of +/- modalities
cognitive+	3	0	2	1	6	13
cognitive-	3	1	1	2	7	
affective P+	0	0	1	1	**2****	6
affective P-	2	1	0	1	4	
anxiety+	2	0	3	1	6	10
anxiety-	0	1	1	2	4	
anger+	4	0	6	6	**16****	19
anger-	0	1	1	1	**3***	
motivational+	2	1	2	2	7	14
motivational-	0	1	2	4	7	
volitional+	0	5	2	0	7	10
volitional-	0	1	0	2	3	
bodily+	4	3	3	1	11	19
bodily-	1	-3	0	4	8	
motor-behavioral+	3	1	1	1	6	11
motor-behavioral-	2	3	0	0	5	
operational+	1	1	0	1	**3***	12
operational-	4	2	3	0	9	
communicative+	2	1	0	1	4	18
communicative-	1	2	7	4	**14***	
DV Sum Dyads	34	**28****	35	35		

* second highest similarity/dissimilarity, ** highest similarity/dissimilarity
DV = differential value; descr. = descriptors

Taken together, a higher accuracy of intensity was revealed for the most unsuccessful performance with a differential value ranged from 0 to 7 than for the most successful performance with a differential value of 0 to 8 across all four dyads. In the most successful performance a higher accuracy between coaches and players was reported for functionally helpful than functionally harmful states. While for the most unsuccessful performance two dyads showed a higher accuracy for functionally helpful and two dyads for functionally harmful states. Within modalities, the intensity level varied strongly between dyads. Nevertheless findings revealed, taken functionally helpful (+) and functionally harmful (-) descriptors together, highest accuracy for modalities of motivational and bodily in the best performance across all dyads with a differential value ranged from 0 to 5, respectively 0 to 6. Highest dissimilarity was established for

the modality anxiety with a differential value of 0 to 9. For the most unsuccessful performance, highest accuracy in intensity was reported for the modality of affective P with a differential value ranged from 0 to 4 across all dyads. Highest discrepancy in intensity was found for the modalities of anger and bodily with differences between 0 and 6, respectively 0 and 4.

5.1.2 Overlap Content Analysis of the Psychobiosocial States between Coach and Player

In both most successful and unsuccessful performances moderate content overlap analyses were found for all four dyads. The content overlap score ranged from .28 to .59 with 1 as a complete match among 20 descriptor states. Two dyads had a higher content overlap for the most unsuccessful performance, one dyad for the most successful performance, and another dyad had an identical content overlap score for best and worst performance, see *table 3*. Besides, in both most successful and unsuccessful performances a higher match for functionally helpful than functionally harmful descriptor states was found, however no patterns within the modalities across the dyads were established. Nevertheless, highest content overlap was established for functionally helpful states of motivational, cognitive, and affective P *(see table 4)*. The lowest content overlap was revealed for functionally harmful states of motor-behavioral and the modality volitional. Noteworthy, in contrast to the high accuracy in intensity, the modality of bodily had rather a low content overlap score.

Table 3: Content Overlap Analysis for best performance (BP) and worst performance (WP) for each coach-player dyad (N=4)

Dyad	BP	N descriptors		WP	N descriptors	
		Player	Coach		Player	Coach
02	0.59	20/20	16/20	0.28	20/20	16/20
03	0.45	20/20	20/20	0.45	20/20	20/20
04	0.35	15/20	20/20	0.47	16/20	18/20
05	0.45	20/20	20/20	0.30	20/20	20/20

For the most successful performance, generally a higher content similarity for functionally helpful than functionally harmful descriptors was found across all four dyads. The highest content overlap, an overlap in all four dyads, was revealed for

functionally helpful cognitive and motivational modality states. Moreover, three out of four dyads had a content overlap for functionally helpful states of affective pleasant, anxiety, anger, and communicative. On the contrary, no content overlap across all four dyads was found for functionally harmful states of anxiety, volitional, motor-behavioral, and operational *(see table 4).*These findings pointed out that coaches were more accurate in rating the psychological dimension of the psychobiosocial state.

For the most successful performance, overlap scores between .35 and .59 were found although the number of matching descriptors ranged from 5 to 10. The best match in content for the most successful performance had dyad 02 with a content overlap score of .59 *(see table 3).* In dyad 02, both player and coach assessed 20 items, whereas in 10 out of 20 rows they chose the same descriptor. For functionally helpful, following descriptors were identically chosen by the dyad 02; *focused* (cognitive +), *confident* (affective P+), *nervous* (anxiety+), *fighting spirit* (anger+), *motivated* (motivational +), *purposeful* (volitional +), *energetic* (bodily +), *effective task execution* (operational+), and *outgoing* (communicative +). Matching descriptor for functionally harmful was *withdrawn* (communicative -).

Content overlap analysis for the other three dyads revealed similar findings (*see table 4).* For the most successful performance, following content overlap descriptors were chosen the most by coach-player dyads; *focused* (cognitive +) was chosen as a descriptors by all four dyads, and *doubtfu*l (cognitive-) corresponded in two dyads. *Confident* (affective pleasant +) and *fighting spirit* (anger+) matched within more than one coach-player dyad. A content overlap was revealed for the other modalities of affective, however each dyad matched in different descriptors. Then, *motivated* (motivational+) was chosen by all coaches and players and *unmotivated* (motivational-) matched for three coach-player dyads. For volitional, *purposefu*l (volitional+) was chosen by one coach-player dyad, whereas no overlap was found for volitional-. In the modality bodily, the descriptor *energetic* and *physically charged* (bodily+) overlapped each in one dyad, no match for the other dyads was established. *Physically tense* (bodily-) was reported by one coach-player dyad, whereas the others did not match in descriptors. *Powerful movement* (motor-behavioral+) was chosen as descriptor state by one coach-player dyad, even so no match in all four dyads was found for motor-behavioral-. Similar results were indicated for the modality operational, where only one dyad revealed a content overlap *for effective task execution*, while no match was found

for operational -. The modality communicative was represented by different descriptors like *outgoing* (communicative+), *withdrawn, alone and uncommunicative* (communicative-), however not more than one dyad agreed on the same descriptor.

For the most unsuccessful performance, generally a higher similarity for functionally helpful than functionally harmful descriptor states was found across all four dyads. The best content overlap for functionally helpful descriptor states was found for affective pleasant and motivational, while the best match for functionally harmful states was revealed for operational with an overlap in three dyads each. No content overlap across all four dyads was established for the functionally helpful state of volitional and the functionally harmful states of motor-behavior and communicative *(see table 4)*. Findings revealed that coaches were more accurate in rating the functional helpful states of the psychological dimensions as well as the social dimension of the psychobiosocial state.

The content overlap for the most unsuccessful performance ranged from .28 to .47 whereby the number of matching descriptors ranged from 6 to 9. Dyad 02 revealed the lowest content overlap score of .28, wherefore dyad 03 with a content overlap score of .45 had be chosen to be presented. In dyad 03, both player and coach assessed 20 items, whereas in 9 out of 20 rows they chose the same descriptor. The other dyads had filled in between 16 to 20 modalities *(see table 3)*. For functionally helpful states, following descriptors were identically chosen by the dyad 03; *focused* (cognitive+), *confident* (affective P+), *nervous* (anxiety+), *motivated* (motivational+), *coordinated* (motor-behavioral+) and *effective* (operational+). Matching descriptors for functionally harmful states were *worried* (anxiety-), and *ineffective* (operational-).

Information for the other three dyads can be found in *table 4*. In the most unsuccessful performance, following content overlap descriptors were chosen the most by coach-player dyads (by more than one dyad); *focused* (cognitive+) and *doubtf*ul (cognitive-) were reported by two dyads, *confident* (affective p+) was chosen by three dyads, whereas for affective- only one dyad was matching. For the modality anxiety, only one dyad matched for anxiety+, choosing *dissatisfied*, and two other coach-dyads chose the descriptor states *troubled* and *worried* for anxiety-. For the modality of anger, *aggressive* and *nervous* (anger+) was chosen by one coach-player dyad each, whereas only one dyad chose *irritated* (anger-). Three coach-player dyads chose the descriptor *motivated* (motivational +), and one coach-player dyad picked *uncommitted*

(motivational-) for the modality of motivational. For the modality of volitional, no content overlap was found. *Physically tense* (bodily+) was reported by one dyad and *physically charged* (bodily-) by two dyads. *Coordinated movements* (motor-behavioral+) was chosen as descriptor state by one coach-player dyad, whereas no content overlap was found for motor-behavioral. For operational+ *effective task execution* overlapped in one dyad and *inconsistent, ineffective and unskillful task execution* (operational -) were each chosen by one coach-player dyads. For communicative+ no similar descriptor states were chosen by more than one dyad and no overlap was found for communicative-. Results indicated that dyad 02 with the lowest similarity in content distinguished itself from the other dyads mainly in a discrepancy for the modalities of affective, because no overlap was found for the functionally helpful states of affective pleasant, anxiety, and anger.

Table 4: Content Overlap scores grouped by dyads for best performance (BP) and worst performance (WP)

MODALITY		Dyad 02 BP	Dyad 02 WP	Dyad 03 BP	Dyad 03 WP	Dyad 04 BP	Dyad 04 WP	Dyad 05 BP	Dyad 05 WP	Sum
cognitive	functionally +	1		1	1	1		1	1	**6***
	functionally -					1	1	1		3
affective pleasant	functionally +	1			1	1	1	1	1	**6***
	functionally -			1				1	1	3
anxiety	functionally +	1		1	1	1	1			5
	functionally -		1		1					2
anger	functionally +	1		1			1	1		4
	functionally -		1	1						2
motivational	functionally +	1	1	1	1	1	1	1		**7****
	functionally -			1				1	1	3
volitional	functionally +	1								**1***
	functionally -						1			**1***
bodily	functionally +	1					1	1		3
	functionally -		1			1	1			3
motor-behavioral	functionally +			1	1					2
	functionally -									**0***
operational	functionally +	1			1					2
	functionally -		1		1				1	3
communicative	functionally +	1			1				1	3
	functionally -	1		1				1		3

Functionally + = functionally helpful, functionally- = harmful,
 * second highest similarity/dissimilarity, ** highest similarity/dissimilarity

5.1.3 Players' Emotional Experiences and Coaches Appraisal

In the interview, both players and coaches were able to recall both best and worst performances and most of them were able to describe the performance beyond the PBS-S scale. Results showed that both coaches and players seemed to be aware of their emotional states and recognized that they were expressing their emotional experiences. Findings of the interviews showed that most players' had meta-experiences about their emotional experiences in best and worst performances. In example, one player reported;

"I mean, I did not play so good in the first set but then I told myself c'mon you can do better than this. And then I got more relaxed, and I just started to go for my shots. Maybe I didn't think about the score so much anymore. I knew already before the match that I have a good chance; that the guy is solid but I have more weapons. Then I was still passive and nervous the first set, but then I said c'mon, let it go and go for it. (...) And then it turned completely." (player 4)

In the most successful performance, players experienced more positive than negative emotions prior and during the match, although negative aspects were pointed out. Especially self-confidence was reported by all players to be a key aspect for and in the most successful performances. One player said;

"I was playing very self-confidentially. During the whole tournament I felt very good. I was playing very reliable; I was very motivated and self-confident." (player 2)

Generally, results indicated that emotional experiences of most unsuccessful performances were more richly described and the majority of both coaches and players emphasized that it was easier to recall the worst performance than the best one. In the most unsuccessful performance, players reported experiencing more harmful emotions, and stressed their overall negative attitude and state. Most players brought up that they did not really understand why they were playing poorly, and that they made a lot of unforced errors. Moreover, it became clear that players were aware that their cognitive and emotional states were distorted and inappropriate, or in other words harmful for their performances. One player mentioned:

"It was a 3 set match, but I had the feeling I was playing very poorly. I couldn't really breathe; I was very nervous, and very tense. I haven't really played; I made a lot of mistakes. Everything was s***. I wanted to finish it as soon as possible so that I don't need to stay on court for longer." (player 2)

Besides, during the worst performance most players highlighted especially their continuously fighting spirit and their harmful aggressiveness. One player said;

"I tried too much, I made too many mistakes. I was really pissed off with myself and dissatisfied about how I was playing. I was not happy on the court. And I was really negative about it, about myself. I had no confidence, was not carefree or enthusiastic. I was too aggressive in my game and in my mind." (player 4)

Coaches were also very detailed in describing their players' emotional experiences for most successful and unsuccessful performances and were able to recall, conformable with their players' explanation, even specific happenings during the performance. Similar to their players, coaches pointed out the importance of self-confidence in the best performance, and the high aggressive level and tendency to take every mistake with a pinch of salt in the worst performances. However, in some aspects dissimilarities between coaches and players were identified. Following an example that shows a mismatch in the social dimension of the PBS-S scale between coach and player in the worst performance. The player pointed out that despite mistakes, lack of self-confidence, and high aggressiveness, she was still open for others. "(…) *But I was communicative, it helps me to talk to others."(player 5)*

On the contrary, the coach experienced the player during the worst performance not really communicative.

".. And she wasn't connected to me anymore. When she is playing poorly, she becomes very introverted even so you can still get through to her. But you recognize that she is pessimistic." (coach 5)

5.2 Emotion Regulation

Analysis for emotion regulation revealed five main themes namely *emotional cues, players' emotional self-regulation, coaches' perception of players' emotional self-regulation, interpersonal emotion regulation,* and *influential factors*. For all categories, both coaches' and players' perspective were outlined.

