ISSN (print) 1991-0177, ISSN (online) 1999-818X
SLOBOZHANSKYI HERALD OF SCIENCE AND SPORT
Vol. 29 No. 2, 2025

Original Scientific Article DOI: 10.15391/snsv.2025-2.05

Self-talk content and performance indicators for young tennis players in competitions

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Authors' Contribution: A – researchdesign/planning; B – datacollection/entry; C – data analysis/statistics; D – data interpretation; E – manuscript preparation; F – literature analysis/search; G – fund raising.

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Abstract

Background and Study Aim. Tennis players have many opportunities to experience and demonstrate self-talk in between points in competition. Uncontrolled negative self-talk can impact attention and accuracy, leading to a tendency for negative self-talk to dominate and increase anxiety levels. Perhaps, with the help of self-talk, it is possible to regulate the emotional state in order to improve results in competitions. In this paper, we studied the influence of self-talk on the results of competition (win or lose) based on a young female tennis player with unstable performance in competitions.

Material and methods. We used the Mann – Whitney test to verify the hypothesis that self-talk of a tennis player influences whether she is winning or losing a match. The initial statistics are the results of a survey of an athlete on the number and content of self-talk before and during the match. We studied automatic self-talk and strategic self-talk. Automatic self-talk can have both positive and negative emotional content. Strategic self-talk consists of motivational and cognitive thoughts.

Results. The number of strategic motivational self-talk and automatic positive self-talk was greater in winning matches than in losing matches at $p=0.02$. At the same time, there was no statistically significant relationship between match outcome and the amount of strategic cognitive self-talk or automatic negative self-talk. The results of the analysis show that wins occurred when the mean of motivational self-talk was 23 and the mean of positive self-talk was 16, and losses occurred when these values were 15 and 11, respectively.

Conclusions. The results of our study show a statistically significant relationship between the content of strategic motivational self-talk and positive self-talk and the outcome of the competition. It should be noted that the small sample size and our doubts about the homogeneity of the competitors and conditions for the matches make our conclusion only an estimate. Also, we cannot accurately answer the question of how many strategic motivational self-talk and positive self-talk instances are needed to defeat an opponent.

Key words: Psychological preparation, Tennis, Motivational self-talk, Cognitive self-talk, Positive self-talk, Negative self-talk, Self-regulation, Mann – Whitney test, U-test, Strategic self-talk, Automatic self-talk.

Анотація

Зміст внутрішнього діалогу та показники ефективності юних тенісистів на змаганнях

Передумови та мета дослідження. У тенісистів є багато можливостей випробувати і продемонструвати внутрішній діалог між окулярами у змаганні. У цій статті ми вивчили вплив внутрішнього діалогу на результати змагань (перемога чи поразка) на прикладі молодої тенісистки з нестабільними результатами на змаганнях.

Матеріал і методи. Ми використали тест Манна – Уітні для перевірки гіпотези про те, що внутрішній діалог тенісистки впливає на те, чи виграє вона, чи програє матч. Вихідною статистикою є результати опитування спортсменки про кількість та зміст внутрішнього діалогу до та під час матчу. Ми вивчали автоматичний

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ISSN (print) 1991-0177, ISSN (online) 1999-818X
SLOBOZHANSKYI HERALD OF SCIENCE AND SPORT
Vol. 29 No. 2, 2025

внутрішній діалог та стратегічний внутрішній діалог. Автоматичний внутрішній діалог може мати як позитивний, так і негативний емоційний зміст. Стратегічний внутрішній діалог складається з мотиваційних та когнітивних думок.

Результати. Кількість стратегічних мотиваційних внутрішніх розмов та автоматичних позитивних внутрішніх розмов була більшою у виграних матчах, ніж у програних матчах при p = 0,02. Водночас не було виявлено статистично значущого зв'язку між результатом матчу та кількістю стратегічних когнітивних внутрішніх розмов або автоматичних негативних внутрішніх розмов. Результати аналізу показують, що перемоги відбувалися, коли середнє значення мотиваційних внутрішніх розмов становило 23, а середнє значення позитивних внутрішніх розмов – 16, а поразки відбувалися, коли ці значення становили 15 та 11 відповідно.

