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Marcela Gonçalves Freitas

SELF-TALK AND SELF-REGULATION OF HIGH-PERFORMANCE YOUNG TENNIS PLAYERS IN TRAINING AND COMPETITION

AUTOFALA E AUTORREGULAÇÃO DE JOVENS TENISTAS DE ALTO RENDIMENTO EM TREINAMENTO E COMPETIÇÃO

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Advisor: Thiago José Leonardi, Ph.D.

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ABSTRACT

Currently, self-talk is one of the self-regulation strategies in Sports Psychology that has been more widely recognized and used by athletes and coaches. The present study has the general objective of describing the observable and unobservable (self-reported) self-talk and gestures of young high-performance tennis players in training and competition settings. Specifically, the present investigation has as main objectives: (1) Identify and compare observable self-talk used by tennis players in training and competition settings; (2) Describe and compare the perceptions that tennis players have about their self-talk (self-reported self-talk) in training and competition settings; (3) Categorize the perceptions that tennis players have about their self-talk and gestures in both contexts; and (4) Verify how much awareness tennis players have about their self-talk by comparing data collected from observations and interviews. It should be noted that an objective that had not been established and that emerged from the data collection with the tennis players was to evaluate the relationship between tennis players' self-reported self-talk and their affective processes. A mixed method approach was carried out in four stages: pilot study, data collection in an international tennis tournament, data collection in training sessions of the participants and semi-structured interview with each of the tennis players. Quantitative data were analyzed using descriptive statistics, analysis of variance (ANOVA) and cluster analysis. Qualitative data were analyzed using a Thematic Analysis. In Study I, mixed research was developed to compare tennis players' self-talk in competition and practice sessions and the tennis players' self-reported self-talk in interviews, with the main focus being the age-related and context-related aspects of self-talk. In Study II, a deductive Thematic Analysis was proposed based on the speeches of the participants in the interviews, with the aim of identifying patterns in the self-talk and gestures of young tennis players in training and competition. We conclude that, although the literature on self-talk already presents empirical investigations in different sports and some possible theoretical models, there is still a vast field to be covered by research, such as the characteristics of self-talk across childhood and adolescence and the level of awareness that the individuals, especially young, have of their self-talk. We present initial data and hypotheses about the nuances of self-talk and awareness of tennis players aged 11 to 17 and we advance in the description of how these participants talk to themselves in training and competitions. Through Study I, we concluded that tennis players have a significant difference in their self-talk in training and competition, mainly in the quantitative aspect, but also in the qualitative, and that younger tennis players have less

awareness about how they talk to themselves in these contexts. From Study II, we expanded the result that had already been described in Study I from the categorization of the most used self-talk categories in competition and training, emphasizing, again, that tennis players largely use this self-regulation strategy in the first context. Finally, we reinforce the importance of carrying out investigations into the self-talk of child and adolescent tennis players in other cultures, as well as investigations into the self-talk of coaches in training and interventions that develop the metacognitive capacity of young athletes.

Key-words: Sport Psychology; Inner dialogue; Emotion regulation; Mixed method.

RESUMO

Atualmente, a autofala é uma das estratégias de autorregulação mais amplamente reconhecida e utilizada por atletas e treinadores no campo da Psicologia do Esporte. O presente estudo tem como objetivo geral descrever a autofala e os gestos observáveis e não-observáveis (autorrelatados) de jovens tenistas de alto rendimento nos contextos de treino e competição. Especificamente, a presente investigação tem como objetivos principais: (1) Identificar e comparar a autofala observável utilizada por tenistas em contextos de treino e competição; (2) Descrever e comparar as percepções que os tenistas têm sobre a sua autofala (autorrelatada) em contextos de treino e competição; (3) Categorizar as perceções que os tenistas têm sobre a sua autofala e os seus gestos em ambos os contextos; e (4) Verificar o nível de autopercepção que os tenistas têm sobre a sua autofala, comparando dados coletados de observações e entrevistas. Ressalta-se que um objetivo que não havia sido estabelecido e que emergiu a partir da coleta de dados com os tenistas foi avaliar a relação entre a autofala autorreferida dos tenistas e seus processos afetivos. Uma abordagem de método misto foi realizada em quatro etapas: estudo piloto, coleta de dados em um torneio internacional de tênis, coleta de dados em sessões de treinamento dos participantes e entrevista semiestruturada com cada um dos tenistas. Os dados quantitativos foram analisados por meio de estatística descritiva, análise de variância (ANOVA) e análise de cluster. Os dados qualitativos foram analisados por meio da Análise Temática. No Estudo I, uma pesquisa mista foi desenvolvida para comparar a autofala dos tenistas em uma competição e em sessões de treinamento e a autofala dos tenistas em entrevistas, com foco principal na relação entre a autofala e a idade dos participantes e o contexto em que é utilizada. No Estudo II, foi proposta uma Análise Temática dedutiva a partir das falas dos participantes das entrevistas, com o objetivo de identificar padrões na autofala e nos gestos de jovens tenistas em treinamento e competição. Concluímos que, embora a literatura sobre a autofala já apresente investigações empíricas em diferentes modalidades esportivas e alguns possíveis modelos teóricos, ainda há um vasto campo a ser percorrido pela pesquisa, tal como as características da autofala na infância e adolescência e os diferentes níveis de percepção que os indivíduos, principalmente os jovens, têm de seu diálogo interno. Apresentamos dados e hipóteses iniciais sobre as nuances da autofala e da autopercepção de tenistas de 11 a 17 anos e avançamos na descrição de como esses participantes conversam consigo mesmos em treinos e competições. Através do Estudo I, concluímos que os tenistas têm uma diferença significativa em sua autofala nos treinos e

competições, principalmente no aspecto quantitativo, mas também no qualitativo, e que os tenistas mais jovens têm menos consciência sobre como falam consigo mesmos em esses contextos. A partir do Estudo II, ampliamos o resultado que já havia sido descrito no Estudo I em relação à categorização das categorias de autofala mais utilizadas em competição e treinamento, ressaltando, novamente, que os tenistas utilizam de forma mais significativa essa estratégia de autorregulação no primeiro contexto. Por fim, reforçamos a importância de realizar investigações sobre a autofala de crianças e adolescentes tenistas em outras culturas, bem como investigações sobre o diálogo interno de treinadores em treinamentos e intervenções que desenvolvam a capacidade metacognitiva de jovens atletas.

Palavras-chave: Psicologia do Esporte; Diálogo interno; Regulação da emoção; Método misto.

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LIST OF ABBREVIATIONS AND ACRONYMS

STAGRS – Self-talk and Gestures Rating Scale

REBT – Rational Emotive Behavior Therapy

CBT – Cognitive Behavioral Therapy

STUQ – Self-talk Use Questionnaire

TA – Thematic Analysis

RTA – Reflexive Thematic Analysis

DMSP – Developmental Model of Sport Participation

RESEARCHER'S PRESENTATION

Since the elaboration of the first pre-project, which, in turn, was responsible for my approval as a master's student, I never had any doubts that my research would have as its theme the development of young tennis athletes. This choice reflects both my personal and professional path, as I am a tennis player passionate about this sport and a clinical and sport psychologist fascinated by understanding the psychological demands of tennis players. Therefore, carrying out this research is of inestimable value to me, as it helps to resolve part of my questions and concerns that I have mainly in three places: sitting in my office, listening to tennis players who, repeatedly, tell me that "they don't play so well in competition as they play in practice", sitting on the edge of the court, watching these same tennis players fight more against themselves on the court than against their opponents and, finally, when I, even as a sport psychologist (but still a human being), am on the court fighting my own self-critical self-talk.

PRESENTATION OF THE THESIS STRUCTURE

Initially, we carried out an introduction to the research theme, making a brief review of the literature on the topic, presenting its relevance and defining the general and specific objectives of the research. Then, we performed a literature review about the most important theoretical aspects for this thesis. In Chapter 3, we detail all the theoretical models used and the procedures performed in the Materials and Methods section. Chapter 4 represents the mixed method article developed in the thesis, followed by Chapter 5, which represents the article with a qualitative approach. All articles present a theoretical introduction, description of data collection and analysis procedures, results, discussion, conclusions and bibliographic references. The discussions proposed in the two articles complement each other and are resumed below in the concluding remarks section. Table 1 illustrates the structure of the thesis and the contents covered in each stage in a synthetic way.

Table 1 - Thesis structure

Chapter 1

1. Introduction.

Brief literature review. Research Questions. Research justification. Research relevance. General objective. Specific objectives.

Chapter 2

2. Literature Review.

Development of young athletes. Self-talk. Emotion regulation.

Chapter 3

3. Materials and Methods.
Pilot study. Research Design. Data collection. Research analytic strategies.

Chapter 4

4. Study I: Self-talk of young high-performance tennis players in training and competition: a mixed method study

Chapter 5

5. Study II: "Because it's just me and myself, you don't have another voice": self-reported self-talk and self-regulation in young high-performance tennis players.

6. Final Considerations: Answers to the research questions. Review of the main results. Questions for future research. Limitations.

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INTRODUCTION

The answers you get depend upon the questions you ask.

Thomas Kuhn

Over the last 20 years, various definitions of self-talk have been formulated, however, in general terms, self-talk can be considered as overt or covert verbalizations or statements that people address to themselves (HARDY, 2006). Among the different categories of self-talk pointed out in the literature, positive self-talk, negative self-talk and instructional self-talk were chosen for the present investigation, according to the proposal of Van Raalte *et al* (1994). The self-talk and gestures of high-performance tennis players aged 11 to 17 years were observed having as a starting point the Self-talk and Gestures Rating Scale (STAGRS), which assesses 14 behaviors in the three aforementioned categories: (1) *positive self-talk*: compliment opponent, positive self-talk and fist pump; (2) *negative self-talk*: ball abuse, racquet abuse, opponent abuse, negative self-talk, hit oneself (positive or negative), "Oh God," in frustration and laughing (positive or negative); (3) *instructional self-talk*: practice the stroke motion and instructional self-talk (VAN RAALTE *et al*, 1994). In this context, self-talk is recognized as one of the cognitive processes through which athletes can regulate their emotional states during performance (FRITSCH *et al*, 2022).

In a long-term perspective, a variety of studies that investigate the relationship between self-talk and sports performance have been produced. In this context, the most investigated self-talk categories related to sports performance are positive self-talk, negative self-talk, instructional self-talk and motivational self-talk (FRITSCH *et al*, 2022). Furthermore, regarding the nature of self-talk, six characteristics have been considered relevant, namely, self-talk's valence (positive or negative), self-talk's overtness (overt or covert self-talk), self-talk's frequency and intensity, self-talk's interpretations and self-talk's functions (HARDY, 2006). Since the beginning of research on the subject, the relationship between self-talk and performance has been explored from two great propositions, known as "first-generation questions" and "second-generation questions" (TOD; HARDY; OLIVER, 2011).

The first-generation questions focused on the effects that self-talk interventions have on performance, while the second generation prioritized the study of the mediators between self-talk and performance. An example of a first-generation research question would be "does

motivational self-talk increase the performance of young tennis players in a forehand drive task?", as investigated by Hatzigeorgiadis *et al* (2008). On the other hand, second-generation questions are not concerned with investigating whether self-talk interventions have an impact on performance, but through what mechanisms this effect occurs (TOD; HARDY; OLIVER, 2011). As indicated by Hardy (2006), it is known that thoughts and self-talk influence both cognitive and affective processes of the individual. In this regard, the present investigation will focus on questions related to the second generation of research, that is, on how emotional processes mediate self-talk and performance.

For this purpose, the research will be based on the fundamental conceptions of the Rational Emotive Behavior Therapy (REBT), which was developed by Albert Ellis in the mid-1950s and is considered to be the first form of Cognitive Behavior Therapy (CBT). The main idea of the Ellis' (2003) model is that is that the human cognitions, emotions and behaviors are deeply related to each other (ELLIS, 2003). A few years later, in agreement with the works of Albert Ellis, CBT was developed and disseminated by Aaron Beck from the understanding that people's automatic thoughts, influenced by their belief system, had an important influence on their emotional and behavioral experiences (BECK, 2019). At the time, Beck's research with depressed patients showed that people's cognitive distortions, that is, their misinterpretations of situations, played a decisive role in their maladaptive emotions and behaviors (BECK, 1963). In other words, "[…] emotions not only make us feel something, they make us feel like doing something" (GROSS; THOMPSON, 2006, p. 5). Thus, we will use the lens of Cognitive Sciences as a basis for understanding self-talk in this study.

In line with the aforementioned cognitive-behavioral models, James Gross's works on emotional regulation (GROSS, 2006) will be the basis for understanding the elements of emotional experience, such as thoughts, expectations, attitudes, and other cognitive processes. The "modal model" explains how emotions emerge from the meanings that individuals attribute to situations that are relevant to their attention. Thenceforth, the emotional responses that occur from the evaluation of the situation involve a circuit of experiential, behavioral and neurobiological changes (central and peripheral), as represented in Figure 1 (GROSS; THOMPSON, 2006). It is notable that the meaning people attach to situations is the key element in the regulation of emotional response (GROSS; THOMPSON, 2006), as also suggested by Hardy, Hall and Alexander's (2014) study of how self-talk can be used as an intervention to promote changes in athletes' affective states.

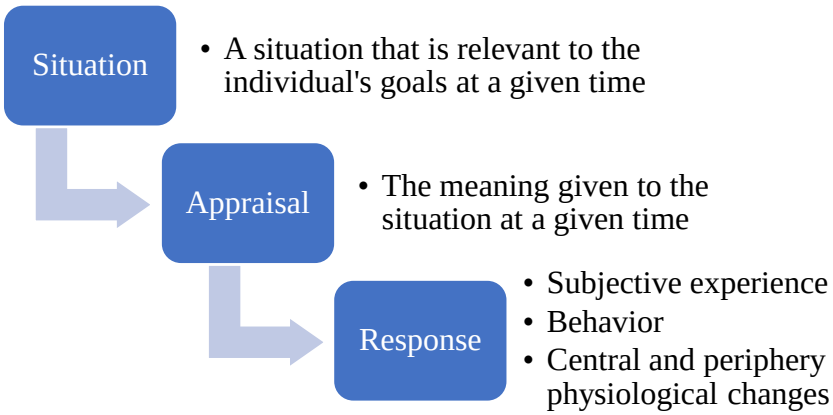

Figure 1 – The "modal model" of emotion (adapted from Gross and Thompson, 2006)

Regarding the relationship between cognitive and emotional processes in the context of sports, the latest theory-driven approaches have emphasized the inherent association between self-talk and emotions, especially when it comes to spontaneous self-talk (FRITSCH *et al*, 2022). Therefore, to reflect about the relationship between self-talk and different emotional responses associated with it, two categories of self-talk have been currently recognized among researchers and distinct: strategic self-talk and organic self-talk (FRITSCH *et al*, 2020). Strategic self-talk can be understood as a verbalization addressed to the self, mostly through predetermined key words, in an intentional way to achieve some goal, such as for motivational purposes. On the other hand, organic self-talk reflects verbalizations that are not used in a predetermined way by athletes, both when they are spontaneous or uncontrolled and when they are goal-directed (FRITSCH *et al*, 2022).

Although we can classify self-talk according to the intention of its use, whether it was predetermined or not, we can't assume the function of self-talk only by its content (HARDY; COMOUTOS, HATZIGEORGIADIS, 2018). For example, as pointed out nearly 30 years ago in the study of Van Raalte *et al* (1994) with young tennis players, negative statements addressed to the self were not entirely related to poorer tennis performance as, for some players, these negative self-statements could serve motivational purposes, which was also indicated by Hardy, Hall and Alexander's (2001) study. Over the years, some functions of self-talk in the context of sports performance have been more studied, such as attentional focus, increase confidence, regulate effort, regulate cognitive and emotional reactions, and trigger automatic motor actions (HARDY; COMOUTOS, HATZIGEORGIADIS, 2018). One of the objectives of the research will be to identify how self-talk relates to different emotional reactions of young tennis players.

It is well established in the literature that the development of emotion regulation occurs mostly during childhood and adolescence (THOMPSON; MEYER, 2006). It is noticeable that the way individuals regulate their emotions from early childhood to adolescence becomes more complex over time, as interactions occur between temperament, neurobiological and cognitive functions, personality and the individuals' environment (GROSS; THOMPSON, 2006). For example, it is expected that children seek more the help of a caregiver in the face of potentially stressful situations and that adolescents use personal strategies such as listening to music or isolating themselves in this context (THOMPSON; MEYER, 2006).

Regarding sports development, Côté (1999) proposes that the healthy and functional development of young people should occur in three stages, namely, the sampling years, the specializing years (from 13 to 15 years old) and the investment years (from 15 years old onwards). The foundation of the sampling years lies in the notion that up to the age of 13, young people should experience a variety of physical, cognitive, affective, and psychosocial stimuli (CÔTE; FRASER-THOMAS, 2007). The physical, mental and personal skills acquired during this period will be the basis that will support young people to specialize in a sport from the age of 13 and then invest systematic hours in this activity from the age of 16 (CÔTÉ; LIDOR; HACKFORT, 2009)

Furthermore, over the years, from childhood to adolescence, individuals become more experienced about themselves and others and in controlling their impulses and regulating their emotions (CHARLES; CARSTENSEN, 2006). Therefore, we realize the importance of young people acquiring awareness about their affective processes and also their use of self-talk, as proposed by Hardy, Robert and Hardy (2009) who investigated the awareness of the use and content of negative self-talk as well as the motivation to alter the use of negative self-talk in late adolescents (M = 19.81). In this way, research on the level of awareness of young athletes is essential, given that it can improve the field's definition and understanding of self-talk (THIBODEAUX; WINSLER, 2018).

Considering the changes in the aforementioned process, the investigation of self-talk and emotional regulation of young tennis players aged 11 to 17 years can bring new contributions on the subject. Firstly, competitive tennis still needs further research, as there are still few investigations examining self-talk in this context to date (BOUDREAULT; TROTTIER; PROVENCHER, 2018). In addition, tennis is an individual sport characterized by intermittent pauses between points and in which it is estimated that only 20% of the match

time is used to actually play points (SAMULSKI, 2011). Thus, it can be assumed that about 80% of the time of a match, tennis players are either talking to themselves spontaneously or strategically or reflecting on their experience in the match and on how they are feeling. Furthermore, tennis competition can be considered as a potentially stressful stimulus for young people who are still learning how to self-regulate, since it is characterized by successes (e.g., gain of a point) and failures (e.g., loss of a point) that occur in short periods of time (BOUDREAULT; TROTTIER; PROVENCHER, 2018).

To date, most studies on self-talk in tennis have investigated the training context, with many of these examining first-generation issues such as the effect of self-talk on the acquisition or development of technical skills (LANDIN; HEBERT, 1999; CUTTON; LANDIN, 2007; HATZIGEORGIADIS *et al*, 2008). In recent years, more studies have sought to investigate the self-talk of tennis players during competitions (LATINJAK; TORREGROSA; RENOM, 2010; BOUDREAULT; TROTTIER; PROVENCHER, 2018, BOUDREAULT; TROTTIER; PROVENCHER, 2019), after the initial publications by Van Raalte *et al* (1994) and Van Raalte *et al* (2000) on how the use of self-talk was frequent in this context and was influenced by the match circumstances.

In the literature on self-talk, there are studies that investigated specifically the self-talk of young tennis players in a competitive setting, such as Van Raalte *et al* (1994) (mean age of participants was 15.43) and Zourbanos *et al* (2015) (mean age of participants was 13.86). However, over the years since the initial publications on the subject, only two studies to our knowledge have investigated the difference in the use of self-talk by tennis players in the two contexts (HARDY; HALL; HARDY, 2005; THIBODEAUX; WINSLER, 2018). Of these two studies, only the one by Thibodeaux and Winsler (2018) investigated, from a mixed approach, both the observable and the self-reported self-talk of young tennis players (M = 12.64) in a competitive summer camp. In this sense, we believe that our study can bring important contributions when investigating young high-performance tennis players in the spontaneous environment of an international tennis championship. Furthermore, to our knowledge, only two studies investigated the observable and self-reported self-talk of tennis players, and only in the study carried out by Van Raalte *et al* (1994), high-performance athletes participated.

Based on the data mentioned in the previous paragraph, the present investigation can bring important contributions on: (1) the differences in the use of self-talk in training and in competition settings, (2) the differences between observable self-talk and self-reported self-

talk, (3) how much awareness athletes have about their self-talk in both contexts, and (4) the differences in the use of self-talk by high-performance young tennis players of three different age categories (U12, U16 and U18). In addition, through self-reported self-talk data, the study can bring contributions on the theme of self-talk and affective processes, which has been explored more in recent years (FRITSCH *et al*, 2020; FRITSCH *et al*, 2022).

1.1 GENERAL OBJECTIVE

The general objective of the research is to relate the observable self-talk of tennis players aged 11 to 17 years in training and competition settings with self-reported self-talk and their perceptions of performance.

1.2 SPECIFIC OBJECTIVES

- Identify and compare observable self-talk used by tennis players in training and competition settings;
- Describe and categorize the perceptions that tennis players have about their self-talk (self-reported self-talk) in training and competition settings;
- Identify the relationship between tennis players' self-reported self-talk and their affective processes (emotions);
- Verify how much awareness tennis players have about their self-talk by comparing data collected from observations and interviews;
- Verify if there are differences in the self-talk of older and younger participants, between the Under 12, Under 16 and Under 18 categories.

CHAPTER 2

An effective and well conducted review creates a firm foundation for advancing knowledge and facilitating theory development

Snyder (2019, p. 333)

2. LITERATURE REVIEW

Initially, the literature review will present considerations on the healthy development of young athletes. In addition, the relevance and functions of agents who are inserted in the youth's sporting context, such as parents and coaches, will be considered.

In the second part of the theoretical framework, a brief history will be presented about self-talk and the evolution of the concept since the first studies of the previous century. In this context, a review will be carried out on studies that investigate self-talk in tennis in different periods of life, from childhood to adulthood, mainly focusing on high-performance tennis. In this regard, the different categorizations given for self-talk will be presented, based on first- and second-generation research questions and in the most current considerations on the subject.

Lastly, a review will be carried out on the central aspects of emotion regulation and self-regulation mechanisms, mainly from the works of James Gross (2006). In this part, the focus will be on the affective processes - and the cognitive processes that underlie them - and, mainly, on the mechanisms related to the regulation and deregulation of emotions.

2.1 DEVELOPMENT OF YOUNG ATHLETES

Considerations about the development of young athletes in sport will be presented mainly through the research of Jean Côté, who is one of the world exponents on the developmental and psychosocial factors that affect sport and physical activity performance and participation. This model of developing young athletes is in line with our understanding of promoting an encouraging and supportive environment that contributes to the development of functional self-talk in young people and positive experiences in sport (MARJANOVIĆ *et al*, 2020).

2.1.1 Developmental Model of Sports Participation (DMSP)

Côté (1999) proposed an initial model for the development of young athletes and practitioners in which he emphasized that diversified experiences in sport - mainly in amount

and type - have a fundamental role for performance excellence. Currently, the DMSP indicates that the healthy development of young people in sport should start with deliberate play (*sampling years*), progressing to a balance between deliberate play and practice (*specializing years*) to, finally, become predominantly deliberate practice (*investment years*) (CÔTE; BAKER; ABERNETHY, 2007). Although elite performance can be achieved both through sampling and early specialization (Figure 7), the first approach represents an appropriate and protective form of development for youth participation in sport (CÔTÉ *et al*, 2020). In terms of the possible outcomes of this model, Wall and Côté (2007) consider three different scenarios of sport participation: (1) elite participation, (2) recreational participation, and (3) dropout.

Ideally, Côté (1999) divides the sports development of young people into three stages, namely, the sampling years, from 6 to 13 years old, the specializing years, from 13 to 15 years old, and the investment years, from 16 years old. (CÔTE, 1999). In the first stage, it is important that the child acquires interest in sports and has pleasant experiences in the activities in which they are involved. In the second stage, which is considered a transition stage, youth engage in fewer activities (two at most), but maintaining a balance between deliberate play and deliberate practice (CÔTE; BAKER; ABERNETHY, 2007). According to Côté (1999), in this intermediate stage, it is essential that young people experience positive experiences in sport, so that they can maintain interest in the practice in the next few years. From the last stage, it is recommended that the young person only commits to a sport activity, which will be characterized by the predominance of deliberate practice (CÔTE; BAKER; ABERNETHY, 2007).

As mentioned before, Côté *et al* (2009) emphasizes that the main difference between the sampling and the investment years is that, in the first, there is a predominance of "deliberate play", while, in the latter, deliberate practice predominates. It is important to distinguish that the term play refers to activities whose main objective is enjoyment, while the term practice refers to organized activities in which the main focus is on developing skills and increasing the performance of practitioners (CÔTE; BAKER; ABERNETHY, 2007). Although deliberate play is characterized as a more informal activity, it can be a powerful source of intrinsic motivation for continuing to practice sports in subsequent years (CÔTÉ, 2009).

