

Effectiveness of a Single-Subject Multiple-Baseline Design Self-Talk Intervention in Tennis Serves

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Abstract

Self-talk which refers to the talking to oneself and has been categorised into various forms has become very prominent in sports psychology. In this work, the effectiveness of self-talk of a single-subject multiple-baseline design self-talk intervention has been carried out. To achieve this, 5 amateur players with minimum of 5 years playing experience within the same age range (11-18 years) were carefully selected. Intervention which tested the ability of these players to successfully aim at set targets with/without self-talk cues, were used to determine the effectiveness of self-talk in their serve ability. All players performed their tasks at different times and days usually in 2-sessions- morning and afternoon scheduled in such a way as not to affect their personal schedule. The entire exercise was done within 5-weeks. They were also encouraged to develop their own self-talk. The results showed that all the players in the intervention group (Players A, B, C and D) performed better ($M=56$, $SD = 26.5$; $M = 72.5$, $SD=29.7$; $M=70.5$, $SD:26.8$, and $M=96.75$, $SD=44.87$ respectively) than the player in the control group (Player E, $M=54.75$, $SD= 26.2$). Combination of motivational and instructional self-talk gave the best result among these players. While a direct relationship between the players' use of self-talk and their performance was equally observed. Finally, the results are discussed compared to the current self-talk literature and future research is recommended.

Introduction:

Self-talk is a mental strategy that has become very prominent in sports psychology. It is used to define what athletes say to themselves during practice or competition. It is an

internal dialogue in which the individuals interpret feelings and perceptions, regulate and change evaluations and cognitions and give themselves instructions and reinforcement (Zourbanos, 2013). Bunker, Williams, and Zinsser (1993) defined Self-talk as the talking to oneself which every individual does when thinking about something; while Theodorakis, Weinberg, Natsis, Douma, and Kazakas (2000) defined it as what people say to themselves either out loud or as a small voice inside their head. Those statements addressed to oneself which are multidimensional in nature having interpretative elements associated with the content of statements employed and somewhat dynamic serving at least two functions: instructional and motivational for the athlete can be said to be self-talk (Zourbanos, 2013). In other words, whatever definitions are given to self-talk, each lays emphasis are made on the content, functions, and possible outcomes of its application.

Two broad research analysis of self-talk has evolved so far namely: self-talk as content of thought, automatic or inherent self-talk - which refers to thoughts that individuals experience inherently and are not planned or prepared (Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, & Papaioannou, 2009); as well as the use of cue words that are planned or prepared, also referred to as mental strategy (Hardy, Roberts, Thomas, & Murphy, 2010). The latter approach has been shown to be helpful in improving performance and other cognitive and affective outcome measures in athletes (Theodorakis, Hatzigeorgiadis, & Zourbanos, 2012). Furthermore, self-talk could either be positive or negative. Positive self-talk is an asset that helps athletes stay focused and not dwell on past mistakes or project far in the future, while negative self-talk is self-demeaning, inappropriate, anxiety producing, and counterproductive. Zinsser, Bunker, and Williams (2001) identified that self-talk can be further categorized as instructional (e.g., Move your arm) or motivational (e.g., You can do it). Instructional self-talk refers to statements related to attentional focus, technical information, and tactical choices, whereas motivational self-talk refers to statements related to confidence building, effort input, and positive moods. However, it has to be mentioned that talking negatively to oneself may not always be detrimental to performance, and in some situations—depending on the nature of the sport and the competitive level of the athlete—it may have motivating effects and facilitate performance (Zourbanos, Hatzigeorgiadis, Tsiakaras, Chroni, & Theodorakis, 2010).

Statement of the Problem:

Despite the increasing volume of research in self-talk and its relevance in sports, research on self-talk concerning non-competitive and competitive sports performance has been very sparse. For sports performance in non-competitive setting, the works of Mallett and Hanrahan (1997) tested the effectiveness of a self-talk intervention in young elite sprinters for 100m sprint race using a single-subject multiple-baseline design; and for simulated marathon competition Weinberg, Miller, and Horn (2012) organized two cross-country running events with collegiate athletes. Both showed that a self-talk intervention based on the use of recorded instructions improved performance from pre- to post-intervention over a week. Also, for competitive sport performance in real competition, Sch'uler and Langens

(2007) tested the use of self-talk strategies as a means for buffering against the negative effects of psychological crisis that occur during a marathon race in non-professional runners. They reported that among runners who experienced a large psychological crisis, those using self-talk coped better than those in a control group. The demands placed on athletes in training and competitions are different both physically and psychologically. Competitive settings are different from training on a number of features, such as the environment, the behavior of the coach, teammates and opponents, the presence of spectators, the importance attached to the occasion, and subsequent cognitive and affective responses.