Figure 6: Emotional experiences and regulation theme
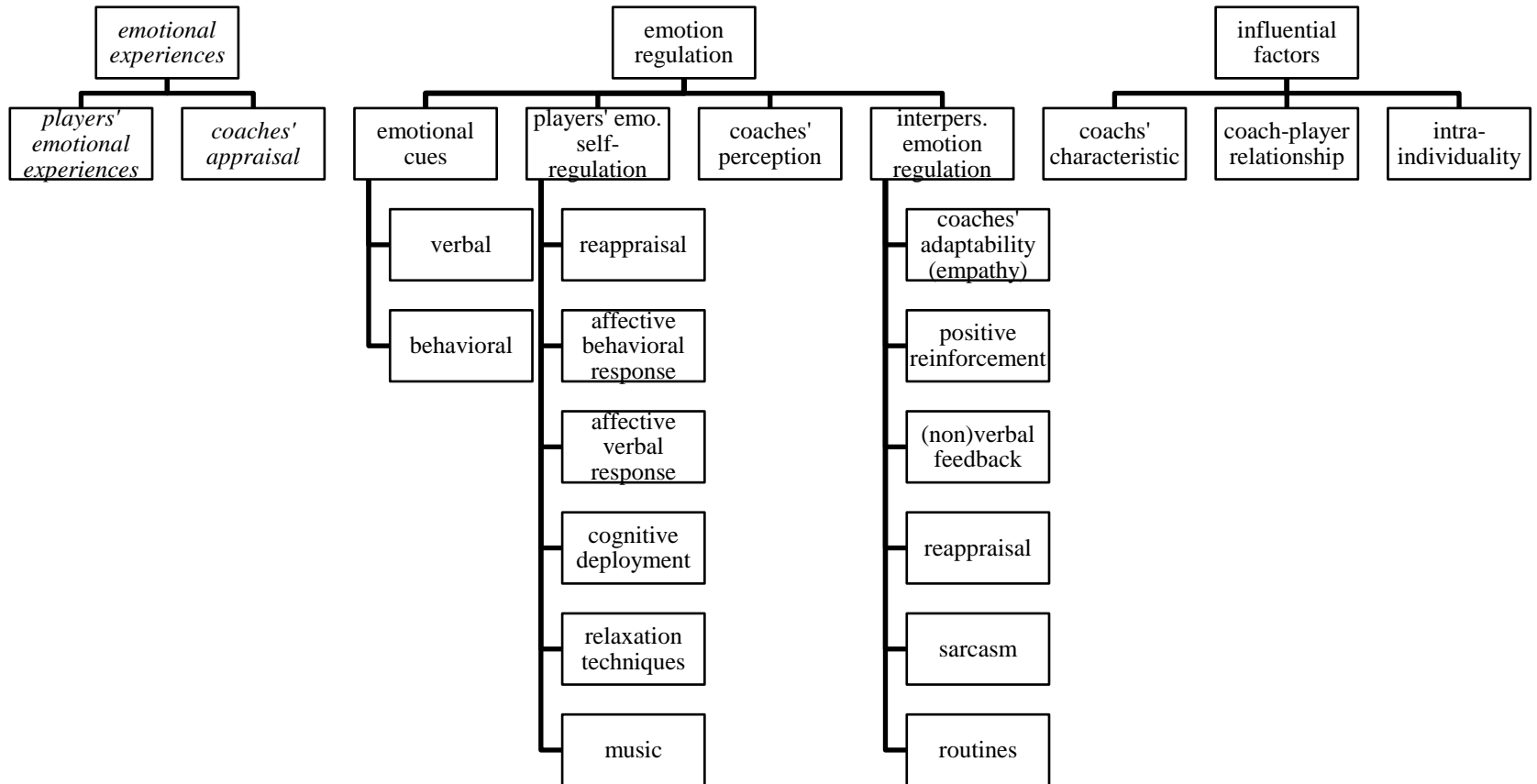
5.2.1 Emotional cues for coaches

Coaches perceived their players as very emotional and very ambitious on the court. Results showed that coaches read their players mostly based on both behavioral (mostly bodily and motor-behavioral cues) and verbal expressions. All coaches reported to use the body-posture (i.e. tension, shoulder position) and facial expression (i.e. eyes, smile) as cues. One coach stressed out the contact to the player (communicative component) and the style of playing (technical and tactical aspects) as helpful cues in recognizing how the player feels. For example, if a player was moving slower between points or getting more introverted, it indicated an increase of negative emotional feelings. One coach summed the message very well up by answering the questions how he is recognizing emotional states of his player as followed;

> *"Body postures, contact, and sometimes her game. If she is not pushing the ball anymore or suddenly starts playing something totally different - or then even stops playing. But mainly the body posture, the shoulders. Or if she's getting quite, if she becomes introverted. Well mainly being introverted."(coach 5)*

Simultaneously, players were asked how their coach might read their emotional experiences. Similar results were found. Players were aware that they send information to their coaches by their body posture (i.e. head down, shoulders), facial expression (i.e. gaze, smiling), motor-behavioral actions (i.e. speed of moving between points and balls, coordination), affective behavioral reactions (i.e. throwing rackets, clapping on laps), and operational aspects (i.e. making more mistakes, ineffective task-execution). Most likely, players believed that they were easier to read when they performed unsuccessfully because in such situations they showed more negative than positive emotions. For example, one player mentioned that she mainly sent affective behavioral and verbal cues to her coach when she did not perform well:

> *"If I am playing really bad then I can also have a fit of rage. But I guess it is mainly my body posture. I play without any enthusiasm, I don't give a damn, and I play as hard as I can. I guess I show it very openly. If I am playing poorly I am very nervous. I am tensed up and I swear." (player 2)*

Interestingly, tactical cues ("I play as hard as I can") which can in this case be considered as operational factors, were send unintentionally. This supported the findings, that coaches' use of tactical and communicative cues were mostly sent unintentionally by players. Another player pointed out that his coach might use his body language and movements between the points as cues for his emotional state;

> "*He can also see it if I feel confident and if I have some doubts about the match. A lot from the body language – moving, face, etc. He can see it in the way I move. Maybe he can see it already during the warm up if I am playing well and if I am feeling confident.*" (player 4)

The coach of the player answered the question how he was reading his players' emotional states as followed: "*Body language, and how he is moving and reacting between points, if he is getting annoyed by stuff or not.*" (coach 4). Although no specific cues were mentioned for recognizing emotions such as anxiety or nervousness, statements of coaches revealed that aforementioned cues are used to identify and read their players psychobiosocial states.

5.2.2 Emotion Self-Regulation of Players

All players recognized the importance of emotion self-regulation and how it can affect one's performance. Players reported different emotion self-regulation strategies which they used to down- or up-regulate their emotions. Results indicated that players were mostly aware of their emotional experiences (meta-experiences) and had specific and various intentional and unintentional strategies to regulate their emotional experiences, what was in line with the aforementioned findings for emotional experiences. Although it became obvious that players were more skilled in regulating functional than dysfunctional emotional experiences. For example, players took good performances and winners for granted, whereas poor performances and mistakes were more likely evaluated as detrimental for both physical and mental states. Strategies such as reappraisal, affective behavioral and verbal strategies, cognitive deployment, relaxation techniques, and music, were mainly described by players.

Reappraisal was stressed out by some players and understood as seeing mistakes as part of a learning process. Instead of getting shaken by them, simply accept mistakes and focus on the next ball. One player mentioned:

"I tell myself sometimes; whatsoever, it is not now or never. Just play and have fun in what you're doing. You will have a lot of matches to come. It doesn't really matter if you win or lose. That helps me, it often goes a bit better afterwards – I guess it is because I can relax a bit."(player 1)

Another strategy which was mentioned by all players was cognitive deployment, mainly focusing on relevant aspects; focusing and refocusing, staying in the present. One player was using self-talk during match to get her focus back and to stay motivated:

"I tell myself; play with more safety and don't try to attack every single ball, but rather play the balls a couple of times into the field. And if you miss a shot, forget about it and focus on the next one. Stay in the here and now and don't be distracted by shitty mistakes." (player 2)

Besides, the majority of players used also goal setting as a strategy for cognitive deployment. Instead of thinking about the score or game, they started taking ball after ball. Forgetting or accepting past mistakes helped them to relax and calm down. One player answered the question what he was doing when he did not perform well to get back on track as followed:

"Normally, whatever I do on the court and before I start a ball, I try to focus on the present. If I am serving and returning, I think about the ball I will hit – in order to focus. When I am serving, I bounce normally four times and I think were to serve – and then I go for it." (player 4)

However, results also indicated that this was not as easy as it seemed to be. Some players stressed that if they did not play well, they showed affective behavioral and verbal reactions such as screaming, swearing, and smashing rackets. They reported that the motivation declined what in turn affected their effectiveness in task execution and

decision making. Unforced errors increased and tactical wrong decision cumulated. For example one player reported:

> "*Maybe I throw the racket or I swear on the court, but I always tell myself let it go and get the next point. But sometimes it is not enough cool down before the next point. And often it goes worse and worse – more and more negative.*" (*player 4*)

Nevertheless, such affective reactions were not only harmful for a player's performance. All players reported using affective verbal and behavioral regulation strategies to help down-regulating dysfunctional emotions and up-regulating functionally helpful emotions in both successful and unsuccessful performances. Pushing themselves by making the fist or a slap on the lap, or giving individual positive and affective self-instructions (self-talk) boosted their self-confidence, and facilitated refocusing on the relevant aspects. One player said:

> "*I push myself, I clap my lap, and I tell to myself that this was good (shot, point), so that I can see what I have been doing really well and that I don't only focus on the negative things*" (*player 5*).

One athlete even described that emotional outburst were like a vent to get rid of heavy feelings:

> "*The strongest emotion for me is when I start to shout. In one way it is negative but in the other way I throw the negative thing away. The feeling that makes me so heavy. And after that I always feel better. People never tell me that I should not scream because they see that I am playing better. It is like a balance for me, I need it.*" (*player 3*)

Three players mentioned the use of breathing techniques and music to calm down, refocus, and motivate. They were both important to get into one's optimal emotional state prior to a match and to help being motivated and disconnecting from mistakes during a match. One player said:

"A lot of things I do with music. If I am very nervous, I try to calm myself down with music. I am often nervous. And because of this, I also try to breathe slowly and to play the first balls simply into the field to get a feeling (for the shots); during a match and practice. And if I am playing poorly in a match then I think about a song. I hum it and try to calm myself down; I try to get a better feeling." *(player 2)*

Some players indicated that they had sometimes troubles in separating personal life from tennis. Concerns, pressure, and stress from significant others (i.e. parents, partner, friends) and institutions (i.e. school) affected their mental and physical performance on court. Hereby they pointed out how important it was to be able to talk about their feelings with others, mainly with their coaches. Talking seemed to facilitate the understanding for those feelings and helped to accept or store them. One player mentioned:

"I am not scared to tell her (coach) anything about what I did poor or good. She takes me as I am. I can be really open and share anything without anxiousness." and the same athlete added *"When you keep silence and you don't know what happens during your match, and you are stiff and you see things in a box – you think life is shit. So you should talk about positive and negative things, how could it become better, how should I do it next time. When you speak about it, you start seeing it and you realize that it was only a simple match."* *(player 3)*

Although it became clear that coaches had an essential impact on their players' self-regulation strategies, all players pointed out that if they once passed a certain limit they close up and their coaches cannot reach them anymore. One player mentioned:

*"For the negative emotions it is all about me. I have to do it myself. He has been telling a lot about how I should do it, he can help to a certain level. But it is more about me and that I should find a solution in such situations. It is me who has to apply it."**(player 4)*

5.2.3 Coaches' Perception of Players' Emotion Self-Regulation Strategies

Coaches' perception of their players' emotion regulation strategies were similar to players' reported used strategies. Results indicated that coaches recognized self-regulation strategies of their players, and were aware of their struggles and challenging situations. Most coaches pointed out that in unsuccessful performances players could not handle the situation and tended to take good performances for granted. More concrete, apparently players were struggling with mainly two aspects; keeping focus on relevant aspects and accepting mistakes. Coaches reported that as soon as a match got tougher, players started looking for aspects they could get angry or bothered with. Players struggled with staying in the present moment and rather got distracted by irrelevant aspects. This was in line with the other highlighted factor, that when players performed poorly they were rather taken away by mistakes. Instead of seeing mistakes as part of the game, they overrated them and simultaneously ignored the circumstances and good shots. Irrational beliefs and mal-interpretation rose what lead to outbursts of dysfunctional emotions. Players failed to change situations or made distorted cognitive attribution. For example, the answer of one coach regarding the question in what situation his player struggled in regulating his emotions covered very well the statements of the other coaches:

"With the acceptance. If it is not going the way he wants it, he can't accept it. The funny thing is, he can show negative emotions very quickly and can't barely control them. It should be ok for him to make mistakes. Knowing that he doesn't have to hit a winner with every single ball. That it is ok to make mistakes." (coach 4)

The results of coaches were comparable with the statements of players, whereby staying in the presence and learning from mistakes were revealed as key components for successful performances. However, both coaches and players did not point out concrete and efficient emotion regulation strategies for unsuccessful performances in order to up regulate functional emotions and down regulate dysfunctional emotions.

5.2.4 Interpersonal Emotion Regulation

All coaches described situations in which they helped regulating their player's emotions and all players reported behaviors and actions of their coaches, which supported them in regulating their emotional states. Emotion regulation was described for prior-, during, and after practice and match, and was hold both intentionally and unintentionally. Results showed that all players experienced the influence of their coaches in regulating their emotional states as crucial and helpful, and barely as harmful. Besides, all coaches were aware of their impact on players' emotional state and subsequently on their performance, and were able to describe different emotional regulation strategies they used to support their players.

Coaches' adaptability

All coaches reported that they adapted intentionally their own emotional responses to their players' emotional state and performance. For example, one coach reported that he adjusted intentionally his own behavior to the behavior of his player. *"if he is close to lose his head, I know that if I dig deeper he will explode. So I rather give him some time. I do this on purpose." (coach 4)*. Coaches pointed out that they did not only stay calm in practice but also tried to create a well-balanced climate during competition. They tried to show only positive gestures, although they normally did not tend to show lot of emotional responses such as jumping around or yelling. One coach said:

> *"I can calm myself down and focus entirely on her (player). I try to stay calm and influence her positively. (coach 3)*

Similar to the coaches' reports, player stressed out that coaches adapt to their needs and emotional states. One player mentioned:

> *"I think, he adapts (coach's behavior) to my performance. If I am playing poorly then he doesn't pull me down. He influences his emotions so that he can help me…",* and the same player said; *"When he recognizes that I am getting angry or nervous, then he stays calm. So he gives me back calmness and supports me to pull myself together…" (player 2).*

In addition, player stressed out more specifically the effect of their coaches' calm and positive disposition on their personal emotional state. The calmness of their coaches was passed on and shaped their personal emotional experiences in a helpful way. Moreover players highlighted how important it was for their own sake that coaches stayed positive throughout a match, and did not show negative emotional responses. One player said.

> *"It is important to me that he (coach) shows positive and good emotions, so that I can calm down when I perform poorly and psych up when I perform well." (player 2)*

Positive reinforcement

Another often reported emotion regulation strategy was positive reinforcement, which was pointed out by all coaches. It was used both in practice and before and after matches. Coaches highlighted the need to remind players of their strengths and to tell them what they did well. They put the performance into perspective and shared their external view with the players in order to straighten out players' irrational beliefs and strengthen their self-confidence. One coach pointed out:

> *"I don't forget. I am like a blotter; I wait for the good blot, which stays. I don't forget the good performances. I continuously illustrate them those ones (good performances). I praise her, make high five. After a practice I often do a follow-up and then I send her a SMS in which I say what was extremely good today. I also address it so that they don't forget about it." (coach 5)*

Another coach highlighted that positive reinforcement could also be non-verbally. In practice coaches did not always have time to give verbal inputs and during a competition they were too far away from their players. Therefore positive gestures and motivational inputs should not be underestimated.

> *"We are always in a certain contact on the court. If I am close enough, I can give her some short inputs such as Allez, c'mon. But sometimes it doesn't work*

out, sometimes you are too far away. In such situations, you try to support the player with positive gestures."(coach 2)

Only some players outlined positive reinforcement as a helpful regulation strategy specifically. One player mentioned that positive gestures or a positive remark after a good ball could affect effectively her self-confidence and motivation.

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" He (coach) says: c'mon, you gonna do it, believe in yourself! Stick to this and that. And that helps me to believe in myself all over again"(player2).

(Non-)verbal feedback

All coaches outlined the essential value of immediate and clear feedback during and after practice and matches. They interfered during a practice, either after a point or during a break, to discuss mistakes or struggles in order to avoid an up-growing frustration and irrational assumptions. In other words, the aim of verbal feedback was to clear out technical and tactical errors and emotional harmful reactions.