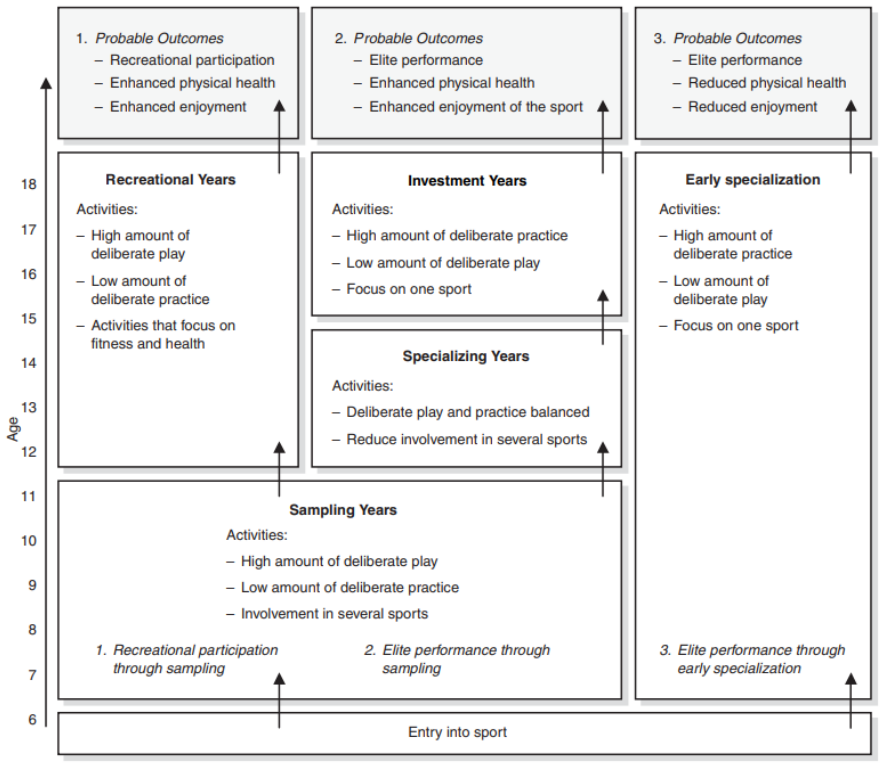

Figure 7 – *Developmental model of Sport Participation* from Côté, Baker and Abernethy (2007, p. 197)

In addition to considering the appropriate characteristics of training for each period, Côté (1999) also emphasizes the social context influencing children's participation in sport, which consists of coaches, peers and the family environment. In this sense, Côté (1999) understands the importance of the coach as a model for the acquisition of positive values, attitudes and behaviors for sports practice. Positively, coaches play a key role in children's competence beliefs, sport enjoyment and motivation to participate and develop in sport. On the other hand, coaches can also contribute to sport withdrawal and, therefore, it is crucial that they understand the characteristics of physical, cognitive, social and psychological development of children and adolescents (CÔTÉ; FRASER-THOMAS, 2007). Moreover, above all, coaches - and also parents - must understand the consequences that high levels of early deliberate practice can have for lifelong involvement in sport and physical and psychological health (CÔTE; BAKER; ABERNETHY, 2007). The trajectory from the diversity of sampling years to the specificity of investment years is illustrated by Figure 8:

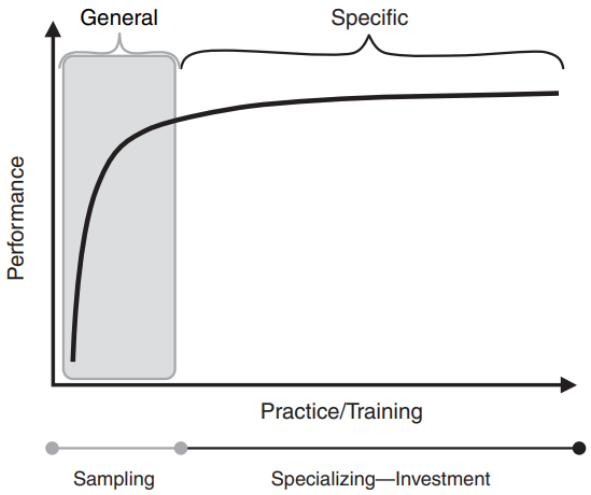

Figure 8 - *Proposed model of diversified early involvement in the development of sport expertise* from Côté, Baker and Abernethy (2007, p. 193)

2.1.2 Development of children and adolescents in sport

The importance of the three-step trajectory (Figure 8) presented lies, firstly, in the opportunity for the child to experience various physical, cognitive, affective and psychosocial stimuli, in addition to different social interactions with peers, coaches and parents (CÔTE; LIDOR; HACKFORT, 2009). Undoubtedly, for the development of sport-specific skills associated with high performance, there are some psychological skills that are considered necessary, such as commitment and persistence (MARTINDALE; COLLINS; ABRAHAM, 2007). With this, one can see the importance of acquiring multiple physical, social and psychological skills from involvement in various sports as a basis for specialization in a single sport in mid-adolescence (CÔTE; LIDOR; HACKFORT, 2009).

Based on the established postulates for healthy development in sport from childhood to adolescence (CÔTE; LIDOR; HACKFORT, 2009) and the myths about youth participation in sport (CÔTE; FRASER-THOMAS, 2007), we summarize the most important principles:

1. Early diversification (sampling) allows children and very young adolescents to have different motor, cognitive, social and psychological experiences and to develop self-regulation and intrinsic motivation to continue in the sport that is of greatest interest to them throughout their youth;

2. By age 13, adolescents can choose either to continue in sport recreationally or to begin speacializing in their sport of interest, while still maintaining inherently enjoyable activities;
3. By age 16, late adolescents have developed the physical, cognitive, social, emotional, and motor skills to invest large amounts of time and effort in organized, specialized training in a single sport;
4. Both early diversification and early specialization can lead to expertise; however, in both the short and long term, the former is considered a healthier path to elite performance after proper maturation;
5. Participation in sport does not guarantee building character and positive values; therefore, the adults responsible for coordinating these activities - coaches and parents - play a key role in children's beliefs and behaviors and in their long-term involvement in sport.

Côté (1999) explains that the type of support that parents must provide their child during the years of sports practice differs in each of the three stages. During the sampling years, parents should consider engaging the child in a variety of inherently fun and exciting activities, while in the specializing years, the playful aspect should be maintained and encouraged along with training in sport-specific skills (CÔTE, 1999). As highlighted by Côte, Baker and Abernethy (2007, p. 198), "in our search to develop elite-level athletes, we need to be conscious not only of the acquisition of sport skills but also of optimizing the health of young athletes through continued participation in sport". For this reason, parents play a fundamental role in the emotional support of the adolescent in the investment years, being responsible for providing comfort and security during the expected periods of stress and anxiety (CÔTÉ, 1999).

Coaches are also essential agents for the development of young people in sport, being responsible from planning activities that promote children's intrinsic motivation to continue in sport to providing feedback on performance, instructions and monitoring the success of the adolescent athlete. (CÔTE; BAKER; ABERNETHY, 2007). Because they are responsible for such a fundamental part of the athlete's development, coaches must consider the possible results and consequences of high levels of structured training before adequate maturity (CÔTÉ *et al*, 2020), whereas many athletes drop out of sport settings throughout adolescence after suffering from the negative effects of an emphasis on short-term results (BARREIROS; CÔTÉ;

FONSECA, 2014). This concern is essential, since, as wisely pointed out by this elite development coach:

> A lot of former world junior champions don’t stay in the sport. They don't make it or they stay in the sport but they don't seem to go on to greater things. There are exceptions of course but again looking at the Aussie model, we think they tend to push them too hard too soon and basically burn them out […] (MARTINDALE; COLLINS; ABRAHAM, 2007, p. 193)

In the context of youth sports, it was found that coaches consider self-talk to be a very important mental strategy and, therefore, encouraging positive, motivational and instructional self-talk is essential (THIBODEAUX; WINSLER, 2021). In addition, coaches, as important models in the training of individuals and in the promotion of a healthy sport climate, are vehicles for promoting youth awareness of how important strategies like self-talk are (ZOURBANOS *et al*, 2011; THIBODEAUX; WINSLER, 2021). Considering the environmental factors of young people's sports development, such as the motivational climate and the perception of competence, it is essential considering that the environment, especially training, will shape the use of self-talk by these young people (MARJANOVIĆ *et al*, 2020).

2.2 SELF-TALK

From a general perspective, self-talk can be conceived as a ubiquitous phenomenon, as we all have an inner dialogue with ourselves at all times (KROSS *et al*, 2014). In this sense, self-talk can be described as “the inner voice that accompanies every human being throughout their lives” (LATINJAK ; HATZIGEORGIADIS, 2020). Despite this, we agree with the perspective of Dickens, Van Raalte and Hurlburt (2017) that it is too simplistic to assume that human beings talk to themselves at all times of the day and that we can call this self-talk. Over the years, different nomenclatures have been used to refer to self-talk, such as inner dialogue, internal monologue, covert speech, private or silent speech, inner voice or speech, self-statements, self-communication, self-directed verbalizations, among others (VAN RAALTE; VINCENT; BREWER, 2016). Talking to oneself has been shown to be an effective practice for several domains, such as in cognitive-behavioral therapies, whose main premise is that by modifying the thoughts and interpretations of individuals, it is also possible to modify their emotions and behaviors (HATZIGEORGIADIS *et al*, 2011).

2.2.2 Definitions of self-talk

Throughout the 1980s and 1990s, some researchers defined self-talk in a global and non-specific way, either from a cognitive-behavioral perspective or, more commonly, from a cognitive perspective (HARDY, 2006). One of the most critical problems in defining self-talk vaguely is that any kind of thought, regardless of its content or purpose, can be recognized as self-talk and confused with other cognitive processes, such as mental imagery (HARDY; GAMMAGE; HALL, 2001). Certainly, in order for a construct to be developed theoretically and applied, it must be defined in its multidimensionality, that is, in its full extent (HARDY, 2006).

For this reason, Hardy (2006) indicated some characteristics that should be considered when referring to this construct, namely, the verbalizations or statements addressed to the self that occur dynamically throughout the performance and whose elements can be interpreted based on their function, whether motivational or instructional, at the time. Considering these characteristics, in the sports literature, self-talk was conceived, at that time, as the self-verbalizations of athletes who operate, mainly, for instructional and motivational purposes (HARDY; HALL; HARDY, 2004). As self-talk has been empirically examined more frequently, its definition has been refined in the literature.

Concisely but precisely, "self-talk can be defined as an act of syntactically recognisable communication in which the sender of the message is also the intended receiver" (VAN RAALTE; VINCENT; BREWER, 2016, p. 142). In the sports field, Hardy, Tod and Oliver (2008) defined self-talk as sport-oriented automatic or deliberate statements and distinguished these verbalizations from those sports-unrelated verbalizations said by athletes. In order to capture the multidimensionality of the concept of self-talk, some attributes must be considered, namely: (1) the coexistence of the sender and the receiver of the message, (2) the subjectivity of the sender, (3) its linguistic (semantics and syntax), (4) their intentionality, (5) their overtness or covertness, and (6) their function (LATINJAK; HARDY; HATZIGEORGIADIS, 2020). Considering the aforementioned aspects, from our point of view, a current and functional definition was proposed by Latinjak *et al* (2019, p. 11), who describe self-talk as:

> […] verbalizations addressed to the self, overtly or covertly, characterised by interpretative elements associated to their content; and it also either (a) reflects dynamic interplays between organic, spontaneous and goal-directed cognitive processes or (b) conveys messages to activate responses through the use of predetermined cues developed strategically, to achieve performance-related outcomes.

2.2.3 Evolution of studies on self-talk

Prior to the beginning of the current century, self-talk was already recognized as both an internal expression (when inside the individual's mind) and an external expression (when said aloud), especially after the study by Van Raalte *et al* (1994) in which observable self-talk was investigated. During this period, most studies dealt with the valence of self-talk, that is, whether the self-talk used by athletes was positive or negative in nature and what was the impact of its use on performance (HARDY; GAMMAGE; HALL, 2001). Moreover, at that time, self-talk was already known for its importance in improving performance by both coaches and athletes around the world, such as the great tennis player Steffi Graf, winner of the Golden Slam (VAN RAALTE *et al*, 2000).

An important advance in the studies was the investigation of the four "W"s of self-talk; in other words: where it is used, when it is used, what is its content and why it is used by athletes during and after the performance (HARDY; GAMMAGE; HALL, 2001). In addition to the consequences of self-talk, its antecedents, that is, the events that precede self-talk during the performance, began to be investigated. In the study by Van Raalte *et al* (2000) with adult tennis players, it was indicated that the loss of a point was a significant predictor for the use of self-talk, mainly negative and positive, but also instructional. At that time, these studies highlighted the importance of investigations and knowledge, by coaches, athletes and sport psychologists, about the environmental factors that influence the use of self-talk, but also the individual factors, such as the athletes' personality, that can influence the use of a certain type of self-talk (VAN RAALTE *et al*, 2000; HARDY; GAMMAGE; HALL, 2001).

One of the concerns of researchers at the beginning of the century was the precariousness of theory-based research on self-talk (HARDY; GAMMAGE; HALL, 2001). In this sense, Hardy (2006) carried out the first review that brought together elements from different studies to develop a theorization about the nature of the construct. Undeniably, the valence (positive or negative) of self-talk and its impact on performance was the aspect most studied by researchers (HARDY, 2006). Contrary to what was expected, in the investigation of adult tennis players, neither positive self-talk nor negative self-talk were predictors of the result that the vast majority of tennis players would have at the next point (VAN RAALTE *et al*, 1994). A few years later, when investigating both the antecedents and the consequences of the use of self-talk by adult tennis players, Van Raalte *et al* (2000) indicated that tennis performance was more strongly influenced by the former.

Hardy (2006) synthesized the few studies that investigated the way in which self-statements were said, in an overt or covert way, noting that, until that moment, no study had investigated, simultaneously, the use of internal and external self-talk by athletes and compared the effectiveness of one in relation to the other. As a result of the lack of studies that had researched this relationship, there were still no robust recommendations for interventions on self-talk overtness for athletes (HARDY, 2006). In addition to the acoustic characteristics of self-talk, the frequency of use of self-talk was identified by Hardy, Hall and Alexander (2001) as having a greater impact on performance when compared to the valence of self-talk used by athletes.

Another aspect regarding the way self-talk is generated concerns the self-determined dimension, which includes the self-statements that are previously determined for the athlete (assigned) and the verbalizations that occur naturally during performance according to the athletes' will (freely chosen) (HARDY, 2006). Regarding this dimension, it should be noted that each athlete has its complexity and that, therefore, it is recommended that mental strategies such as self-talk cues be individualized to the preferences, needs and abilities of each one (THEODORAKIS *et al*, 2000).

Considering the self-determined dimension, one of the most important questions about the use of self-talk began to be examined more deeply by Hardy, Gammage and Hall (2001): why do athletes use self-talk? The study that included 150 varsity athletes identified that athletes used self-talk for two main purposes: cognitive (instructional) and motivational. The cognitive function of self-talk is indicated by athletes for the development and improvement of their specific skills, as well as for the improvement of performance in general (HARDY; GAMMAGE; HALL, 2001). The motivational function was divided into three sub-categories, according to what the athletes wanted to achieve with the use of self-talk: motivational mastery (focus, self-confidence, mental readiness, and coping), motivational arousal (psyching up, relaxation, and arousal level control) and motivational drive (maintaining or increasing drive and effort levels) (HARDY; GAMMAGE; HALL, 2001).

Undoubtedly, the reasons why athletes use some kind of self-talk are also associated with when and where the self-statements are used by them. As an example, Hardy, Hall and Alexander's (2001) research with team and individual sports indicated that junior athletes used positive self-talk significantly more before competition than before training. A few years later, a larger study with young adult athletes from a variety of team and individual sports showed

that participants who competed in individual sports used significantly more self-talk than athletes who competed in team sports. Also, throughout the sporting calendar, the frequency of self-talk increased as the competitive period intensified (HARDY; HALL; HARDY, 2004). It is important to note that Hardy, Gammage and Hall (2001), in their study on self-talk four "W"s (what, when, where and why), had already identified that athletes used self-talk mainly close to a competitive event, when they used self-talk before and during competition.

Over the years, based on evidence that self-talk has an effect on performance (HATZIGEORGIADIS *et al*, 2008), the researchers' main question has become the "how". In other words, through which mechanisms does self-talk operate to increase performance? One of the first experimental studies that provided preliminary data on how self-talk, specifically motivational and instructional, improve performance in a swimming task was performed by Hatzigeorgiadis (2006). According to the perceptions of twenty-six female swimming-class students, the use of the instructional self-talk cue helped athletes in attentional, effort, confidence, anxiety control and automaticity functions. In the view of the participants, the motivational cue had a higher effect on effort than instructional self-talk did, had a similar effect on attention and helped in confidence, anxiety control, and automaticity functions (HATZIGEORGIADIS, 2006).

Another study that examined the functions of self-talk indicated that it operates to increase performance of adult athletes through five mechanisms, respectively from the most effective to the least: regulating effort (e.g., "I maintain effort to high levels"), enhancing attentional focus (e.g., "I concentrate on what I'm doing at the moment"), increasing confidence (e.g., "I feel more confident in my abilities"), cognitive and emotional control (e.g., "I interrupt negative thoughts"), and automaticity (e.g., "The execution comes automatic") (THEODORAKIS; HATZIGEORGIADIS; CHRONI, 2008). One important advance on self-talk literature was the "throughput model" (Figure 9), whose schema locates the antecedents and consequences of self-talk and identifies the four mechanisms through which self-talk influences performance, namely: cognitive, affective, motivational and behavioral mediators (HARDY; OLIVER; TOD, 2008).

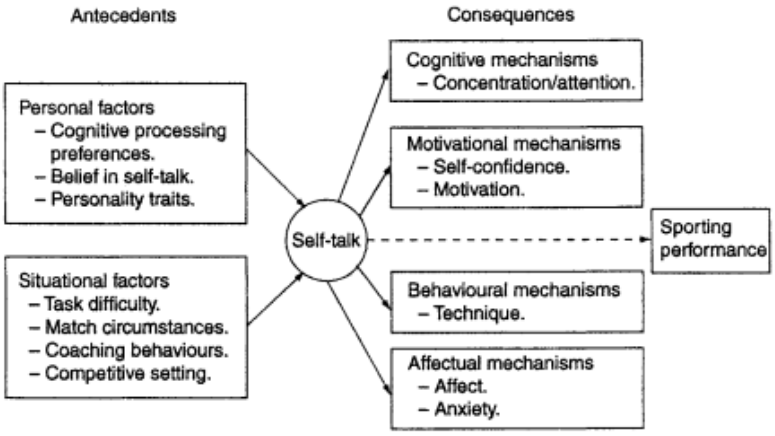

Figure 9 – *The throughput model of self-talk* by Hardy, Oliver and Tod (2008, p. 39)

As reported in the previous paragraphs, in the first decade of the 21st century, research focused on the effects of instructional and motivational self-talk on performance and the mechanisms through which this effect occurs (HARDY; COMOUTOS; HATZIGEORGIADIS, 2018). At that time, there was already robust evidence about the effectiveness of interventions with self-talk, especially in the acquisition of new skills, when self-talk has more immediate effects. Despite this, it was also evident the recommendation that coaches, athletes and other sports professionals maintain self-talk interventions even after the learning period in order to maximize performance (HATZIGEORGIADIS *et al*, 2011).

2.2.4 Current considerations of the self-talk literature

In recent years, two advances have been important to increase the robustness of the literature on self-talk. Previously anchored in an inductive perspective, that is, in a data-driven approach to self-talk, the need for new explanations and concepts made researchers start to investigate self-talk from a deductive perspective (LATINJAK et al, 2019). First, one of the important efforts to develop a theoretical model for self-talk was Van Raalte, Vincent and Brewer's (2016) adaptation of Kahneman's dual-processing theory to differentiate two types of cognitive processing: one that is faster and more intuitive and another that is slower and more deliberate. System I self-talk represents the immediate, efortless and emotionally-charged reaction to a situation, while System II self-talk involves more logical, rational and planned processing (VAN RAALTE; VINCENT; BREWER, 2016).

Second, recent reflections on the conceptualization and classification of self-talk have resulted in the formulation of two distinct categories: organic self-talk, divided into spontaneous and goal-directed, and strategic self-talk (LATINJAK et al, 2019). In terms of the content, organic self-talk and strategic self-talk may be identical, however, there is an evident distinction between them: the former is the result of psychological and cognitive processes inherent to individuals, while the latter is, as a rule, predetermined and commonly resulting from a psychological intervention (LATINJAK; HARDY; HATZIGEORGIADIS, 2020). In summary, this semantic detail can be understood in the sports context as follows:

> a statement like “calm down” can be organic if it is the result of a rational cognitive process purposely used to solve a problem, such as heightened anxiety. However, it may also be strategic, if the athlete follows a predetermined plan that consists of repeating this particular phrase at certain moments (LATINJAK; HARDY; HATZIGEORGIADIS, 2020, p. 19)

Within organic self-talk, spontaneous self-talk refers to verbalizations and statements that come to mind effortlessly and unintentionally in reaction to a situation that is relevant to the sender of this message (LATINJAK, 2020). To put it in another way, it is easy to understand why this type of self-talk "can be viewed as a window into the mind of the athlete" (LATINJAK; HARDY; HATZIGEORGIADIS, 2020, p. 20), as it reflects his or hers most automatic and genuine thoughts about a situation. There are two important aspects to consider about spontaneous self-talk: its structure (valence and time perspective) and its content. Spontaneous self-talk can have both a positive and a negative connotation (valence) and can refer to a past (past-related) or future (future-related) situation. In this sense, its content may be related to past results or predictions about future events (LATINJAK; HATZIGEORGIADIS; ZOURBANOS, 2017).

In contrast, goal-directed self-talk reflects more controlled mental processing, which is usually related to problem solving and decision-making performed deliberately by the athlete (LATINJAK *et al*, 2019). Although both goal-directed and strategic self-talk serve a purpose, the difference between them is that the former is used by the athlete instinctively during performance, as when a tennis player says to himself "bend your knees" or "calm down" (LATINJAK; MASÓ; COMOUTOS, 2018). Despite being said instinctively, these verbalizations were undoubtedly aimed at solving two problems in performance, respectively: improving technique for performing some task and decreasing arousal (LATINJAK; MASÓ; COMOUTOS, 2018). Currently, this type of organic self-talk has been indicated for the control

and regulation of cognitive and emotional reactions during performance (GALANIS; HATZIGEORGIADIS, 2020).

With regard to self-talk interventions, it is important to distinguish between process-oriented interventions, such as strategic self-talk, and skills-oriented interventions, such as reflexive self-talk (LATINJAK, 2020). Strategic self-talk is related to the use of predetermined cue words and phrases, mainly of an instructional or motivational nature, with the purpose of achieving a desired performance result and, therefore, can be understood as a procedural intervention (LATINJAK; HARDY; HATZIGEORGIADIS, 2020). It should be noted that strategic self-talk is anchored in memory processing for the activation of appropriate responses for performance (LATINJAK *et al*, 2019).

On the other hand, reflexive self-talk aims to reflect on the psychological challenges of athletes and promote changes on their self-regulation and on their metacognition, that is, on the level of awareness of their psychological processes (LATINJAK, 2020). In this sense, this type of self-talk has been considered as a contemporary alternative to strategic self-talk (MCCORMICK; ANSTISS, 2020), since it can help athletes: “(a) raising awareness of psychological challenges, (b) improving the choice of psychological skills, and (c) thinking about the content of goal-directed self-talk” (LATINJAK *et al*, 2020, p. 92).

2.3 EMOTION REGULATION

Before exploring the process of emotion regulation, it is first necessary to understand what an emotion is. A classic definition of emotion was proposed by Lazarus (2000, p. 230) as: "an organized psychophysiological reaction on ongoing relationships with the environment, most often, but not always, interpersonal or social". In summary, emotions are a psychological response to a stimulus that is relevant to the individual and involve whole-body reactions, mostly at three levels: subjective experiences, physiological processes and observable behaviors (GROSS, 2015). Considering this, emotion regulation is related to the processes through which people manage their emotions, that is, with how people manage to leave a given emotional state (KOOLE, 2012). Therefore, it is easy to understand why, in the sports context, emotions are an intrinsic and fundamental part of sports practice and competitions (FRITSCH; JEKAUC, 2020).

In addition to defining what an emotion is, it is also necessary to define what is not an emotion. There are concepts that, despite being strictly related to what we consider to be an

emotion, present distinctions that are often nebulous (KOOLE, 2012). The first important concept is affect, a psychological state that can include stress responses, emotions (e.g., anger, sadness) and moods (e.g., feeling grumpy, feeling great) and which generally seems to come and go, although we can exercise some control over it. Another essential distinction is between moods and emotions: moods last longer than emotions, in addition to being more diffuse and less likely to elicit a behavioral reaction (GROSS, 2006). Feelings, on the other hand, refer to the subjective impression that an individual has that an affective state is, for example, pleasant or unpleasant (FRITSCH; JEKAUC, 2020).

2.3.1 What processes are involved in feeling an emotion?

Of all the mechanisms involved in feeling an emotion, four aspects will be more contemplated due to the direct relationship they have with self-talk and performance, namely: triggers, cognitions, bodily reactions and feelings (FRITSCH; JEKAUC, 2020). If we understand the emotional process as a cycle, we will certainly consider that there is an initial event (a trigger), such as the loss of a point in tennis, which is a precursor of a series of reactions in the individual (FRITSCH; JEKAUC, 2020). Undoubtedly, emotions arise when an individual has an internal stimulus, such as a memory of past experiences, or an external stimulus, such as the anticipation of an important event, which has a relevant meaning for him or her (GROSS; THOMPSON, 2006). However, Ekman (2007, p. 38) explains that sometimes our automatic appraisals about a situation overlap the knowledge and meaning we give to it, as in the following example:

> Walking near the edge of a cliff can be frightening, despite the knowledge that a clearly visible fence would prevent a person's fall. It matters little that the path is not slippery and the fence is not fragile; the heart still beats faster and the palms still become sweaty. The knowledge that there is nothing to fear does not erase the fear [...] the danger is felt even though it does not objectively exist.