Висновки. Результати нашого дослідження показують статистично значущий зв'язок між змістом стратегічних мотиваційних внутрішніх розмов та позитивних внутрішніх розмов і результатом змагань. Слід зазначити, що невеликий розмір вибірки та наші сумніви щодо однорідності учасників змагань та умов проведення матчів роблять наш висновок лише оцінкою. Також ми не можемо точно відповісти на питання, скільки випадків стратегічних мотиваційних внутрішніх розмов та позитивних внутрішніх розмов потрібно для перемоги над суперником.

Ключові слова: психологічна підготовка, теніс, мотиваційний внутрішній діалог, когнітивний внутрішній діалог, позитивний внутрішній діалог, негативний внутрішній діалог, саморегуляція, тест Манна-Вітні, U-тест, стратегічний внутрішній діалог, автоматичний внутрішній діалог.

Introduction

Tennis is a sport in which there are many opportunities for players to experience and demonstrate self-talk and emotions between points in competition. Initially, it is important to define the terminology associated with self-talk. In the paper [1], a working definition of self-talk was presented. Self-talk is a multidimensional verbalization or statement addressed to oneself that has interpretive elements associated with the content of statements used. These statements must be dynamic enough and perform at least instructional and motivational functions for the athlete. A theory-driven classification recently introduced to sport psychology distinguishes between goal-directed self-talk as a controlled type of self-talk (strategic self-talk) and spontaneous self-talk as an uncontrolled type of self-talk (automatic self-talk) [2, 3]. These types of self-talk have different effects on emotions. Automatic negative self-talk and the emotions that an athlete experiences at this time worsen his performance. One of the most common trigger mechanisms of negative self-talk is the athlete's mistakes in crucial moments when the tension is the highest — for example, at the end of a game or set — preventing the athlete from demonstrating a positive performance, allowing double faults or unforced errors [4,5]. Multilevel models showed that the intensity of emotions experienced was lower in instances where players reported solely goal-directed self-talk than in instances where players reported solely spontaneous self-talk [2]. A targeted self-talk intervention (strategic self-talk) can help improve the psychological state and performance of young athletes [6]. For example, one article studied the influence of strategic internal dialogue on the psychological and athletic performance of young athletes. Self-talk can help improve psychological well-being and performance in young athletes [5]. Internal dialogue is a conscious or automatic self-talk process through which an athlete evaluates his actions, formulates instructions for future steps, and provides emotional support during training or competition. In tennis, internal dialogue plays a crucial role due to the fast-paced decision-making, the need for quick adaptation, and emotional control during matches. Strategic Internal Dialogue is a conscious and controlled self-talk process used for planning actions, correcting technical errors, and making tactical decisions. For example, during a break between points, a player may tell himself: "Focus on serving down the center" or "Play short shots to tire out the opponent." This type of internal dialogue helps organize game strategy, improve concentration, and boost confidence in challenging moments. Automatic Internal Dialogue occurs subconsciously or spontaneously in response to successes or failures during the game. For instance, players may react instinctively to errors by saying: "Oh no, another out!" or "That was a great shot!" While positive automatic dialogue can maintain motivation, negative automatic dialogue often increases stress and reduces performance effectiveness. From a functional point of view, self-talk may have two functions, namely cognitive and motivational [7]. The cognitive function refers to learning and performing sport skills, and developing strategies of play [8,9]. The motivational function refers to focus, self-encouragement, self-confidence, mental readiness, arousal regulation, and coping [10]. The motivational function of self-talk represents