Studies and observation over time has shown that most tennis players find the serve technique most challenging. This has hampered the performance of most seasoned players including professionals. As one of those techniques in tennis requiring precision and accuracy rather than strength and endurance, there is a need to improve this technique through self-talk intervention. Being the less practiced skill in the game and having identified the tennis serve as a weakness of most players, this study shall be geared towards improving this skill through the use of self-talk.

Aim and objectives of the Research:

This study is therefore aimed at investigating the effectiveness of a single-subject multiple-baseline design self-talk Intervention in tennis serve

The study aimed to achieve the following objectives:

- Guide individual players through the use of instructional and motivational self-talk cues, as well as their personal self-talk cues.
- Identify the impact of self-talk intervention on the serve target of individual players by comparing their performance with the control.

Scope of the Research:

Participants for this study were five Greek National tennis players drawn from different divisions of tennis team. These participants have an age range of 11-18 years, each of whom were given a consent form to sign that they accepted to take part in the intervention before the beginning of data collection. The effectiveness of self-talk intervention on the competitive performance of these participants was studied over a 5-6 week period.

Hypotheses:

Based on the research framework, the following hypotheses were formulated.

H₀₁: There is no significant difference in the performance of players who use self-talk during tennis practice from those who don't.

H₀₂: There is no significant difference in the impact of different self-talk types and how they affect the players who use them.

Methods and Procedure

The work comprised of 5 amateur tennis players having a minimum of 5 and maximum of 7 years playing experience ($M = 6.2$, $SD = 1.06$) who were carefully selected. All participants were drawn from junior and senior Greek private and public schools that practice at tennis icon academy. These participants had an age range of 12-17 years ($M = 14.4$, $SD = 1.95$), and were each given a consent form to sign that they accept to take part in the intervention before the beginning of data collection. These players were randomly assigned as experimental ($n = 4$ players) and control ($n = 1$ player). All players were made to perform their tasks at different times and days usually in 2-sessions- morning and afternoon. Also, with considerations for the availability of tennis court and hours of training, care was taken to ensure that each training session for the competitive team comprised of maximum of eight 8 players and a minimum of four 4 players so as to avoid overcrowding.

Procedure

The procedure was approved by Internal Ethics Committee of the Department of PE and Sport Science, University of Thessaly. Players and their individual coaches were contacted and the players, asked to participate in the program. These Coaches were briefed with regard to the purposes of the study and subsequently gave their consent. Participants were then informed about the purpose of the program as well as about consent of their individual coaches. They were also told that participation was voluntary and that they could withdraw without any consequences anytime they wished. After which they were each given a consent form to sign that they accept to take part in the intervention before the beginning of data collection.

Experimental Group: Prior to the intervention, participants were given a short presentation on self-talk and how the intervention was going to work. The need for the participants to attend all the training sessions according to their schedule was emphasised. At the beginning of each practice session, the players were informed of the purpose and the content of the session, the daily plan was also communicated accordingly. The need for and how to use the necessary self-talk plan for the day were also highlighted. All through these practice sessions, players were made to understand, learn and master the use of self-talk, as well as being able to effectively develop their own self-talk cues.

Control Group: The Participant in this group was informed that his performance during the practice session would be recorded to evaluate the progress made. Emphasis was made on why it is important for him to attend all the practice sessions according to his schedule. At the end of the data collection, this participant was debriefed and offered to attend the intervention program if he so wished.

Baseline Intervention: A target was set where the players were made to aim at without any form of instruction/correction, In other words with no self-talk cues. This routine was done 3-times a week.

The intervention was performed with some form of self-talk cues which the players had to say before they serve. These self-talk cues are 'Ball', 'Wide', 'Middle' or 'Tee'. Others are 'Toss', 'Knees' or 'Arrow'. These were considered instructional self-talk cues. Other athletes were made to practice serve for 2-weeks without any form of self-talk. Self-talk was introduced to them after the 3rd week following the same format (i.e. Instructional self-talk for 2- weeks followed by motivational self-talk, then a combination of both). They were subsequently encouraged to develop their own self-talk cues (i.e. what they will like to say to themselves in practice session during the last week of the intervention). The ability of the players to successfully aim the set target pre and post-intervention was used to evaluate their performance.

Scoring System

There were 6 targets in total- 3 at the right side of the court and 3 at the left side of the court. A box was drawn at the area of the 3 targets and 2 cones were placed in each box. There were 2 sets of 5 balls to each target, giving a total of 10 balls in each target; hence a total of 30 balls to the right service box and another 30 to the left service box. Total number of balls = 60.