"I let him finishing the ball and then I take him aside. I tell him; this and that you don't need to do again, it is useless, it doesn't help you at all." and the same coach continued *"You try to put it into perspective and to outline the positive aspects."(coach 4)*

Similar relevance was acknowledged by players. Players explained that getting positive and constructive feedback during practice was helpful in order to improve or becoming aware of some issues. One player mentioned:

"He (coach)is giving me tips what to do that it gets better. If I am too far from the ball, then he tells me to go closer. If I am too angry on the court then he says; calm down, take your time. And he takes me out for half a minute so that I can calm down." (player 4)

Feedback after a match was also established as crucial by both coaches and players. After a match, all coaches reported to sit together with their players and discuss

technical, tactical, and affective behavioral components together. All coaches outlined the importance of keeping the feedback positive-toned; however negative aspects were not ignored but rather brought up as potential factors on which can be worked on. One coach reported:

> *"I try to communicate the things I experienced as poor during a match in a rather positive manner. I don't say that she moved crappy. But I rather tell her that we will pick this up in the next training session and work on it. She shouldn't get the feeling that I am entirely dissatisfied with her match, because this wouldn't be true." (coach3)*

Coaches reassured that players' left the meeting assertive and motivated. Findings outlined that players experienced the feedback of coaches beyond the correcting characteristics but rather as a sign of interest and care. Similar to coaches, players perceived the feedback as mainly positive where negative aspects are put as potentials to improve on. For example one player mentioned:

> *"He (coach) is mostly very positive. Of course, it depends how sensitive you are, then he adapts to your state. He says what was good and what I should keep doing. And then he points out what were the aspects which were less good. He shows me what we need to work on." (player 1)*

Thus, the strengthen-oriented approach was acknowledged by player, although the beneficial impact of it was not specially emphasized. This might lie in the fact that analysis after a match is part of a routine and the omnipresent benefit of the feedback is rather unconsciously for players.

Moreover, all coaches highlighted the importance of including the opinion and perception of the player in the analysis in order to show their player respect and acknowledge that they are experts of their own game. They encouraged players to share their subjective experiences, concerns, and struggles, what helped both strengthening the quality of the relationship and the development and personal growth of the player. Similar to coaches, players emphasized the importance of having some self-responsibility in solution processes. One player said:

"During practice he is talking a lot. If I am not playing well, we sit together during breaks and he asks me why nothing works out. He encourages me to find the reason and solution myself. Of course, he asks me, gives me advices and motivates me. He tells me; ok you can to this, just try this and that." (player 2).

This consensus implied a good relationship quality and a shared platform to communicate. Sitting together during breaks and being open to listen to both opinions and experiences seemed, as results highlighted, to be important and valuable for both coaches and players.

Aside from verbal feedback, coaches stressed as well the use of non-verbal feedback such as gaze, prompts, or in form of positive reinforcement during competition. Nevertheless, coaches warned from glorifying a player's performance; honesty and realism need to be maintained. Players were also aware of the non-verbal feedback of their coaches. The nonverbal signals gave players information about coaches' satisfaction regarding their performance and revealed suggestions of changes. One gesture or one prompt of the coach was often enough for the player to realize what had to be changed. This phenomenon of mutual understanding was mentioned by three out of five dyads. One player mentioned;

"...and simply his (coach) gaze tells me what I need to do. He doesn't need to say anything, I know that I have to push myself (at this moment). For him it is almost redundant to say something because we know what we need to do if we look at him." (player 5).

After all, most players mentioned that feedback was essential but on the court they had to face and overcome challenging situations on their own. As a player reported;

"For the negative emotions it is all about me. I have to do it myself. He has been telling a lot how I should do it, but he can help only up to a certain level. Well, it is more about me and that I should find a solution (for negative emotions). He can help me, but in the end it comes from the player - how he acts on the court. The coach can just give advices and he can tell me how to behave and react on the court. But I am the one who has to show it on the court." (player 4).

Reappraisal

Reappraisal was another strategy to regulate mainly dysfunctional emotional states of players and also often used when giving feedback. Coaches described the importance of putting performances into perspective and not evaluating everything by victory or loss. More importantly for coaches was that players were motivated to improve their tennis, were able to identify their potential, and worked out solutions regardless of results. As one coach mentioned:

> *Victory or Loss is not so important anymore. More important is to realize on what we have to work on; so that we don't get into the same situation again. We need to find new solution processes so that she knows how to face optimally and use successfully various situations." (coach 5)*

This rather mastery-approach philosophy was shared by most of the coaches, although all coaches highlighted that this did not mean that tennis was only fun and poor performances were excused. Moreover, players were well aware of their coaches' reappraisal strategies and experienced them as beneficial. For example one player answered the question how her coach reacts after a loss by saying:

> "*She just says that it is a really cool thing (victory) or that it is not the end of the world (loss). It is not the final of Wimbledon; it is not the main draw after a hard qualification round. It is only a simple match that helps you to gain more experiences. Plus, we think about positive things and negative things."(player 3)*

Another way of reappraisal was providing a balance between hard work and fun. Tennis requires besides physical and mental effort as well social sacrifices. Hence, coaches were concerned to pass fun and passion about tennis to their players, what in turn helped players to put their performance and tennis in general into perspective. Based on the result, inducing fun by coaches could be seen as another emotion regulation strategy:

> "*If you want to achieve something you need to give 100% but of course, you should not forget the fun. I try to give them opportunities to love to go to the*

court, love to go to the fitness, love to go for a run. It is part of the game."
(coach 1)

Sarcasm

Two coaches described the use of sarcasm to regulate player's emotions. There were situations in which nothing worked out and the player simply performed on her or his worst. Instead of using the sledgehammer, a player should put the performance into perspective. Coaches aimed with sarcasm to help players dissociate from mistakes, negative shots and emotions, and rather help them getting more relaxed .One coach said:

"Sometimes I only can laugh about it. I can only say; this is extremely bad, this is a horror. I laugh at her for the purpose to get her away from this believe; I have to use the sledgehammer. I show her that she's right, that it is extremely bad today and nothing works. But then I try to show her possibilities how she can improve it." (coach 5)

The player mentioned the use of sarcasm by her coach as well. However, in contrast to the coach's helpful intention, the player experienced sarcasm as rather bothering. Although the player was aware that the coach made jokes during poor performances in order to motivate her. She said about her coach:

"He tries to motivate me. He often makes jokes. And sometimes they are a bit a pain in the neck. You think; aaaaah, don't annoy me right now. Seriously, it is not funny. He will motivate me with his jokes. Sometimes it is helpful and sometimes you get really annoyed by them…" (player 5).

Hereby the importance of knowing one's player and his or her preferences became apparent. The use of sarcasm, jokes, or other behaviors can harm a player's performance if coaches and players have a different understanding about the effect of the strategy.

Routines

Another strategy which was mentioned unintentionally by two coaches was encouraging players' to stick to their routine after a match. Coaches conceded players personal time

to calm and cool down before they sat together to analyze the match. One coach mentioned:

> *"I send her generally, no matter if it was good or bad, to do the cool down. (..) she gets her time, sometimes more sometimes less. And then we talk, we analyze the match, we discuss what was good and what was bad." (coach 2)*

How this was conducted did not become clear during the interviews. Nevertheless, players mentioned the benefit of having time for themselves after a match before they had the follow up, because it gave them the possibility to work out their first emotions and to open up for their coaches' feedback. The player of the coach, who stressed specifically the intention of giving some time to the player after a match, reported following:

> *"He is analyzing the match with me, but not right after the match, what I like. I finished (the match), we have a hand shake and then he says: now you go to your room, have a shower, do your stretching and then we meet later for diner. So you have time to cool down a bit, you can cry, etc. And then when you cooled down bit and you had time to analyze the match individually, he comes and asks about it. It is helpful for me that he gives me time after a match to cool down. He's doing a great job.(player 2)*

Hence, accepting a player's space seemed important to build up a fruitful and fostering post-analysis.

Expectations

Although players rated their coaches all high in the ability to adapt and react efficiently to their emotions, some players brought on some suggestions. Three players mentioned that coaches sometimes did not show enough positive gestures when they performed well. Players perceived their coaches behavior after a victory or great success as rather emotional flat and had the feeling that coaches took the success for granted.

> *"I wish sometimes that he (coach) would show more emotions. For example, after a great shot, I wished he would really stress it and not only clap hands. Or*

after a match, if you played awesomely, you often have the feeling that it is taken for granted. (...) I wished that he would come and say; yes you played super, I am proud of you. And not that you have the feeling he thinks; well, finally you made it…" (player 2)

This was contrary to coaches' opinion, who said that players need less appreciation and positive reinforcement if they performed well than if they performed poorly. One coach answered: *"she only needs small pieces of appreciation. A small nodding, but yes she is looking for the contact. But she does not need that many positive gestures." (coach 2)* Both coaches and players, however, agreed that it is generally hard for a coach to support and influence a players' emotional state during a match. Especially when the player did not perform well, it was perceived as difficult to reach and psych the players up. As a player described the situation during a poor match;

"If I am not playing well at all, then I get 1'000 of different thoughts. In such situations he (coach) cannot do much for me. He tries to bring me back to the here and now, but I often don't see anything anymore. I think, he is wrong anyway, he simply tries to cheer me up so that I stay positive - but I know how I feel. Then (in such situations) you can't help me anymore, you can't build me up anymore. .." (player 2).

In sum, results showed that coaches used different ways of communication to support regulating their players' emotional states. Coaches invested a lot of time talking about concerns, problems, and both good and bad aspects of a performance. Nevertheless, most proposed strategies were conducted rather on an intraindividual communicative basis and not many specific tasks were mentioned to concretely regulate emotional states. Only one coach pointed out very specifically that goals were set with the player and with the help of a sport psychologist to down-regulate dysfunctional emotions and up-regulate functional emotions during a match. The coach mentioned:

"I give him just very simple things so that he keeps up his routine between the points. Hence, when he wants to show some negative emotions, then he also needs to show something positive- so we can provide a balance. Little steps but they help us to improve for every following match." (coach 4)

In addition, the used strategies primarily focused mainly on tennis-related aspects. Although coaches highlighted the importance of getting a better understanding about concerns and problems of players' on and off the court, the aim of the provided emotion regulation strategies was to increase the performance on the court.

5.2.5 Influential Factors

Coach characteristics
Results indicated several different key characteristics a coach should have. The most common named aspects were; patience, calmness, empathy, and active listening. Patience was understood in terms of the work with players on court. Coaches highlighted that tennis and subsequently also the players are rather emotion-laden. This fact asked coaches to be patient and to see the development of a player as a learning process including success, losses, and setbacks. One coach mentioned:

"you (coach) need a lot of patient in the cooperation with your player. You cannot force it to happen; you need patience to teach players over and over again the relevant aspects so that they can get automated" (coach 4)

In line with the aspect of patience, all coaches reported to be very calm as a person with a high tolerance level. Similar results were reported by players. Four out of five players described their coaches as very calm persons. Players experienced a coach's calmness as very beneficial and helpful for their own performance and psychological state. *"He can stay very calm. I get sometimes a bit angry on court. I think he is a good mix here. He brings calmness on the court." (player 4)*

Further, coaches reported to emphasize the importance of listening to and being interested in their players and to take their concerns, desires, and needs seriously. Taking time for their athlete and not being judgmental about their experiences and feelings was pointed out as basis for not only being a successful coach but also for a functional relationship. Hence, most coaches stressed the aspect of empathy. One coach reported:

"It is important that players have the feeling you care for them, that you show your understanding, and that you cater for their needs. And that you have individual talks and that you as a coach take enough time for them. I think this important for all players, maybe even more important for girls." (coach 3)

Similar aspects were mentioned by players. Most of the players highlighted that coaches' care for and understand them. The unrestricted interest of their coaches in their players, during practice and competition, was perceived as very helpful and important by players to build up trust and commitment to their coaches. In addition, players pointed out that their coaches were very loyal and trustworthy what encouraged players to share their tennis-related and private concerns and struggles with their coaches. One player answered the question about her coach's key quality:

"His character. He is very understanding, he listens, and he gives tips. He doesn't pull you down, he supports you. He feels with you. As soon as something is bothering me, he directly asks me about it, he wants to help me. He recognizes instantly when I am not feeling well. He is very loyal. This helps me a lot to build up pure trust to him." (player 2)

Besides, the coaching philosophy seemed to have a crucial impact on the relationship between coaches and players, and shaped how they interact and react on each other. All coaches stressed the importance of personal growth as a tennis player and human being. Main aim was to foster individuals potential as well as support and accompany players in the best possible way on their journey. Results indicated that coaches tended to follow a mastery approach. One coach said:

"...as a coach you should reinforce your player not only as a tennis player but also as a person. In this sport (tennis) it is the way that if you are performing well, everyone will be next to your side. However, if you are not performing well, you are on your own. Therefore it is important that (especially) girls know that they are both a good tennis player and a cool woman, a cool human being." (coach 3)

Coach-player relationship

Both coaches and players pointed out the importance of professionalism, closeness, shared values, mutual communication, and performance for a successful relationship.

According to all coaches and players the coach-athlete relationship was more than a bond on the tennis court. Results indicated the importance of feeling close within a coach-athlete relationship, feeling the chemistry between coaches and their players. Coaches pointed out that key aspect for a good rapport was to give players the feeling of being interested in them, carting for their needs, and providing an understanding for their concerns. Besides, coaches stressed out how crucial it was to take time for their players and to provide individual moments for exchanges; players need to feel valued and taken seriously. One coach reported:

> *"Players need to have the feeling that we care about them. As coaches, we need to show the players our respect and interest, and players need to feel understood. And above all, we have to engage with each player individually, we have to provide personal conversations and invest time for them." (coach 3)*

Results indicated that most of the coaches reported having a close and amicable relationship with their players. However, all coaches pointed out to be aware of keeping a distance to the players. One coach said:

> *"as a coach you need to provide a trustful basis. But in my opinion you should not be too close (to player). You definitely need to maintain a certain distance even so it might be a very amicable climate. Certain professionalism needs to be kept up" (coach 2)*

Players' perception of their relationship to their coaches was similar. All players felt close to their coaches, and described their relationship as close and amicable. In order to feel close to a coach, players stressed the need of trust and understanding. Similar to coaches, players mentioned that for creating a trustful relationship, a coach had to show unrestricted interest in a player. As one player said:

> *"She is here in the present. And you feel it that she is here only for you. Now, in this moment, she is here only for you and nobody else exist" (player 3)*

Another important aspect regarding the coach-athlete interaction was the balance between fun and seriousness on and off the court. Despite a good relationship, coaches pointed out the relevance of hard work and strict guidance. The focus on the court was on tennis, professionalism had to be maintained. The professionalism, as aforementioned, could be considered as an unintentional interpersonal emotion regulation strategy. Simultaneously, players mentioned a similar understanding about the work ethic on and off the court. Most of the players experienced their coaches on the court as strict and very demanding. However, off the court and during breaks in practice, players described their coaches as relaxed, with whom they can have fun and laugh. A coach's differentiation between on and off the court was experienced as beneficial and fruitful by all players. One player mentioned:

"so she is really strict on the court but when we go off the court, she is a true friend. And that is why I completely trust her, and she knows that. It is not only about the court, it is so much about off the court." (player 3)

Nevertheless, both coaches and players pointed out that in the end coaches are their coaches and not their best friends.