However, once the situation changes, or even the meaning we give it, the emotion will also change, which explains the well-known exaggerated reaction of tennis player Mikhail Youzhny after losing a break point against tennis player Nicolas Almagro in the second round. Miami Open 2008, when he repeatedly smashed his racket against his head, causing a lot of blood to spill out (THE GUARDIAN, 2008). After receiving medical attention and the match continued and the situation changed (or the meaning he had given to the aforementioned break point loss), Youzhny went on to eventually win the match. Gross (2006) called this cycle the "modal model" of emotion, that is, an interaction between a person and a situation, which has

a psychologically relevant meaning for the individual, triggers a coordinated whole-body response to the person-situation interaction and so forth, as exemplified by the Figure 10:

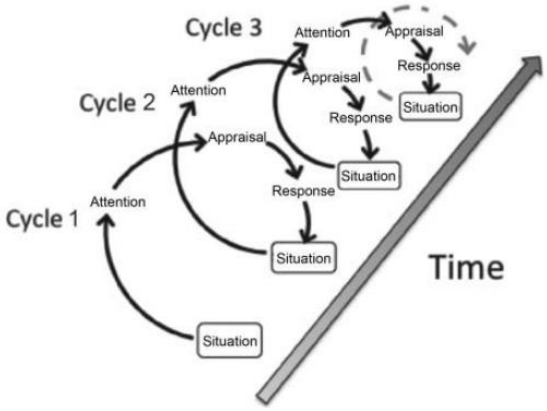

Figure 10 – *The modal model of emotion in spiral format, to show that it extends over time* by Gross (2015, p. 4)

Once the person has focused attention on the relevant situation, a relatively quick process of "good or bad" discrimination is inevitable, in which the person will assess the familiarity of the situation, its valence and its value relevance (GROSS; THOMPSON, 2006). In terms of what triggers the emotional response and, consequently, changes in experiential, behavioral, and neurobiological systems, there is a broad agreement that appraisals - or the meaning and relevance that the individual gives to the situation - are responsible for triggering this process (GROSS; THOMPSON, 2006). The emotional response itself is neither good nor bad for the individual, as it can be helpful or harmful depending on the context in which that person is (GROSS, 2015). For example, in a sports context, we know that there are social norms of how one should behave regarding the expression of certain emotions (BEER; LOMBARDO, 2006), as demonstrated in Mikhail Youzhny's overreaction example mentioned in this subchapter.

CHAPTER 3

3 MATERIALS AND METHODS

For the researcher, the most important touchstone is reflection on your own position/s and coming to clarity about your research purpose
Grant and Giddings (2002, p. 25)

The main purpose of the current study was to describe both observable and unobservable self-talk and gestures of young high-performance tennis players in training and competition settings. Another central purpose was to relate: (a) observable data on self-talk and gestures and tennis players' perception of their self-talk and gestures and (b) tennis players' self-talk and gestures in training and competition. As auxiliary objectives, firstly, it was intended to investigate the differences between how tennis players self-regulate in training and competition. In this regard, another relevant purpose was to determine possible differences between the categories of self-talk and gestures used in these contexts, the frequency in which they were used and in what circumstances they were used.

Considering the aforementioned objectives and, as noted by Grant and Giddings (2002), that there must be a congruence between the research question, the methodology and the method, the methodological path of the research is detailed below. First, the researcher carried out a pilot study and a training for the use of the *Self-Talk and Gestures Rating Scale (STAGRS)* (VAN RAALTE *et al*, 1994). Then, as part of a larger mixed-method approach, the research was carried out in three stages: 1. assessment of observable self-talk and gestures of participants and match scores in an international tennis tournament, 2. assessment of observable self-talk and gestures of participants during practice sessions, and 3. a semi-structured interview to investigate the perceptions of each of the participants of the above topics and the self-reported self-talk.

The large amount of qualitative data collected was analyzed through a Thematic Analysis (BRAUN; CLARKE, 2006), due to the understanding that a major objective of the research was to identify patterns of behavior among these high-performance athletes. In the present research, it was established that the different sources of evidence would provide rigor, depth and complexity for the research from the triangulation of data. The details of the instruments and procedures used in the study by the researcher will be described in the following subsections.

3.1 PILOT STUDY

Since the researcher of the present study would assess only one of the players in the matches, and not both, as proposed in the original study by Van Raalte *et al* (1994), it was performed a training process that took place in three phases prior to data collection: 1. familiarization with the instrument, 2. live pilot study, and 3. tennis matches' video analysis. Furthermore, it's important to point out that the researcher kept in contact with one of the specialist researchers responsible for the development of *STAGRS*, before the data collection period, in order to obtain more information about the instrument application.

In the first stage, the researcher studied the materials obtained through contact with one of the organizers of the *STAGRS*, which were the *Training manual for the Self-talk and Gestures Rating Scale* (APPENDIX II) and the *Tennis umpire scoring tips* (APPENDIX III). In the second stage, the researcher conducted a pilot study in the final round of the Boys U16 category of a state junior tennis tournament. The championship was held in the city of São Leopoldo, Rio Grande do Sul, Brazil, in January 2022 and followed the best-of-three format with advantage. After the pilot study, the researcher contacted the specialist again to get additional information about the application of the instrument.

3.2 TRAINING FOR USING *STAGRS*

In the last stage of the training process, the researcher watched and assessed three matches from two previous editions of the same international tennis tournament that would be part of the present study in the 2022 edition, which were available on Youtube. The final round of the Boys U16 of 2016 and the final rounds of the Boys U18 and the Girls U18 of 2020 were chosen for the last stage of the training, in which the researcher carried out the evaluation on two different dates that were two weeks apart. All matches followed a best-of-three format with advantage. The average intrarrater reliability between the two evaluations was calculated in the *SPSS* software by kappa test (k = 0,89) and indicated a strong level of agreement according (MCHUGH, 2012).

3.3 RESEARCH DESIGN

Research design is understood as the procedures adopted in the study to collect, analyze, interpret and record data. In other words, research design refers to the plan through which the researcher will determine which are the most appropriate methods to answer the research

questions (CRESWELL; PLANO CLARK, 2018). Therefore, the methodological decisions elected for the study will be detailed in the next subsections.

3.3.1 Mixed Method Approach

For this research, a descriptive empirical investigation was conducted within a larger mixed-method approach. The descriptive strategy was considered particularly suitable because the main purpose of this investigation is to describe the phenomenon as it occurs, without any manipulation of the variables. Therefore, the objective of the descriptive strategy is to define, classify and categorize events in order to describe mental processes and manifest behaviors (ATO; LÓPEZ; BENAVENTE, 2013). Within the descriptive strategy, the research is characterized as an observational and selective study, considering that it aims both to observe and classify behaviors and to record opinions and attitudes (ATO; LÓPEZ; BENAVENTE, 2013).

Consistent with Carter and Little's (2007) perspective that the methodology is not the method itself, but it is what justifies the research strategies chosen, it was decided that the mixed method would provide a better understanding of the proposed questions. Mixed method studies began to emerge in the late 1980s due to the lack of approaches that could answer to complex research problems. As a result of weaknesses found in both quantitative and qualitative approaches to responding to specific problems, researchers discovered solutions in the combination of both forms of data (CRESWELL; PLANO CLARK, 2018). Nonetheless, it should be noted that "the goal of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies" (JOHNSON; ONWUEGBUZIE, 2004, p. 14-15).

As many relevant studies have already collected quantitative data on observable self-talk and gestures (VAN RAALTE *et al*, 2000; NEDERGAARD; CHRISTENSEN; WALLENTIN, 2021; THIBODEAUX; WINSLER, 2021), in the present study, the main purpose was to expand this understanding from the perspectives of athletes about these behaviors. Specifically, a central question to be answered was: is the perception of the participants about their self-talk and gestures convergent or divergent in relation to the observable and standardized data? Moreover, another important inquiry was: how the qualitative data from the interviews explain the numerical data collected from the observation instrument?

Hence, for this purpose, it was well-marked that neither the qualitative data nor the quantitative approach would provide a satisfactory answer for the research problem. In

addition, the rationales mentioned above also contemplate the scheme proposed by Bryman (2006) regarding the possible reasons for conducting mixed-methods research. Among the reasons indicated from the review of 232 mixed studies, it was identified that the present research questions contemplated 13 of the 16 criteria, namely, triangulation, offset, completeness, process, different research questions, explanation, unexpected results, credibility, illustration, utility, confirm and discover, diversity of views and enhancement (BRYMAN, 2006).

According to Johnson and Onwuegbuzie (2004) propositions about the decisions that the researcher must make when conducting mixed research, it was established that: 1. the dominant approach in the research would be qualitative, and 2. the data collection steps would occur sequentially. Although two of the three stages of data collection are composed mostly of quantitative data, it is understood that the data from the interviews are dominant in terms of volume and robustness, mainly due to the small number of participants. Specifically, in the quantitative phases of the research, general indicators about observable behaviors were established in a standardized way. However, from the qualitative data, it was possible to interpret the nuances, the context and the linkages between these indicators. In other words, as punctuated by Creswell and Plano Clark (2017, p.45), the mixed methods are especially suitable when only one type of evidence would "not tell the complete story".

3.4 PARTICIPANTS

In the case of the present study, seven high-performance young tennis players of different ages from a traditional club in the city of Porto Alegre, Brazil, were intentionally selected for convenience to be part of the study. The club was chosen specifically for its tradition of forming young tennis players, besides having as members of the team the tennis players who are ranked among the 10 best athletes in the state in the sport and the 100 best tennis players in the country.

A group of male and female tennis players aged 11 to 17 years was selected through the following inclusion and exclusion criteria. As an inclusion criterion for the study, it was established that the participants should be ranked among the top ten players in the Gaúcho Tennis Federation (FGT, in portuguese) of their category at the beginning of data collection. Moreover, to be part of the study, it was determined that the player should be ranked among the top hundred players in the Brazilian Tennis Confederation (CBT, in portuguese) at the same period. As exclusion criteria, it was established that the tennis players could not be injured or

have abandoned training and local competitions during the data collection period. The following table (Table 5) shows the association between the athlete's identification, his or her category and if he or she is competing in the first or second year of the category:

Table 5 – Athlete's identification for the study, their category and the year that they are playing in the category

Athlete's identification for the study	Category	Year of the category
Athlete 1	Girls Under16	First year
Athlete 2	Boys Under18	Second year
Athlete 3	Girls Under16	Second year
Athlete 4	Girls Under16	Second year
Athlete 5	Boys Under12	Second year
Athlete 6	Boys Under12	Second year
Athlete 7	Boys Under16	First year

In the current season, which corresponds to the period from January to December 2022, the club had seven tennis players aged 10 to 18 years who meet the inclusion and exclusion criteria, three of which are female and four are male. The mean age of the players selected for the study was 13,85 (SD = 2,19). Additionally, four of the players in the sample were ranked among the top fifty athletes in the national ranking and two of these athletes were classified among the top thirty athletes in their category. One of the athletes in the sample had already scored in the Women's Tennis Association (WTA) ranking at the beginning of the data collection.

The tennis players selected for the research started training tennis with an average of 5 years of age (SD = 1,15) and began to compete with an average of 8,57 years of age (SD = 1,81). All participants had at least three years of competitive experience (M = 5,42, SD = 1,51) and had been training systematically for at least seven years (M = 9,14, SD = 1,67). All the athletes in the sample had already competed numerous times in national tournaments and had competed at least once in an international level tournament.

The U12 Boys category tennis players performed their training in the first training session of the afternoon, which lasted 1 hour and a half. Then, the tennis players of the U16 Girls, U16 Boys and U18 Boys categories trained together for two hours in the second training session of the afternoon. The technical training of all research participants always started with

warm-up activities with a ball and racket on the tennis court. In addition, in all training sessions observed, closed activities (drills), semi-open activities (drills and points) and open activities (free games in different formats, such as tiebreak and set) were performed.

3.5 DATA COLLECTION

The data were collected between February and April 2022 in the city of Porto Alegre, period in which the researcher carried out the study in three stages, respectively: non-participant observations at an international junior tennis tournament, non-participant observations at tennis players' training sessions and semi-structured interviews.

3.5.1 Data collection instruments

At the first stage, data were collected using the *Self-talk and Gestures Rating Scale (STAGRS)* (VAN RAALTE *et al*, 1994) to record players' observable self-talk and gestures and to record the score of their matches (APPENDIX I). In the second stage, the researcher collect data on six training sessions from participants in the sports club where they practice. The evaluation instrument used in the training was built based on the 14 categories of the *STAGRS*, however, instead of recording the points, the type of activity that the tennis players were performing at the time they used a self-talk and gesture category was recorded (APPENDIX IV). The observed training activities were classified into four categories, according to their characteristics: warm-up exercises, open drills, semi-open drills and closed drills (MURPHY *et al*, 2014).

In the third stage, the researcher scheduled and conducted one semi-structured interview with each of the participants. The interview consisted of a blend of closed and open-ended questions and took place in a reserved space in the club where the athletes train (APPENDIX V). The researcher chose the semi-structured interview method so that she could ask more open-ended questions to the participants. The main reason for which the researcher made this decision was due to variability of age among the participants and the possibility to investigate more deeply different emphases given by the participants.

3.5.2 Data collection procedures

3.5.2.1 First stage: data collection in international tennis tournament

The first stage of data collection took place in the international tennis tournament "Brasil Juniors Cup 2022" in which five of the participants played in the main draw. The tournament was held in three phases and followed the knock out format, which is the most traditional one in tennis competitions. Three of the participants were previously classified for the main draw, one of which received a "wild card". This invitation is given by the tournament's organization and allows a player to participate in an event to which he or she would not qualify with their current ranking. Two of the participants earned a spot in the main draw, one of which competed in the qualification rounds and the other in the pre-qualification rounds. In the pre-qualification stage of Girls U16, twenty-six athletes competed in an eliminatory format to dispute one spot in the main draw. Meanwhile, in the qualification stage of Girls U16, twenty-nine athletes competed in the same format to dispute for four spots in the main draw. It should be noted that one of the participants played the three stages of the tournament. Also, two of the participants competed in the pre-qualification rounds, but did not classify for the main draw.

The pre-qualifying, qualifying and main draw had different scoring formats and, therefore, the matches had a wide range of duration, with the shortest match lasting 44 minutes and the longest match lasting 120 minutes. The pre-qualifying rounds followed the "Pro Set" format, in which the players dispute only one set up to eight games with tiebreak if the score is 6 all. Then, in the qualifying round, the matches were played in a best-of-three format with no advantage, in which the first player to reach four points wins the game. Lastly, in the main draw, all matches were played in a best-of-three format with advantage. Altogether, of the 17 matches observed, 6 matches were evaluated in the pre-qualification stage, 3 matches in the qualification stage and 8 matches in the main draw.

The researcher watched and assessed at least one match of each of the research participants, since the tournament followed the eliminatory format and four of the participants lost in their first matches. Two of the participants lost in the first round of the pre-qualification rounds and two of the participants lost in the first round of the main draw.

3.5.2.1.1 Tennis matches' assessments

In total, 17 matches were watched and evaluated using *STAGRS*. In all matches, the researcher stationed herself at the netpost on the far side of the tennis court, opposite the players' bench (Figure 2). As the researcher observed only one of the players on the court, she remained positioned on the netpost from where she accompanied the tennis player evaluated on both sides of the court during side switches. The data of the matches were registered by the researcher with a clipboard with the printed sheets of the instrument and were later fully transcribed into an excel document.

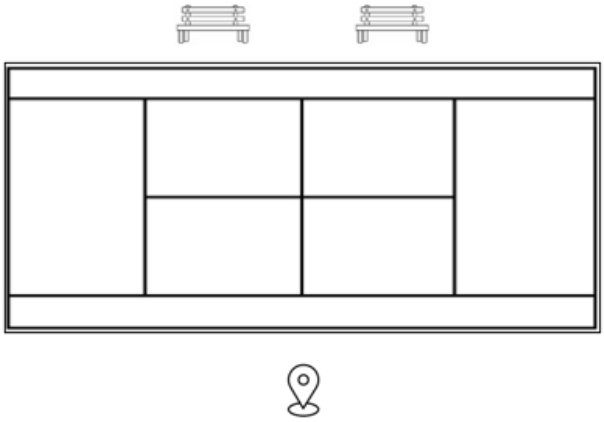

Figure 2 – Position of the researcher during tennis matches

3.5.2.2 Second stage: observation of training sessions

In the second stage of data collection, the researcher made non-participant observations and evaluations of tennis players' training sessions in the club where they regularly train. The instrument used to evaluate the training sessions was built based on the *STAGRS* (VAN RAALTE *et al*, 1994) categories (APPENDIX IV). The same categories of the instrument were assessed, however, while in *STAGRS* the behaviors are registered in each of the players' points, in this second stage, it was registered what type of training activity the participants were performing when they emitted the behavior.

During the observations, four categories of exercises were proposed by the coaches in the training sessions: warm-up exercises, open-pattern drills, semi-open drills and closed-technical drills (MURPHY *et al*, 2014). Warm-up exercises were performed approximately within the first thirty minutes of training and included 2-on-1 or 1-on-1 warm-up with players hitting the ball first near the service area and then near the baseline. Open-pattern drills are

exercises in which players have complete decision-making about their actions during point-play or match-play activities. In the same-open drills format, players start the activity with a predetermined pattern of strokes, and once they complete that goal, they have full decision-making about what they will do while playing the point. Lastly, closed-technical drills are exercises in which players follow a predetermined pattern of strokes, whose main objective is to improve some element of the technical execution of the strokes, such as accuracy or control (MURPHY *et al*, 2014).

It's important to point out that the researcher followed only the technical training of the participants and that the physical training was not part of the observation. This choice mainly because in our literature searches, we did not find articles that evidenced the use of self-talk during physical training. Practice sessions for under-12 tennis players had an average duration of 1.5 hours, while training sessions for under-16 and under-18 tennis players lasted two hours.

The number of training sessions to be evaluated was determined during the observation period itself, since the criterion chosen was the data saturation. This methodological principal concerns to the point in coding when the researcher finds that no new codes occur in the data, but many of the same categories (SAUNDERS *et al*, 2018). Thus, in total, the researcher followed six days of the tennis players' training, however, the number of training sessions observed varied for each participant. A minimum of three training sessions and a maximum of six training sessions of the participants were observed, as shown in Table 1 (M = 3,71, SD = 0,95).

Table 2 - Total number of training sessions observed of each participant

Athlete	**Number of training sessions evaluated**
Athlete 1	5
Athlete 2	6
Athlete 3	3
Athlete 4	4
Athlete 5	4
Athlete 6	4
Athlete 7	4

This variability occurred because tennis players from different categories train on different days of the week and at different times during the afternoon. In additional, for personal

reason, some of the tennis players were unable to attend some training days during the second stage of data collection. Despite this, with the number of sessions observed for each participant, it was possible to find the data saturation point.

3.5.2.2.1 Recording of training session

During the second stage of data collection, the researcher observed and evaluated only of participant per training session, so that she could reliably record self-talk, gestures and their context of use. Therefore, in order to monitor the largest number of participants on each observation day, all training sessions were filmed during this stage. In total, four high-definition video cameras (2 JVC Digital Mini-DV GR-D850 and 2 SONY Handycam DCR SX41) were used for the researcher to collect data from an athlete on a court at the same time that she could collect the self-talk and gestures of the other athletes through footage.

During practice sessions, two cameras were placed per court, with each of the equipment positioned at the back and center of each side of the tennis court, as shown in Figure 3. It was determined that the location in which the cameras would be positioned during practice would be the same location were the participants' official matches had been filmed. After each day of training observation, the researcher watched the recordings in order to code the participants' behaviors and the context in which they occurred. The records made live and the records made from the recordings were transcribed into an Excel table for further analysis (APPENDIX IV).

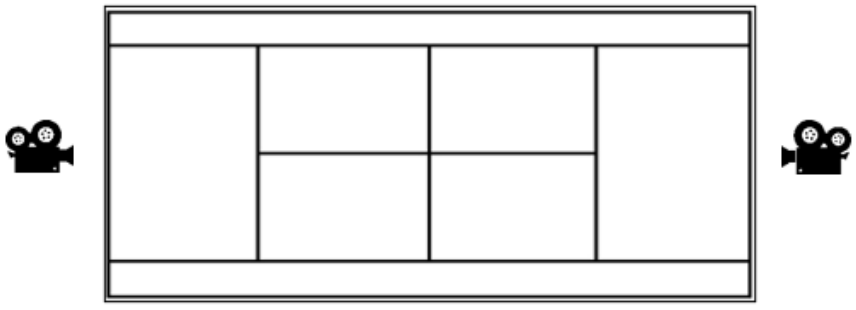

Figure 3 – Position of the cameras during training sessions

3.5.2.3 Third stage: interviews

In the final stage of data collection, the researcher conducted an interview in a semi-structured format with each of the participants, according to Horton, Macve and Struyven's (2004) recommendations, mainly in relation to the flexibility given to the researcher in

designing and refining the interview guide. The interviews were carried out inside the club where the athletes train and were previously scheduled with the tennis players and their coaches. The interviews were recorded and happened after the technical training session of participants in a private space of club. All interviews were recorded in audio format with a cellphone recorder (Iphone 12 64GB Mini) so that they could be transcribed for later analysis. The shortest interview lasted 17,57 minutes and the longest interview lasted 50,32 minutes (*M* = 29,92, SD = 11,40) as shown in Table 3.

Table 3 – Total interview time for each participant in minutes

Athlete	Time (in minutes)
Athlete 1	34,13
Athlete 2	50,32
Athlete 3	35,29
Athlete 4	30,50
Athlete 5	21,17
Athlete 6	17,57
Athlete 7	20,51

The interview script was composed of 27 pre-structured questions formulated to meet the research objective and three questions about basic information, such as the category in which the participant currently plays and how long they train and compete in tennis (APPENDIX V). The first 7 questions were adapted from the *Self-talk Use Questionnaire* (*STUQ*, HARDY; HALL; HARDY, 2005) and were aimed to investigate the covert and overt (out loud and whispering) self-talk. The second block of questions was composed from the adaptation of the 14 categories of the *STAGRS* (VAN RAALTE *et al*, 1994). The last 6 questions were formulated by the researcher and her advisor to investigate the athletes' perceptions of the relationship between self-talk and gestures and performance and the difference of use of these behaviors in training and competition settings. The total interview time was 209,49 minutes and the interview script and the participants' answers were fully transcribed in a total of 66 pages. The transcripts of the interviews were not added in full to the appendices of this research because they contained information that could violate the anonymity of the participants.

3.6 RESEARCH ANALYTIC STRATEGIES

3.6.1 Quantitative data

Descriptive statistics were used to evaluate the data collected through STAGRS in the first two stages of the research through the Statistic Package for Social Sciences (SPSS) software version 20. The data were normalized by number of matches in competition and number of practice sessions observed by athlete. The normality of the data and the rejection of the null hypothesis (that the behaviors exhibited by the participants had the same frequency in training and competitions) were verified using Shapiro-Wilk test and all data were non-parametric. The Kruskal-Wallis Test (Kruskall & Wallis, 1952) was used to compare the difference between the training and competition data. The *Kruskal-Wallis* is a nonparametric test used to examine the difference between more than two variables when the samples are independent. This test, which is an extension of the *Mann-Whitney*, is used to compare variables mean ranks, namely, the medians. Also, in the *Kruskal-Wallis* test, the null hypothesis is that the variables medians are equal, which means that if this hypothesis is rejected, then there is a difference between at least two of them. Therefore, when this happens, the result is said to be statistically significant (BEWICK; CHEEK; BALL, 2004). In the present study, the null hypothesis was that the behaviors exhibited by tennis players at the same frequency in training sessions and competitions, which were the two main variables among the quantitative data. Finally, we used ANOVA to compare the variances between training and competition means for the self-talk categories described by STAGRS. To perform all statistical analysis, we used the Statistical Package for Social Sciences (SPSS) version 26 and we adopted α=0.05.

3.6.2 Qualitative data

The main strategy elected to analyze the large amount of qualitative data collected from the interviews was Thematic Analysis (TA), as described by Braun and Clarke (2006). Despite the existence of records on thematic analysis since the beginning of the 20th century, Braun and Clarke were the authors who best described and elucidated the steps for the application of this methods (BYRNE, 2021). Moreover, this method was chosen due to the understanding that a major objective of the research was to identify patterns of behavior among these highly skilled athletes from their statements in the interviews.

3.6.2.1 Thematic Analysis

Thematic analysis is an interpretative method in which the researcher has an active role in the identification, analysis and description of patterns within data set. TA is considered a flexible method, since researchers can decide which is the most suitable theoretical framework according to their positions and values and the questions to be answered (BRAUN; CLARKE, 2006). However, Braun and Clark (2019) pointed out that this method has been misinterpreted in many sport and exercise researches, resulting in unreflexive and conceptually mistaken practices. Considering this, in this TA, the six steps described by Braun and Clarke (2006) will be followed and complemented by recent recommendations on Reflexive Thematic Analysis (RTA) (BRAUN; CLARKE, 2019).

Although TA has already been criticized for the idea that it was consisted of linear and rigid steps, Braun and Clarke (2019) emphasize that one of the central aspects of this method is the subjectivity of the researcher. Particularly, the themes are generated by the researcher from its profound engagement with the data and its creative and reflexive capacity. Herein, the idea that themes are not inherently in the data set to be "found", but rather actively generated from the interpretative choices of the researcher, is one of the aspects emphasized in the RTA (BRAUN; CLARKE, 2019). In this regard, although there is no complete agreement on the definition of themes (BRAUN; CLARKE, 2016), it can be considered "as stories about particular patterns of shared meaning across the data set" (BRAUN; CLARKE, 2019, p. 4).