Scoring was done in such a way that each time the participants hit the ball into the box whether it hits the cone or not, he/she scores 5 points. But if the ball doesn't fall into the box (the target), he/she scores 0 (zero). Each player was made to serve 10 balls to each box where the cone was placed. Hence scores were done in this format: *wide*: 2/10, *middle*: 1/10, *Tee*: 4/10 etc. The scoring system was properly explained to the players as a vital aspect of the practice session. Two observers recorded the performance of each participant's balls, 10 serves on each target (wide with a slice serve, middle with a flat serve, and tee with topspin).

Follow-Up

All participants were interviewed by the researcher at the tennis academy, individually and away from the other players, using Semi-structured interviews. The players were asked to complete a questionnaire with open ended questions. Interviews lasted for ten minutes or less. The research focused on a pilot study. The intervention lasted for five week

Results:

Use of Self-talk

Generally, the mean score for the use of self-talk in the tennis serve practice session was 8.15 ($SD = 0.93$), suggesting that all the players made adequate use of the self-talk cues. Most importantly, this result also shows that these players adhered to the use of these self-talk cues to a large extent. Two of the participants in the intervention group (Player C and

D) were observed to apply self-talk days before the intervention started. Player C consistently applied motivational self-talk within the first 2-weeks, while Player D was observed to have applied self-talk in the first week (Days 1, 2 and 7). The self-talk type employed by this participant on Day 2 was motivational in nature. The player in the control group reported saying some specific things to himself (Self-talk) almost every time he was about to serve which were motivational in nature. However, because this self-talk was unorganized and utilized in a non-systematic way, they were considered negligible for the purpose of this study.

Self-Talk Interventions

The results obtained from the players' performance were obtained. For players in the intervention group, the spaces in the plot of their scores per day indicate the performance of these players before and while in intervention (when they started to apply self-talk in their game).

With a mean score of 56, Player A had the least performance in terms of hitting the set target as compared to other players in the experimental group. The best performance of this player came with the use of a combination of Motivational and instructional Self-talk. The use of personal self-talk also improved this player's performance considerably. It was observed that this player chose personal self-talk which were instructional in nature rather than motivational example: "Ball", "Toss", "Jump", "follow the serve", name of the angle (such as "wide", "tee", and "middle")

This player (B) had the second best performance of all ($M=72.5$). Performance of this player showed the effectiveness of personal Self-talk as the highest score in hitting the set target came with the use of this, which also gave consistently high scores. Also, his use of a combination of instructional and motivational Self-talk as directed by the researcher also gave good scores, thereby enhancing his serve ability.

Prior to the guide and directive of the researcher, Player C was seen to have consistently applied motivational self-talk on himself in order to aid his serve ability ($M=70.5$). The maximum score of 115 was obtained on day 15 when a combination of instructional and motivational self-talk was applied by this player. The use of personal self-talk which was developed by the player also gave considerably high scores. The effectiveness of Self-Talk in enhancing the serve ability of Tennis player was very evident with the performance of Player D. With $M = 96.75$, this player had the most accuracy and precision in hitting the set targets and this is attributable to the fact that this player used Self-talk at almost every stage of the practice session (starting from Days 1, 2 and 7) even before being instructed to do so. The highest scores were observed between days 15 – 17 when this player talk. Furthermore, it was observed that applying the personal self-talk of the player between (days 18-20) as well as instructional self-talk (day 9 -11) gave relatively high scores for hitting the target and thus underscores the effectiveness of self-talk in enhancing the serve ability of players.

Having had no form of intervention, the control player (Player E*) had the least scores ($M=54.76$) for the practice test. The high scores on days 10 and 20 (115 and 100 respectively) might be attributed to some form of self-talk which this player admitted to

have used in the course of the practice session though in a non-systematic or pre-planned way as had been reported by Hatzigeorgiadis, Galanis, Zourbanos & Theodorakis (2014). It must however be stated that it is normal for people talk to themselves, especially athletes in achievement contexts; however it is the systematic use and maybe the knowledge of purpose that produce the desirable effects. Hence the form of self-talk being employed by Player E* did not form part of this study.

Comparatively, the score of the all the players in the intervention group were relatively higher than that of the player on the control group. Thus the results of this study have confirmed the previous findings regarding the effectiveness of self-talk on sport performance in non-competitive (practice) setting.