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the mental manipulations that can boost self-encouragement in individuals to achieve higher levels of performance [11]. The cognitive function of self-talk represents the mental manipulations that can help individuals focus attention, gain an understanding of causal relationships, create new forms of knowledge, and solve problems. Many athletes use verbal statements (cue words, sentences) that serve either the cognitive or the motivational function [12,13]. Encouraging positive self-talk is one of the strategies judged to be most effective and frequently used by many coaches to enhance athletes' self-efficacy and performance. The main explanation is that self-talk decreases the frequency of interfering thoughts and thus enhances focus and concentration [14]. Internal dialogue and psycho-emotional adjustment play a crucial role in tennis, as this sport combines physical exertion with high mental preparation demands. During a match, a tennis player constantly faces challenges such as unpredictable opponent actions, the need for quick decision-making, and emotion management. Positive internal dialogue helps athletes stay focused, maintain self-confidence, and regain control after unsuccessful rallies. Research shows that using specific internal dialogue techniques, such as self-encouragement ("I can do it!", "Stay calm"), allows tennis players to better adapt to stressful game conditions. For example, a study by Gardiner and Matthews found that tennis players who employed positive mental cues during matches demonstrated higher serve accuracy and better technical control [15]. Similarly, research by Creighton and White showed that psycho-emotional adjustment helps athletes maintain focus even under pressure and ensures resilience against emotional outbursts common in long matches [16]. In a domestic study conducted by Lebedeva among Ukrainian tennis players, it was emphasized that combining techniques such as self-suggestion, visualization, and self-control significantly improved performance stability in crucial game moments [17]. Athletes who effectively prepared themselves before decisive points demonstrated greater emotional resilience and a reduced tendency to panic-induced errors. Thus, internal dialogue and psycho-emotional adjustment are powerful tools for tennis players, helping improve focus, reduce the impact of stress, and achieve consistent sports results. So, in order for an athlete to demonstrate his best results, he must be aware of his internal dialogue and its intensity, and also learn to regulate it in time so that it does not negatively affect his results in the game. A participant in the research was a young female tennis player, who was looking for the reasons for her unstable competition performance and negative self-talk in competitions. However, the question arises: How effective is this strategy for an individual athlete?

The purpose of the research was to identify the influence of self-talk on winning or losing in competitions for an athlete.

Materials and Methods

Participants

The subject was a 16-year-old female tennis player who was ranked 1st–21st place in the Latvian ranking, with experience in both Latvian and international competitions. The athlete had been playing tennis for 11 years. Two tennis coaches and two psychologists also took part in the pedagogical observation.

Research Design

Data collection was carried out during the summer games season (June to August) of European tennis tournaments in which the subject participated. The data for analysis consisted of answers to questions divided into four categories.

The first questionnaire used was the Automatic Self-Talk Questionnaire for Sports (ASTQS) to determine the athlete's automatic self-talk [6]. The test covered both positive and negative self-talk. Responses were measured using a five-point Likert scale (Table 1). Items 1–4 represented positive self-talk, while items 5–8 represented negative self-talk.

We calculated the total points for each of the 15 competitions. Total response values for neg-

Table 1. Automatic Self-Talk Questionnaire for Sports

Please read each one carefully and indicate how often you have used self-talk						
No	**Self-talk content**	**Never**	**Rarely**	**Some**	**Often**	**Always**
1	Psych up	1	2	3	4	5
2	Anxiety control	1	2	3	4	5
3	Confidence	1	2	3	4	5
4	Instruction	1	2	3	4	5
5	Worry	1	2	3	4	5
6	Disengagement	1	2	3	4	5
7	Somatic fatigue	1	2	3	4	5
8	Irrelevant thoughts	1	2	3	4	5

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ISSN (print) 1991-0177, ISSN (online) 1999-818X
SLOBOZHANSKYI HERALD OF SCIENCE AND SPORT
Vol. 29 No. 2, 2025

Table 2. Strategic Self-Talk Questionnaire.

Please read each one carefully and indicate how often you have used self-talk						
No	**When I compete:**	**Never**	**Rarely**	**Some**	**Often**	**Always**
1	I talk to myself in order to be able to concentrate more fully on the competition	1	2	3	4	5
2	I talk to myself about the technical elements of the competition	1	2	3	4	5
3	I talk to myself to give directions	1	2	3	4	5
4	I talk to myself to enhance my self-confidence	1	2	3	4	5
5	I talk to myself to motivate myself	1	2	3	4	5
6	I talk to myself to increase my effort	1	2	3	4	5
7	I talk to myself to encourage myself	1	2	3	4	5
8	I talk to myself to strengthen a positive thought	1	2	3	4	5
9	I talk to myself to stop negative thinking	1	2	3	4	5
9	I talk to myself in order to help myself to relax	1	2	3	4	5
11	I talk to myself to correct my mistakes	1	2	3	4	5

Table 3. Test answers to questionnaire questions with automatic self-talk for different matches.