Another important aspect to be considered is transparency in relation to the theoretical framework on which the researcher relies, such as essentialism, constructionism, and contextualism (BRAUN; CLARK, 2006). In this TA, the interpretive choices will be guided by the constructionist paradigm, which understands that knowledge of reality takes place through the way individuals and groups perceive and construct it, rather than the idea that the reality has an objective validity (AMERICAN PSYCHOLOGICAL ASSOCIATION, 2015). Clarity regarding the theoretical position is essential so that the reader can understand where the researcher's assumptions about the data set come from and so that the research can be evaluated by others (BRAUN; CLARKE, 2006).

Furthermore, Braun and Clarke (2006) indicate some important decisions that must be made regarding the type of TA that will be carried out. First of all, it was decided that all the material collected in the interviews would be analyzed, despite the fact that a part of the questions in the script already corresponded to pre-established themes. This decision was made

so that the researcher could find both semantic and latent themes in the participants' speeches. In the latent approach, the researcher searches, in an interpretative way, for themes that underlie the surface of the content, while in the semantic analysis, the focus is on the first level of meaning of the data. In addition, it is understood that the analysis will also be carried out at both an inductive and a deductive level, since the researcher will partially guide the analysis from pre-existing coding frames (BRAUN; CLARKE, 2006).

In TA, there is a constant analytical movement that runs through the data set, and writing is an integral part of the process, since the initial phase of data collection. In other words, the analysis does not follow a linear process, but recursive, that is, in which the researcher goes back and forth along the data set. Moreover, it's important to point out that the generation of themes also happens during all stages of TA and even before the analysis stage itself starts (BRAUN; CLARKE, 2006). Considering that "a theme captures something important about the data in relation to the research question", the researcher had already engaged with the literature related to the topic and to data analysis, due to the view that this prior familiarization could make the identification of themes more accurate (BRAUN; CLARKE, 2006, p. 82).

3.6.2.1.1 Phases of TA

3.6.2.1.1.1 Familiarization with data

Since the researcher carried out all the interviews, it was possible to have some prior knowledge of the data even before the beginning of the analysis stage. In addition, it is important to point out that the interviews were recorded in audio format and transcribed by the researcher, when it was possible to have a new contact with the data. After that, the researcher sent the interviews to the participants so that its content could be validated by them. Then, the researcher translated the interviews, which were written in Portuguese, that is, in the native language of the participants, into English, when she could become more familiar with the data again. It is also worth noting that, because the researcher is not a native speaker of English, the transcribed interviews were reviewed by a native American reviewer who also speaks Portuguese.

Furthermore, after this initial familiarization, the researcher engaged in repeated readings of the interviews before starting the data coding process, as recommended by Braun and Clarke (2006). During the first phase, the researcher read the interviews in a word file and

highlighted in different colors and through comments the ideas that emerged from this familiarization. According to Braun and Clarke (2006), once the researcher has become deeply familiar with the data and has a broad understanding of it, he or she is ready for the formal coding process.

In this first stage, 33 initial ideas were pointed out by the researcher from excerpts from the interviews underlined in different colors in a word file. Of the 33 initial ideas, 17 were identified by the researcher at a semantic or explicit level, while 16 ideas were classified as latent or interpretive.

3.6.2.1.1.2 Generation of initial codes

In the second phase, the researcher reread the interviews with the initial notes and began to generate all potentially relevant codes mostly from a "data-driven" perspective. Given the researcher's training as a cognitive and behavioral psychologist, a sports psychologist and a former tennis coach, it is worth noting that the coding was also partially carried out from a "theory-driven" perspective. At this stage, it should be noted that the codes are not generated from the researcher's interpretive activity and, therefore, do not represent the themes themselves yet, which are more generally broader. Although the units of analysis will only be generated in the next step, it is important that, during coding, the researcher is aware of aspects in the data items that has the potential to become the repeated patterns across the data set (BRAUN; CLARKE, 2006).

For the second stage, 145 data extracts were selected among the content of the 7 interviews. For each data extract, 1 to 5 codes were generated, depending on the complexity of the content and the size of the selected extract. In total, 278 codes were generated, and some of these codes were used more than once to classify different data extracts. Table 6 presents an example of data extract from each of the research participants and the codes generated from them:

Table 6 – Example of data extracts and codes

Data extract	Coded for
I do that *(ball abuse)*, but it's not, like, always. That's when you've reached a level so I can't control it like that, you know?[1] To a certain level, like, I can be calming down. Like, "All right, let's go". But sometimes when you cross that line like that. It's the last case, that I'm going to go back	1. Ball abuse behavior related to high emotional dysregulation 2. When you cross a line that you can't manage your emotions anymore, there's a chance that you may scream or engage in behaviors like ball abuse.

somewhere that's not going to come back, on the grid or on the net, you know? But it's the last case, when I'm way over. Like, I freaked out a lot (laughs) […] or I'm going to scream, you know?[2] Like, something to relieve, because then I'm holding it so I don't... that feeling, then I find some way to de-stress like that.[3] **(Athlete 1 – U16G)**	3. When you experience a high emotion arousal, you have to do something to relieve the stress.
Sometimes I thought "Oh, but you've already won, you have to finish the guy"[1] It's just that the obligation turned to anger[2] and the anger turned... (pause) I got lost[2], understand? **(Athlete 2 – U18B)**	1. Play against some opponent you've played and won before and feel like it's your obligation to win the match again 2. Talked about how the obligation to win agains a known opponent turned into anger and emotion dysregulation
Over and over again. It's very common[1] *(negative self-talk)*. I say that I don't do anything right, that I can't do anything[2]. A lot of times, that I'm going to lose, that I'm going to miss another ball.[3] **(Athlete 3 – U16G)**	1. Talking about how common it is to say negative things to yourself when playing tennis 2. Saying negative things to yourself in a generalized way after a specific situation 3. Guessing, a lot of times, negative things about your future performance
Training is a more relaxed thing, isn't it? I don't need to vibrate or anything.[1] But when I'm playing, especially when I'm losing, I have this need to put myself up. So, yes, I celebrate a lot.[2] **(Athlete 4 – U16G)**	1. In training, you don't need to vibrate, because you're in a more relaxed environment 2. When you're at the competition, you need to vibrate and put yourself up, especially when you're losing 3. Differences in how you feel and what you do in training and competition settings
I try to demonstrate as little as possible. But sometimes you can't hide it.[1] **(Athlete 5 – U12B)**	1. You have to try not to show your emotions when you're playing
Oh, when I'm frustrated... frustrated... *(laughing in frustration)*. But I only laugh in practice.[1] In competition I don't do that[3] [...] Because in practice it's practice, it's not worth anything like that. Then you can joke more too.[2] **(Athlete 6 – U12B)**	1. Talking about laughing in frustration, but only at practice 2. In practice, you can laugh and joke, even when you're frustrated, because it's not worth anything 3. Differences in how you behave in training, which is a more relaxed environment, and competition, where you have to be more serious

What I end up doing, which I started with the help of my psychologist now... that she taught me that, like, it's better if I imagine me hitting the right and the main thing is where the ball goes, not the movement itself.[1] I can know what I did wrong, which was the leg position, for example, but I have to ignore the leg and imagine myself hitting the ball where I wanted. So, that's why I stopped saying, "oh, no, you're late" and these things.[2] **(Athlete 7 – U16B)**	1. You should imagine yourself executing the shot and the most important thing is that you imagine a successful ball trajectory 2. It's better for your performance if you imagine yourself hitting the shot rather than repeating the shot without the ball or giving instructions to yourself.

3.6.2.1.1.3 Search for themes

At this stage, the researcher is expected to have a list of different codes that will be analyzed and integrated to form potential themes. Braun and Clarke (2006) suggest the construction of a thematic map as one of the possible ways of representing and organizing codes, themes and sub-themes within the selected data. At this stage, it is important that no records are discarded yet, as these materials will still be analyzed and refined again.

Due to the volume of data, the researcher divided the third phase into two sub-steps, so that she could organize the codes generated in the previous step into potential themes. In the first sub-step, the researcher organized all the codes into 12 potential themes, which she preliminarily called: “Hide emotions in competition”, “Differences between training and competition”, “Instructional self-talk”, “Feel angry”, “Be too hard on yourself or Don’t tolerate mistakes”, “Positive self-talk”, “Sportsmanship in tennis”, “Behaviors that give you confidence or motivation”, “Motion of stroke”, “Mental imagery”, “Behaviors that help you play better” and “Miscellaneous”. The “Miscellaneous” theme was created so that the researcher could temporarily house the codes that didn’t seem to fit into any other theme, according to Braun and Clarke’s (2006) recommendation.

In the second sub-step, the researcher reorganized the potential themes into broader themes and sub-themes, according to the research questions and the prevalence of items within the entire data set. Thus, a first thematic map was created from the organization of themes, sub-themes and sub-themes within the sub-themes. The sub-themes of the "Miscellaneous" theme were temporarily kept out of the thematic map in this step to be better evaluated in the next phase. At this stage, from an inductive perspective, the researcher developed an initial thematic map (Figure 4) in order to graphically represent the large volume of Participants' speeches and the initial ideas.

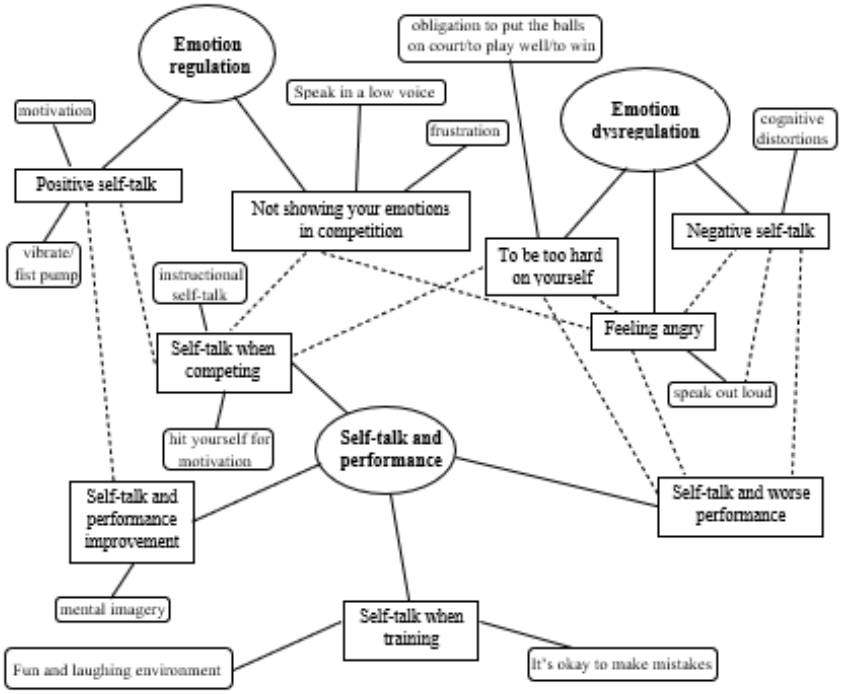

Figure 8 – Final thematic map

Thematic map subtitle

Represents a theme

Represents a subtheme

Represents a subtheme within a subtheme

Association between a theme and its subthemes

Association between a subtheme and its subthemes

Association between subthemes of different themes and subthemes within the same theme

Figure 4 – Initial Thematic Map

3.6.2.1.1.4 Reviewing themes

In the fourth stage of the TA, the researcher will be engaged in the refinement of the candidate themes. In the refinement process, it is possible that some themes are discarded, while others are integrated or broken down, so that the themes can have a clear boundary that distinguishes them from each other. For the proper selection of themes, the researcher must answer two sequential questions, namely: 1. does the candidate themes appear to form a coherent pattern? and 2. does the candidate themes are congruent with the data set? As stated by Braun and Clarke (2006, p. 92), "at the end of this phase, you should have a fairly good idea of what your different themes are, how they fit together, and the overall story they tell about the data".

In this step, the researcher reorganized the sub-themes into the 3 major themes that had been identified in the previous step and associated them with the participants' data extracts to verify if they were coherent with each other. In this process, some excerpts were relocated to another theme or were excluded, when they did not fit within any theme or sub-theme. An example of this is the “Behaviors that give you confidence” and “Behaviors that give you motivation” sub-themes, whose excerpts were mainly distributed among the “Self-talk when competing” and “Positive self-talk” themes. In addition, the researcher underlined the excerpts that represented the essence of the data extracts in order to identify possible sub-themes within the sub-themes, as shown in example in Figure 6.

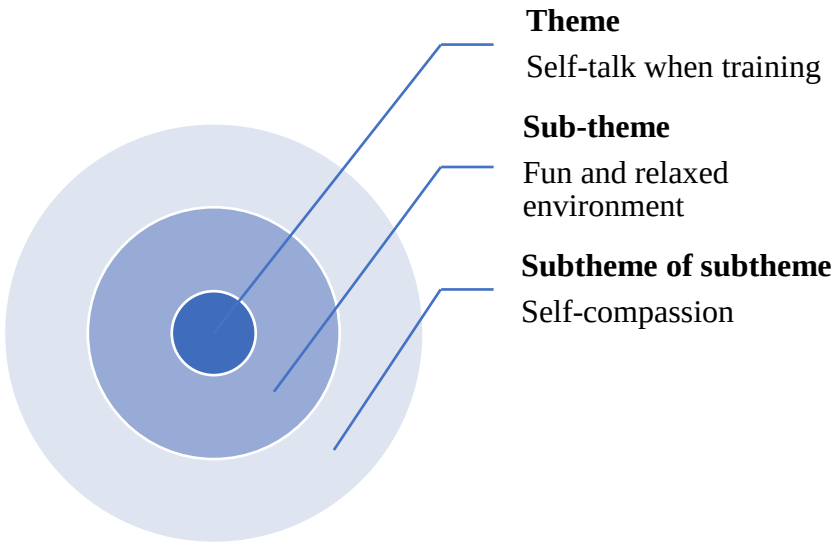

Figure 5 – Example of a set of theme, sub-theme and sub-theme within the subtheme

It is noteworthy that the sub-themes contained within other sub-themes were identified based on the prevalence of these contents in interview extracts of different participants and their relevance within the entire data set. The process of identifying the sub-theme "Fun and relaxed environment" among extracts from different participants, exemplified in Figure 6, is detailed in Figure 7:

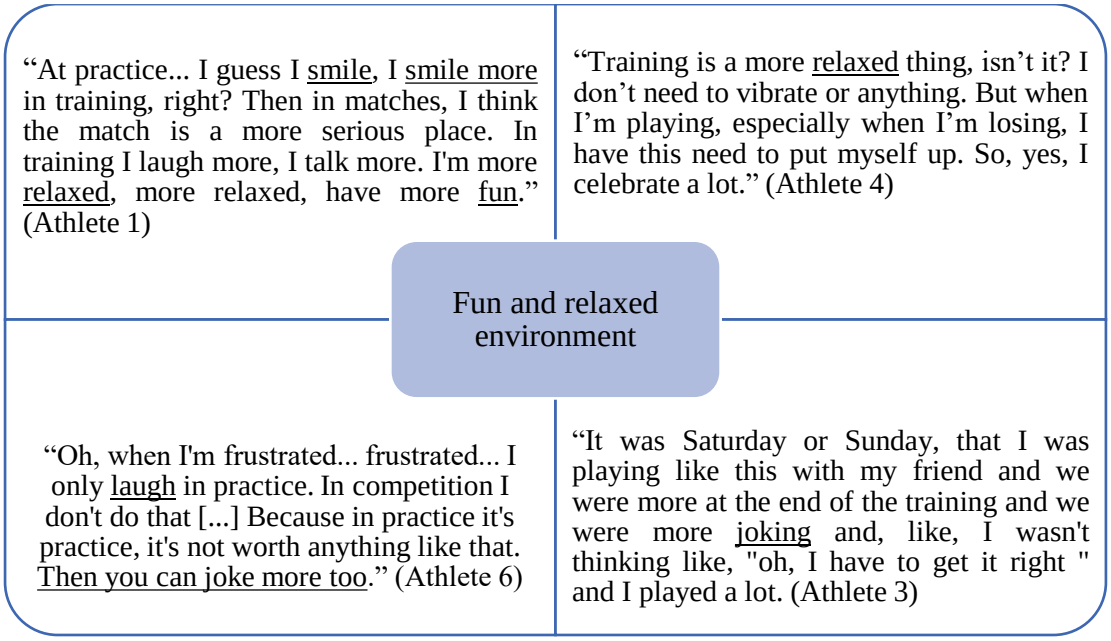

Figure 7 – Example of construction of the sub-theme “Fun and laughing environment” within the sub-theme “Self-talk when training”

3.6.2.1.1.5 Defining and naming themes

At this stage, the researcher has two essential tasks: to make the final refinement of the themes and to identify the essence of each one of them and how they relate with one another. A decisive aspect at this stage is to analyze how each of the themes fits with the guiding questions of the research. Additionally, at that moment, the distinction between a theme and a non-theme and the clarity regarding the sub-themes that are within each theme should be evident to the researcher. Although probably at this stage the meaning of the themes will be clear to the researcher, it should also be evident to the reader what each name of the themes represents in general terms (BRAUN; CLARKE, 2006). In the fifth step, the researcher defined the essence of each of the themes and verified which sub-themes fit within each theme and each sub-theme, as shown in Table 7.

3.6.2.1.1.5 Production of the report

In this final step, it is expected that the investigator has already obtained a set of fully worked-out themes, so that it is possible to formulate a valid and coherent analysis of the generated themes. It is important that the researcher can demonstrate the relevance of the themes through an amount of consistent data extracts (BRAUN; CLARKE, 2006). According to Braun and Clarke (2006, p. 93), this procedure is essential to “convince the reader of the

merit and validity of your analysis". The results of the thematic analysis can be seen, more succinctly, in Study I, and, in more detail, in Study II of this thesis.

Table 7 - Themes, subthemes and subthemes of subthemes

THEME 1 – Self-talk when competing

Subthemes:

1. Negative self-talk
   - 1.1 Self-critical self-talk
   - 1.2 Performance pressure
   - 1.3 Irrational beliefs
2. Positive self-talk
   - 2.1 Positive self-talk
   - 2.2 Motivational self-talk
3. Instructional self-talk

THEME 2 – Self-talk when training

Subtheme:

1. Self-compassionate self-talk
   - 1.1 Fun and relaxed environment
   - 1.2 Express emotions freely

CHAPTER 3

Study I

Self-talk of young Brazilian high level tennis players in training and competition: a mixed method study

Marcela Gonçalves Freitas, Thiago José Leonardi

School of Physical Education, Physiotherapy and Dance, Federal University of Rio Grande do Sul

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SELF-TALK OF YOUNG BRAZILIAN HIGH-PERFORMANCE TENNIS PLAYERS IN TRAINING AND COMPETITION: A MIXED METHOD STUDY[1]

ABSTRACT

Self-talk is one of the self-regulation and performance improvement strategies most used by athletes and coaches today. For this reason, this mixed study aims to compare the use of self-talk by tennis players in training and competition and verify the accuracy between observed data and self-reported data in these contexts. The study sample was composed by 7 Brazilian high-performance tennis players aged 11 to 17 (male and female) who compete at state, national and international levels. The *Self-talk and Gestures Rating Scale* (STAGRS) instrument was used to assess the self-talk in competition and in practice sessions. A semi-structured interview was conducted with each of the participants. The results indicate that tennis players use self-talk much more frequently in competition than in training. In practice, tennis players mostly used negative self-talk, while, in competition, the majority of tennis players mostly used positive self-talk. Differences were identified in self-talk between the younger and older tennis players and the ANOVA test indicated variance in Fist pump, Positive self-talk, Ball abuse, and Self-talk in general categories.

Keywords: Inner dialogue. Cluster Analysis. Thematic Analysis.

Introduction

Self-talk is one of the most popular self-regulation strategies in sport psychology, as well as in developmental psychology and in Cognitive-Behavior Therapy (CBT) and Rational Emotive Behavior Therapy (REBT) (Latinjak, 2020). Self-talk is related to verbalizations or

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statements that are addressed to the self (and not to others), either overtly or covertly, whose content has interpretive elements and has a function in a given context (Hardy, 2006). In the sports field, self-talk can be considered as the “inner coach” that makes a rational counterpoint to the irrational "inner voice" of athletes (Latinjak & Hatzigeorgiadis, 2020). In other words, self-talk refers to a self-regulatory communication mechanism in which the sender of the message is also its receiver.

Considering that self-talk is intricately related to spontaneous and rational thought processes (Latinjak, 2020), its use is shown to be an important mechanism of emotion regulation (Fritsch et al., 2022) and behavior change (Latinjak, 2020). Self-talk strategies have been investigated since the late 1980s and interventions in this area have already been shown to be effective in facilitating learning and improving performance (Hatzigeorgiadis et al., 2011). In recent years, an important advance in the literature on self-talk was marked by the transition from purely data-driven approaches to theory-driven approaches (Fritsch et al., 2020), mainly by the integration with dual-process theories (Van Raalte, Vincent & Brewer, 2016).

Currently, two classifications of self-talk are widely accepted in the sports literature: organic self-talk, previously called automatic, and strategic self-talk (Latinjak et al., 2019). Within organic self-talk, there is a type of self-talk that is spontaneous, and that can represent beliefs, emotions, arousal, automatisms, and so on; and another type that is goal-directed, which ranges from intrapersonal psychological skills (e.g., self-motivation skills) to interpersonal psychological skills (e.g., persuasion skills) (Latinjak, 2020). Strategic self-talk, on the other hand, concerns strategies deliberately employed and supported by memory whose main purpose is to enhance performance or achieve a desired result (Latinjak et al., 2019). In this case, strategic self-talk is commonly part of process-oriented psychological interventions,

along with other strategies, such as goal setting, relaxation, team building, and so forth (Latinjak, 2020).

It is a fact that environmental factors, whether transitory or stable, comprising cultural variables and task characteristics, play a key role in sports performance (Latinjak, 2020). To understand how self-talk affects performance, it is important to consider both its antecedents and consequences, along with individual characteristics (in the case of individual sports) or group characteristics (in the case of team sports or training teams) (Van Raalte et al., 2000). Regarding their antecedents, personal factors such as personality, traits and beliefs, and situational factors must be considered, that is, the task difficulty, the match circumstances, the coaching behaviors, and the competitive setting (Hardy, Oliver & Tod, 2008).

Therefore, the contextual particularities of self-talk must be considered, that is, whether the statements occur in a context of training (e.g., during a challenging task) or competition (e.g., the score of the match), as well as the elements present in these environments, such as the influence of the behavior of significant others, such as coaches, peers, and parents (Latinjak, 2020). This aspect was widely discussed in Bandura's Social Learning Theory, which explains how the behavior of individuals is shaped and learned by the influence of those around the individual (Bandura, 1977). In this sense, it is understandable why the language used by significant others, and the self-talk itself, is potentially a predictor of the individual's self-talk, and, thus, should also be considered as an environmental factor (Latinjak, 2020).

Previous studies indicated that in approximately 30% of the points played, tennis players use some type of verbalization or gesture (Van Raalte et al., 1994; Van Raalte et al., 2000) and that they report using self-talk more in competitions than in training (Hardy, Hall & Hardy, 2005). There seem to be few studies that have investigated the characteristics of spontaneous self-talk of tennis players in training, and it has been indicated that tennis players

seem to react mostly emotionally to situations in this context (Thibodeaux & Winsler, 2018). Also, most studies on self-talk have investigated novice athletes and only a few studies have involved high level athletes (Latinjak, 2020).

In addition, other studies have already pointed to the existence of discrepancies between the self-talk that is observable and the self-talk that is self-reported by tennis players, which may suggest that athletes have little awareness of their inner dialogue (Winsler & Naglieri, 2003; Thibodeaux & Winsler, 2018). In view of the possibility of improving athletes' awareness of their self-talk and also of psychological interventions, it is extremely important to investigate both observable and unobservable self-talk in the context of training, where tennis players spend most of their time, as well as in competition.

Thus, the purpose of current study was to explore the observable and self-reported self-talk of young high-performance Brazilian tennis players aged 11 to 17 in the context of training and competition. Specifically, we aimed to explore mainly if: (a) there are differences in the self-talk of the participants in training and in competition; (b) there are differences in the self-talk of older and younger participants, between the Under 12, Under 16, and Under 18 categories; and (c) there is a discrepancy between observed data (observable self-talk) and self-reported data (self-reported self-talk).

Materials and Methods

Study Design

A mixed method approach was conducted in order to provide a better understanding of the quantitative and qualitative data collected. According to Johnson & Onwuegbuzie (2004, p. 14-15), “the goal of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies”. As many relevant studies have already collected quantitative data

on observable self-talk and gestures (Van Raalte et al., 2000; Nedergaard, Christensen & Wallentin, 2021; Thibodeaux & Winsler, 2021), in the present research, one of the main purposes was to expand this understanding from the perspectives of athletes about these behaviors in training and competition settings.