In line with players' assumption about importance of having similar work ethic was the aspect of having shared values; having the knowledge about each other's goal and needs to create a successful interaction. To provide the best possible support for their players, coaches highlighted the need of knowing their players and knowing what they want to achieve. Players defined the common goals and shared direction of progress also as crucial. Having a same language, having the same values regarding work on and off the job facilitated developing trust and the feeling of mutual commitment and understanding. One player stated:

"I think the connection is quite good, we understand how to work together, and how to bring the best effort on the court. I think it is really important to you have the same goals, to think a little bit the same way. If you work the same ways as a player and coach, it is beneficial. But if the coach wants something else or is completely different, then the player does not work that well on the court." (player 4)

Another influential aspect was the role model which coaches took on. In this sense, both coaches and players highlighted the importance of respect and shared responsibilities. One player reported that their coach motivated and gave her a feeling of appreciation by participating in drills and physical exercises herself. Coaches were experienced as more authentic and gave players the feeling of self-determination and responsibility. One player mentioned

"I asked her what she will do this time. And she (coach) said; well, I run with you! Or very difficult exercises on the court, she is doing them as well. She is a great example. It is motivating, if you perform exercises and you see that somebody is doing them with you. And if the other one is better than you, you get a bit more competitive and you want to do it better." (player 3)

Intraindividuality

In addition, all coaches pointed out that every player asked for a different coaching approach. Coaches believed that it is essential as a coach to learn reading a player's needs, preferences, and behavioral reactions; as a coach you need to know your player as a person:

"You cannot compare players with each other. Everyone is individual. So you have to approach a player individually. You need to get to know what your feeling is with this player, how you can be with this player. With one you need to be more sensitive, with the other you can be more direct, and with a third one you can be more hard. It is very mixed." (coach 1)

Besides, most coaches brought up the factor gender. Working with female players required different self-emotion regulation strategies because it was explained that girls were more sensitive to their coach's emotional states than male players. One coach said:

"Boys are less complicated. Girls are more sensitive and emotional. It is important that girls feel humanly comfortable. Of course, they should not be treating with kid gloves, but you also can't attack them too aggressively. If so you destroy them." (coach 3)

6 DISCUSSION

The purpose of this study was to examine emotional experiences and meta-experiences of best and worst performances, cues to recognize emotional states of players used by coaches, as well as self- and interpersonal emotion regulation strategies within five coach-player dyads in competitive Swiss tennis. All players and four coaches were able to recall their own respectively their player's best and worst performances and filled in the PBS-S scale. Overall, players' reported more functionally helpful and less functionally harmful experiences in their best performances, and the opposite in their worst performance. Analysis of coaches' accuracy in assessing players' emotional experiences revealed moderate consensus in both intensity and content overlap for best and worst performances. Results showed that coaches were most accurate in identifying the psychological state of their players' psychobiosocial state. Moreover, different behavioral and verbal cues were identified which coaches used to recognize players emotional states, although most coaches focused on bodily and motor-behavioral signs. Hence, coaches used somatic cues to identify players' psychological states. In addition, concrete strategies were identified which players utilizes to regulate their own emotional experiences such as reappraisal and cognitive deployment. Coaches' perception of their players' emotion self-regulation strategies were very similar to players' comments. Besides, similar interpersonal emotion regulation strategies were established for all five coach-athlete dyads. Participants emphasized the benefit of their coaches' calm characteristic (adaptability), positive reinforcement, technical and affective verbal and non-verbal feedback, reappraisal, sarcasm, and post-performance routines. It became apparent that emotion regulation strategies are only effective if coaches' intention of and players' perception about impact and effectiveness of these strategies are consistent. Moreover, additional factors such as coaches' characteristics (calmness, loyalty) and the interpersonal relationship quality (professionalism, working ethic) were identified which influenced coaches' accuracy in reading players' emotional states and interpersonal emotional regulation processes. The results emphasized the impact of coaches' emotional regulation on their players' emotional states, supporting the research in combining interpersonal emotions and emotion regulation and intra-individual emotional experiences in sport.

6.1 Tennis Players' Psychobiosocial States in Best and Worst Performance

The psychobiosocial state scale (PBS-S scale) revealed for each player an individual profile about functional and dysfunctional states. Findings of the PBS-S scale support the assumption of the IZOF model (Hanin, 2000; 2004) that emotional experiences are a multidimensional construct because each player used all eight modalities to describe how they felt in their best and worst performances. Moreover, the characteristic of the individual PBS-S scale was consistent with previous findings, showing an association between performance outcome and functionality as well as valence of emotional experiences. As assumed, three players reported generally more functionally helpful than functionally harmful emotional experiences in their best performance. Simultaneously, these three players had more functionally harmful and less functionally helpful emotional experiences in their most unsuccessful performances. However, two out of these three profiles revealed, contrary to expectations, low intensity levels for functionally harmful affective pleasant states. A comparison of the modality affective pleasant across all five dyads revealed reverse intensity levels for functionally harmful states such as satisfied and complacent. In other words, the descriptor state of functionally harmful affective pleasant (*of overjoyed, complacent, pleased, and satisfied)* was rated high in intensity in the best and low in intensity in the worst performance. It became apparent that players associated the functionally harmful descriptor states with positive effects for their performance, what is contrary to intention of the PBS-S scale. This misunderstanding of meaning, which occurred for both German and English version of PBS-S scale, suggests a reconsideration of the descriptors states for the modality of affective pleasant.

In addition, the profiles of two other players were not in line with the expected intensity distribution regarding functionally helpful and harmful modality states. One player (03) had similar intensity levels for functionally helpful and harmful in best and worst performances. This let assume that single states do not really have an impact on the players' performance outcome (successful vs. unsuccessful). It is rather the interaction between certain modalities, which have an essential impact on the player's performance. In the case of this player, the profile indicated a decisive role of functionally helpful states of affective pleasant, anger, and motor-behavioral. It can be assumed that having low self-confidence (affective p+), low aggressiveness (anger+) and no coordination (motor-behavioral+) might make the difference between successful

and less successful performance for this player. The framework of IZOF and the underlying concept of the principle of optimal zones (Hanin, 2000; 2004) support the assumption that the interaction effects of modalities have an impact on the quality of the performance. Another player's profile (04) differed from the profile model by very similar intensities for functionally helpful and harmful states in the worst performance. However, the high intensities for functionally helpful states of anxiety, anger and bodily as well as the low intensities for affective P+ and operational+ stood out. These findings support, as aforementioned, the assumption that interactions of modalities have a decisive impact on the performance outcome (Hanin, 2000; 2004). For this player, functionally helpful descriptor states of self-confidence (affective P+) and operational+ might be essential factors for the performance quality. However, the other functionally helpful descriptor states did not differentiate remarkably in intensity between best and worst performance, what les assume that the characteristic of the functionally harmful states might take over, aside from affective P+ and operational+, a crucial role regarding the performance outcome. In other words, if functionally harmful descriptor states are high, they lead to a rather less successful performance although the functionally helpful descriptors states are high in intensity. Nevertheless, player's explanation highlighted an additional aspect regarding the rather high intensity levels of functionally helpful states in the worst performance. The player explained that he had a bad start into the game but could grow during the match and showed a great performance in the end. Hence, the player considered the match as the best match because of his high motivation level and his will to keep fighting although his self-confidence was not very high; which might explain the varied intensity levels across functionality of modalities. In other words, extreme up and downs of performance-related experiences, for example an intense and close three set match, can mainly influence the reported intensity of the psychobiosocial states. Considering this, it is essential to mention that single psychobiosocial performance profiles should be interpreted with caution. One psychobiosocial pattern might be optimal for an athlete in one situation, but does not necessarily have to be optimal in another performance under another condition.

Nevertheless, the characteristics of each modality varied across the players, which is in line with the claim of the IZOF modal that every individual athlete has his or her own emotional pattern. Interestingly, findings highlighted the importance of the affective modalities such as affective pleasant, anxiety, and anger. In the present study, all players reported a high level in intensity for functionally affective pleasant emotions

in the best performance, choosing either self-confidence or carefreeness as descriptor. These results suggested that self-confidence is a crucial aspect for performance outcomes. This assumption is supported through the interviews, in which players highlighted the importance of self-efficacy and confidence prior and during the match. Players pointed out that prior to their best performance they felt confident about their game, were optimistic about their chances to win, and felt well prepared. These findings are in line with the results of Covassin and Pero's study (2004) where they revealed that successful tennis players experienced more self-confidence than less successful players did. In addition, findings of the present study revealed the essentiality of the preparation phase. Several players reported that they needed good practice sessions before a competition in order to feel certain and determined about their ability and performance. Arriving to a tournament with a rather dissatisfying training preparation was associated with insecurity, nervousness, and a lack of confidence. This is consistent with previous research regarding sources of self-confidence. Studies emphasized the deciding impact of past experiences on the self-efficacy and sport specific confidence of an athlete (Bandura 1997; Feltz and Lirgg, 2001; Wilson, Sullivan, Myers, Feltz, 2004). Subsequently, it can be assumed that coaches can support players' in building up confidence and feelings of determination before a match by providing a fostering and positive climate during the practice phase. Strengthen a player's self-confidence seems especially important, because in the worst performance all players rated functionally helpful affective pleasant descriptor states very low in intensity.

A closer look to the PBS-S profiles of the present study revealed interesting findings for functionally helpful modality state of anger. Most players chose the descriptors states fighting spirit and aggressiveness, and rated them of moderate to high intensity in both best and worst performances. However, players differentiated between the functionality of the descriptor states fighting spirit and aggressiveness. More precisely, in the best performance, players experienced a high level of fighting spirit, which was seen as very facilitative. Simultaneously, in the worst performance four out of five players chose aggressive as a descriptor for functionally helpful anger. Despite the positive valence of the descriptor (according to the PBS-S scale), all four pointed out the detrimental effect it had on their performance. For example, players reported that they often felt too aggressive in their mind and game, which hindered efficient and effective behavioral and cognitive responses. These findings provide further evidence for the work of Jones, Swain, and Hardy (1993) who argued that the appraisal of

emotional experiences shapes their effect on the performance. In the context of the present study, it can be said that tennis is an individual and non-contact sport and experienced aggression is most likely directed at oneself. Moreover, in tennis every ball counts and matches often last for more than an hour. Hence, aggressive behavior and thoughts do not only affect the emotional state and performance for a well-defined moment, but also rather influence upcoming situations. For example, a player might get a warning from the referee after throwing the racket for misbehaving, or a player might start attacking every single ball, which increases the amount of unforced errors. Considering this, it can be assumed that aggression is seen as harmful because it affects the self-concept and self-confidence. However, findings of the present study do not clarify if the characteristic of the modalities of anger and anxiety are specific for tennis or not. Nevertheless, further research is needed to gain more insight into how anger and anxiety might affect athletes' psychobiosocial states and to explore if a tennis specific psychobiosocial state profile exists.

Taking these findings into consideration, one aspect stood out; the interaction effect between the modalities of affective pleasant, anxiety and anger. As suggested by Lazarus (2000) and Woodman and Hardy (2003) anxiety and anger might be entailed in the modality of affective pleasant. As mentioned earlier, players experienced a high level of self-confidence or carefreeness in their best performance. This high level of affective pleasantness can be interpreted as a resource to deal with stressful situations more easily, and conclusively helps players appraising signs of anxiety or anger as beneficial. On the other hand, a low level of self-confidence or carefreeness is associated with a lack of coping resources, such as not being good enough for the situation, and therefore emotions of anxiety or anger might be interpreted as detrimental for the performance. These assumptions are in line with the meta-analysis of Woodman and Hardy (2003) about the interaction between cognitive anxiety and self-confidence. Several studies pointed out that self-confidence can shape the performance decisively, and can affect the level of experienced cognitive anxiety significantly. However, it should always be considered that individuals might not perceive the same intensity level as helpful or harmful, as proposed by IZOF.

6.2 Comparing the Perception of Coaches' and Players' Psychobiosocial States

Tennis coaches' accuracy in reading their player' psychobiosocial states for best and worst performance, as well as what strategies coaches' used to recognize these states, were analysed. Similar to players, coaches used all modalities to describe the performance related emotional experiences of their players. Interestingly, the analysis of intensity revealed a higher accuracy in intensity for the most unsuccessful than for the most successful performance. This was supported by coaches' comments that it was easier to fill in the PBS-S scale profile of their player for the worst performance. Hence, it can be suggested that either players showed more dysfunctional emotions and reactions during poor performance, or coaches and players analyzed unsuccessful performances in more detail. Moreover, a higher accuracy for functionally helpful states was found for the best performance in all dyads, although the discrepancies for functionally harmful states were in most cases also quite moderate with a differential value between 0 and 5 on a CR-10 scale. Therefore, it can be assumed that coaches were aware that their players experienced both functional and dysfunctional states in their best performance, but that functionally helpful states were experienced higher in intensity. These findings support the assumption of the principle of zones of the IZOF model, which claims that being in one's optimal zone is associated with more functionally helpful states and subsequently more successful performances (Hanin 2000; 2004). On the other hand, in the worst performance no clear tendency was found. Two dyads had a higher accuracy in functionally helpful, while two others dyads matched better in functionally harmful states. Explanations for these results are unclear because the current study did not focus specifically on the reasons for differences within successful and unsuccessful performance cues. However, based on the information gathered through the interviews, the differences could be associated with players' individual characters. Coaches highlighted that each player reacts on and deals with unsuccessful performances differently. One player might show his or her emotions openly (i.e. start swearing) another player might rather become very silent (i.e. no verbal reaction). Hence, coaches' sensitivity to players' intraindividuality seems essential in order to read players' psychobiosocial states. Nevertheless, these are only assumptions and further information would be needed for a proper argumentation.

In addition, findings regarding the accuracy in intensity for each modality state revealed that coaches were overall especially accurate in recalling players' affective

pleasant states in both best and worst performances. In addition, a high match was found for the modality of motivational and bodily in the best performance, and anxiety and volitional in the worst performance. Based on the findings it can be said that coaches distinguished themselves by recalling bodily states best in the most successful performance and psychological states in the worst performance. These findings were compared with the content overlap analysis to gain additional insight into coaches' awareness of their players' psychobiosocial experiences.