No	**Self-talk content**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**Sum**
1	Psych up	2	4	4	4	4	4	4	3	4	4	4	2	4	4	5	56
2	Anxiety control	2	4	4	4	4	4	4	2	4	4	4	1	4	2	3	50
3	Confidence	1	4	4	4	4	3	4	3	3	4	4	1	4	2	4	49
4	Instruction	2	5	5	3	3	3	4	2	3	5	5	1	4	3	4	52
5	Worry	5	4	4	4	4	4	5	3	1	5	4	4	1	3	3	54
6	Disengagement	3	1	1	1	2	3	2	2	3	1	4	3	3	4	4	37
7	Somatic fatigue	3	1	1	4	4	3	5	2	3	4	2	4	2	5	5	48
8	Irrelevant thoughts	2	1	1	4	4	4	4	3	3	4	2	4	3	4	4	47
Total points		20	24	24	28	29	28	32	20	24	31	29	20	25	27	32	393

ative and positive self-talk could range from 4 (very low-intensity self-talk) to 20 (very high-intensity self-talk).

The second questionnaire used was the Strategic Self-Talk Questionnaire (S-TQ) [7]. This survey assessed both cognitive and motivational self-talk. Responses were measured using a five-point Likert scale (Table 2).

Items 4–10 represented the motivational function, while items 1, 2, 3, and 11 represented the cognitive function. The total points were calculated for each of the 15 competitions. Total response values for each scale ranged from 4 (very low-intensity self-talk) to 20 (very high-intensity self-talk) for the cognitive function, and from 7 (very low-intensity self-talk) to 35 (very high-intensity self-talk) for the motivational function. The athlete's self-talk was adapted specifically for tennis [8]. Additional competition conditions were also described, including meteorological conditions, the age and skill level of the competitors, and the behavior of the athlete and her opponents [8]. This provided valuable information for further analysis and control measures. The data obtained during the study were processed mathematically using Microsoft Office Excel and OriginPro data processing programs.

Statistical Analysis

Since the distribution law of the random variable was unknown, the Mann–Whitney test (U-test) was used to verify the hypothesis that a tennis player's self-talk influenced whether she won or lost a match. Outliers were tested using a modified Z-score based on the median and median absolute deviation (MAD). Thus, nonparametric tests were applied.

Results

The results from the Automatic Self-Talk Questionnaire in different competitions are presented in Table 3. The match numbers from No. 1 to No. 15 correspond to the order of their dates. The subject of our study won matches No. 2–7, 10, and 11. The athlete demonstrated a high level of automatic self-talk, both positive and negative. The total points for the 15 matches ranged from 47 to 56. The highest-intensity automatic self-talk items were 'Psych up' (56 points) and 'Worry' (54 points).

The total number of positive and negative automatic self-talk points for each match is presented in Figure 1. There was no significant predominance of one type of automatic self-talk over the other. An exception was observed in matches

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ISSN (print) 1991-0177, ISSN (online) 1999-818X
SLOBOZHANSKYI HERALD OF SCIENCE AND SPORT
Vol. 29 No. 2, 2025

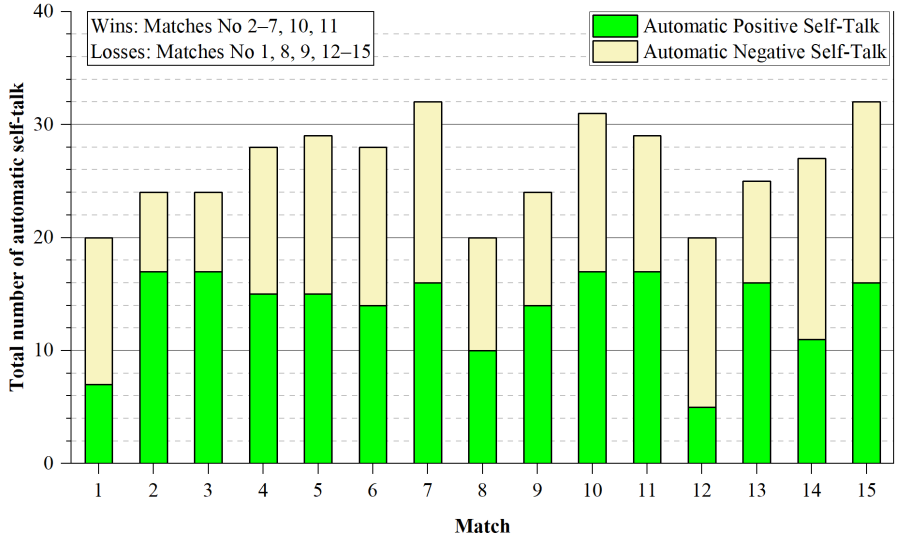

Figure 1. The sum of the points of automatic self-talk in different matches.