Participants Characteristics

A total of 7 young high level tennis players aged 11 to 17 (3 females and 4 males; M = 13.85, SD = 2.19) with at least four years of competitive experience (M = 5.42, SD = 1.51) and seven years of systematic training (M = 9.14, SD = 1.67) were recruited to participate in the study. Athletes were selected based on the following eligibility criteria: (a) being ranked among the top 10 players of their category in the Gaucho Tennis Federation (FGT, in Portuguese), (b) being ranked among the top 100 players of their category in the Brazilian Tennis Confederation (CBT, in Portuguese), and (c) be competing between the Under 12 and Under 18 categories. All athletes aged 10 to 18 years who met the established inclusion criteria and who train in the sports club in the city where the researchers' university are located were selected. To preserve confidentiality, each participant was assigned a number for the study (one for the practice and one for the competition), as shown in Table 1, which describes the characteristics of the participants, including the interview time for each one:

Table 1 - Participants' sports information

Athlete's Identification (Competition and practice)	Age	Category	Interview duration (In minutes)	Training experience	Competitive experience
Athlete 1 (8)	15	Girls U16	34.13	11 years	8 years
Athlete 2 (9)	11	Boys U12	20.51	7 years	4 years
Athlete 3 (10)	11	Boys U12	17.57	7 years	4 years
Athlete 4 (11)	15	Girls U16	30.50	9 years	4 years
Athlete 5 (12)	17	Boys U18	50.32	10 years	6 years
Athlete 6 (13)	14	Boys U16	21.17	9 years	6 years
Athlete 7 (14)	14	Girls U16	35.29	11 years	6 years

Instruments

Self-Talk and Gestures Rating Scale (STAGRS).

In the first two stages, data were collected using the *Self-Talk and Gestures Rating Scale* (STAGRS, Van Raalte et al., 1994), and in the evaluations carried out in the second stage, the instrument was adapted for the training context. STAGRS evaluates 14 behaviors in three categories: (1) *positive self-talk*: compliment opponent, positive self-talk and fist pump; (2) *negative self-talk*: ball abuse, racquet abuse, opponent abuse, negative self-talk, hit oneself(positive or genitive), "Oh God," in frustration and laughing (positive or negative); (3) *instructional self-talk*: practice the stroke motion and instructional self-talk (Van Raalte et al., 1994).

The researcher had approximately 15 hours of training to use the *STAGRS*, starting from the contact with the researcher responsible for the instrument and the study of the *Training manual for the Self-talk and Gestures Rating Scale* and the *Tennis umpire scoring tips*, both materials provided by the specialist. After that, the researcher conducted a pilot study in a state junior tennis tournament and, finally, watched and assessed three matches from BoysU16, BoysU18 and GirlsU18 categories from two previous editions of the same international tennis tournament that would be part of the current study, which were available on *Youtube*. The time between the first assessment of the matches in the videos and the second was two weeks. The average intra-rater reliability between the two evaluations was calculated in the *SPSS* software by kappa test (k = .89) and indicated a strong level of agreement according (McHugh, 2012).

Semi-structured interview

The interview guide was composed of 27 pre-structured questions formulated by adapting the Self-Talk Use Questionnaire (STUQ, Hardy, Hall & Hardy, 2005) and the Self-Talk and Gestures Rating Scale (STAGRS, Van Raalte et al., 1994). The questions adapted

from the STUQ were used so that we could investigate the covert and overt (out loud and whispering) self-talk; the questions adapted from the STAGRS were added so that we could investigate the perceptions that tennis players have about the 14 self-talk categories observed and assessed in the two previous phases. The last six questions were formulated by the researcher and her advisor to investigate the athletes' perceptions of the relationship between self-talk and gestures and performance and the difference of use of these behaviors in training and competition settings.

Procedures

Participants read and signed the informed consent form and their guardians signed the informed consent form. Participants and their guardians were informed about the research purpose, data confidentiality, and their right to withdraw at any time during the study. Ethical approval was granted by the local research ethics committee.

The research was conducted in three phases, respectively: (1) data collection at an international tennis tournament, (2) data collection at practice session, and (3) a semi-structured interview with each of the participants. The first stage of data collection took place in the international tennis tournament *Brasil Juniors Cup* 2022 in which five of the participants played in the main draw (two of these participants also played the qualifying round) and two of the participants played in the pre-qualifying rounds. The number of matches observed by each Participant was subject to the eliminatory nature of the competition and, therefore, 1 to 6 matches were watched by each tennis player ($M = 2.42$, $SD = 2.14$).

The researcher watched and assessed at least one match of each of the research participants, since the tournament followed the eliminatory format and four of the participants lost in their first matches. Two of the participants lost in the first round of the pre-qualification rounds and two of the participants lost in the first round of the main draw. In total, 17 tennis

matches were observed and evaluated using the *STAGRS* from the pre-qualifiers to the quarter-finals (Van Raalte et al., 1994).

In the second stage of data collection, the researcher made non-participant observations and evaluations of tennis players' training sessions in the club where they regularly train. The instrument used to evaluate the training sessions was built based on the STAGRS (Van Raalte et al., 1994) categories. The same categories of the instrument were assessed, however, while in *STAGRS* the behaviors are registered in each of the players' points, in this second stage, the score was not recorded, since the athletes were in technical training, which was composed by warm-up exercises, open-pattern drills, semi-open drills and closed-technical drills (Murphy et al., 2014).

In the final stage of data collection, the researcher conducted a semi-structured interview with each of the participants, composed by 27 questions. The interviews were carried out in a private space inside the club where the athletes train after their technical practice session and were previously scheduled with the tennis players and their coaches. All interviews were recorded in audio format with a cellphone recorder (Iphone 12 64GB Mini) so that they could be transcribed for later analysis. The shortest interview lasted 17.57 minutes and the longest interview lasted 50,32 minutes (M = 29.92, SD = 14.49).

Data analysis

Quantitative analysis

Descriptive statistics were used to evaluate the data collected through STAGRS in the first two stages of the survey. The data were normalized by number of games in competition and number of practices observed by athlete. The normality of the data and the rejection of the null hypothesis (that the behaviors exhibited by the participants had the same frequency in training and competitions) were verified using Shapiro-Wilk test and all data were non-

parametric. The Kruskal-Wallis Test (Kruskall & Wallis, 1952) was used to compare the difference between the training and competition data.

We performed hierarchical cluster analysis due to the small number of subjects and the non-parametric characteristic of the data collected. Our objective when using the Clustering procedure with Ward's linkage method was to find groups (clusters), and their influencing factors, within the quantitative data set that contained similarities or patterns among themselves (Suzuki & Shimodaira, 2006). In the Cluster analysis, we focused on classifying tennis players into groups with similar patterns across training and competition in relation to the 14 categories described by the STAGRS. The main purpose of this method was to identify the strength of the relationship between participants in training and competition and the strength of the relationship between the self-talk categories used in these two contexts. Finally, we used ANOVA to compare the variances between training and competition means for the self-talk categories described by STAGRS. To perform all statistical analysis, we used the Statistical Package for Social Sciences (SPSS) version 26 and we adopted α=0.05.

Qualitative analysis

Thematic Analysis. For qualitative data, we employed the six steps proposed by Braun & Clarke (2006) to conduct a deductive thematic analysis to both analyze the content of the interviews and increase confidence of the cluster method used. Thematic analysis is an interpretive and flexible method that was used so that the researchers could have an active role in the identification, analysis and description of patterns within the data set (Braun & Clarke, 2006). Since the researcher carried out and transcribed all the interviews, it was possible to have some prior knowledge of the data even before the beginning of the analysis stage. Then, the researcher engaged in repeated readings of the interviews, when the first ideas that emerged from this initial familiarization were highlighted and commented on, as recommended by Braun & Clarke (2006).

As the researcher was already deeply familiar with and had a broad understanding of the data, the coding process began with attention directed to data items that had the potential to become repeated patterns across data sets. Across stages three to four, the researcher worked on the integration of codes that could become themes and on the refinement of candidate themes that emerged. Then, at the fifth stage, the researcher made the final refinement of the themes and identified the essence of each one of them and how they relate with one another and with the research questions. In the last step, the researcher had already obtained a set of fully worked-out themes, which could be integrated and analyzed in a valid and coherent way with the quantitative data. It is possible to find the more detailed results of the Thematic Analysis in Study II of the present thesis (Page 80).

Results

This section will be described in an integrate perspective, mixing quantitative and qualitative data.

Self-talk categories most used by participants in practice and competition

Descriptive statistics provide an overview of the self-talk and gestures exhibited by the participants in training and competition (Table 2). In addition, descriptive data referring to measures of Positive self-talk, Negative self-talk and Instructional self-talk were calculated. These measures were formed by calculating the scores of the respective STAGRS categories according to the note below Table 2. We can note significant differences ($p<0.05$) between self-talk in training and competition in the Fist pump, Positive self-talk, and Self-talk in general categories, along with the combination between the scores of the following categories: Compliment Opponent, Fist pump, and Positive self-talk (POS.ST in Table 2).

Table 2 – Absolute and normalized frequencies and comparison between self-talk types in training and competition

STAGRS categories	*Training sessions*		Competition (17 matches)		Kruskal-Wallis test
	Absolute (SD)	*Normalized (SD)*	Absolute (SD)	Normalized (SD)	p
Ball abuse	*1.86 (.88)*	*0.43 (.20)*	1.71 (1.04)	.44 (.22)	.892
Compliment opponent	*.29 (.18)*	*.06 (.04)*	.86 (.59)	.38 (.29)	.465
Fist pump	*1.71 (.56)*	*.39 (.14)*	33.57 (15.99)	10.50 (2.46)	.007
"Oh God" in frustration	5 (1.65)	1.26 (.42)	6.86 (2.46)	3.46 (1.46)	.237
Instructional self-talk	1.29 (.61)	.27 (.12)	.71 (0.42)	0.37 (0.18)	.588
Hit yourself	7 (2.36)	1.67 (.60)	10.71 (5.55)	4.89 (2.04)	.236
Laughing	.14 (.14)	.29 (.29)	0.57 (0.20)	.34 (0.17)	.102
Motion of stroke	1.14 (.59)	.27 (.15)	4.00 (2.84)	2.03 (1.42)	.72
Negative self-talk	10.29 (.94)	2.47 (.29)	5.71 (2.50)	2.34 (0.93)	.901
Opponent abuse	.14 (.14)	.36 (.36)	0.43 (.30)	.08 (0.05)	.593
Positive self-talk	4.14 (1.30)	1.05 (.35)	30.29 (17.40)	9.09 (2.69)	.21
Racquet abuse	1.43 (.61)	0.32 (.14)	1.71 (1.55)	.34 (.31)	.786
Self-talk in general	3.29 (.84)	0.77 (.21)	10.00 (3.78)	4.47 (.94)	.10
NEG.ST	25.86 (3.63)	6.22 (.96)	27.71 (10.86)	11.88 (2.63)	.123
POS.ST	6.14 (1.67)	1.50 (.43)	64.71 (33.28)	19.98 (4.85)	.009
INST.ST	2.43 (0.57)	.54 (.13)	4.71 (2.77)	2.40 (1.38)	.090

Note: The "NEG.ST" code refers to the grouping of categories Ball abuse, "Oh God" in frustration, Hit yourself, Laughing, Negative self-talk, Opponent abuse, and Racquet abuse; the code "POS.ST" refers to the grouping of categories Compliment opponent, Fist Pump and Positive self-talk; and the code "INST.ST" refers to the grouping of the Instructional self-talk and Motion of stroke categories.

Self-talk in practice vs Self-talk in competition

All Participants used some type of negative self-talk more frequent in practice, and negative verbalizations were used most frequently by 71% of tennis players. In competition, tennis players used the three categories of self-talk proposed by *STAGRS* (positive self-talk, negative self-talk and instructional self-talk) more frequently. However, Positive self-talk and Fist pump were the most used categories for more than half of tennis players (57%). As shown in Table 2, it's worth noting that all participants used self-talk significantly more in competition than in training. On average, tennis players used self-talk 4.7 times more often in competition

than in training. It is also possible to observe that, although discreetly, tennis players use instructional self-talk more in competition than in training, when we consider the combination of Instructional Self-talk and Motion of Stroke scores.

Self-talk in practice

The dendrogram illustrated in Figure 1 shows that, in practice, a single cluster was formed with a strong association between the participants. Hierarchically, we understand that in this context, Participant 5 has a very strong association with Participant 7, then with Participant 2 and so on, in decreasing order of strength.

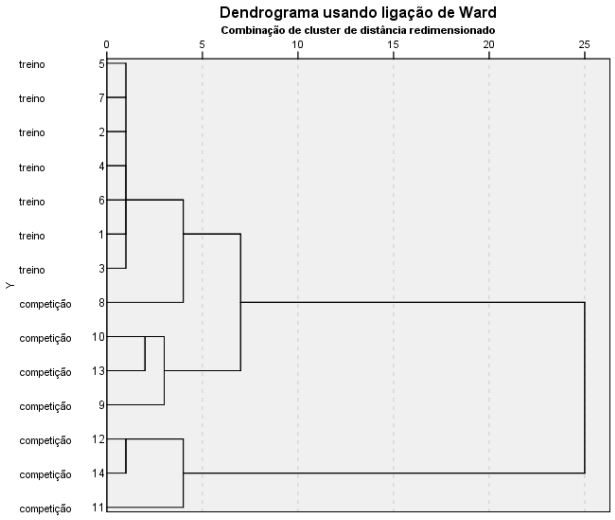

Figure 1. Dendrogram by subjects using Ward's method. Note: to analysis, the numbers 1 and 8 represent the subject 1 in both contexts (training and competition). The same idea must be applied, respectively, to the others participants.

The cluster analysis that compared the subjects in practice (Figure 1) suggests that tennis players present a very similar behavior regarding self-talk and gestures in this environment. Furthermore, the single cluster formed in the training is more strongly represented by Participant 5, who is the oldest tennis player in the sample and who competes in the Boys Under 18 category. This data suggests that in practice, where tennis players spend

most of their time, the behavior of the older tennis player can influence the behavior of his peers. Through Thematic Analysis, we identified a new category of self-talk used by all Participants and unquestionably associated with practice. The self-compassionate self-talk category can be exemplified by the way the Participants 5, 1, 2, 4, and 6 perceive this environment:

> […] "Let's go out there and we'll practice the forehand, man, if you make a mistake, it's okay." It's a training and then that's the mentality (Participant 5).
>
> […] I think in practice […] you don't try to do everything, you know, on the line, because you know that if you make a mistake, you're not going to miss something. So, you try your best, but at the same time, you don't keep pushing yourself (Participant 1)
>
> […] In practice I'm not so hard on myself like I am in matches (Participant 2)
>
> […] In the training I'm a little more like "Oh, all right, I made a mistake, let's go next time" (Participant 4)
>
> […] In training, I always try to put myself up, because I know it's training and I'm there to miss, right (Participant 6)

Self-talk in competition

When we analyzed Participants' self-talk in the competition, we obtained two clusters: (a) a first cluster with a stronger association, formed by the youngest tennis players in the sample (9(2), 10(3), 13(6)), and (b) a second cluster formed by the older tennis players in the sample (11(4), 12(5), 14(7)). In the first cluster, a stronger association can be seen between participants 10(3) and 13(6), whose association is responsible for grouping participant 9(2) in this cluster. Meanwhile, in the second cluster, we noticed an even stronger association between Participants 12(5) and 14(7), whose grouping attracts Participant 11(4) to the cluster. Participant 8 was considered an outlier for all the analyzes we performed, associating very weakly only with the cluster of youngest athletes in the competition.

It's important to note that when it comes to competition, Participant 8(1) was an outlier for all the cluster analysis we performed. It is possible to notice that the closest to associating

with this athlete is Participant 6, who is grouped within the trainings with participants 5, 7, 2, 4, 1 and 3. This means that, even being considered an outlier, the Participant 8(1) has characteristics in common mainly with Participant 6, both in practice and competition, which makes her association with the clusters. We observed that, in training, Participant 6 uses Negative Self-talk and Positive Self-talk more often, while Participant 8(1) uses the Hit Yourself category more often and, in competition, Participant 6 uses Fist Pump and positive self-talk, while Participant 8(1) uses the Hit yourself category more often. As we identified that the profile of use of the self-talk categories in the two contexts differs between the two Participants, we infer that there is an association between the Participants with regard to the number of occurrences of self-talk. Participants 6 and 8(1) had the closest means of self-talk use per game and training among all tennis players (Participant 6 $M_{competition} = 26$, Participant 8(1) $Mc_{competition} = 22$, Participant 6 $M_{practice} = 12.5$, Participant 8(1) $M_{practice} = 10.75$).

Notably, the participants were able to make better descriptions of self-talk and gestures when talking about the competition, which resulted in most of the themes found being associated by them with this context. In relation to competition, we identified 6 themes of self-talk from the Thematic Analysis: Self-critical self-talk, Performance pressure, Irrational beliefs, Positive self-talk, Instructional self-talk and motivational self-talk. We identified that there is a strong association, in the competitive environment, between the categories Self-critical self-talk, Performance pressure and Irrational beliefs. To exemplify the intersection between these elements, we highlight the perceptions of tennis players regarding the Performance pressure they feel during competition through the speeches of participants 2, 4, 5, and 6:

> In the match there is more pressure. Like, if I don't win, I don't go to the next round (Participant 2)

> I think that when I'm at the competition I think too much and my performance just drops (Participant 4)
>
> I had a terrible, terrible match even against a kid that I already have a history. Like, I've won and stuff [...] I went thinking "I'll impose myself" (Participant 5)
>
> I'm losing to a kid who's weaker than me […] Then I end up saying, "Oh, you're really bad" (Participant 6)

Younger tennis players' self-talk vs older tennis players' self-talk

At the end of the interview, when we had already asked the tennis players about all the categories explored by *STAGRS*, we asked them: (1) Of all the behaviors and speeches we talked about, which one or which ones do you think you use the most in practice? And (2) Of all the behaviors and speeches we talked about, which one or which ones do you think you use the most in competition? We observed that, in practice, the self-talk categories most used by Participants 2 and 3, who are the youngest in the sample, were *Negative self-talk* (Participant 2, M = 2.0) and *"Oh God" in frustration* (Participant 3, M = 3.25), while in competition were *"Oh God" in frustration* (Participant 2, M = 12) and *Motion of stroke* (Participant 3, M = 10.5). Despite what we had observed from the *STAGRS*, these Participants reported in the interviews:

> *Of all the behaviors and speeches we talked about, which one or which ones do you think you use the most in practice? (Interviewer)*
>
> […] The speech of, like, it's try to put the serve on the court, so… […] It's more like a positive thing (Participant 2)
>
> […] In practice... is... (pause) I think it's saying "Come on, come on, let's go" (Participant 3)

> *Of all the behaviors and speeches we talked about, which one or which ones do you think you use the most in competition? (Interviewer)*
>
> […] It's... to put the serve on the court, to win the point, try to throw the ball to the other side anyway, even if I don't make the right move like that (Participant 2)
>
> […] It's the "Come on, come on, let's go" and curse me when I'm playing badly (Participant 3)

Thus, among the participants of the Under 12 category, an evident discrepancy was found between how they behave in training and games and how they believe they behave in

these contexts. Both participants reported using positive self-talk more frequently in training, although we observed that it was negative self-talk that had the greatest expression in this context. Also, when asked about the competition, Participant 2 reported using positive and instructional self-talk and Participant 3 reported using both positive and negative self-talk, while, in our observation, we found the highest averages for negative self-talk ("Oh God" in frustration, in the case of Participant 2) and for instructional self-talk (Motions of stroke, in the case of Participant 3).

On the other hand, when we compared the self-reported and observed measures of the young (Participant 6) and middle (Participant 1) adolescents, we noticed greater coherence between observation and self-perception. For example, from the evaluation with the STAGRS, we identified that the self-talk category most used by Participant 6 in training is negative self-talk (M = 10.0), while, in competition, the highest averages were for the *Fist Pump* (M = 8.0) and *Positive self-talk* (M = 7.0) categories. In the evaluations of Participant 1, we identified that both in training and in competition the most used self-talk category is *Hit yourself* ($M_{training}$ = 5.0, $M_{competition}$ = 13.0). In the following excerpts from the interviews, it is possible to identify the level of awareness that these athletes have about their self-talk in both contexts:

> *Of all the behaviors and speeches we talked about, which one or which ones do you think you use the most in practice? (Interviewer)*
>
> […] In practice? I think I'm... (pause) I think of me complaining a little with myself (Participant 6)
>
> […] In practice... (pause) I think body language I do a lot in training too (Participant 1)
>
> *Positive or negative? (Interviewer)*
>
> Positive. Usually, when I start hitting my leg it's for "let's go", something to encourage me (Participant 1)

> *Of all the behaviors and speeches we talked about, which one or which ones do you think you use the most in competition? (Interviewer)*
>
> […] In matches, I think it's clenching my fist and vibrating (Participant 6)
>
> […] It's hitting the legs, usually, or even the calf. That's one thing that when I'm more frustrated with something, I take my racquet and hit the racquet on my calf. It's not very usual, but I do it when I'm not

> cool. I have to be very angry, but I've already done it to the point of making my leg purple (Participant 1).

Undeniably, tennis players in the Under 16 and Under 18 categories showed greater awareness of most self-talk categories when compared to those in the Under 12 category. However, the only exception to this finding was for the measures of the Negative self- talk in the practice environment, for which 6 of the 7 Participants had a lack of awareness. With the exception of Participant 6 (Under 16 category), none of the other Participants reported using negative verbalizations more frequently in the practice. Conversely, we found that all Participants reported being less hard on themselves in training and forgiving themselves for their mistakes (self-talk we called self-compassionate). Despite this, we observed that the highest frequency of self-talk by the Participants in this environment was related to negative self-talk. Participants 2, 4, 5, 6 and 7 predominantly used negative self-talk in training, while Participant 1 used the Hit Yourself category and Participant 3 used the "Oh God" category in frustration.

Still in relation to age-related differences between the Participants, we observed that the youngest athletes (2, 3, and 6) carried out the interviews with the shortest duration in minutes: 20.51, 17.57 and 21.17, respectively. It is possible to notice the discrepancy between the duration of the interview of the two youngest Participants (2 and 3) in relation to the two oldest Participants, whose interviews lasted, respectively, 34.13 and 50.32 minutes. It is important to note that the same interview script was used for all participants and that all tennis players were encouraged to describe their answers in greater detail. Even when encouraged, it was evident that the younger Participants had difficulties in thinking about their self-talk and gestures in training and competition.

Association between self-talk categories

The ANOVA test (Table 3) and, particularly the interpretation of the Z score, reinforced the magnitude of the variance of the Fist pump and Positive self-talk categories in comparison

to the other categories, as can be seen by the high values of Z, which are found to many standard deviations above the means.

Table 3. ANOVA test

	Cluster		Error		Z	Sig.
	Mean Square	df	Mean Square	df		
Ball abuse	0.815	2	0.2	11	4.077	.047
Compliment opponent	0.1	2	.332	11	.3	.747
Fist pump	304.244	2	.423	11	719.001	0.0
"Oh God" in frustration	19.779	2	7.965	11	2.483	.129
Instructional self-talk	.03	2	.18	11	.166	.849
Hit yourself	28.051	2	15.484	11	1.812	.209
Laughing	0.166	2	.119	11	1.399	.287
Motion of stroke	13.772	2	6.254	11	2.202	.157
Negative self-talk	6.435	2	2.432	11	2.645	.115
Opponent abuse	.029	2	.01	11	2.914	.096
Positive self-talk	219.97	2	8.761	11	25.108	0.0
Racquet abuse	.49	2	.352	11	1.395	.288
Self-talk in general	25.415	2	3.262	11	7.792	.008

From the illustration in Figure 2, it is possible to identify the formation of three clusters. We found a cluster with a strong association between the categories *Laughing in smile, Opponent abuse, Compliment opponent, Instructional self-talk, Ball abuse, and Racquet abuse.* Unexpectedly, despite the strong association, these were the self-talk categories that appeared less frequently both in training and in competition. It is important to note that the *Motion of stroke* category is an outlier in relation to the clusters, despite being attracted by the *Instructional self-talk* category, which is the central element of cluster 1 (*Laughin*g, *Compliment opponent, Instructional self-talk, Ball abuse, and Racquet abuse).*

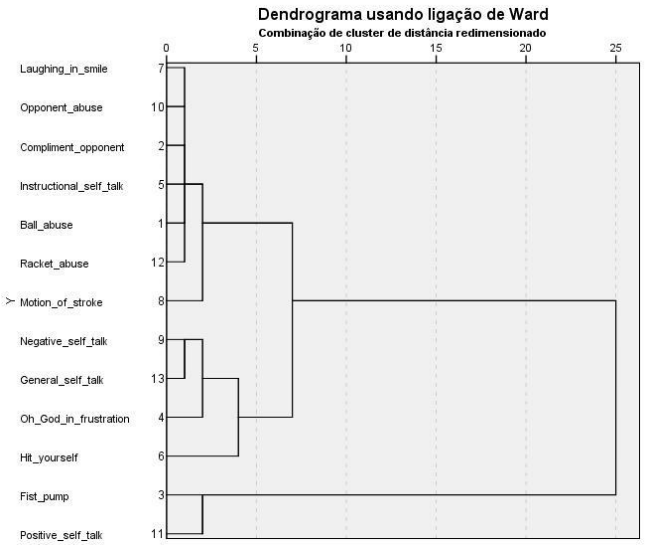

Figure 2 – Dendogram by variables

The second cluster was formed by the categories *Negative self-talk, Self-talk in general* and *"Oh God" in frustration*, with a strong association between the first two categories. It is interesting to note that this cluster attracts, albeit weakly, the *Hit yourself* category, which can represent both a motivational gesture and a gesture of frustration and punishment. Based on the association found with the categories of negative self-talk *Negative self-talk, "Oh God" in frustration*), we infer that the gesture of hitting oneself has been used as a way of punishing oneself during training and competition. For the same reason, we also assume that the *Self-talk in general*, whose content could not be heard and identified at the time of data collection, was possibly also content with negative statements directed to the self.