Discussion:

Having studied and proven the effectiveness of self-talk intervention in competitive situations, over the years, there has been a need to study its effectiveness in practice/training session in order to clearly ascertain the difference between spontaneous (non-systematic) and systematic self-talk. Being the strongest moderator of the effectiveness of every competition (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011), it is training that makes performance at competitive level effective. Hence the need to seek a design of self-talk intervention during practice or training session, as addressed in this work. Self-talk cues were not given to the players on the first day in order to allow them master the scoring system as well as to avoid promoting the use of self-talk among these players especially the control player as recommended by Hardy, Hall, Gibbs and Greenslade (2005). More importantly too, to maintain a level playing ground, it was ensured that none of the players had previously received a psychological skills training intervention prior to their involvement in the process

Furthermore, because learning requires concentration, the combined instructional and motivational self-talk cues might have helped these players identify and shift attention to the task-relevant stimuli, while also psyching them up thus facilitating their learning process during the practice session. Also, instructional self-talk has been identified to be effective for novel tasks; while motivational self-talks are very effective for tasks at automatic performance stage (Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, 2014). It therefore implies that the combination of these self-talk types would have helped these players to adequately adapt to the serve techniques required of them from these sessions; especially as it involved a transition from learning these serve skills (and the scoring system) to the mastery of same. Hence it can be deduced that the preference for the players involved in this study for a combination of instructional and motivational self-talk cues resulted from the nature of the sports. Besides being a sport with lots of technical movements, tennis also requires maximum concentration, direct attention, precision and accuracy. In addition, players having similar experience range (5-7 years), experience

might have played a role in their choice of self-talk type. This is in accordance with the work of Hatzigeorgiadis, Zourbanos, Latinjak, & Theodorakis, (2014) which reported that beginner and highly experienced athletes are more likely to benefit from instructional and motivational self-talk types respectively. Moreover, paralysis by analysis might have been responsible for the observed relative poor performance of these players when they used only the Instructional self-talk type.

Effectiveness of Self-Talk

From this study, it was observed that all the players in the intervention group [Players A, B, C and D] performed better than the player in the control group. This work also sought a link between the player performance and their use of self-talk.

Hence, the results above show a direct relationship between these players use of Self-talk and the precision with which they hit the set target when they served. Hatzigeorgiadis, Zourbanos, Galanis, and Theodorakis (2011) had earlier reported Self-talk to be more effective for tasks requiring fine skills such as precision and accuracy rather than tasks requiring gross skills, such as strength and endurance. Since the effectiveness of the use of self-talk in this work was determined by the precision and accuracy with which these players hit their set targets, it is therefore in agreement with the earlier submission. Tennis coaches and sports psychologists should therefore note the following on how to apply self-talk during practice and competition sessions. Coaches need to take note of what their players say to themselves either negatively or positively and also seek an approach that is suitable for each athlete as players differ from the other. Also, since self-talk could be positive or negative and having also found the detrimental effect of negative self-talk, it is important for coaches and sports psychologists alike to make concerted effort to discourage the use of negative self-talk among their players.

However, it is also advised that the decision to either encourage or discourage the use of self-talk among players should be done with a careful consideration of their individual needs. This is because while negative self-talk could have detrimental effect in the performance of some players, it enhances that of others- for example, cases exist of players who only perform well when they get angry and say negative things to themselves. In the same vein, more work should be done by tennis coaches and sports psychologists alike in order to identify their individual needs, so as to know which self-talk cue types to suggest to these players; and how they can go about their use.

It is also recommended that coaches equip themselves with the mental aspect of the game. Hence attending update and refresher courses regularly is strongly advised. This would help acquaint them with the latest trend especially as regards sending the right information across to these players as well as the right use and application of self-talk cues among these players. Tennis being a sport that requires lots of mental skills such as: technical movements, concentration, direction of attention, precision, accuracy etc, self-talk helps players to maintain these components. And this is what differentiates professional from the amateur.

Future Research Direction And Recommendation

Based on the observations from this study, three important future directions can be derived from the current research: First, Use of self-talk in other areas of tennis game such as serve-return, ball placement, maintaining focus during the game etc is recommended. This would help to determine the effects of self-talk cues in this area. It will also further determine the impact of self-talk and that of inherent skills of the players. Secondly, more research should be done on the use of self-talk in tennis under competitive conditions. Since competitiveness brings out the best in players, these results will further strengthen the findings from this study. Finally, comparative study of effect of the use self-talk in practice session as well as competitive situations is recommended.

Conclusion

In conclusion, the use of self-talk in the experimental group suggests that all the players in the intervention group made adequate use of their self-talk cues. The use of these cues resulted in improved scores of the players in the intervention group as compared to the one in the control group. Combination of motivational and instructional self-talk gave the best result among these players. Preference for this self-talk type has been attributed to the sport type- being one which requires technical movements, concentration, direct attention, precision and accuracy. Number of years of experience is another factor that could have also influenced this choice. Above all, these players admitted/attested to the use of self-talk greatly improving key aspects of their game such as: concentration level on what they do, their mental strength, helped them maintain focus, as well as psyche themselves up all through the practice session. They also reported an improvement in their target execution ability. A direct relationship between the players' use of Self-talk and the precision with which they hit the set target when they served was also observed. Therefore, this work has shown that the use of a single-subject multiple-baseline design self-talk intervention is effective in tennis serve.

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