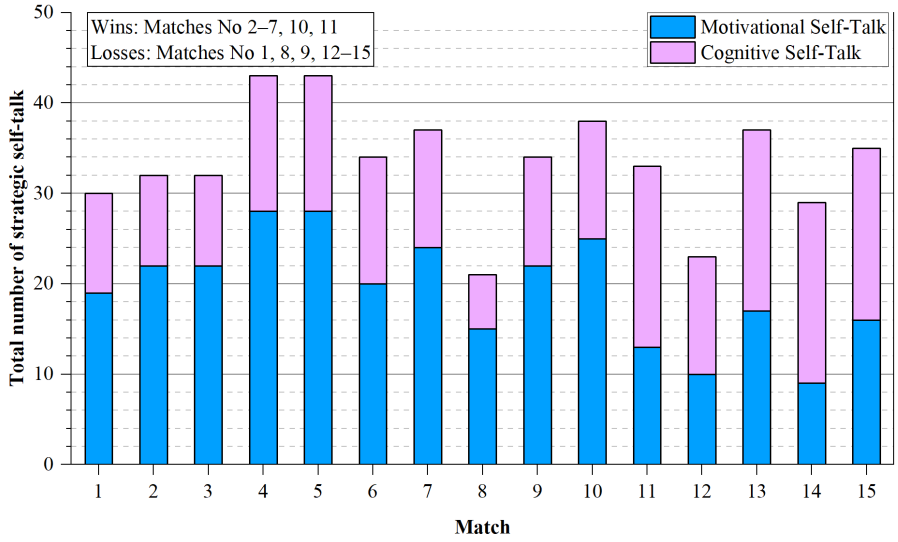

Figure 2. The sum of points for strategic self-talk across different matches.

No. 2, No. 3, and No. 12, where the number of points for negative and positive self-talk differed by more than twofold.

The total number of motivational and cognitive self-talk points for each match is presented in Figure 2. No significant predominance of either type of internal dialogue was observed. However, the motivational component generally appeared more frequently than the cognitive component. Toward the end of the season (matches No. 11 to No. 15), an increase in the cognitive part of the strategic self-talk was noted.

When comparing the intensity of automatic internal dialogue with that of motivational internal dialogue, it can be observed that their intensities are approximately equal. The total points for automatic self-talk range from 50% (Matches No. 1, 8, 12) to 80% (Matches No. 7, 15) of the maximum (40 points), while the total points for strategic self-talk range from 38% (Match No. 8) to 78% (Matches No. 3, 4) of the maximum (55 points).

Outliers were tested using the modified Z-score with a threshold of 3.5, revealing no outliers in the samples.

It is of interest to determine whether a statistically significant relationship exists between an athlete's self-talk and their wins or losses in matches. The Mann–Whitney test (U-test) was employed to verify the hypothesis that an athlete's self-talk influences the outcome of the match. The null hypothesis posits that the median distribution of matches in which the subject won is equal to the median distribution of matches in which they lost. The alternative hypothesis suggests that these medians are not equal. The main hypothesis assumes that an athlete's self-talk does not affect the match outcome, while the alternative hypothesis posits that self-talk does influence the match result. The

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ISSN (print) 1991-0177, ISSN (online) 1999-818X
SLOBOZHANSKYI HERALD OF SCIENCE AND SPORT
Vol. 29 No. 2, 2025

Table 4. Mann–Whitney test for the influence of self-talk on the outcome of the match

Self-talk	Mean		Std. Dev.		Median		MAD		U		p
	Won	Lost	Won	Lost	Won	Lost	Won	Lost	Won	Lost	
Strategic Motivational	22.75	15.43	4.86	4.65	23	16	2.5	3.0	7	49	0.017
Strategic Cognitive	13.75	14.43	3.20	5.38	13.5	13	1.5	6.0	29	27	0.953
Automatic Positive	16.00	11.29	1.20	4.31	16.5	11	0.5	4.5	7.5	48.5	0.019
Automatic Negative	12.13	12.71	3.36	3.04	13.5	13	1.0	3.0	31.5	24.5	0.726

results of the test are presented in Table 4.