Although clusters 2 (*Negative self-talk, Self-talk in general, "Oh God" in frustration*) and 3 (*Fist pump* and *Positive self-talk*), hierarchically, represent the weakest associations in the dendrogram (when we analyze from the vertical perspective), it is worth noting that the categories of cluster 3 were the most frequently used by tennis players, followed by the categories of cluster 2. The third cluster, formed by the categories *Fist Pump* and *Positive self-talk*, despite having the lowest expression in the dendrogram, represents the actions most frequently performed by tennis players. In addition, the association between these two

categories in the dendrogram confirms the trend observed in the matches and reiterated by the descriptive statistics, that these actions occur, in most cases, simultaneously or subsequently to each other, as mentioned by Participants 5 and 6:

> […] On the positive side, the most normal thing I do is clench my fist and try to keep me motivated, jumping and thinking positive (Participant 5)
>
> […] I clench my fist, I think because I'm vibrating lifts me up a little more. Sometimes it even gives a low on the opponent, because he sees that you are well in the game, that you are strong (Participant 6)

Discussion

The aim of the current study was to compare the use of self-talk by tennis players in training and competitions and verify the accuracy between observed data and self-reported data in these contexts. The results of the cluster analysis for the research subjects in training and competition revealed a large cluster with a strong association between participants in training. When dealing with the measures of competition, two clusters were found, one formed by the three youngest participants and another formed by the three oldest, with one of the athletes from outside and considered an outlier. The thematic analysis revealed two major ways in which tennis players talk to themselves, highlighting the differentiation between self-talk in training and self-talk in competition.

Self-talk in practice vs Self-talk in competition

We identified, both through quantitative and qualitative data, we identified that tennis players use self-talk differently in training and competitions. First, we observed that tennis players use self-talk significantly more in competition than in training. Hardy, Hall & Hardy (2005) had already noticed that athletes use self-talk more frequently in the competition environment and specifically more extensively during performance rather than before or after. The higher frequency of use of self-talk in competition was also confirmed in the study by Thibodeaux & Winsler (2018), although, contrary to our findings, the study identified that

athletes use instructional self-talk more frequently in training. Although they did not compare the spontaneous self-talk of athletes in training and competition, Dickens et al., (2018) also identified that self-talk was frequent (31%) in the competitive environment. Therefore, we identified that our findings regarding the amount of self-talk used in competition, when compared to training, is in agreement with what had already been pointed out in the literature.

Data from the interviews provide further clarification on differences in tennis players' use of self-talk in training and competition. All tennis players portrayed competition as an environment in which they feel more pressured and in which they are harder on themselves, especially in relation to mistakes made. We classified this type of self-talk as “Performance Pressure”, as already identified in the study by Boudreault, Provencher & Trottier (2018). This type of self-talk is evident when the athlete reports that they feel an obligation to perform well, especially when playing against opponents they consider inferior (Boudreault, Provencher & Trottier, 2018). In this sense, we infer that, due to the greater pressure they feel in competition, athletes are not able to have compassion with themselves, which means, in other words, that they cannot feel forgiveness for themselves and for their mistakes (Neff, 2003).

On the other hand, the training was characterized by the participants as an environment in which they feel more relaxed and are more tolerant and self-compassionate in relation to the mistakes made. From the participants' perspective, training is a place where they can make mistakes, as they will have the opportunity to repeat and improve what they made mistakes and, for this reason, we call the self-talk of tennis players in this environment "Self-compassionate self-talk", a new category that, to our knowledge, had not yet been described in the literature on self-talk. For this, we were inspired by the definition by Neff (2003, p. 85), which states that self-compassion “is an emotionally positive self-attitude that should protect against the negative consequences of self-judgment, isolation, and rumination”, which is in line with the nonjudgmental attitude and understanding that tennis players have in this environment.

However, although the participants reported using this type of self-talk in training, in the observations, we identified that the type of self-talk most used by all tennis players was negative. This inconsistency between how tennis players perceive their negative self-talk and how it is observed in the field reiterates what had already been found in other studies (Van Raalte et al, 1994; Van Raalte et al, 2000; Thibodeaux & Winsler, 2018). In the case of the present study, tennis players report that they perceive training as an environment in which they tolerate more mistakes, despite the fact that, overtly, they use negative verbalizations more frequently.

One possibility is that, in the interview, where they are not suffering from the influence of environment factors (e.g., task characteristics) (Latinjak, 2020), they perceive training in a more rational way. However, once immersed in the training environment, it is possible that they cannot effectively put into practice this kind of self-compassionate self-talk as they believe. Another possibility is that, during training, athletes use negative verbalizations as a way of "unloading" the frustrations they are feeling at the moment, and, therefore, are not aware of it, given that they reported that they feel free to express themselves. your emotions in that environment. This hypothesis is consistent with what was indicated by Thibodeaux & Winsler (2018), that athletes reacted to situations that occur in training mainly emotionally. As highlighted by Neff (2003), the self-compassionate attitude requires that individuals are not over-identified with their emotions, because, in this scenario, it becomes more difficult to understand the situation from a broader context.

Through Thematic Analysis, we identified that the participants associated the categories Self-critical self-talk, Performance pressure, Irrational beliefs, Positive self-talk, Instructional self-talk and Motivational self-talk to the competition. Only one category (Self-compassionate self-talk) was associated with the training environment, which suggests confirmation of the quantitative results we obtained in training and competition. In other words, we inferred that,

as tennis players use almost five times more self-talk in competitions, they were able to have more awareness and report more details about how they talk to themselves in this environment. However, despite reporting being very harsh and critical of themselves in competition, we found that positive self-talk is used much more significantly in competition than negative self-talk. This data is in opposition to the findings of previous studies that investigated the spontaneous self-talk of young tennis players, in which the athletes reported using positive and instructional self-talk, although, in practice, it was observed that they use negative self-talk (Van Raalte et al., 1994; Van Raalte et al., 2000). In this sense, as observed by Thibodeaux & Winsler (2018), there seems to be a discrepancy between self-report and observation that, in our study, occurred mainly in relation to positive self-talk and negative self-talk for the vast majority of participants.

Younger tennis players' self-talk vs older tennis players' self-talk

In the training environment, we identified a single cluster with a strong association between participants, which suggests that the tennis players in the sample, regardless of age, behave similarly in this context. As indicated by Bandura (1997), from observing the behavior and way of thinking of models, people learn which are the most effective skills and strategies to deal with environmental demands. Thus, it is possible to infer why the cluster analysis that compared the subjects in practice is more strongly represented by Participant 5, who is the oldest tennis player in the sample and who competes in the Boys Under 18 category. This data suggests that in the training environment, where tennis players spend most of their time, the behavior of the older tennis player can influence the behavior of their peers.

When we analyze in an environment shared by a group of athletes, it is possible to consider that the self-talk of one of the individuals is an environmental factor that can influence the way in which the others will talk to themselves in this context (Latinjak, 2020). Also, as

Bandura (1997) explains, models provide much more than the social standard for subjects to assess their personal capabilities. For this reason, it is possible to understand how, in the training environment, the observation of older athletes, considered models in that context, possibly motivates others to reproduce behaviors seen as successful and discourages them from reproducing behaviors that they observe to have negative consequences (Bandura, 1986). In this sense, self-talk and the behaviors of team mates, opponents, parents and, especially, coaches, can influence the types of self-talk used by athletes (Brinthaupt & Morin, 2020).

Conversely, we clearly identified that there are two distinct clusters when we analyze the competition: a first cluster, with a stronger association and formed by younger tennis players, and a second cluster, formed by older tennis players. In terms of development, we understand that two of the tennis players from the first cluster are in a period called late childhood (ages 7 to 11), while two of the tennis players (one from the first cluster and one from the second) can be considered young. adolescents (aged 11 to 15) and three of the tennis players (two from the second cluster and one outlier) can be considered Middle adolescents (ages 15 to 17) (Santrock, 2014). It is worth mentioning that, although the participants train on adjacent courts in the same sports club, the younger tennis players train with their peers of the same age group, as well as the older tennis players, which could explain the formation of the two clusters. However, when we contrasted the quantitative data with the data from the interviews, two aspects became evident: 1. The younger tennis players, even if encouraged, had little repertoire to talk about self-talk, which can be confirmed by the time of the interviews and 2. The self-report of younger tennis players was not consistent with the data observed for any of the categories we analyzed.

According to Piaget's Cognitive Developmental Theory (1954), from 7 to 11 years of age, the child is in the Concrete Operational Stage, a period in which logical and rational thinking to assess specific situations is gradually developed. In the next stage, between 11 and

15 years of age, a period known as Formal Operative, Piaget (1972) emphasizes that formal operational thinking becomes increasingly abstract, which allows the adolescent to calculate hypothetical scenarios. Thus, it is clear that the abstract quality of the adolescent's thinking is refined as he or she develops through the Formal Operative stage, a period in which he begins to think more about thinking itself. Therefore, we understand that the ability to "think about one's thoughts", or metacognition, is not yet developed in the tennis players in the sample who competes for the Under 12 category, which explains the inconsistency between observation and self-perception (Santrock, 2014). Although the topic is still little self-explored, evidence has already been found that children's awareness of their-talk increases significantly with age (Winsler; Naglieri, 2003). This finding corroborates the notion that metacognition is developed from childhood to adolescence according to increasing age, improving youth planning, assessment and self-regulation strategies (Dimmitt & McCormick, 2012).

Association between self-talk categories in training and competition

Cluster analysis for self-talk categories revealed three clusters, hierarchically from the strongest association to the least, formed by: 1. Laughing, Opponent abuse, Compliment Opponent, Instructional self-talk, Ball abuse and Racquet abuse, 2. Negative self-talk, Self-talk in general, “Oh God” in frustration and Hit Yourself and 3. Fist pump and Positive self-talk. The self-talk categories proposed by STAGRS were only investigated in association with game situations (e.g., losing or winning a game) and among them (ZOURBANOS et al., 2015), however, to our knowledge, no study had analyzed the association between the own categories both in competition and in training. We infer that the strong association between the elements of the first cluster occurs due to the common element they share: they are the types of self-talk less used by tennis players in both contexts. The low use of these types of self-talk in competition had already been identified by the descriptive statistical analysis performed by Zourbanos et al. (2015), who also analyzed the frequency of categories in 17 official games.

In our study, we identified that, in the second cluster, the categories Negative self-talk and Self-talk in general are strongly associated and, for this reason, we inferred that the inaudible verbalizations were possibly negative verbalizations. As identified by Zourbanos et al. (2015), we found that the gesture of frustration "Oh God" was also related to negative verbalizations. In addition, although weaker, we also identified an association of the Hit yourself gesture with this cluster, which suggests that tennis players probably hit themselves during the performance to demonstrate frustration (rather than a gesture of motivation) and, possibly as a form of punishment, as highlighted by Participant 1 in "I take my racquet and hit the racquet on my calf. It's not very usual, but I do it when I'm not cool. I have to be very angry, but I've already done it to the point of making my leg purple"

Although, in the cluster analysis, the Fist pump and Positive self-talk behaviors hierarchically present the lowest strength in the dendrogram, we infer that these categories form a cluster precisely because of the high frequency with which they are used by tennis players in competition ($M_{\text{fist pump}} = 33\ .52$, $M_{\text{positive self-talk}} = 30.29$). This aspect was also confirmed by the verification of the high Z values for these categories ($Z_{\text{fistpump}} = 719.001$, $Z_{\text{positive self-talk}} = 25.108$) obtained through Analysis of Variance (ANOVA). The immediate association between the psych-up gesture (Fist Pump) and positive verbalizations in competition had already been pointed out by Zourbanos et al. (2015). From this, we infer that, in the competitive situation, the immediate association between the clenching of the fist and the positive verbalizations is a way for the tennis player to increase confidence and psych-up at the same time (Hatzigeorgiadis et al., 2020). Furthermore, considering that audible and observable self-talk can have an impact on the opponent, the combination of these types of self-talk can be seen as an environmental factor that influences the opponent's self-talk in the competitive scenario (Latinjak, 2020), as indicated by Participant 6: "I clench my fist, I think because I'm vibrating lifts me up a little

more. Sometimes it even gives a low on the opponent, because he sees that you are well in the game, that you are strong".

Conclusions

In the current study, we identified that there are differences in the participants' self-talk in training and competition, both in a quantitative aspect and in relation to positive and negative self-talk. Furthermore, when we compared observed data with self-reported data, we identify that younger tennis players are less aware of their self-talk than older tennis players. However, when dealing with negative self-talk, especially in training, all participants showed a lack of awareness regarding their self-talk. We recognize that cluster analysis has its limitations when compared to other analysis methods, however, it allows us to observe, in a small number of subjects and with a variable without parametric correlation, similarities between groups of subjects within the sample. In other words, cluster analysis allows us to identify, in a small sample, which participants or variables are most strongly associated with each other in a non-parametric way. For this reason, the mixed method proved to be an important tool, since the interviews were able to guarantee the robustness of the study from the complementation between quantitative and qualitative data. The present study reiterates the need to confirm self-report by observing athletes in the field and advances the understanding of the lack of awareness that young athletes, especially late childhood athletes, have about their self-talk. Furthermore, we suggest that future research should investigate and compare the self-talk of young tennis players in training and competition, investigating athletes from other cultures and regions and encompassing a greater number of participants.

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CHAPTER 4

Study II

"Because it's just me and myself, you don't have another voice": self-reported self-talk and self-regulation in young high-performance Brazilian tennis players

Marcela Gonçalves Freitas, Thiago José Leonardi

School of Physical Education, Physiotherapy and Dance, Federal University of Rio Grande do Sul

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"BECAUSE IT'S JUST ME AND MYSELF, YOU DON'T HAVE ANOTHER VOICE": SELF-REPORTED SELF-TALK AND SELF-REGULATION IN YOUNG HIGH-PERFORMANCE BRAZILIAN TENNIS PLAYERS[2]

ABSTRACT

The purpose of the current study was to describe and relate the perceptions that young tennis players from Rio Grande do Sul have about their self-talk (overt and covert), their self-regulation and their performance in training and competitions. Participants were seven tennis players aged 11 to 17 years (three females and four males; M = 13,85, SD = 2,19) who compete at state, national and international levels. A semi-structured interview was conducted with each of the participants after their training session. The questions proposed in the interview were elaborated from an adaptation of the instruments The Self-Talk and Gestures Rating Scale (STAGRS) and the instrument Self-talk Use Questionnaire (STUQ). The interviews were analyzed using the Thematic Analysis method. Seven self-talk themes were identified within the dataset: (1) self-critical, (2) performance pressure, (3) irrational beliefs, (4) self-reinforcement, (5) self-compassionate, (6) instructional, and (7) motivational. The result of the study showed that the participants perceive that they talk to themselves differently in training and competitions. Training was described as an environment in which it is possible to make mistakes and use self-compassionate self-talk, while competition was described as an environment in which they are more pressured and self-critical.

Keywords: Self-talk, Thematic Analysis, Tennis, Elite athletes.

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Introduction

Self-talk can be conceived as a ubiquitous phenomenon, as we all have an inner dialogue with ourselves at all times (Kross et al., 2014). Likewise, it is undeniable that emotions are inherent to the athletic and competitive experience and that they can have both beneficial and deleterious effects on sports performance (Robazza, 2006). In the sports literature, self-talk is one of the cognitive processes through which athletes can regulate their emotional states during performance (Fritsch et al., 2022). Furthermore, along with other psychological strategies, such as mental imagery, self-talk is recognized as one of the interventions that facilitate learning and improve sports performance (Hatzigeorgiadis et al., 2011). Regarding its concept, different nomenclatures have been used to refer to self-talk, such as inner dialogue, internal monologue, covert speech, private or silent speech, inner voice or speech, self-statements, self-communication, self-directed verbalizations, and so forth (Van Raalte et al., 2016).

In the early 2000s, self-talk was studied mainly from its content and functions, whether instructional or motivational, and considered as a phenomenon that occurs dynamically throughout the athletes' performance (Hatzigeorgiadis, 2006). In addition, six dimensions of' self-talk were addressed by the data-driven approaches, namely, its valence, its overtness, its frequency, its self-determination, its interpretation, and its functions for athletes (Hardy, 2006). At that time, in the sports literature, self-talk was conceived as the athletes' self-verbalizations who operate, mainly, for instructional and motivational purposes (HARDY et al., 2004), and that affect athletes' behavioral processes and therefore their performance (Hatzigeorgiadis et al., 2008). However, as self-talk has been empirically examined more frequently, its definition has been refined in the literature over the years.

Therefore, Tod et al. (2008) defined self-talk as sport-oriented automatic or deliberate statements and distinguished these verbalizations from those sports-unrelated verbalizations

said by athletes. Currently, two broad categories of self-talk have been frequently recognized and used by researchers: spontaneous, or organic, self-talk and strategic self-talk (Latinjak et al., 2019). Based on Kahneman's dual-processing theory, Van Raalte et al. (2016) had also distinguished these two types of self-talk from the ways in which individuals process information. On the one hand, information can be processed by individuals immediately, intuitively, effortlessly, and emotionally charged (System 1 self-talk), while, on the other hand, it can be interpreted more deliberately, rationally, slowly, and emotionally neutral (System 2 self-talk) (Van Raalte et al., 2016).

Organic self-talk refers to the covert or overt verbalizations that athletes address to themselves either spontaneously and automatically (*spontaneous self-talk*), or more deliberately and widely used for self-regulation *(goal-directed self-talk)* (Latinjak et al., 2019). Undoubtedly, goal-directed thoughts have been extensively studied since Cartesianism and associated with reasoning, problem solving, and decision-making paradigms (Christoff et al., 2011). In that regard, goal-directed self-talk is a result of cognitive control and is used deliberately by athletes in problem solving and in regulating behavior and emotional states (Latinjak et al., 2014). Despite the emphasis given to controlled cognitive processes over the years, spontaneous thoughts play an essential role in memory, motivation, decision-making and emotional processing (Christoff et al., 2011). In the sports context, spontaneous self-talk mainly reflects athletes' evaluations of previous outcomes (*retrospective*) and predictions about relevant future events (*anticipatory*) (LATINJAK et al., 2016).

Meanwhile, strategic self-talk is characterized as a deliberate mental process strategically used by athletes primarily for cognitive and motivational and performance-enhancing purposes (Latinjak et al., 2019). It is important to note that both goal-directed and strategic self-talk are a result of slow, conscious and effortful processes, however, what distinguishes them is the fact that the latter is related to cue words or phrases that are previously

programmed to be used at specific times of performance (Latinjak et al., 2016). Therefore, the main difference between organic self-talk (spontaneous or goal-directed) and strategic self-talk resides in its origin and not in its content, which can be the same (Latinjak et al., 2019).

One of the reasons why self-talk has gained popularity in studies of interventions in sport is its potential for regulating emotions and behaviors and increasing performance (Fritsch et al., 2022; Tod et al., 2011; Hatzigeorgiadis et al., 2011). As we know, athletes have to deal with stressful and challenging situations that require them to self-regulate when they realize that their current state is different from their ideal performance state (Fritsch et al, 2022). Regarding the two entities of self-talk, Latinjak et al., (2014) reported that athletes from different sports use significantly more goal-directed self-talk than spontaneous self-talk to regulate their emotions (specifically, sadness, anger, resignation, anxiety, relief, euphoria, confidence and excitement). Thus, Fritsch et al., (2022) point out that goal-directed self-talk and strategic self-talk are related to emotion regulation, while spontaneous self-talk is more associated with affective processes such as emotion-filled thoughts.

With regard to organic self-talk, both spontaneous and goal-directed can be classified according to the perspective of time, that is, the moment the athlete's words refer to, whether in the past, present or future (Latinjak et al., 2014). For example, an athlete's goal-directed self-talk may refer to a description of a mistake just made ("you've bent your arm") or an instruction to the next point ("extend your arm") (Latinjak et al., 2019). However, when dealing with spontaneous self-talk, we refer to its valence, whether positive or negative, and, on the other hand, when dealing with goal-directed self-talk, we must think of its function in terms of activation, that is, whether verbalizations are used to increase or decrease the level of arousal (Latinjak et al., 2014).

Since cognitive science studies, cognitive processing is recognized as the mediator between events, whether overt or covert, and the emotional and behavioral response (Beck, 2019). In this sense, it is known that emotions also have an impact on judgments and behaviors, in addition to being fundamental for decision making, for the preparation of motor responses, for learning and for the regulation of social behavior (Robazza, 2006). For this reason, it is commonly advised that individuals should avoid taking actions in the "heat of the moment", as emotions can be responsible for distorting cognitions and behaviors. Despite this, it is recognized that individuals have the ability to intentionally direct their thoughts and regulate their feelings through antecedent or response-focused affect regulation strategies, such as reappraisal, distraction, and suppression of thoughts and feelings (Loewenstein, 2006).

In terms of intensity and duration, emotions can become problematic for the individual when they persist beyond the episode that originally evoked them, a situation that is commonly maintained by the self-maintenance of distorted thoughts (Watts, 2006). In terms of intensity and duration, emotions can become problematic for the individual when they persist beyond the episode that originally evoked them, a situation that is commonly maintained by the self-maintenance of distorted thoughts (Watts, 2006). For this reason, it is essential that we think about investigations about self-talk from the theories of self-regulation (Masters & Maxwell, 2008) and emotional regulation (Gross, 2006; Beatty & Janelle, 2020) so that we can understand how this mental strategy impacts one's behaviors and feelings.

Considering this, as indicated by Boudrealt et al., (2018), it is crucial to investigate how athletes perceive and interpret their self-talk in sports contexts and what circumstances influence their personal interpretations. To date, the observable self-talk of tennis players has been extensively investigated in the sports literature than self-reported self-talk, which still lacks further investigation, especially with regard to how much awareness children and adolescents have about their self-talk and self-regulation (Winsler, 2009). In addition, as

discrepancies between self-report and observable self-talk were indicated (Thibodeaux & Winsler, 2018), we believe that this research may contribute to further clarification on the subject and also the understanding of the psychological skills and self-regulation strategies used by young tennis players and also to the interventions of applied practitioners (Latinjak & Hatzigeorgiadis, 2021). To this end, this study has one main objective, categorize the perceptions that young tennis players have about their self-talk and their self-regulation in training and competition settings.

Method

Research design

The current study employed a qualitative design, using semi-structure interviews for data collection. Qualitative research was chosen in order to explore and understand the meaning that the participants hold about their self-talk and gestures in training and competition settings. It is worth noting that this form of inquiry increased significantly (about 12% from the 1990s to the first decade of this century) in productions in the field of sport and exercise psychology (Smith & McGannon, 2018). Among the interview categories, semi-structured format was elected due to the possibility for the researcher to ask specific questions to all participants and also be able to have the flexibility to explore other topics and questions that may emerge during the interview and that are relevant to the research topic (Merriam & Tisdell, 2016).

Participants

Participants were 7 tennis players aged 11 to 17 years (3 females and 4 males; M = 13,85 years, SD = 2,19) selected through the following inclusion criteria: (a) be ranked among the top 10 players of their category in the Gaucho Tennis Federation (FGT, in portuguese), (b) be ranked among the top 100 players of their category in the Brazilian Tennis Confederation (CBT, in portuguese), and (c) be competing between the Under 12 and Under 18 categories. To preserve confidentiality, each participant was assigned a number for the study (Table 1).

Table 1 shows the description of athlete's identification, his or her category and if he or she is competing in the first or second year of the category, along with other relevant information:

Table 1 - Description of participants' information and sport experience

Athlete's identification	Category	State ranking	National ranking	Training experience	Competitive experience
Athlete 1	Boys U12	7	84	7 years	4 years
Athlete 2	Boys U12	12	73	7 years	4 years
Athlete 3	Boys U16	9	100	9 years	6 years
Athlete 4	Girls U16	5	21	11 years	6 years
Athlete 5	Girls U16	7	37	11 years	8 years
Athlete 6	Girls U16	1	10	9 years	4 years
Athlete 7	Boys U18	2	33	10 years	6 years

As shown in Table 1, all participants had at least three years of competitive experience (M = 5,42 years, SD = 1,51) and had been training systematically for at least seven years (M = 9,14 years, SD = 1,67). Additionally, four of the players in the sample were ranked among the top fifty athletes in the national ranking and two of these athletes were classified among the top thirty athletes in their category. One of the athletes in the sample had already scored in the Women's Tennis Association (WTA) ranking at the beginning of the data collection. All the athletes in the sample had already competed numerous times in national tournaments and had competed at least once in an international level tournament.

Interview script

The first stage in the development of the interview script was to consult previous research and instruments which had investigated self-talk categories and overtness. The interview protocol consisted of 7 questions adapted from the STUQ (Hardy et al., 2005), 14 questions adapted from the STAGRS (Van Raalte et al., 1994) and 6 questions formulated by the researcher and her advisor to investigate the athletes' perceptions of the relationship

between their self-talk and gestures and their performance in training and competition settings. The questions formulated from the adaptation of the STUQ were designed so that we could explore athletes' perceptions of their covert and overt self-talk along with STAGRS self-talk categories. STAGRS evaluates 14 behaviors in three categories: (1) positive self-talk: compliment opponent, positive self-talk and fist pump, (2) negative self-talk: ball abuse, racquet abuse, opponent abuse, negative self-talk, hit oneself, “Oh God” in frustration and laugh in frustration, and (3) instructional self-talk: practice the stroke motion and instructional self-talk (Van Raalte et al., 1994).

Procedures

Permission to conduct the study was provided by the research ethics committee (CEP, in portuguese) of the Brazil Platform (Plataforma Brasil, in portuguese). In order to participate in the research, all participants read and signed an informed consent form and their guardians signed an informed consent form indicating that their participation was voluntary and could be terminated at any time.

The researcher conducted a semi-structured interview with each of the participants, composed by 27 questions. The interviews were carried out in a private space inside the club where the athletes train after their technical practice session and were previously scheduled with the tennis players and their coaches. All interviews were recorded in audio format with a cellphone recorder (Iphone 12 64GB Mini) so that they could be transcribed for later analysis. The interviews lasted between 17,57 and 50,32 minutes (M = 29,92, SD = 11,40).