The content overlap analysis revealed similar findings in terms of a higher accuracy for the psychological states. Moreover, in both best and worst performances, a higher content overlap was found for functionally helpful than functionally harmful states. Mainly state modalities of motivational, cognitive, and affective pleasant had a high overlap. These findings supported the results regarding the accuracy in intensity, and additionally it strengthened the assumption that coaches are especially aware of players' psychological states. A closer look revealed that for the modality state of motivational+, all four dyads chose the descriptor *motivated* and three chose *unmotivated* for motivational-. Similar findings were made for *focused* (cognitive+) and *self-confident* (affective pleasant+), and *fighting spirit* and *aggressiveness* (anger+). These results indicated a shared language between coaches and players, and underlined that verbal feedback, analysis, and chats during practices and after matches are highly valued by both coaches and players. However, compared to the accuracy level in intensity, some variances became apparent, especially for the worst performance. Mainly two aspects stood out: the different results for the modality states of anger and bodily. In contrary to the high content overlap, coaches and players rated the intensity of the functionally helpful state of anger very differently. This might be explained by a different understanding of the modality's impact on the performance. In other words, coaches were aware that players were aggressive when they performed poorly, but they did not perceive it as detrimental as their players did. However, more interestingly were the different findings for the modality of bodily and motor-behavioral. In contrary to the good accuracy in intensity, the content overlap for biological states was very low, although all coaches reported using mostly somatic-based cues to read their players' thoughts, emotions, and performance.

Findings of the interviews revealed that coaches often used cues such as body language (facial expression, body postures), motor-behavioral aspects (speed of moving, activeness between balls), way of playing (mistakes, tactical and technical execution),

and also affective verbal and behavioral expression (swearing, pushing, clapping on lap, smashing rackets), to identify their players' emotional states. Hence, coaches used mainly non-verbal, somatic-oriented cues. This raised the question, as mentioned above, why coaches were not able to identify biological states more accurately. It might be assumed that using somatic cues does not automatically imply that they are only used to recognize biological states. On the contrary, the high accuracy of coaches in describing cognitive, affective pleasant and motivation states of their players indicates that body language and motor-behavioral aspects are mainly used to identify psychological and social experiences. In other words, body language, motor-behavioral aspects, as well as the way of performing, contain information about a player's thoughts and emotions. For example, one coach mentioned that eyes never lie, while another one pointed out the way of moving is a sign of motivation, confidence, and alertness. Moreover, players of the present study pointed out that they believed their coaches are using body language, speed of moving, and body postures as cues to understand how they feel. The assumption that emotions in others are mostly detected by body language is supported by the study of Hawk, van Kleef, Fischer, and Van der Schalk (2009). They compared the accuracy of three different decoding strategies for different emotions, namely non-linguistic affect vocalization, speech-embedded vocal prosody, and facial cues; taking into account the richness of human language, verbally and non-verbally (e.g. volume, tone, speed of speech, rate of speech). Findings revealed a higher accuracy for non-linguistic affect vocalization (breathing, shrieks, laughter, etc.) and facial expression than speech-embedded cues. For example, the non-linguistic affect vocalization provided the best coding for emotions such as anger, contempt, disgust, fear, joy, and sadness. However, as argued by Hawk et al. (2009), identifying emotions by non-linguistic affect vocalization or facial expression can entail some challenges and disadvantages. Coaches are often far away from their athletes and getting accurate information through the behavior might be very challenging and almost impossible. The same is true for tennis. During a competition, coaches are often several courts away from their players, which make it difficult to read or understand their players' facial expressions or mumblings.

Therefore, it can be assumed that coaches used additional cues and strategies to identify players' psychobiosocial experiences. As revealed by the content overlap analysis, coaches were very accurate in naming the psychological modality states of their players. The ability to choose the same descriptor to describe affective and cognitive experiences

indicated a common language. During the interview, coaches kept pointing out how important it is to know their player, to know how they tick, and how they react in different situations. Moreover, both coaches and players emphasized the importance of a good communication and discussion during practice and after a match. However, botch coaches and players did not consciously consider the verbal exchange as a valuable cue to recognize players' cognitive and affective states. This let assume that talking, discussing, and listening is part of the tennis coaching philosophy or simply part of tennis coaches' personality. For example, coaches considered aspects such as showing interest in players' thoughts and concerns regarding tennis- and private-life-related aspects, talking and discussing with each other, and listening and getting to know their players' goals and work ethics, as very important and basic aspects of an interpersonal relationship. Taking these aspects into account, it can be said that coaches' understanding about their players' thoughts, feelings, needs, and concerns is not only based on the somatic and behavioral cues but also on an imaginary bond. For example, in two cases coaches had to rate the psychobiosocial state of their players for a performance where they were not present. Nevertheless, coaches were still able and very accurate in their description and assessment. These findings support the results of Rauers, Blanke, and Riediger's study (2013). In their study, they investigated the ability of younger and older couples in recognizing their partners' emotions. They pointed out that people do not necessarily need to see the other person to detect the emotional states of the partner, as they make use of other resources such as gathered knowledge about a person and specific situations. The construct, which encompasses this certain ability, is called empathetic accuracy. Empathetic accuracy is not only based on sensory cues, but also depends on how well a person knows the other. The importance of a partner's empathetic understanding for a successful relationship was also acknowledged by Jowett and Ntoumanis (2004) in the 3+1C model. Based on the assumption of the 3+1 C model (Jowett & Ntoumanis, 2004), a successful relationship is, among other factors, based on a co-oriented and empathetic understanding. Tennis as an individual sport is characterized by close and time-intensive partnerships. As mentioned by most coaches, they spend a lot of time on and off the court with their players, they are travelling to tournaments together, and sometimes coaches even see their players more often than their family and friends. In addition, tennis gives the opportunity of face-to-face interaction where coaches can focus entirely on players' needs and concerns and presumably build up accurate meta-experiences. Therefore, coaches' ability to

recognize and read their players' emotional states might be explained by the coaches' well developed empathetic understanding, where coaches consider behavioral cues as reflections of players' psychological states. Moreover, because of the special characteristic of tennis in the way that active coaching is prohibited during competition, the paramount use of behavioral-oriented cues as well as verbal-affective cues to recognize emotional experiences seems convincing.

6.3 Players' Emotion Self-Regulation Strategies

Players of the present study were able to describe different emotion self-regulation strategies, which they used in successful and unsuccessful performances to manage helpful and harmful emotional experiences. Coaches reported very similar strategies what let assume that they observed and understood their players' resources for regulating different emotions.

As proposed by Gross and Thompson (2007), players in the present study reported regulating their emotions in order to evoke, reduce, prolong, or boost the intensity of emotional experiences. Research has shown that over 400 different strategies exist, and effectiveness and preferences vary among individuals (Augustine & Hemenover, 2009; Richards & Gross, 2000). In the present study, players pointed out several emotion self-regulations strategies which were categorized into six themes, namely; *reappraisal, affective behavioral response, affective verbal response, cognitive deployment, relaxation techniques, and music*. When these categories were compared to the actual research state, similarities to the emotion regulation process model of Gross (1998) became apparent. The process model of Gross (1998) is often used as an anchor for different regulation strategies, and differentiated between five regulation categories: situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross and Thompson, 2007). Importantly, these strategies are used in different stages of the emotional process. The first four categories (situation selection, situation modification, attentional deployment, cognitive change) are antecedent-focused emotion regulation strategies, which are intended to either evoke and/or inhibit the intensity of emotional experiences before being exposed to an emotional stimulus. On the contrary, the fifth category (response modulation) encompasses strategies to deal efficiently with triggered emotions (Gross, 1998). In addition, Gross (1998) argued that antecedent-focused strategies often include

reappraisal, while response-focused include suppression. Research has shown that reappraisal is more effectively in decreasing unpleasant emotions (Gross and John, 2003) and is associated with less cognitive costs than suppression (Richards and Gross, 2000). Adopting the model of Gross as framework for the emotion self-regulation strategies, similarities between the findings of the present study and the five categories of Gross's model were identified.

For example, all players of the present study highlighted the effectiveness of reappraisal. Reappraisal is a reinterpretation of the situation's meaning in order to change the emotional response. According to the process model of Gross (1998), reappraisal is defined, besides social comparison, as an essential strategy within the category of cognitive change, which refers to changing the appraisal of the situation. For example, instead of giving up the chance of winning against a strong opponent before the game has started, the match should be interpreted as a challenge. Negative experiences should be viewed as something positive. Gross and John (2003) also showed in their study that reappraisal is associated with a lower level of somatic arousal when confronted with stressful situation, what subsequently outlined the beneficial effect of reappraisal on down-regulating negative emotions. Although reappraisal was highlighted as a very effective emotion regulation strategy, the study by Troy, Shallcross, and Mauss (2013) revealed that the effectiveness is based on context. While reappraisal was very beneficial in uncontrollable situations of stress, higher cognitive-reappraisal ability was associated with a greater level of depression in controllable situations. Taking this into account, reappraisal might be useful for dealing with a strong opponent, referees, or other environmental factors in tennis. However the same strategy might not be as applicable if the player is unhappy with his own performance and behavior. In other words, if it is extremely windy, it is helpful to focus on the positive aspects of it (i.e., "I am a very agile player what helps me to adapt easily to the ball"). However, if a player is not bending his knees enough, it could be detrimental to put it in a positive light (i.e. "I am good in giving spins with my wrist, so I can compensate the struggles with my knees"). Although players pointed out that the relevance and effectiveness of reappraisal, coaches' perception revealed some inconsistencies. As pointed out by the coaches, one major struggle for players is accepting mistakes and making mal-attribution of winners. Hence it can be assumed that even though players see the benefit and necessity of reappraisal, when it comes down to it, most of them cannot apply it efficiently. Subsequently, findings indicate that there is

a gap between knowing and doing, which can be interpreted as a great potential. Due to the fact that reappraisal is an efficient emotion regulation strategy, both coaches and players should take the chance and work on and improve the skill of reinterpreting the situations optimally.

Another strategy which was pointed out in the present study was the use of cognitive deployment. Players described the importance of being able to focus and refocus on essential aspects because in tennis every shot counts and requires utmost concentration. In order to avoid distraction (mostly during poor performances) players often used self-talk or goal setting to stay in or come back to the present moment. This is very similar to the category of attentional deployment in Gross's (1998) work. According to the process model, attentional deployment includes strategies such as physical withdrawal (closing eyes), internal redirection (concentration or distraction), and responding to external redirection (others help to change focus) (Gross and Thompson, 2007, p.19). In the present study, players did not especially name their coaches' behavior as a source of emotion self-regulation. However findings revealed that coaches have a key role in regulating players' emotional experiences, but they were generally mentioned under the scope of interpersonal emotion regulation. Thus, the benefit of external redirection will be discussed in more detail later on.

Moreover, behavioral and verbal affect responses were mentioned as helpful strategies. Interestingly, players experienced affective responses as both harmful and helpful for regulating evoked emotions, although the beneficial impact was more dominant. This let assume that a verbal or physical outburst, such as screaming or slapping one's thighs, does not necessarily harm the player's self-belief but instead boosts motivation and vents off frustration and anger. Besides, players pointed out that they used these emotional strategies, compared to the other four strategies, to regulate triggered emotions. This is in line with the assumption of Gross's model (1998) that response modulation is used to alter the intensity of experienced emotions. An explanation for the importance of the strategy of behavioral and verbal affect response might be the characteristic of tennis or it might also be a phenomenon in the sport setting in general. In tennis, a player is first of all alone on the court, and secondly a match often lasts for hours. Hence talking to or pushing oneself might be seen as way to communicate or interact with oneself (because there are no teammates who could do so), and to help keep up or gain back motivation and belief to continue fighting after

being down. Or alternatively, sport is shaped by emotional experiences and players' emotional expressions and responses.

Although relaxation techniques could be categorized under response modulation, and music as a strategy to focus and refocus (attentional deployment), it was decided to state them separately due to the special emphasis made by the players. Breathing techniques were identified as helpful to calm down before and during a match, while music was used as strategy to either psych up before a match or to relax and refocus during a match. This is in line with findings of Terry (2004) that music is often used as a pre-competition routine by athletes to manage arousal and emotions. Pates, Karageorghis, Fryer, and Maynard (2003) found in their study with netball players that listening to music before a match increased their performance and evoked more positive emotions and thoughts. In addition, music also seemed to be beneficial in coping with pressure. Balk, Adriaanse, de Ridder, and Evers (2013) showed that music as well as reappraisal decreased the probability of choking during performance. Hence, relaxation and music can be considered as helpful strategies in regulating emotional experiences, although every individual is differently receptive to it.

Noteworthy, any participant has reported using suppression as response modulation. This let assume that players are generally using healthy emotion regulation strategies. Besides, the variety of mentioned emotion self-regulation strategies indicate that players' are aware of different resources and highlight nicely benefit and effectiveness of such strategies depend on the individual player.

In addition, it needs to be considered that although players described successful use of different strategies to up-regulate functional emotions and down-regulate dysfunctional emotions, results revealed some gaps. Findings indicated potential to improve and broaden players' emotional self-regulation strategies, because all players described situations in which they did not know what to do to keep up their motivation and self-belief. Being overwhelmed with certain situations is normal and it is impossible to regulate constantly one's emotional experiences successfully and efficiently. However, players can improve or build up new emotional regulation strategies, since only a few have mentioned the use of additional strategies such as situation modification, goal setting, routines, etc. Additionally, literature has shown that coaches take on an essential role in the interpersonal relationship (Jowett, 2004), and they could essentially contribute to enriching players' emotional self-regulation toolbox. Therefore, special emphasis was put on the interpersonal emotion regulation strategies.

6.4 Coaches' Support in Regulating their Players' Emotional States

Findings revealed a variety of different and effective interpersonal emotional regulation strategies, namely coaches' adaptability, positive reinforcement, (non-) verbal feedback, reappraisal, sarcasm, and routines. Most of the interpersonal emotional regulations strategies were mentioned by both coaches and players, and players' described the provided support by their coaches mainly as helpful and beneficial. The accuracy between coaches and players is noteworthy and let assume that coaches were aware of and understood their players' thoughts, emotions, and needs. This is not only in line with the aforementioned findings that coaches were able and accurate in recognizing their players' psychological states but also supports the construct of empathetic understanding of Jowett (2004). According to Jowett's 3+1C model (2007), empathetic understanding is a dimension of co-orientation and is defined as the "…degree to which a relationship member understands the other member's feelings, thoughts, and behaviors…" (Jowett, 2007, p.19). It is assumed that empathetic understanding is a crucial aspect to strengthen the bond within a relationship because it forms the basis to adjust and react optimally to the partner's needs and concerns, and to understand and develop common goals and values. So for example, a coach who is able to put on the shoes of his player might help a player to build up feelings of closeness and commitment towards the relationship. Moreover, the fact that players experienced the emotional support by their coaches as influential and beneficial, gives also support for the two underlying processes of van Kleef's model of emotion as a social information, namely inferential process and affective reactions (EASI; van Kleef, 2009). Inferential process, as introduced, reflects the aspect that people make appraisal and gain information through the emotional expression of others. This assumption is in line with the findings that coaches use their player's somatic and affective reactions to recognize and understand their psychobiosocial state. However, it also indicates that also players can use their coaches' emotional expression to evaluate their own performance and behavior. For example, a coach's applaud might inform the player that he or she did well, what subsequently might enhance the player's self-confidence. In contrary, affective reaction encompasses the affective effect of emotional expression on the interpersonal bond, and it is divided into emotional contagion and interpersonal liking. Emotional contagion can be defined as the process, where showing emotional states

triggers an emotional reaction in the observer and most likely leads to an adaptation of an observers' emotional state to the emotional state of the expresser. In other words, if a coach is smiling (emotional expression), it might provoke a smile in the player (emotional reaction), what can increase a player's psychological state (i.e. more motivated or confident). In contrary, interpersonal liking rather suggests that emotional expression can affect the interpersonal relationship quality. Hence it can be said, that coaches can induce pleasant or unpleasant feeling to their athletes based on their own emotional expression. With regard to the results of the interpersonal emotion regulations strategies of the present study, following assumption can be made.