We see that at the **0.02** level, the distributions of strategic motivational self-talk and the distributions of automatic positive self-talk in won and lost matches are significantly different, while the distributions of strategic cognitive self-talk and automatic negative self-talk in won and lost matches are not significantly different.

Discussion

Our study confirms that self-talk influences competition results and athlete performance, and reveals the presence of other factors influencing results, such as physical fitness, weather conditions, and time. When evaluating automatic self-talk depending on performance (wins or losses), it becomes clear that the tennis matches won are associated with positive self-talk.

Table 5. Main Difference Between Strategic and Automatic Internal Dialogue

Aspect	Strategic Internal Dialogue	Automatic Internal Dialogue
Control	Fully conscious	Subconscious or spontaneous
Purpose	Planning actions, error correction	Reaction to immediate situations
Examples of Phrases	"Focus on short shots"	"I can't play like this!"
Impact on Performance	Enhances focus and confidence	Can either support or hinder performance

Combining strategic internal dialogue with the ability to manage automatic responses allows tennis players to better control their mental state, maintain psychological balance, and achieve consistent results in demanding match situations. The athlete has high-intensity inspiring thoughts, thoughts about anxiety control, and thoughts that help build self-confidence. In matches that the athlete loses, the number of positive thoughts decreases by 1 or 2 points. In this case, there is also an increase in negative thoughts about disengagement, somatic fatigue, and irrelevant thoughts. The anxiety ('worry') is high for all matches. Our results coincide with the findings of sports scientist R. Weinberg, who suggests that successful matches are usually characterized by positive and encouraging self-talk, while unsuccessful matches are marked by negative self-talk [4]. The difference is that we did not find a statistically significant relationship between the games in which the subject lost and the number of automatic negative thoughts. This may be due to other factors that we did not take into account.

At the end of the season, the intensity of positive thoughts decreases, and negative thoughts increase. This suggests the importance of other factors, such as time and climate conditions. For example, thoughts about fatigue were very intense in match No. 7 (Table 3). At that time, athletes complained about the heat and had to play for 3 hours in 33°C heat. At the end of the season, the intensity of thoughts is affected by the athlete's physical fatigue. All these conditions can occur simultaneously, as they work as a trigger mechanism against the background of the athlete's psychological fatigue, especially at the end of the competition period. The subject had a sharp drop in performance in August. A psychologist (expert) found signs of burnout. For the athlete, thoughts related to fatigue appear in the surveys, and their intensity is described as «always.» Such a tendency signals possible exhaustion of the athlete's energy at the end of the season («I couldn't think mentally»), while thoughts about «quitting the game» also appear «often.» The subject, on the advice of the coach and psychologist, attempted to engage in self-regulation through strategic self-talk throughout the season. The athlete used strategic self-talk, but it did not help regulate the negative states. A similar situation is described in a paper by [9]. It argues that the simultaneous occurrence of emotionally negative information, high pressure, and previous failure can lead to a chain of events in which negative stimuli, such as previous failure and the possibility of future failure, are reinforced, causing additional anxiety and further failure.

We can observe the connection between motivation and burnout by evaluating the functionality of self-talk (instructive and motivating), where at the end of the season, we observe a sharp drop in motivational self-talk during competitions, with a significant increase in instructive self-talk (Figure 2). The last games are losses with signs of burnout, which we can partially observe also by

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analyzing the dynamics of the functional self-talk.

Content indicators of strategic self-talk reveal the dominance of motivational self-talk over cognitive/instructive self-talk in June and July, but change at the end of the competition period in August. This may indicate a general decrease in the athlete's work ability at the end of the competition period and possible burnout.