Data analysis

The strategy elected to analyze the data from the interviews was Thematic Analysis (TA), as described by Braun & Clarke (2006). The interviews were transcribed by the researcher and then read several times in order to get familiar with the content. Then, a deductive, or “top down”, approach was carried out according to the aforementioned research

questions (Braun & Clarke, 2006). The data extracts were coded and then organized and reorganized multiple times along the six stages of the TA, having identified themes and different levels of themes (sub-themes and sub-themes). In this process, three aspects were rigorously considered by the researcher, namely, the prevalence and relevance of the codes so that they could form a theme, the relationship between the codes, themes and sub-themes and the validity of the themes in relation to the data set (Braun & Clarke, 2006). The TA steps were then reread and revised by a more experienced researcher, who has already completed his Ph.D. studies, and, in cases of disagreement, the material was reformulated based on a consensus between the researchers.

Quality standards

In the present study, the eight markers for high quality in qualitative methods were considered to ensure the rigor of the research (Tracy, 2010). We agree with the view that rigor is mainly related to the reliability (i.e., *consistency*), the validity (i.e., *internal validity* or *soundness*), and the generalizability (i.e., *external validity*) of the research (Morse, 2015). For this reason, to establish trustworthiness, as formerly referred, the following criteria were considered: (1) the relevance of the subject, (2) the thoroughness of the research, (3) the transparency about the researcher's biases and goals, (4) the in-depth description, (5) the resonance, (6) the significance of the study's contribution, (7) the ethical premises of the research, and (8) the internal coherence of the study (Tracy, 2010).

Considering this, it is important to recognize that the first author of the research, who conducted all the interviews, is currently finishing her master's studies on self-talk, works as a clinical psychologist in the cognitive-behavioral approach and as a sports psychologist, working primarily with tennis athletes. In addition, the researcher followed all study participants during their matches in an international tennis tournament and during at least 3 training sessions as a non-participant observer. It is undeniable that these experiences

facilitated understanding and communication between the interviewer and the participants during the interviews, although they also constitute biases in the interpretation of the researcher while working in the area of cognitive sciences.

Results

The Thematic Analysis of the interviews revealed 7 main categories of self-talk reported by all participants: (1) Self-critical, (2) Performance Pressure, (3) Irrational Beliefs, (4) Self-reinforcement, (5) Self-compassionate, (6) Instructional, and (7) Motivational. Based on the content of the interviews, a table was generated containing examples of each identified self-talk category (Table 2). Quotes in table 2 are presented to illustrate self-talk content experienced by the athletes in both contexts. The thematic map was built based on the cognitive behavioral framework that a situation, within a specific context, is interpreted by individuals, who present an emotional and behavioral response to these cognitions (Ellis, 2003). In the sports field, the analysis was built in order to identify, through the speeches of the participants, which are the antecedents and the consequences of self-talk categories most used by the participants in training and in competitions and what are the emotional and behavioral consequences of these verbalizations in the performance.

Self-critical

Self-criticism was identified within the negative verbalizations of the participants, which can be recognized by its inappropriateness, irrationality and counterproductivity for performance (Latinjak et al., 2019). Self-criticism refers to the self-judgments and self-evaluations of individuals, whose content commonly involves an emphasis on personal mistakes, feelings of inadequacy, and the intention to punish oneself (Longe et al., 2010). This type of spontaneous self-talk was associated by tennis players mainly with mistakes made in competitions, as illustrated by Participant 1 (“I say a lot of bad words when I miss some easy points”) and Participant 2 (“In practice I’m not so hard on myself like I am in matches”). In this situation, it

is worth noting that the tennis players' verbalizations have a punitive characteristic, related to the perception that they made an unacceptable mistake, as demonstrated by Participant 4 (“Oh, how ridiculous, how did I miss this”) and Participant 7 (“The guy didn't do anything and you made a mistake”).

Performance pressure

As noted by Boudreault et al., (2018), we also identified that all participants reported the perception that they have to perform well in certain competitive situations. The performance pressure was related to being playing against an opponent they had already won, as mentioned by Participant 7 (“I had a terrible, terrible match even against a kid that I already have a history. Like, I've won and stuff”), or against opponents they judged to be weaker, as illustrated by Participant 3 (“I'm losing to a kid who's weaker than me […] Then I end up saying, "Oh, you're really bad”). When reporting on the pressure to perform well, Participants 2, 4, 5 and 6 explicitly compared the training and the competition contexts, emphasizing that this type of self-talk occurs mostly in the latter, as perceived by Participant 5 (“In practice, like I said, it’s less pressure, right? So, it doesn’t require me to push myself so much as in the competition”). The speech of Participant 4 explains and summarizes why this type of self-talk is not associated with training by any of the tennis players in the research: “The match is a more serious place. In training I laugh more, I talk more. I’m more relaxed”.

Irrational Beliefs

Irrational beliefs are rigid, illogical and unhelpful ways of evaluating situations that can occur in the sports context, especially in the face of adversities, such as the pressure to perform well (Turner & Baker, 2014). Irrational beliefs have also been characterized as exaggerations of performance-related aspects that lead to unreasonable and unattainable expectations about

how one should perform (Wood et al., 2018), and are associated with dysfunctional emotions, such as anxiety and anger (Turner & Baker, 2014).

For example, the irrational shift from “want to” to “have to” (Turner & Baker, 2014). is recognized by Participant 5, who claims: “I have a hard time understanding that I want to win and that I don’t have to”. This unreasonable and self-imposed demand is also observed by Participant 2, who explains: “It’s like someone's telling me that I have to hit the serve right; It's not that I can serve right, but it's that I have to serve right”. the characteristic of this type of spontaneous self-talk can be illustrated by the speeches of participants 4 and 6, who declare, respectively: “Wow, your backhand is ridiculous, really, a kid can hit that ball and you got it wrong” and “I don't believe that I play well anymore”.

Positive

We identify self-reinforcement as positive verbalizations addressed to the self and serving the purposes of encouragement and praise for performance (Theodorakis et al., 2008). These goal-directed thoughts may reflect anticipatory or retrospective-positive thinking and therefore may refer, respectively, to expectations of future success or the acknowledgement of past successes (Latinjak, 2016). In terms of time orientation, Participants 4 and 5 presented past-oriented self-reinforcements related to actions they perceived to be successful, as in “Oh, well played that point" and “Oh, nice move, nice play”, respectively. Meanwhile, Participants 1 and 3 expressed present-future oriented positive statements, as represented by the latter in “Man, come on, you’re playing well”, and Participant 2 presented a future-oriented self-reinforcement with the statement “We're going to win, we're going to win”. Participants 6 and 7 did not clearly express the timing orientation and the verbal content of their self-reinforcements, although they did demonstrate that they often vibrate and clench their fists when playing.

Table 2 – Examples of speeches by self-Talk categories reported by the tennis players in the study

Players	Self-critical	Performance pressure	Irrational beliefs	Positive	Self-compassionate	Instructional	Motivational
1	I say a lot of bad words when I miss some easy points	I say a lot of bad words when I miss some easy points, when I'm losing the match to a guy I know I can win	Out loud, I talk when I miss an easy point that was in my hand, so I was supposed to win. I go there and miss a very easy ball	"Come on" "You're playing well"	In practice it's practice, It's not worth anything	"Sometimes I tell myself some game strategy [...] "Hit with more spin" or "hit more on the right or left"	"Come on," "You're playing well," "You can win"
2	In practice I'm not so hard on myself like I am in matches	In the match there is more pressure. Like, if I don't win, I don't go to the next round.	It's like someone's telling me that I have to hit the serve right; It's not that I can serve right, but it's that I have to serve right	"We're going to win, we're going to win"	At the practice, I can repeat. I can repeat what I did wrong.	I imagine myself putting the ball in	"Let's win, we're going to win, let's turn the game"
3	I think when I miss a ball that it's easier, I end up getting angrier and not controlling myself	I'm losing to a kid who's weaker than me […] Then I end up saying, "Oh, you're really bad"	Only when I'm losing in a way that I wasn't supposed to lose. Like, I'm losing to a kid who's weaker than me	Oh, sometimes when I'm playing well, I can realize it and I say "man come on you're playing well"	In training, I always try to put myself up, because I know it's training and I'm there to miss, right	"Oh, move your legs more", "Adjust your arm a little bit", "You were late"	"Keep going because you're okay, one hour he's going to falter and you' re going to pass in front"
4	"Oh, my God, I'm really bad". Like, I don't say I'm bad, but "oh, how ridiculous, how did I miss this"	The match is a more serious place; In training I laugh more, I talk more, I'm more relaxed	I say "Wow, your backhand is ridiculous, really, a kid can hit that ball and you got it wrong"	"Oh, well played that point", "Oh, good forehand"	The training is not like it's worth anything […] "It's okay if I lose, it's okay"	"My volley is good, I'm going to start going more to the net because that's working"	"Yes, come on, that point!", "come on, come on, let's concentrate here".
5	To say that I'm dumb, to say that I don't know how to play tennis, that I have to play ping-pong, that I'm very bad	In practice, like I said, it's less pressure, right? So, it doesn't require me to push myself so much as in the competition	I have a hard time understanding that I want to win and that I don't have to, right? […] I always said that I sought perfection	I made a good move and I think, "Oh, nice move, nice play"	In practice […] you know that if you make a mistake, you're not going to miss something. So, you try your best	I say to myself, "oh, you changed the grip" or "you didn't get the ball right in front"	I have this thing about hitting my leg to keep saying "Come on, go, go!", to encourage me to keep going, not to give up, you know?
6	I say that I don't do anything right, that I can't do anything	I think that when I'm at the competition I think too much and my performance just drops	I've been feeling this way. How can I say... I don't believe that I play well anymore	I vibrate	In the training I'm a little more like "Oh, all right, I made a mistake, let's go next time"	Since the beginning of the game. When I'm going to serve, when I'm going to return	Sometimes when I want to motivate myself, I do it a little *(say positive things)* and I vibrate
7	It's always pushing myself too hard, right? […] "The guy didn't do anything and you made a mistake," you know?	I had a terrible, terrible match even against a kid that I already have a history. Like, I've won and stuff [...] I went thinking "I'll impose myself"	"Oh, but you've already won *(this guy)*, you have to finish the guy"	Then you win the point and you vibrate for the coach, you vibrate for yourself	"Let's go out there and we'll practice the forehand, man, if you make a mistake, it's okay"	Practically at all points I try to talk, make feedback of the point and already thinking about the next	The most normal thing I do is clench my fist and try to keep me motivated, jumping and thinking positive

Self-compassionate

In contrast to self-criticism, self-compassion “involves offering nonjudgmental understanding to one’s pain, inadequacies and failures” (Neff, 2003, p. 87) and, therefore, “is an emotionally positive self-attitude that should protect against the negative consequences of self-judgment, isolation, and rumination” (Neff, 2003, p. 85). Self-compassion was positively related to the intention to try to be kinder to oneself and to try to feel better and negatively related to being hard on oneself in difficult situations (Leary et al., 2007). In this sense, we understand self-compassionate self-talk as a form of rational self-talk that is actively used when faced with setbacks and that seeks to forgive oneself for failing to meet ideal standards. The rational characteristic that we identified in this type of self-talk is illustrated by Participant 2, who reports that "At the practice, I can repeat; I can repeat what I did wrong". Thus, it is worth noting that this self-compassionate attitude is not related to passivity, as failures are not unnoticed and overlooked, but that actions necessary to achieve optimal functioning will be kindly and rationally encouraged (Neff, 2003).

In the interviews, it was evident that this type of self-talk was associated by tennis players with the training environment which, unlike the performance pressure of competition, was characterized by them as a situation that “it’s not worth anything” (Participants 1 and 4). Differently to how they react to mistakes made during the competition, Participants 6 and 7 clarify that when this situation occurs in training their self-talk is “Oh, all right, I made a mistake, let’s go next time” and "Let's go out there and we'll practice the forehand, man, if you make a mistake, it's okay", respectively. In addition, Participants 3 and 5 explain how self-compassionate self-talk influences their behavior during training: "In training, I always try to put myself up, because I know it's training and I'm there to miss, right" (Participant 3) and "In practice […] you know that if you make a mistake, you're not going to miss something. So, you try your best" (Participant 5).

Instructional

Instructional self-talk is related to statements mainly focused on technical and tactical aspects of movements, whose purposes can be to increase concentration or attentional focus (Zinsser et al., 2006). The instructions that athletes provide to themselves can be classified as skills-related, when they relate to technical information, and as strategy-related, when they relate to tactical choices (Latinjak et al., 2019). For example, four of the Participants reported using skills-related instructions during performance, such as “Hit with more spin” (Participant 1), “Adjust your arm a little bit” (Participant 3), “My volley is good, I’m going to start going more to the net because that’s working” (Participant 4), and “You didn’t get the ball in front” (Participant 5). Regarding the types of skills-related instructions, it is important to note that, in the statements mentioned above, Participants 1 and 3 used self-talk as technical adjustment following errors, while Participant 4 uses the instructions as technical transference following success and Participant 5 gives a description of the error committed.

On the other hand, Participant 1 mentions the use of strategy-related instructions, as can be seen in the statement “Hit more on the right or left”, as can also be inferred from the speech of Participant 7, who reports that he usually always gives feedback on the previous point before moving on to the next one. Participant 2 did not mention using instructional self-talk, however, he reported using mental imagery ("I imagine myself putting the ball in"), as did Participant 3, who, at one point in the interview, reports: "It's better if I imagine me hitting the right and the main thing is where the ball goes, not the movement itself. I can know what I did wrong, which was the leg position, for example, but I have to ignore the leg and imagine myself hitting the ball where I wanted".

Motivational

Research has described motivational self-talk as the statements commonly used for psyching-up, regulating effort and anxiety, increasing self-confidence, and creating positive attitudes and moods (Theodorakis et al., 2008; Hatzigeorgiadis et al., 2008; Latinjak, 2016). In addition, motivational self-talk can be divided according to the role it plays on performance, which can be to increase arousal, mastery or impulse (Latinjak et al., 2019). All athletes reported using motivational self-talk for psyching-up, that is, to get mentally prepared for important moments, as reported by Participant 1"Come on", "You're playing well", "You can win", Participant 2 "Let's win, we're going to win, let's turn the game", and Participant 4 "Yes, come on, that point!", "come on, come on, let's concentrate here". The speeches of Participants 3 and 5 illustrate how important motivational self-talk is for inspiring greater effort, for encouraging and persistence, respectively: "Keep going because you're okay, one hour he's going to falter and you're going to pass in front" and "I have this thing about hitting my leg to keep saying "Come on, go, go!", to encourage me to keep going, not to give up". Regarding Participant 5's speech, we can realize how the behavior of hitting herself during the match occurs simultaneously and in addition with motivational self-talk. The arousal-increasing function of motivational self-talk emerges explicitly when participants 6 and 7 report vibrating and jumping, respectively, in order to motivate themselves.

Overview: Self-talk in practice vs. Self-talk in competition

An important aspect to be highlighted with regard to how Participants perceive training and competition can be seen from the illustration of the Thematic Map (Figure 2). We identified that 5 of the 7 tennis players reported feeling the need to suppress the expression of the negative arousal during competition, which can be exemplified from Figure 2:

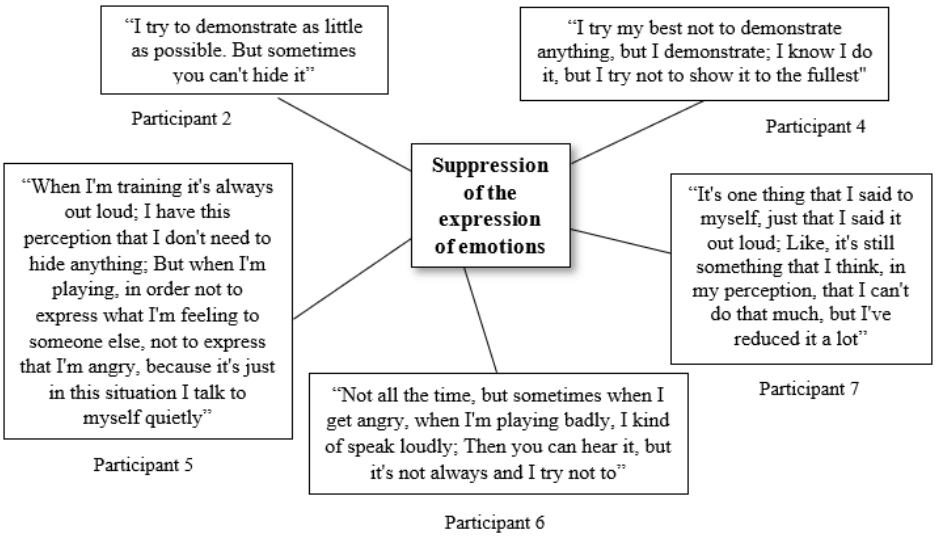

Figure 1 – Tennis players' posture in the face of competition: suppression of the expression of emotions

On the other hand, as can be seen in Figure 1, the training is characterized, also by 5 of the 7 participants, as a fun and relaxed environment, in which it is possible to express emotions freely and in which they do not feel pressure to have a good performance. The following statements from the tennis players illustrate how the training environment is described: "I only laugh in practice" (Participant 1), "In the match there is more pressure (Participant 2), "At practice I guess I smile, I smile more in training, right? (Participant 4), "Training is a more relaxed thing, isn't it? I don't need to vibrate or anything (Participant 5), "I was playing like this with my friend and we were more at the end of the training and we were more joking and, like, I wasn't thinking like, "oh, I have to get it right " and I played a lot" (Participant 6), and "Let's go out there and we'll practice the forehand, man, if you make a mistake, it's okay." It's a training and then that's the mentality" (Participant 7).

Integration of self-talk categories: Final Thematic Map

The difference in how participants portrayed training and competition allowed us to build a thematic map (Figure 2) based on current considerations about self-talk (Latinjak et al.,

2019) and the understanding of Rational Emotive Behavior Therapy (REBT) (Ellis, 2003) about human functioning. Based on the REBT, we consider that all individuals have a belief system that, in a given situation, influences them to have rational (when not biased) or irrational thoughts (when biased by cognitive distortions), which, in turn, Instead, it triggers them to feel emotions that may or may not be dysfunctional for the situation (Ellis, 2003). We identified two opposing beliefs in the way participants perceive each of the contexts, training being perceived as an environment in which it is possible to express emotions freely and competition being a place where tennis players must hide their emotions. Although tennis players believe they have to suppress the expression of their emotions in competition, it seems evident that this strategy does not help for the effective regulation of emotions.

> […] I've tried not to say anything during the matches you know? Like, I'm not going to say anything, I'm not going to make a peep at the game, I'm going to stay on mine. It's just that I was, like, really tense, you know? It's like I've kept everything, all the emotions inside me. Then there came a time when it started to weigh like that and I blew up (Participant 4)

In competition, we identified that some game situations elicit spontaneous self-talk, in the case of negative elicit-emotion situations (e.g., losing the previous point, missing an easy ball and being losing to an opponent considered weaker) and goal-directed self-talk, in the case of positive elicit-emotion situations (e.g., winning the previous point and realizing that you are playing well in the game). This relationship between a trigger situation (whether negative or positive), its interpretation (self-talk) and the emotional response can be illustrated by the speech of the Participants 6 and 3, respectively:

> […] Not all the time, but sometimes when I get angry, when I'm playing badly, I kind of speak loudly (Participant 6)

> […] Sometimes when I'm playing well, I can realize it and I say "man come on that you're playing well" (Participant 3)

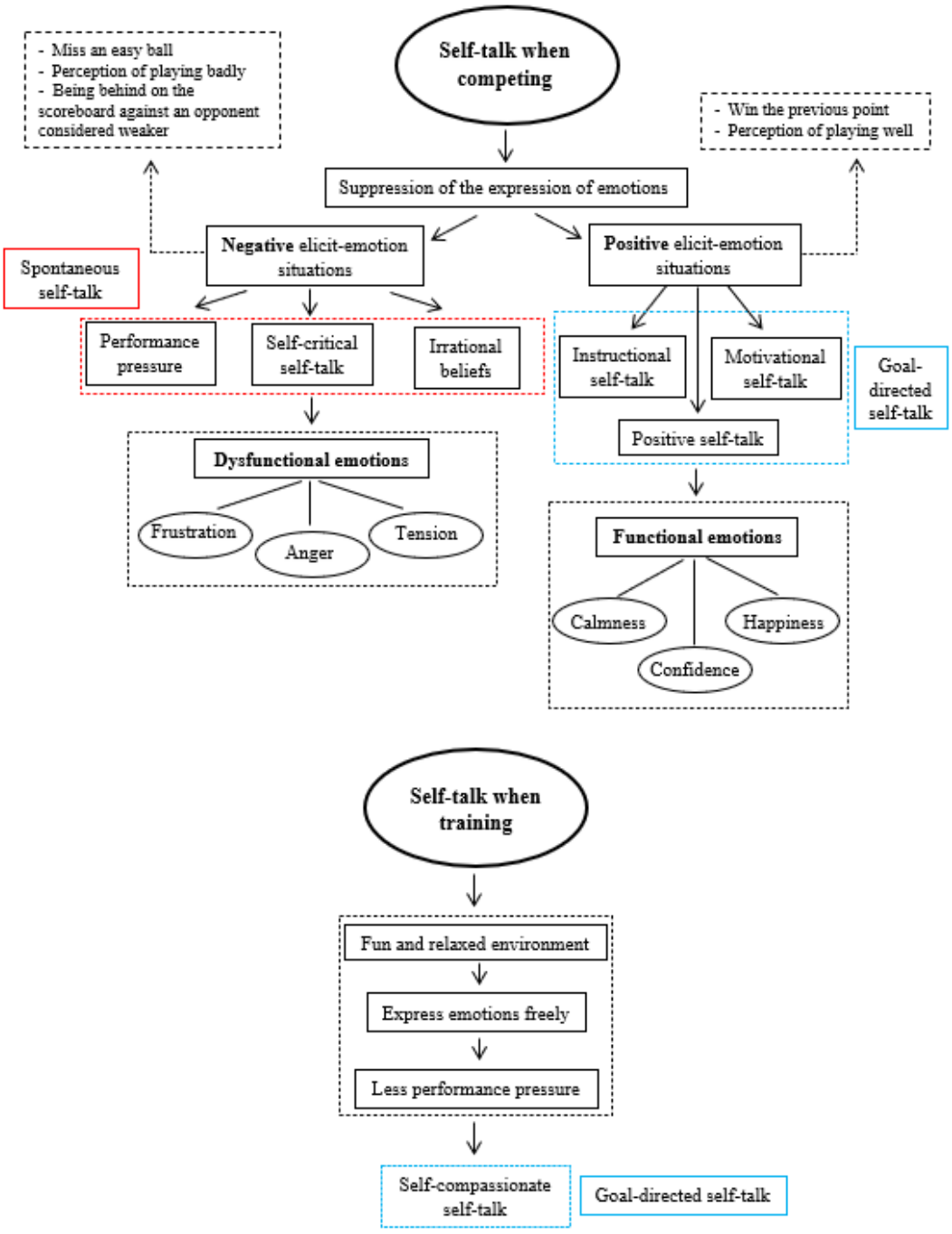

Figure 2 – Thematic Map of self-talk in training and in competition

Discussion

Overview

The purpose of the current study was to investigate and categorize the perceptions that young high level tennis players have about their self-talk in training and competitive settings.

The investigation of self-talk in relation to self-regulation was not a primary objective of the research, however, based on the participants' statements, it was possible to think about this relationship during the analysis. The study aimed to expand upon previous research on tennis players' self-reported self-talk by tennis players in both settings. To our knowledge, this is the first study to investigate the self-talk of high-performance Brazilian tennis players in these two contexts.

This study sought to expand the findings on the individual experiences of elite tennis players (Boudreault et al., 2018) from an in-depth investigation of the training and competition contexts. From the thematic analysis, we were able to find new categories of self-talk that, to our knowledge, had not been described in the literature: self-critical and self-compassionate. These additional findings of the study will be covered, contemplating the findings that are or are not in accordance with the literature. Finally, strengths and limitations of the study will be discussed along with directions of future research. In short, the current study supports prior work in several ways, and brings new contributions to the theme.

“The training is not like it’s worth anything”: Self-talk in practice

Undoubtedly, the self-talk category that was most related to the training environment was self-compassionate self-talk, as we called it. All study participants characterized training as an environment in which "you have nothing to lose" and that, consequently, mistakes are more tolerated since it is possible to "repeat what you did wrong". We understand that this type of self-talk goes against how tennis players perceive competitions, which are characterized as a situation in which they feel more pressured and in which mistakes are more intolerable. In this sense, we understand that the Participants spoke to themselves in a compassionate way during training, being kind to themselves and having a nonjudgmental attitude in the face of their failures in that context (Neff, 2003).

It is also possible to notice that, by having self-compassionate self-talk, the Participants were able to self-regulate and motivate themselves to continue trying to improve in the face of setbacks. As indicated by Neff et al., (2005), self-compassion is associated with mastery orientation, that is, feeling motivated to develop one's skills. In other words, self-compassion is related to coping strategies of acceptance and positive reinterpretation, and to the reduction of aversiveness of stressful events (Leary et al., 2007). In addition, Participants associated the training environment mainly with the emotions of relaxation and joy. These results were consistent with what was proposed by Van de Pol & Kavussanu (2012), in which training was unrelated to feeling tension and anxiety and was also characterized as an environment of enjoyment, when compared to competition.