Both coaches and players pointed out the relevance of coaches' adaptability to players' thoughts, emotions, behaviors, needs, and concerns, what supports both the empathetic understanding of coaches, and inferential process and affective response. Especially coaches' ability to stay calm and to provide a balance to their players' emotional arousal was highlighted. These findings are also in line with Côté et al.'s (2007) assumption that excellent coaches need to be able to alter their behavior so that it is congruent to their players' needs. Moreover, the idea of adjusting one's behavior in order to support one's partner optimally is bolstered by Vargas-Tonsing and colleagues (2004), who showed in their study that athletes' interpret their own emotional experiences depending on coaches' emotional and behavioral expression, what is similar to the inferential process. Therefore, it can be assumed that staying calm and positive throughout a competition is an essential strategy for coaches to boost their players' self-efficacy and self-confidence. However, it is not clear if coaches' calmness and harmony is simply a regulation strategy or rather a characteristic trait of tennis coaches. For example, coaches mentioned that they are concerned to hide their negative emotions and only show positive emotions and gestures. Nonetheless, coaches did not experience hiding negative emotional expressions as suppression because they simply do not get angry or frustrated easily. They pointed out that they are also calm and well-balanced in their private life, what might suggest that they tend to have an agreeable personality character.

Further support for the empathetic understanding, and inferential process and affective response, was provided by the findings for positive reinforcement. Coaches' explained that positive reinforcement is an essential aspect to strengthen players' self-confidence and to correct their mal-attribution. Players are often not aware of what they have done well, and coaches need to take on the role of pointing out the good or

excellent aspects. Simultaneously, players' underlined that receiving positive reinforcement, both verbally (i.e. "you can do it!") and non-verbally (i.e. clapping, smiling), from their coaches boost their self-belief and self-confidence, what is in line with the aim of the inferential process. Moreover, if players see their coaches being positive and optimistic it evokes similar feelings in them, what supports the assumption of emotional contagion. The fact that players' experienced positive reinforcement as accurate and appropriate indicates the empathetic understanding of coaches.

Moreover, coaches' empathetic understanding was also reflected by the interpersonal emotion regulation strategy of post-performance routine. Interestingly, both coaches and players described players' post-performance routine as a valuable strategy. Although routines might be considered as a self-regulation strategy, in the current study they were identified as an interpersonal strategy because coaches encouraged players intentionally to do their cool-down, to have a shower, or to get some food after a match. Giving players some time and space to overcome the first level of frustration or excitement after a performance facilitates, according to coaches and players, a more rational and open-minded post-match meeting. Hence, it can be assumed that routines help regulating the psychobiosocial state. Therefore, it can be said that coaches' ability to step back and to provide space clearly asks for an empathetic understanding.

In addition, empathy is seen as an important dimension of communication (Jowett, 2004; La Voi, 2007). In the present study, findings revealed that communication is one major interpersonal emotion regulation strategies by highlighting the importance of a clear, objective, and positive-toned feedback culture. Findings showed that coaches interact with their players almost continuously. They communicate with each other before, during, and after practice sessions and matches. Moreover, coaches mentioned that if they analyze or simply talk with their athletes during and after practice or after a match, they always encompass the feelings and emotions of their players. For example, they actively asked players how they felt during a match, why they were frustrated on the court, etc. Hence, it can be assumed that the active, bi-directional verbal exchange facilitates the development of a shared language and a mutual understanding. Coaches get to know how their players tick and what their values are. These findings are also in line with the assumption that the deeper bond between coaches and players might be a reason for coaches' accuracy in understanding and recognizing players' emotional experiences.

Besides, both coaches and players pointed out the importance of non-verbal and verbal feedback, and emphasized that it is always positive-toned but critical, and that it includes technical, tactical, emotional-related aspects. The feedback should always focus on the strength of a player, although weaknesses and struggles are not neglected. Weaknesses are simply approached as potential that can be improved in the coming practice sessions. Besides, focusing on positive aspects can furthermore be linked with the aim of reappraisal. Coaches' are aware that players sometimes dwell too much on negative aspects of a match, wherefore it is important to help putting mistakes into perspective by outlining the positive aspects of the performance. This understanding or coaching philosophy can be associated with the mastery approach and coaches' empathetic understanding. It seems that coaches are aware of encouraging players without glorifying the performance.

However, findings also emphasized the detrimental effect of a lack of empathetic understanding, and a lack of awareness of inferential process and affective responses. The discrepancy in coaches' intention, and players' perception and expectations can harm the player's psychobiosocial state. For example, results showed that coaches might have the tendency to adjust the degree of positive emotional expression to players' performance. In other words, coaches provided more positive affective (non-) verbal support when players performed less successfully. In coaches' opinion, players are enough self-confident and self-efficient when they play well and do not need extra support. However, when players struggle on the court, coaches rather tend to give more deliberate positive emotional support. This is somehow contradictory to players' expectations. Three out of five players emphasized that they seek for and need appreciation and confirmation even during and after a successful performance. Similar findings were revealed for the interpersonal emotion regulation strategy of sarcasm. Two coaches mentioned that they support their players in dealing with frustration or other dysfunctional psychobiosocial states by using sarcasm or making jokes. Coaches explained they want to encourage players to put their performance into perspective. Instead of getting angry about small mistakes or trying to change really bad performance with the sledgehammer, players should rather take a step back and relax. However, players did not agree on the effectiveness of sarcasm and did not define it as supportive, but rather see it as annoying and harmful. Once again, this highlights the importance of a consensus in coaches' intention and players' perception of interpersonal emotion regulation strategies.

In conclusion, findings of the present study showed that coaches recognized and understood their players' psychobiosocial states accurately and were able to adapt their own emotional experiences to their players' needs in order to provide beneficial support for their players in regulating their emotional experiences. These findings are in line with the assumption of the hierarchical four branch model of emotional intelligence of Mayer and Salovey (1990). The model suggests that in order to regulate emotional experiences appropriately, a person needs first to be able to recognize, use, and understand his own and others emotional experiences.

Chan and Mallett (2011) argued that emotional intelligence is one of the main qualities of successful and effective high-performance coaches and claimed that emotional intelligence might actually make the difference between good and excellent coaching, and conclusively also between good and great coach-athlete relationship. Chan and Mallet assumed that coaches, who are able to recognize their players' emotional experiences accurately, can use it as cues to predict behavior or performances, to alter players' response and behavior, to provide early intervention before problems get serious, and to differentiate between honest and dishonest expressions of emotions. Thus, communication about and interest in athletes' needs and concerns is critical to get to know athletes and how they function. Moreover, they suggested that an efficient use of emotions by coaches, such as celebrating little successes, can create a more positive climate and strengthen the social bond. Hence, positive reinforcement and positive feedback are important. In addition, Chan and Mallett (2011) suggested that coaches should understand when certain emotional experiences are beneficial and when they are harmful for athletes, and should know how they can support athletes to reach their optimal zone of performance. Each individual is different and every athlete has his or her own emotional recipe, which is why it is crucial to keep in mind the intraindividuality. Additionally, it is not only about providing support but also about providing the optimal and accurate support. As revealed, sarcasm or less positive reinforcement and feedback after successful performances can be contra-productive. After all, Chan and Mallett (2011) pointed out that the ability to regulate emotional experiences efficiently requires overall emotional abilities and competences. Transferred to the present study, it can be said that coaches ability to describe and recall the psychobiosocial state of their players during best and worst performance accurately, and the similar perception of coaches and players about

the interpersonal emotional regulation strategies, indicate that coaches are moderate to highly emotional intelligent.

Nevertheless, findings of the present study put special emphasize on the coach-athlete relationship quality. As claimed by Jowett, Yang, and Lorimer (2012), athletes' perception of the quality of the relationship with their coaches is influenced by empathetic understanding. Hence, players' who feel more understood and respected by their coaches also perceive the relationship as better and subsequently are more satisfied with the practice and performance. Conclusively, it can be assumed that emotional intelligent coaches might have a higher level of empathy what in turn increases players' perception of the relationship quality and encourages an open communication. In addition to the knowledge provided by Jowett (2007) about the quality of coach-athlete relationships and their impact on psychological state of athletes, the construct of altruistic leadership should be considered (Miller, Fink, Pastore, Baker, Mason, 2012). Altruistic leadership is defined as "...guiding others with the ultimate goal of improving their wellness..." (Miller et al., 2012, p.4). In their study, they revealed that the focus in altruistic leadership is on four aspects; character, caring, empowerment, and balance. Under character, coaches pointed out how important it is to be intrinsically motivated for the task in order to build up ethical and moral values within a relationship. If compared to the findings of the present study, it becomes apparent that coaches' also stress the importance of being passionate about the job and following one's personal philosophy. The aspect of caring was understood as caring for athletes such as meeting their needs, providing individual attention, and being a role model or parental substitute. Similar results were established in the present study; coaches stressed the need to adjust behavior, emotions, and practice sessions to the needs of their players and act as a role model. In addition, both coaches and players pointed out the importance of giving full attention to and being interest in the player, as a person and as a tennis player. Empowerment, the third aspect, was explained by enabling athletes' life skills, aiming for improvement, and keeping a positive mindset, regardless of the outcome. In the present study, coaches' highlighted that it is important to give players responsibility and including them into feedback and performance analysis. In order to support players in their personal growth and tennis career, coaches give them the possibility to think and experience. Finally yet importantly, is the aspect of balance. In the study of Miller et al. (2012), coaches referred to the fact that it is not only about wining – not for players nor for coaches. More importantly is to evaluate one's personal development, what includes

obviously the nurture of the mastery approach. Similar ideas were pointed out in the present study by the coaches. Keeping a balance between fun and hard work is essential to strengthen motivation, commitment, and the coach-athlete relationship. Based on the these assumptions it can be suggested that altruistic leadership seems to share some crucial aspects with the construct of emotional intelligence, and might actually give more concrete insight and explanations, why tennis coaches' were so successful and accurate in reading and regulating their players' emotional states; why they were emotional intelligent.

6.4 Limitations

A major strength of this study was its inclusion of both coaches' and players' perceptions. This allowed a direct comparison between intrapersonal and interpersonal perspective, between self- and meta-experiences. Thus, new and rich insight into players' perceptions of their coach's emotion-related supportive behaviors was gained.

Nevertheless, some limitations need to be considered. Emotional experiences were described with the psychobiosocial scale (PBS-S). The PBS-S scale is a new instrument and up to date, no validation has been done for the scale. Besides, PBS-S scale did not exist in German language, which is why a translation from English was conducted at the beginning of the study. Although a back translation was done to provide the best trustworthiness and validity as possible, an entirely match within meaning could not be guaranteed. In addition, the recall of psychobiosocial experiences in the best and worst performance does not necessarily represent a players' absolute optimal and functional state. However, the aim of the present study was not the validation of the scale but rather considered the PBS-S scale as a beneficial tool to gain more insight into coaches' perception of emotional experiences and their emotional intelligence. Furthermore, information gathered through interviews was highly sensitive and subjective, wherefore the completeness is matter of participants' willingness to share and ability to recall. Another restriction which hast to be considered is the very specific target group of the present study. The unequal gender-distribution and the different cultural backgrounds can shape the understanding and social acceptance of emotions, what could have decreased the validity of some results. Coaches and players might have a different perception of emotions, although it became apparent that the accuracy was moderate and a same language was used.

Another ethical issue is the subjectivity of the researcher. Due to the personal past tennis career, the researcher was familiar with some of the participants and specific expectations towards interviews and findings could not be excluded. To avoid a possible researcher bias, the semi-structure interview guide and data analysis was run under the scope of interpretative phenomenological approach and second coders were used to increase trustworthiness and validity. Interviews were recorded so that a word for word transcription was provided.

6.5 Future Research

In the present study, the PBS-S scale was used for the first time under both intrapersonal and interpersonal perspectives, and findings revealed the benefit of the scale for gathering information about coaches' ability in emotion recognition and emotional intelligence. Therefore, in future research it might be interesting to develop this approach further and compile additional studies in different sport settings in order to validate the PBS-S scale and to explore the relevance and characteristic of emotional intelligent coaches in other sports. However, to gain a more reliable understanding about players' optimal psychobiosocial states and their coaches' emotional intelligence, the PBS-S scale should be assessed for more than one best and worst performance.

Moreover, findings of the present study pointed out only a few emotion regulation strategies used by coaches and players. In future research, it would be interesting to examine other intrapersonal and interpersonal emotion regulation strategies in both individual and team sports to acquire deeper knowledge about the use and efficiency of emotion regulation strategies. These findings might add valuable information for coaching education programs in terms of recommendation or guidelines for providing an optimal and successful support in regular athletes with their emotions.

Furthermore, the unique, close, and trustful relationship between tennis coaches and players became apparent. This let assume that the coach-athlete relationship plays a crucial factor within emotional regulation, although is not clear if the social bond is a cause or result of emotional intelligent coaches. Hence, it might be interesting in a next study to investigate if altruistic leadership (Miller et al., 2012) is associated with emotional intelligence, the athletes' emotional regulation efficiency, and successful performances.

Finally yet importantly, findings of the current study put special emphasis on coaches' calm personality trait. Both coaches and players pointed out the beneficial impact of a well-balanced and positive coach on players' emotional regulation and performance. It might be interesting to investigate if this is a specific characteristic trait of tennis coaches, and if other personality traits might serve as an efficient emotion regulation strategy as well.

6.6 Conclusion

Findings of the present study highlighted the interconnection between coaches' ability to recognize their players' psychobiosocial states accurately and to provide efficient regulation strategies for their players' emotional experiences. These findings supported the aim of the hierarchical model of emotional intelligence (Mayer & Salovey) which claims coaches' ability to recognize, understand, and utilize their own and others emotions as basis for an optimal support in regulating functional and dysfunctional emotional states. However, what strategies are actually used by coaches depend on athletes' personality and needs, on situational factors, and on a coach's philosophy and characteristic. Nevertheless, the study highly supported the construct of empathetic understanding (Jowett, 2007; Jowett & Ntoumanis, 2004; Jowett et al., 2012) and the process of emotional contagion (van Kleef, 2009) by highlighting the crucial impact of coaches' emotional response on players' emotional state and self-confidence.

This study, conducted with the PBS-S scale, has served as an interesting example for further consideration of an investigation in the use of the PBS-S in interpersonal relationships in sport setting. It can be assumed that future research will gain beneficial insight in how intrapersonal and interpersonal process regarding emotional experiences and emotional regulation are associated if using a cross-modal approach.