The results of the athlete's self-report at the end of the competition period reveal a more frequent presence of thoughts not related to tennis. These thoughts appear in almost all matches, most of which were lost. Towards the end of the competition period, the intensity of motivational self-talk decreases, while cognitive self-talk increases. The performance in these matches, including sports performance and the ability to self-control, rapidly deteriorated. We see that the dominance of instructional self-talk over motivational self-talk negatively affects match performance.

It should be noted that when evaluating the athlete's self-assessment questionnaires about strategic self-talk in the matches won, internal motivational self-talk is relatively higher than cognitive/instructive self-talk, which could indicate an optimal starting state for this athlete (Figure 2). Some explanations for this phenomenon suggest that even with well-learned movements, instructive self-talk can negatively affect the automaticity of movements [9–11]. We cannot accept the hypothesis that high-intensity cognitive self-talk during the game has a positive effect on the outcome. Quite the contrary, it has a negative effect.

Statistical analysis revealed the following: The number of wins in our chosen population was 8, while the number of losses was 7. The amount of strategic motivational self-talk and positive self-talk was greater in winning matches than in losing matches, at p=0.02. At the same time, there was no statistically significant relationship between the match outcome and the amount of cognitive self-talk or negative self-talk.

It should be noted that the small sample size and doubts about the homogeneity of the competitors make our conclusion only an estimate. Additionally, we cannot accurately answer the question of how much strategic motivational self-talk and positive self-talk are needed to defeat an opponent. The results of the analysis show that wins occurred when the mean of motivational self-talk was 23 and the mean of positive self-talk was 16, while losses occurred when these values were 15 and 11, respectively. The number of these talks had a statistically significant effect at p=0.02 on the outcome of the match.

Thus, we have confirmed that there is a link between self-talk and competitive performance. However, this link is more complex than suggested in the introduction, as there is no ideal competitive environment. Competition performance is influenced by a large number of other factors, which often interact with each other. Our findings are consistent with previous research, revealing the need to seek individualized strategies for players [1, 9, 10]. The results of the self-reports study reveal the dominance of positive automatic self-talk in the matches won, as well as a combination of strategic self-talk, where motivational self-talk dominates over cognitive (instructive) self-talk. The number of strategic motivational self-talk and positive self-talk was greater in winning matches than in losing matches at p = 0.02. At the same time, there was no statistically significant relationship between match outcome and the amount of cognitive self-talk or negative self-talk. The results of the analysis show that wins occurred when the mean of motivational self-talk was 23 and the mean of positive self-talk was 16, and losses occurred when these values were 15 and 11, respectively. The number of these talks had a statistically significant effect at p=0.02 on the outcome of the match.

It should be noted that the small sample size, our doubts about the homogeneity of the competitors, and the influence of unaccounted factors (weather conditions, time, physical condition of the athlete) make our conclusion only an estimate. We cannot accurately answer the question of how much strategic motivational self-talk and positive self-talk are needed to defeat an opponent.

Thus, we have confirmed that there is a link between self-talk and competitive performance. However, this connection is more complex than previously thought. The number of strategic motivational self-talk and positive self-talk at p=0.02 level in winning matches is greater than in losing matches. However, there was no statistically significant relationship between match outcome and the amount of cognitive self-talk or negative self-talk.

Conclusions

- To improve performance, it is recommended to implement a long-term self-hypnosis intervention using more self-directed strategies, leading to more functional automatic self-hypnosis.

- In match practice, it is advised to spend less time on instructions during the game period and more time on motivational support.

- Based on the analysis of psycho-emotional external factors, attention should be paid to signs of athlete burnout and the process of recovery should be optimized.

- The results of our work reveal the content of a particular athlete's introspection in won and lost matches, which can serve as one of the indicators

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to help the athlete recognize the optimal psychological state.

- During the game, we recommend using more strategic motivational self-talk.

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Supplementary Information

Article details

The online version available at
https://doi.org/10.15391/snsv.2025-2.05

Acknowledgements
The authors are grateful for the support and cooperation of scientists from the State Biotechnology University, Kharkiv, Riga Stradins University and the Latvian Academy of Sports Education, Riga.

Conflict of interest
The authors report about absence of any conflict of interests.

Application for funding
The current study received no specific funding. Its implementation took place at the expense of attracting the authors' own funds.

Received: March 10, 2025; Accepted: May 21, 2025
Published: June 30, 2025

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