Considering the above, we consider that self-compassionate self-talk is similar to rational self-talk, as it represents a more deliberate process and requires a more rational analysis of the situation from the individual. On the other hand, we understand that self-compassionate self-talk, despite being based on reason (Latinjak et al., 2019), is not emotionally neutral (Van Raalte et al., 2016), since, in the investigated participants, it was responsible for evoking feelings of tranquility and motivation. In addition, from the investigation in both contexts, we understand that the self-compassionate attitude that the Participants have with themselves in training is opposite to that used by them in competition, in which they are very hard on themselves. In this way, by the nomenclature of self-compassionate self-talk, we wanted to emphasize the attitude of tennis players to be kind and understanding with themselves in training.

Furthermore, we understand the self-compassionate self-talk used by tennis players during training as organic, since "is the result of an ongoing rational cognitive process deliberately employed to solve a problem in a specific situation" (e.g., self-regulation and motivation to keep trying to improve after making a mistake in training) (Latinjak et al., 2019,

p. 15). As noted by Van de Pol & Kavussanu (2012), this finding is important considering that athletes spend most of their time training, but, on the other hand, it should be noted that this type of self-regulation strategy was not mentioned by tennis players when referring to the competitive context.

“The match is a more serious place”: Self-talk when competing

It had already been suggested that athletes speak to themselves differently in training and in competition and that, probably, in the competitive environment, it would be possible to perceive more emotionally reactive self-talk (Thibodeaux & Winsler, 2018). In the analysis of the Participants' statements, it became clear that not only do they view training and competition differently, but also that they talk to themselves differently (e.g., "The match is a more serious place; In training I laugh more, I talk more, I'm more relaxed" and “In practice I’m not so hard on myself like I am in matches”). This is a significant contribution of this study regarding training pedagogy, which shows that athletes should practice self-talk strategies as often as possible, in addition to increasing the level of self-awareness about how they perceive and behave in both environments (Marshall et al., 2016).

Competition was characterized as an environment in which they feel more pressured to perform well and in which tennis players describe that they are harder on themselves. Thus, as noted by Boudreault et al. (2018), in competition, tennis players’ self-talk is related to the belief that they have an obligation to perform well and to win, which is probably what generates performance pressure in this context. In the competition, it can be seen that mistakes are less tolerated by the Participants, especially in situations where they found shots to be easy to make, when they have a self-critical self-talk, unlike the self-compassionate attitude they have with themselves in training. In addition, we understand that the performance pressure that participants described takes their attention away from performance-relevant aspects and directs

it to task-irrelevant cues (e.g., worrying that they have already beaten the opponent) (Marshall et al., 2016).

Although the self-critical self-talk is very similar to the negative self-talk already described by many authors (Van Raalte et al., 1995; Hardy et al., 2001; Zourbanos et al., 2009), we understand that the participants' self-criticism has relationship with negative judgments with an attentional focus on their personal mistakes and failures (Longe et al., 2010). As pointed out by the participants, this type of self-punishment is associated with feelings of anger, frustration and tension (Longe et al., 2010), contrary to self-compassion, which, in turn, is negatively associated with negative, pessimistic and self-critical thoughts (Leary et al., 2007). Based on the types of negative self-talk identified by Zourbanos et al., (2009), namely, worry (e.g., worry about losing), disengagement, (e.g., giving up thoughts) and somatic fatigue (e.g. express tiredness), we understand that Participants' self-talk is mostly focused on criticism of their skills and abilities.

The irrational beliefs category was based on one of the types of spontaneous self-talk described by Latinjak et al. (2019) as irrational, inappropriate and counterproductive (e.g., “It’s like someone's telling me that I have to hit the serve right; It's not that I can serve right, but it's that I have to serve right”). Although this self-talk category contains some elements of the self-criticism and performance pressure categories, we noticed that the participants' statements were more related to cognitive distortions, that is, to negatively biased errors in thinking (Beck et al., 1979) (e.g., “I don't believe that I play well anymore”, “I was supposed to win”, and “I have a hard time understanding that I want to win and that I don’t have to, right?”). Therefore, we interpreted the Participants' beliefs as those that "create self-defeating feelings and behaviors by constructing and creating irrational or self-defeating beliefs" (Ellis, 2003, p. 220) and that "produce dysfunctional emotions and behaviors" (ELLIS, 2003, p. 222), as also described by tennis players.

It is possible to notice that the speeches of the participants related to positive self-talk are much more succinct than those described in the categories of self-criticism, performance pressure and irrational beliefs. We hypothesized that tennis players' difficulty in describing their positive self-talk in interviews is related to the cognitive distortion of mental filtering, that is, focusing on negative information and disqualifying positive information (Beck et al., 1979). This aspect was clear in the speech of Participant 6, who pointed out, when talking about her positive self-talk, that "I don't talk much about like, positive stuff, because it's like hitting the balls on the court is the minimum, so fuck it".

Despite this, all participants reported speaking positively to themselves in the competition, mainly from the perception that they are playing well or after scoring a good point. As described in the literature, we identified that the positive self-talk of the participants was mainly related to the functions of psyching-up (e.g., "Come on"), confidence building (e.g., "You're playing well" and "We're going to win") (Nedergaard et al., 2021), and retrospective attributions of success (e.g., "Oh, well played that point", "Oh, good forehand", and "Oh, nice move, nice play") (Latinjak et al., 2019).

As found by Boudreault et al. (2018), we also identified motivational and instructional self-talk in the analysis of interviews, mainly related, in our study, to the competitive scenario. We identified that, with the exception of Participant 5, both the Participants' instructional and motivational self-talk referred to goal-directed thoughts, as they emerged from their organic self-talk (Latinjak et al., 2019). Only Participant 5 mentioned strategically planned self-talk: "I have like a word stuck to my racket, that every time I start to get lost and do not want to express anything else, for someone else not to see that I'm frustrated, I keep looking at that word to see if I can concentrate. It's the word "focus". It is evident, in the Participant's speech, that the word "focus" was used deliberately and strategically, aiming to enhance performance in moments perceived as challenging of the match (Hatzigeorgiadis et al., 2011).

Conclusions and Future Directions

In the current study, we identified that tennis players perceive training as a situation in which they can show their emotions freely and in which their mistakes are more tolerable, while they perceive competition as a situation in which they must suppress their emotion expression and in which errors are less tolerable. We advanced in the research by identifying a self-talk category that, to our knowledge, had never been described in the sports environment: self-compassionate self-talk. Despite potential limitations, such as the small number of participants, the results of the current study have shed some light on potential intervention strategies for the self-criticism of high-performance tennis players. We suggest that future researches investigate the theme with young tennis players belonging to other cultures so that the results can be compared and, possibly, expanded. In addition, we suggest that future research investigates the occurrence of self-compassionate self-talk that was suggested in the findings of this study, even as an alternative to circumvent the negative consequences of critical and punitive self-assessments (Neff, 2003). Finally, this study raised an important contribution about the structuring of the training environment by coaches and the huge discrepancy pointed out by the participants in terms of pressure and how they feel when compared to competition.

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FINAL CONSIDERATIONS

The present thesis aimed to describe and compare the self-talk and the observable and unobservable gestures of a group of young Brazilian tennis players with high performance in training and competition. Initially, the general and broad objective of the research was limited to exploring self-talk and gestures in young Brazilian tennis players, considering that we did not find any research carried out or in progress that addressed this issue. Due to the richness of the theme, we chose the mixed approach in order to try to contemplate the complexity of the theme. We believe that, in this way, we could minimize the weaknesses and strengthen the potential of each of the traditional approaches. Although the research started with a very exploratory character in relation to an emerging theme in the Brazilian context, we came across new objectives along the way. First, we realized that there was a fruitful field to be explored in the tennis players in our sample: the different stages of development in which they find themselves. Still, from the data collection process, we came across another "accidental objective" for which we also found a gap in the literature: the level of awareness that tennis players have about their self-talk in training and competition.

To contemplate and answer the questions of the complex objectives that we have outlined, two articles were developed to explore: 1. the intersection between quantitative and qualitative data and 2. the richness and vast amount of qualitative data that we had collected in the interviews. Our goal was to build two distinct discussions that, at the same time, were interdependent and complemented each other. To familiarize ourselves and immerse ourselves in the subject, we built a theoretical framework covering the most essential topics of this thesis: the development of young athletes from the sampling years to the investment years, self-talk and emotional regulation. It should be noted that the selected topics have such depth and vastness and, for this reason, due to the time and space we had to develop the thesis, we had the difficult task of choosing the most important elements of each of the aforementioned topics.

In Study I, we had the general objective of, from a mixed approach, comparing the data we had observed from the STAGRS in competition and training sessions with the tennis players' perceptions of how they talk to themselves in these environments. In order to give more relevance to the study, we chose to carry out the collections in an international tennis tournament, in which the best players from South American countries of each category compete, and select the best ranked tennis players at the state and national levels belonging to a traditional sports club that trains athletes. From the quantitative data and the statistical

analyzes we carried out, we were able to confirm data that had already been verified by relevant international studies in the area, such as the fact that tennis players use significantly more self-talk and gestures in competitions than in training. In addition, we believe that cluster analysis and thematic analysis were efficient methods for data analysis, since: 1. the participants' statements expanded and explained the results of the cluster analysis and 2. the cluster analysis confirmed what had been identified through the speeches of the participants. Furthermore, we believe that, due to the richness of the data collected, this study advanced in the understanding of the self-talk of young tennis players, especially with regard to how they talk to themselves in training and competitions and the differences in metacognitive capacity or in the level of awareness of tennis players who are in different stages of youth. We also believe that this study has practical implications for the training environment, especially in the exercise of coaches. The discrepancy found between the self-talk of tennis players in training and competitions raises important questions for Sport Pedagogy and even for Sport Psychology: The training environment is capable of creating conditions for tennis players to develop self-regulation skills to deal with the pressures of competition? And if training does not provide the necessary conditions for tennis players to develop self-regulation skills and learn to deal with pressure, how can coaches and sport psychologists intervene in this scenario? What is the role of the coach, who accompanies tennis players daily, on the self-talk and behaviors of their athletes in training? What is the role of parents, that is, of primordial models, on the beliefs of their children who practice high-performance tennis?

In Study II, our main objective was to develop a thorough Thematic Analysis to explore the rich content of the tennis players' interviews. In the construction of the interview script, we had three main purposes: 1. to contemplate each of the self-talk categories proposed by STAGRS, 2. to question the tennis players about their covert and overt self-talk based on the STQU and 3. to verify the level of awareness that tennis players have about their self-talk and behavior in training and competitions. Through the interviews, we were able to identify some self-talk categories that had already been pointed out recently in the literature, such as Pressure Performance. The identification of the self-compassionate self-talk category, unquestionably associated by tennis players with training, raises new questions for future research on self-talk: Do young tennis players from other cultures also report this type of self-talk associated with training? Is this type of self-talk identified in samples of elite adult tennis players? By identifying three categories of negative verbalizations in the Thematic Analysis (Self-critical self-talk, Performance pressure and Irrational beliefs), we believe that the present study

advances the understanding of how young athletes perceive competition and how psychologically and emotionally prepared they are for it. be systematically inserted in this context. Still, we believe that the study advances in understanding the discrepancy between the stimuli that the training environment brings to young tennis players and that competition brings. Among them, we can mention the feeling of pressure to perform well in the competition, to win in the tough knockout games and the difficulty of regulating emotions in the face of the challenges that the competition presents. It is worth questioning the mismatch between the recommendations on the healthy development of young people in sport, especially in the light of Jean Côté's work, and what is actually seen in the daily practice of clubs that train athletes. It caused us strangeness and disquiet how young tennis players who have just entered adolescence already experience such pressure to perform well and to obtain results, in addition to the harsh criticism they make to themselves in the face of mistakes that are part of the daily life of any sportsman, from recreational to elite. We assume that at some point along the trajectory of these young athletes - many still in the transition between childhood and adolescence - the recommended practices regarding their path to sports specialization were modified, forgotten or lost.

Finally, we believe that, from Study I, we were able to describe the way young high-performance tennis players talk to themselves in training and competition, highlighting idiosyncrasies and notorious differences, and advancing the understanding of the metacognitive development of athletes from different backgrounds. ages. In study II, we expanded the story told by the numbers, seeking to immerse ourselves in the subjectivity of each of the participants and make sense of what we had described statistically. Despite the limitations of the present study, which will be addressed in the following topic, we believe that we present contributions to the theme of self-talk, which has been growing and standing out in the sports literature in the last thirty years. Furthermore, we believe that our study leaves some complex questions for the field of development of young athletes: What is the impact that the beliefs formed during childhood and adolescence in the competitive system have on the human being that is still in formation and who, in addition to being an athlete, is a son, a student and a friend? How (we Sports Science professionals) can we help young athletes to form positive, healthy and functional beliefs about themselves, about the world, about the future, even in the midst of the hard daily life of high-performance sport?

Limitations

A possible initial limitation of our study is related to the disparity of data collected from each of the participants, given that the number of matches analyzed by each tennis player was subject to the eliminatory nature of the championship. In other words, we set out to analyze the number of rounds for which tennis players qualified, which made us analyze from 1 to 6 games of the participants. We believe that we would have more robust evidence regarding the behavior profile of each tennis player if it were possible for us to follow at least two matches of each participant, which would be unfeasible given the period we had for data collection and for the other procedures. (data transcription, data analysis, data interpretation, article writing). Also due to the limited calendar available for the master's degree, we proposed to follow two weeks of training for tennis players, which meant that, although to a lesser extent, we followed from 3 to 6 training sessions of the participants. Regarding the data analysis procedure, one of the limitations that our study had was due to the small sample of participants that we had due to the inclusion criteria that we chose and that we believe could bring new contributions to the literature and greater relevance for the study. The small number of participants made it impossible to carry out some statistical procedures that could give more robustness to the study and, therefore, we used the Cluster Analysis strategy. Although it was not our first choice of analytical procedure, this method proved to be fruitful, especially in the dialogue with the qualitative data we had. Finally, another limitation we had was the disagreement between the large volume of data we had collected and the space and time we had to interpret and synthesize all this information within two articles, in which we had the limitation of the number of words and pages. Therefore, we believe that the data collected and the discussions proposed in the thesis can still be further developed and expanded.

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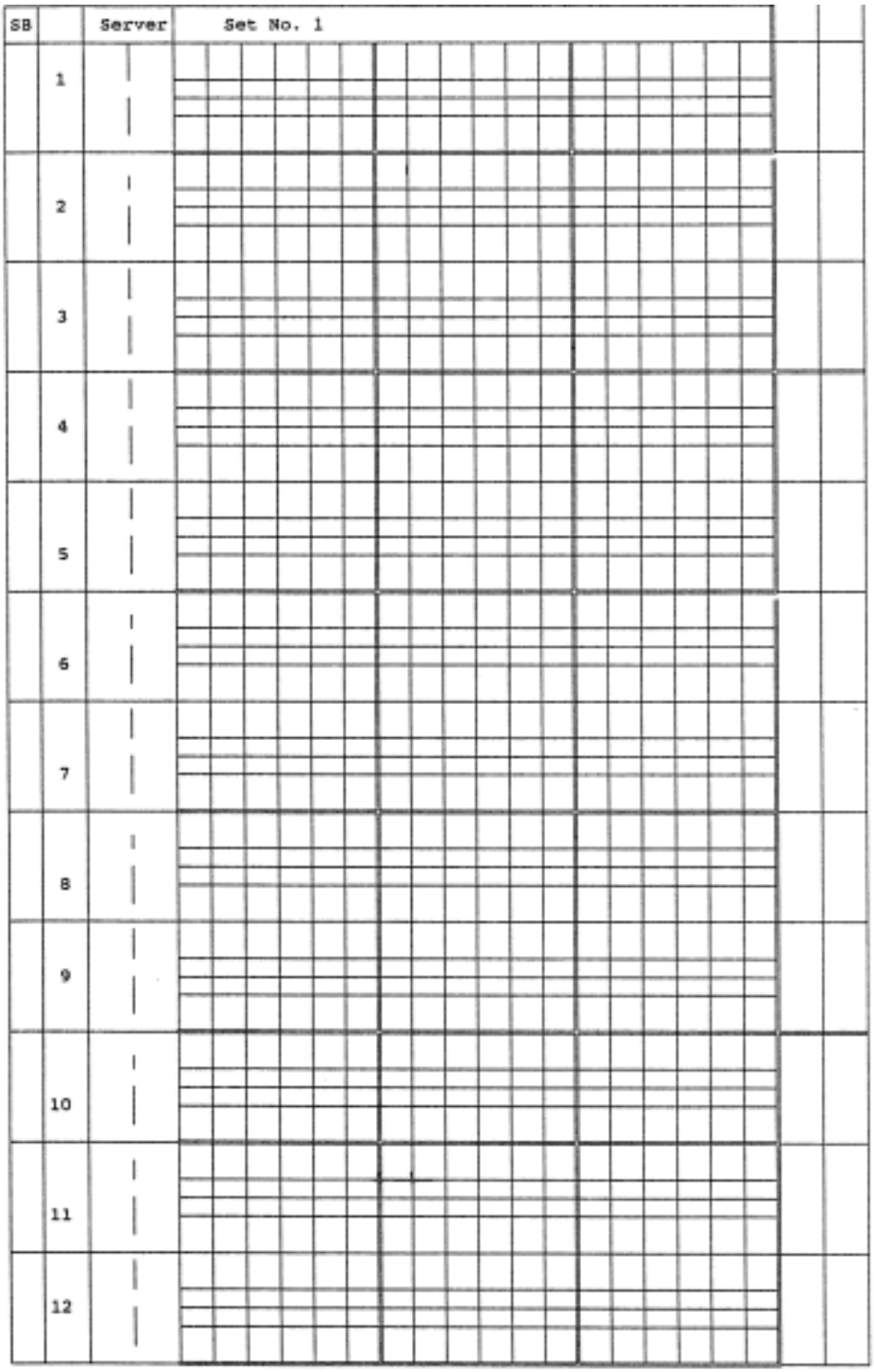
APPENDICES

APPENDIX I – The Self-talk and Gestures Rating Scale

(VAN RAALTE *et al*, 1994)



APPENDIX II – Training manual for the Self-talk and Gestures Rating Scale

(VAN RAALTE *et al*, 1994)

TRAINING MANUAL FOR THE SELF TALK AND GESTURES RATING SCALE (STAGRS)

Judy L. Van Raalte, Patricia M. Rivera,
Britton W. Brewer, and Albert J. Petitpas

Center for Performance Enhancement and Applied Research (CPEAR)
Department of Psychology
Springfield College
Springfield, MA 01109

Development of this manual was supported by a grant from the United States Tennis Association (1993). We would like to thank Dr. Ron Smith for his assistance in developing this manual. Parts of this manual are based on Smith, Smoll, and Hunt's (1976) Training manual for the Coaching Behavior Assessment System (CBAS).

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APPENDIX III – Tennis Umpire Scoring Tips

(This instrument was granted by one of the researchers responsible for creating the STAGRS as part of the researcher's training)

Tennis Umpire Tips

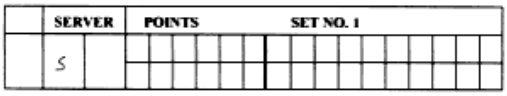
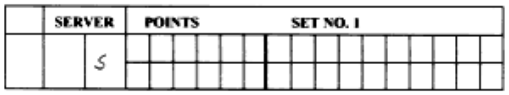
http://users.eastlink.ca/~pens/tennis/marking/index.html

Marking Score

There are four symbols to be used when entering points on the scorecard:

Symbol	Meaning
/	A diagonal line through the server's or receiver's box indicates the winner of the point.
.	A dot is the symbol for a fault and is placed in the centre of the line between server and receiver for the appropriate point.
D	The symbol for a double fault, which should not be used unless there is already a "." (dot) in that point.
A	The symbol for a service ace (a serve which is untouched by the receiver in any way).

Now we can start using the scorecard to mark the score. Be sure to always use a **pencil** that has an eraser when marking the score. The name of the server is Stuart and the initial "S" for Stuart has been placed on the scorecard for the first game.

Marking Scorecard	Interpretation
	If serving to the left of the chair umpire
	If serving to the right of the chair umpire

APPENDIX IV – Training observation table

(Adapted from the categories of the *Self-talk and Gestures Rating Scale*) (VAN RAALTE *et al*, 1994)

TRAINING OBSERVATION TABLE

(based on the 14 self-talk and gestures categories) (Van Raalte *et al*, 1994)

Athletes evaluated live	
Athletes evaluated in the recordings	
Training time of each athlete	
Date	

STAGRS codes

Ball abuse (B)	Motion of stroke (M)
Compliment opponent (C)	Negative self-talk (N)
Fist pump (P)	Opponent abuse (O)
"Oh god!" (G)	Positive self-talk (P)
Instructional self-talk (I)	Racquet abuse (R)
Hit oneself (H)	Self-talk in general (S)
Laughing (L)	Other (nº)

Athlete	Self-talk and gestures codes	Type of activity	Brief description of the activity

APPENDIX V – Interview script

Identification data

Which category or categories do you currently play in?
How old were you when you started training tennis?
How old were you when you started competing in tennis?

General questions about self-talk based on the *Self-talk Use Questionnaire* (Hardy *et al,* 2005)

I'm going to ask you a few questions about how you talk to yourself when you're playing tennis. There are three main ways in which you can talk to yourself. You can speak to yourself out loud, in a way that other people can hear your, whispering or "speaking in a low voice", so that only people close to you can hear you, and within your own mind, without making any sound.

1) Do you usually talk to yourself when you play tennis?
2) How often do you talk to yourself while playing tennis?
3) When you're playing tennis, how often do you talk to yourself out loud so that other people can hear what you are saying? *In what situations does this usually occur? Can you tell me examples?*
4) When you're playing tennis, how often do you talk to yourself in a low voice or whispering, so that only you or a person who is very close to you can hear you? *In what situations does this usually occur? Can you tell me examples?*
5) When you're playing tennis, how often do you talk to yourself completely inside your own head, so that only you can hear what you're saying to yourself? *In what situations does this usually occur? Can you tell me examples?*
6) Do you believe that talking to you, whether out loud, whispering, or within your own mind, helps you play better? *In what situations does this occur? Can you tell me examples?*
7) Do you believe that talking to yourself can impair your performance when you are playing tennis? *In what situations does this occur? Can you tell me examples?*

Questions about the items of *the Self-talk and Gestures Rating Scale* (Van Raalte *et al*, 1994)

I'm going to ask you about some kinds of behaviors that can occur when you're playing tennis. For each of the items I ask you, it is important that you can tell if you usually have this behavior and, if so, if you identify that you have this behavior in training and/or competition settings. In addition, it is important that you can give examples of how this behavior occurs.

1) When you are playing tennis, do you usually hit the ball toward the net, wall, grid or off the court when you feel frustrated? *In what situations does this usually occur? Can you tell me examples?*
2) When you are playing tennis, do you usually compliment your opponent when he/she makes a good move? *In what situations does this usually occur? Can you tell me examples?*
3) When you're playing tennis, do you usually clench your fist to celebrate when you make a good shot? *In what situations does this usually occur? Can you tell me examples?*
4) When you are playing tennis, do you often demonstrate frustration through your body language, that is, through your body? *In what situations does this usually occur? Can you tell me examples?*
5) When you are playing tennis, do you usually give instructions to yourself on how you can improve some stroke or play better? *In what situations does this usually occur? Can you tell me examples?*
6) When you are playing tennis, do you usually slap or hit yourself with the racquet or with your hand, to motivate yourself or to demonstrate frustration? *In what situations does this usually occur? Can you tell me examples?*
7) When you are playing tennis, do you often laugh or smile after making a mistake, when you feel frustrated or when you make a good shot? *In what situations does this usually occur? Can you tell me examples?*

8) When you are playing tennis, do you usually practice the correct movement of strokes (*forehand, backhand, slice...*) without the ball? *In what situations does this usually occur? Can you tell me examples?*
9) When you are playing tennis, do you often say negative things to yourself? *In what situations does this usually occur? Can you tell me examples?*
10) When you are playing tennis, do you usually argue with your opponent or challenge the mark ball made by he/she? *In what situations does this usually occur? Can you tell me examples?*
11) When you are playing tennis, do you often say positive things to yourself? *In what situations does this usually occur? Can you tell me examples?*
12) When you are playing tennis, do you usually throw or hit your racket somewhere when you feel frustrated? *In what situations does this usually occur? Can you tell me examples?*
13) In addition to the speeches and gestures we have talked about, do you usually say other kinds of things or make other types of gestures when you are playing tennis? *In what situations does this usually occur? Can you tell me examples?*

Questions about the relationship between self-speech and performance

Now, I'm going to ask you a few questions about these behaviors that we talked about and how you talk to you when you play tennis and your performance, that is, whether you play better or worse.

1) Do you believe that talking to yourself, whether out loud, whispering, or within your own mind, helps you play better? *In what situations does this occur? Can you tell me examples?*
2) Do you believe that talking to you can impair your performance when you are playing tennis? *In what situations does this occur? Can you tell me examples?*
3) Do you believe that the way you talk to yourself is different in training and competitions? *What changes do you notice from training to competition?*
4) Of all the behaviors and speeches we've talked about, which ones do you believe you use the most in training? *Which of these behaviors do you believe help you play better? Which of these behaviors do you believe that can impair your performance?*

5) Of all the behaviors and speeches we've talked about, which ones do you believe you use the most in competitions? *Which of these behaviors do you believe help you play better? Which of these behaviors do you believe that can impair your performance?*
6) Of all the behaviors we've talked about, in your perception, which ones make you feel more or less ready or prepared to play the next point.