While the results might not be conclusive on the role of tennis coaches in regulating their players' emotional states, they should stimulate new research in the field to add valuable information to coaching education programs, especially in Switzerland.

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APPENDICES

APPENDIX A

Interview guide for coaches

1. Demographics

• Age
• Sex
• Origin
• Region, Club
• Education/coaching level
• Time span of experience in coaching
• Language
• Can you describe shortly your coaching career up to date?
    ○ *players, clubs, education, special highlights as coach or player, goal*
    ○ *What was your biggest success?*

2. Coach-athlete relationship

• Since when are you working with your actual player?
    ○ *How many times per week are you working with your athlete? How many times in individual sessions?*
• Are you joining your athlete to tournaments?
• What do you like about coaching?
    ○ *Which is the most challenging aspect in coaching for you personally?*
    ○ *Which aspect for successful performance?*
• What is important for you to build up a trustful and supportive of the coach-athlete relationship?
    ○ *What are key aspects, which need to match between coach and athlete?*
• How would you describe your relationship with your player?
    ○ *How is it on the court? How is it off the court?*
      What is your role in your coach-athlete relationship
• What is your key characteristic as a coach?
    ○ *Can you describe me this a bit more? What is beneficial about it?*

3. Emotions in tennis

• What do you think are the most important emotions in tennis setting?
    ○ *For what reason?*
    ○ *Do you put special emphasize on these aspects in practice?*
• How do emotions influence your coaching performance?

4. **Emotion regulation**
a. Coaches' emotional awareness

• What is the role of your own emotions?
    ○ *Would you describe yourself as an emotional person?*
    ○ *Do you think your own emotions influence how you are coaching? If so, how?*

- How would you describe your player regarding emotions?
    - *What emotions does your athlete most likely experience on the court?*
    - *When he/she is performing successfully/unsuccessfully*

Based on the PBS:
- How do you recognise these emotional states?
    - *What are the signals?*
    - *Is there a difference between successful and unsuccessful performance?*
- When your athlete is performing on his best / worst, what is different to normal performances (focus on emotional experiences)

b. Coaches' emotion regulation strategies

- How do you react on such emotional states of your player?
    - *Can something trigger your emotional response*
    - *What emotions do you express? What emotions do you try to down regulate?*
- How do you regulate in general your emotions?
    - Do you have certain strategies? Are they always the same? Where did you acquire these strategies?
- Can you describe me more specifically what you are doing to prolong positive functional emotions?
    - *Is it easy for you to regulate your emotions in successful situations?*
- Can you describe me what you are doing when you are dissatisfied or stressed? *(when your athlete is not performing well)*
    - *Is it easy for you to regulate your emotions in stressful situations?*
- What emotion are the most difficult ones to regulate? For what reason?

c. Coaches' approaches to athletes' emotion regulation strategies

Based on the PBS and mentioned signals:

- How do you help your athlete regulating dysfunctional emotions?
    - *What are you doing when your athlete is down, angry, devastated?*
        - *Is it more instructional, affective?*
    - *How do you react when your athlete has not performed well (practice and match). How do you react if your athlete has lost a match, tournament? How do you support/motivate him or her?*
    - *Can you describe me, how you help your athlete dealing with losses?*
    - *How do you regulate your own personal emotions in such situations?*
- How do you help your athlete regulating functional emotions?
    - *What are you doing if your athlete is overjoyed and excited?*
        - *Is it more instructional, affective?*
    - *How do you react when your athlete has performed very well (practice and competition?) When your athlete won a match, tournament?*
    - *Can you describe me how you support your athlete in dealing with victories*?
- How do you behave and regulate your emotions in such situations? Do you adapt your emotions to your athlete's state*?*
    - *Do you try to change or suppress your emotions to support your athlete*
- Do you have a tip for other coaches concerning helping athletes regulating their emotions?

Comments?

Interview guide for players

1. Demographics

- Age
- Gender
- Ranking
- Main club
- Training sessions per week
- Language
- Can you describe shortly your tennis career up to date?
  - *when did you start playing tennis, coaches, clubs, goal*
  - *What was your biggest success?*

2. Coach-athlete relationship

- Since when are you working with your actual coach?
  - *How many times per week are you working? How many times in individual sessions?*
- Is your coach joining you to tournaments?
- What is important for you to build up a trustful and supportive of the coach-athlete relationship?
  - *What are key aspects, which need to match between coach and athlete?*
- How would you describe your relationship with your coach*?*
  - *How is it on the court? How is it off the court?*
- *What is the role of your coach in your coach-athlete relationship*?
- What is the key characteristic of your coach?
  - *Why do you experience this as so beneficial?*

3. Emotions in tennis

- What do you think are the most important emotions in tennis setting?
  - *For what reason?*
  - *Do you put special emphasize on these aspects in practice?*

4. Emotion regulation

a. Athletes emotional awareness

- How would you describe yourself regarding emotions?
  - *What emotions do you normally have on the court?*
- What is in your opinion the most important thing to perform successfully in tennis?
- What are the most important emotions for you to perform successfully?

Based on the PBS
- How do you feel about these emotional experiences?
  - *Is there something surprising? Something of special interest?*
- What was different before your most successful / unsuccessful performance compared to regular performances
- How do you express your emotions usually?
  - *When yes in what situations? How?*
  - *Do you talk to our coach about your emotions*?

Coach und PBS
- What do you think, how well will your coach be able to guess your emotional

experiences during your most successful and unsuccessful
- Does he/she recognize signals of your emotional state?
    - *Can you give me some specific examples?*
- How does your coach react on your emotions?
    - *Can you give me some specific example?*
- How do you experience your coach on the court?
    - *Does your coach show his/her emotions in practice/competition? When yes, which ones and how?*

a. Players' emotion regulation strategies

BASED ON PBS:

- How do you regulate your emotions (in successful and unsuccessful) situations?
    - *Do you have certain strategies? Are they always the same? Where did you acquire these strategies? Ask for concrete examples*
- Can you describe me more specifically what you are doing to prolong good emotions if you are performing well?
    - *Is it easy for you to regulate your emotions in successful situations?*
- Can you describe me what you are doing when you are dissatisfied or stressed?
    - *Is it easy for you to regulate your emotions in stressful situations?*

b. Athlete's perception of coach's emotional state and regulation strategies

- How is your coach on the court? How would you describe your coach concerning emotions?
    - *Does your coach show his or her emotions on the court? What emotions? When?*
- What is your coach doing to help you regulating your harmful emotions?
    - *What is he doing when you are not performing well?*
    - *What does he/she do when you are nervous/afraid*
    - *Does your coach make you nervous, can he/she be a stressor?*
- If you lose a match, do you perceive your coach as supportive?
    - *What is he doing?*
    - *Do you perceive your coach as supportive*
- What is your coach doing to help you regulating functional emotions?
    - *What is he doing if you are performing well?*
- *What* is your coach doing when you won a match?
    - *Can you describe me in more detail what how your process looks like?*
    - *Do you perceive your coach as supportive*
- Does your coaches' behavior differ between successful and unsuccessful performance?
- Does your coach try to cover negative emotions?
    - *What strategies does your coach use to regulate his dysfunctional emotions?*
    - *Do you remember situations when your coach had difficulties in regulating his/her emotions? Situations in which he/she was stressed, angry, etc?*
- Does your coach's behavior influence you in anyway? How?

c. Athletes' expectations

- What could your coach do that you could regulate your emotions more efficiently?
- What support would be great?
- Do you have any tips for other tennis players regarding regulating emotions?
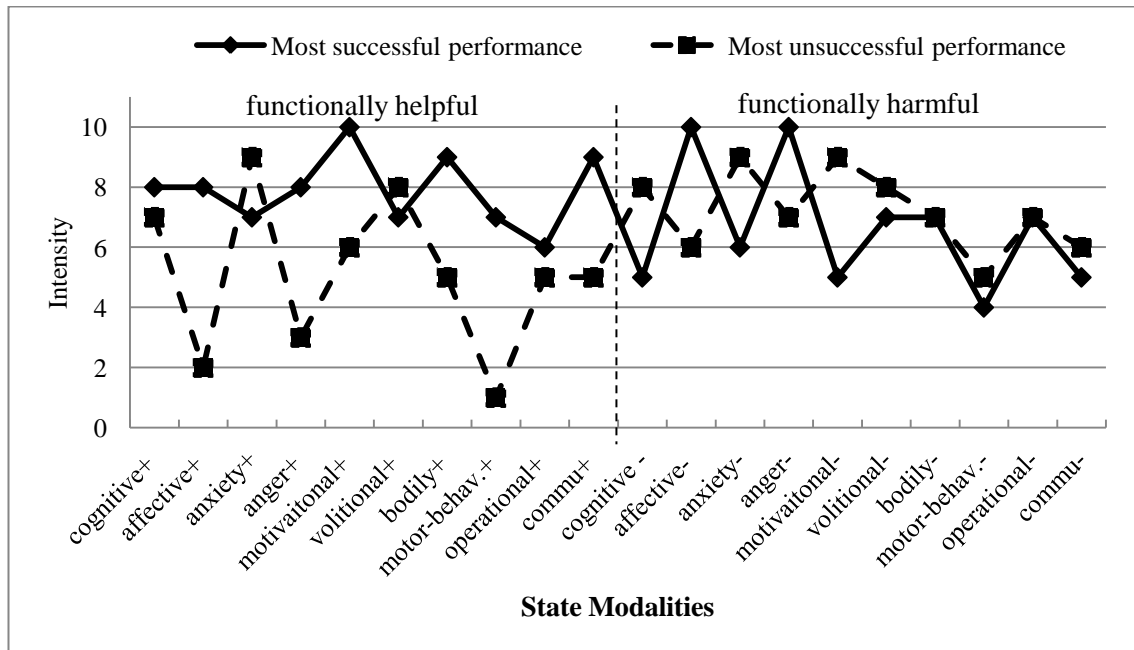
Comments

APPENDIX B

Players' individual psychobiosocial states profiles (PBS) for most successful and
unsuccessful performance

PBS profile of a tennis player (01) for most successful and most unsuccessful performance
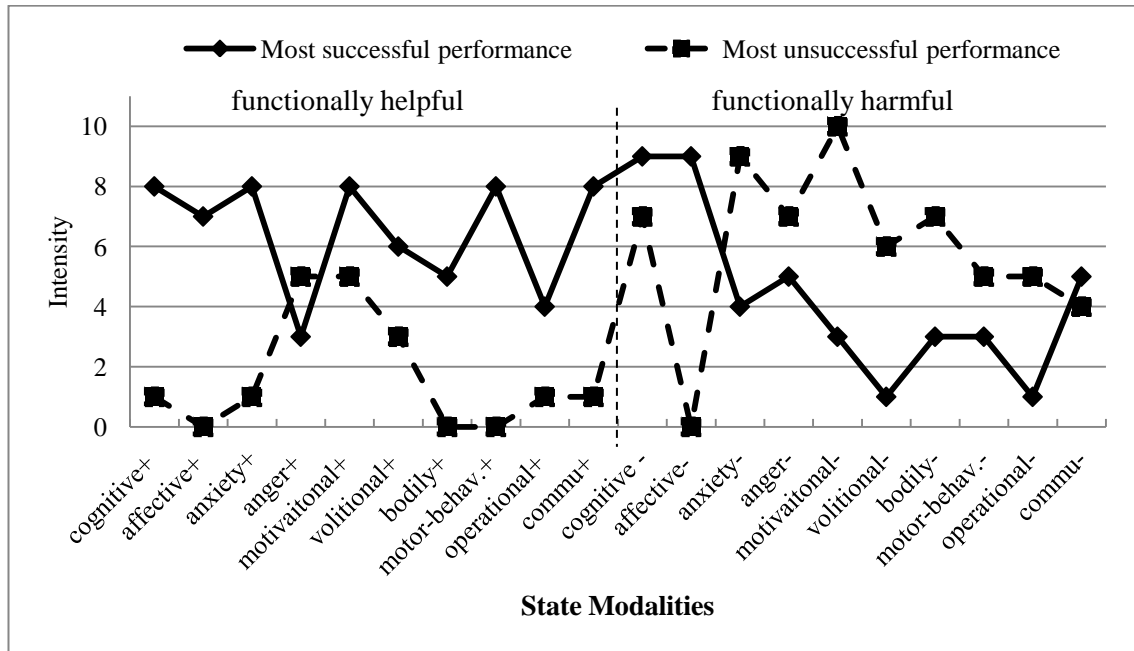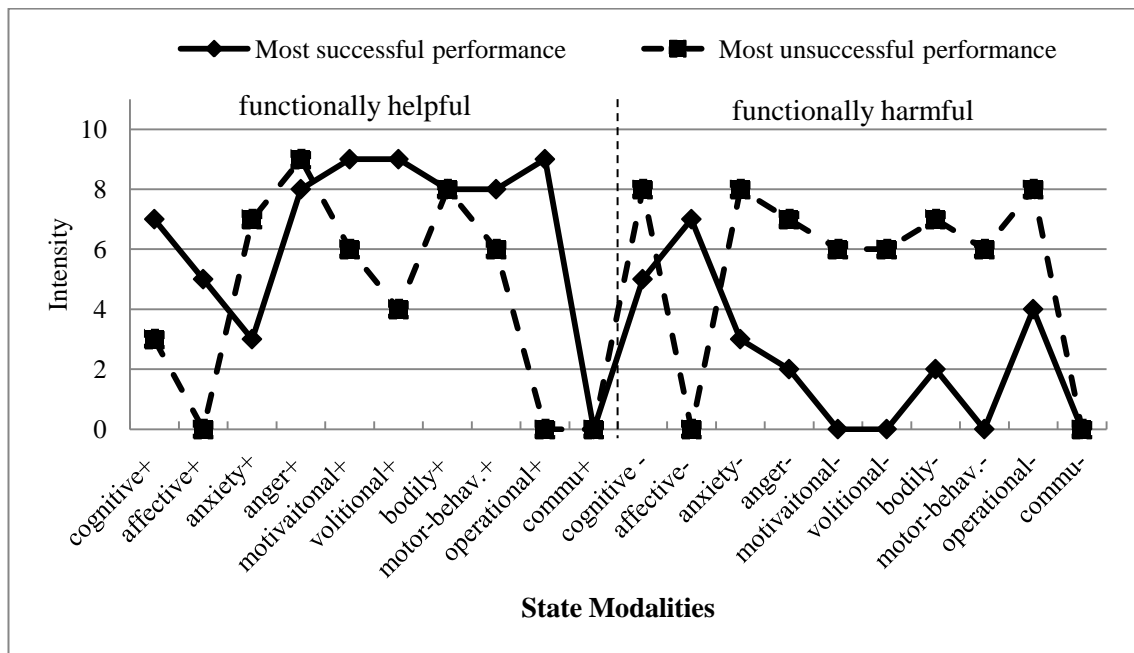

PBS profile of a tennis player (03) for most successful and most unsuccessful performance
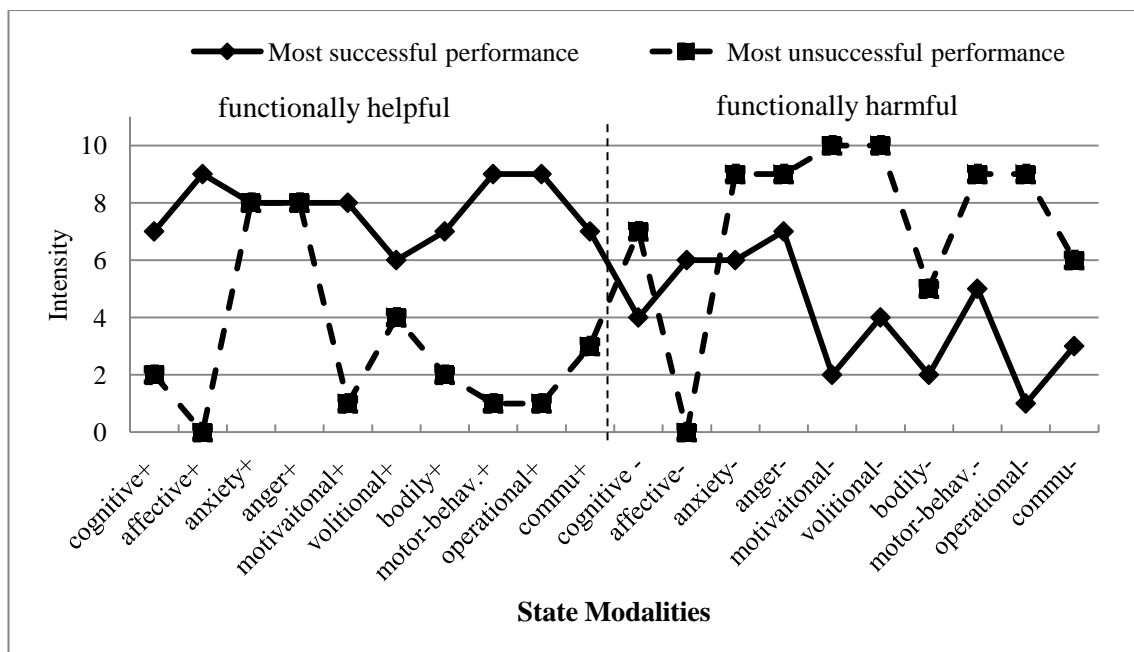
PBS profile of a tennis player (04) for most successful and most unsuccessful performance
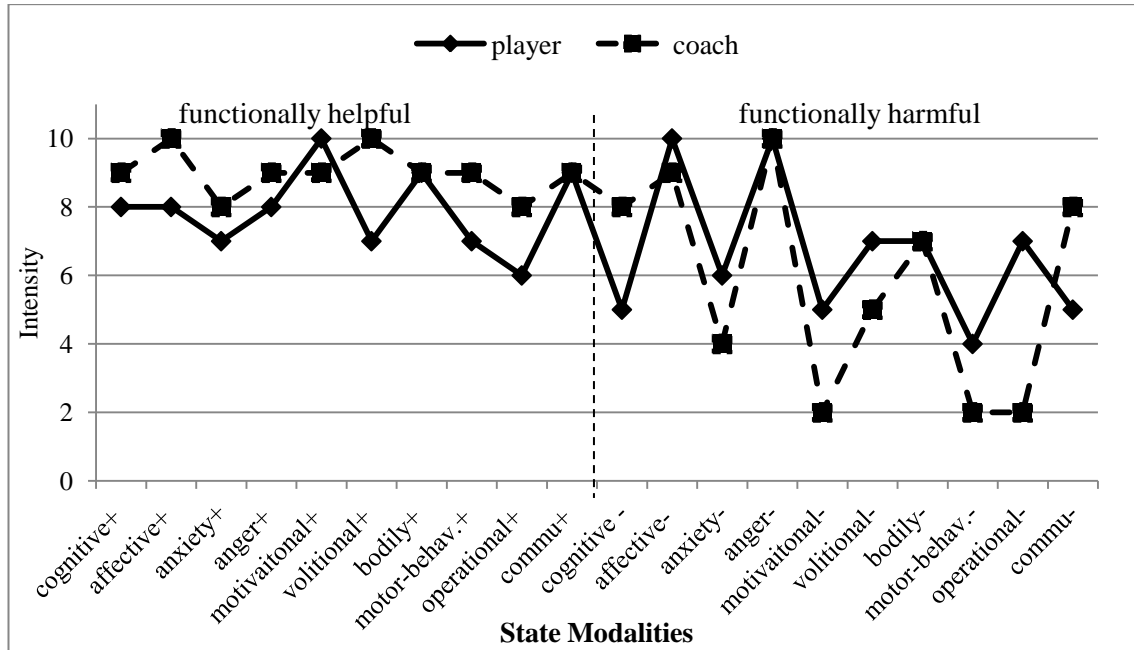

PBS profile of a tennis player (05) for most successful and most unsuccessful performance

APPENDIX C

Comparison of coaches' and players' psychobiosocial state profile (PBS-S) for most successful and most unsuccessful performance
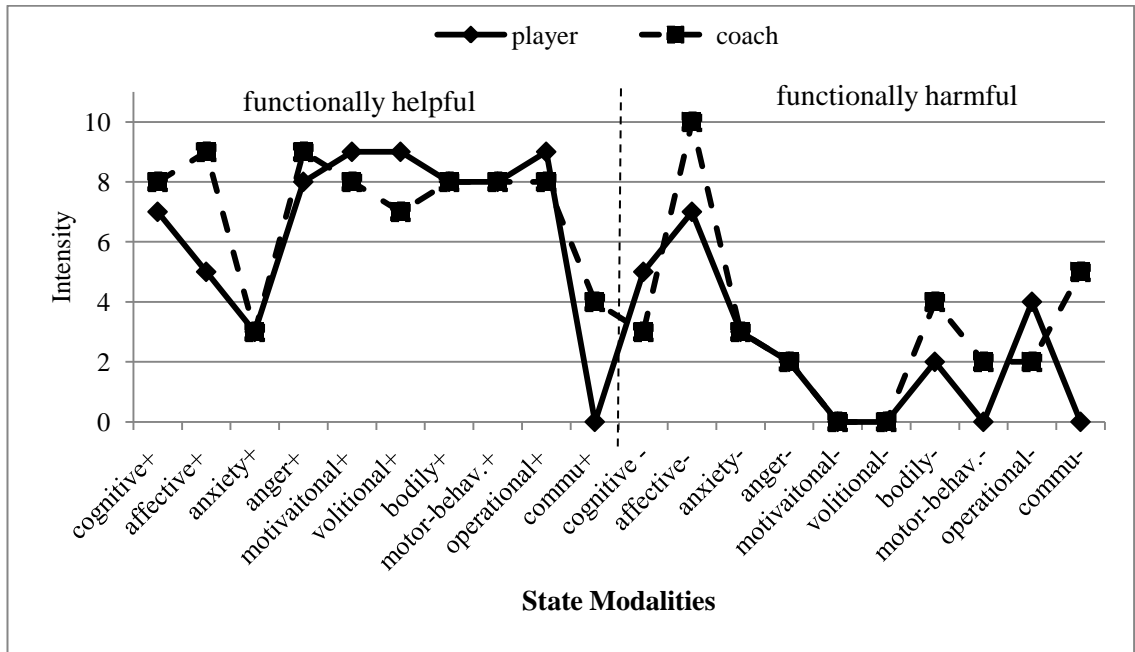
Accuracy in intensity of psychobiosocial states between coach and player for the most successful performance; dyad 03
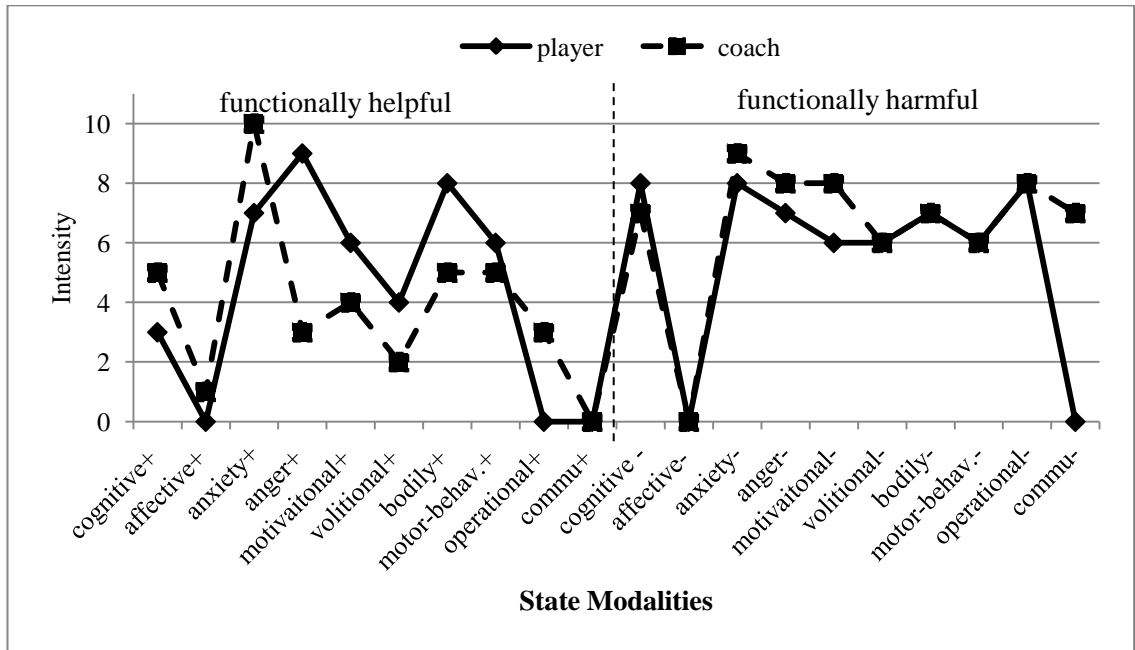

Accuracy in intensity of psychobiosocial states between coach and player for the most unsuccessful performance; dyad 03
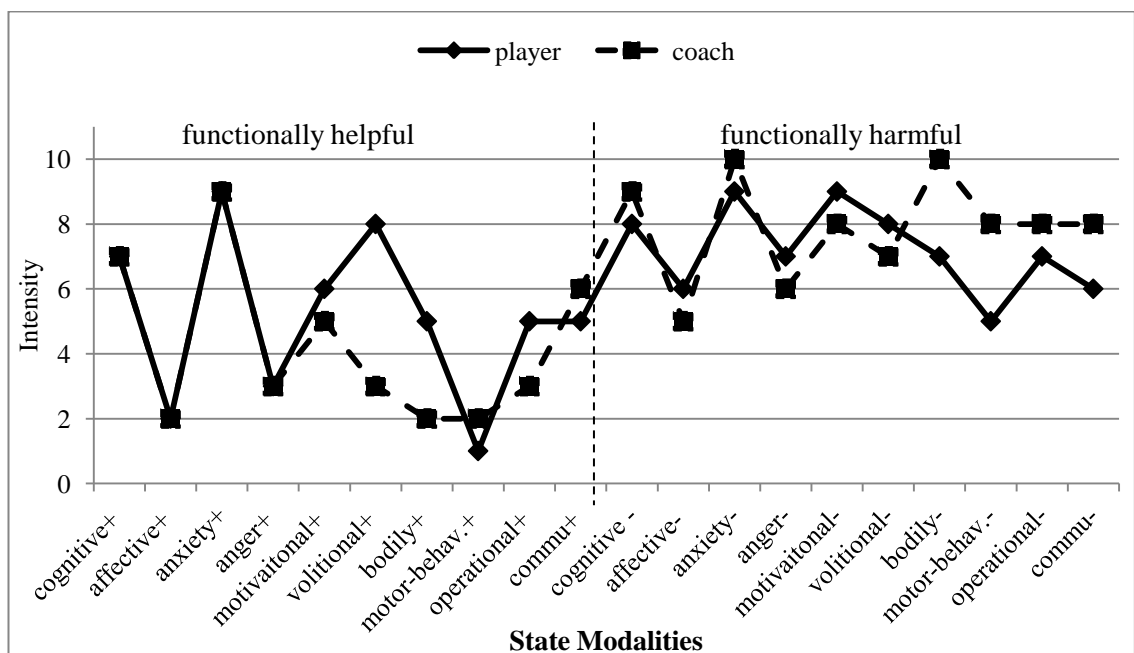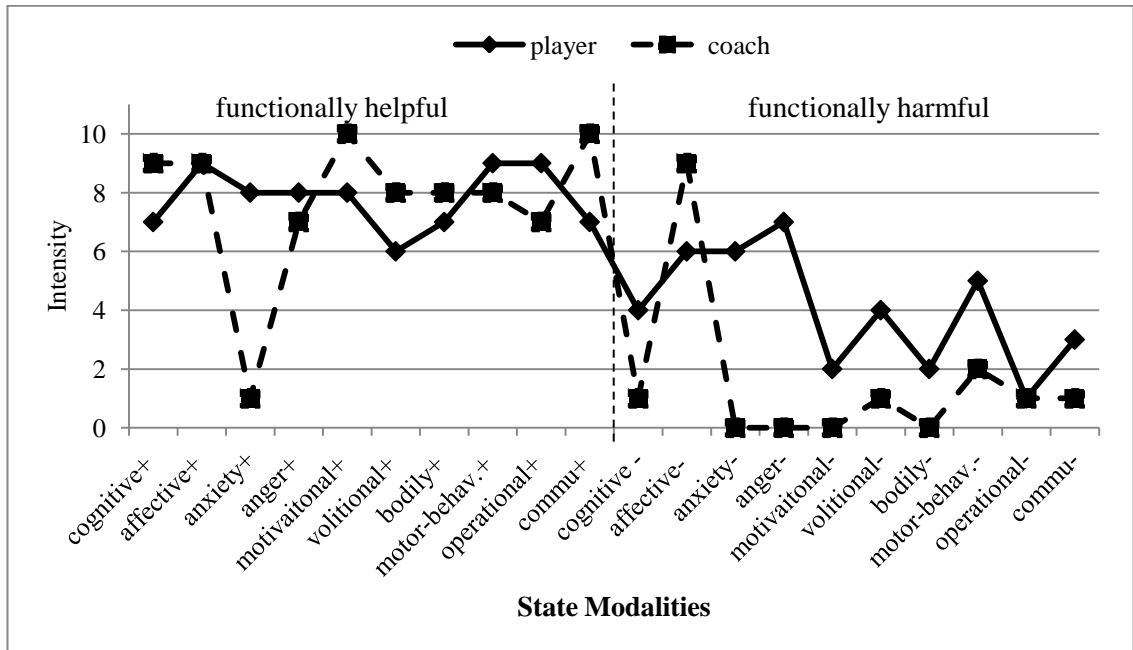
Accuracy in intensity of psychobiosocial states between coach and player for the most successful performance; dyad 04

Accuracy in intensity of psychobiosocial states between coach and player for the most unsuccessful performance; dyad 04

Accuracy in intensity of psychobiosocial states between coach and player for the most successful performance; dyad 05

Accuracy in intensity of psychobiosocial states between coach and player for the most unsuccessful performance; dyad 05