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An Analytical Study of Self-Talk (Cognitive and Motivational) in the Snatch, Clean, and Jerk Movements of Elite Weightlifters

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Abstract

The researchers stated that self-talk affects performance. According to researchers, it can be said that positive self-talk can improve performance and have a more positive impact on the results obtained. Therefore, the purpose of the study is to analyze the self-talk (cognitive and motivational) in the snatch, clean and jerk movements of elite weightlifters. This research is applied in terms of purposeful sampling and descriptive comparative in terms of data collection. The statistical population of the present study included adolescent weightlifters and adults. Eligible people who volunteered to participate in the study were selected through the virtual groups of this field. And they answered the self-talk questionnaire in sports by Zervas et al., (2007). To determine the sample size, the number of 5 to 10 times the questions, the statistical sample was selected. Multivariate variance analysis and confirmatory factor analysis were used to analyze the data in the research. The findings showed that cognitive and motivational self-talk was preferable in adult weightlifters than in adolescents. There is a significant difference between the self-talk of elite weightlifters based on the snatch, clean, and jerk movements. In general conclusion, it should be stated that to train a full-fledged athlete in this Olympic field, in addition to basic and strength training, psychological training such as self-talk training should be done for the athletes of this field.
Keywords: Weightlifting, Self-talk, Snatch, Clean, and Jerk.

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INTRODUCTION

Weightlifting is one of the most popular, Olympic and world medal-winning sports and the whole in our country and many athletes are interested and participate in this sport every year. Weightlifting is a type of strength sport that two or more joints play a role in performing weightlifting movements. Weightlifting has been a major part of the modern Olympic Games and has international growth. During the snatch, clean and jerk movements, the weightlifter must have maximum power. These two movements are so complex that engage the whole body in a series of heavy muscle contractions (Anoushiravani et al., 2021). But this factor is not the only success criterion for weightlifters. The science of sports psychology has introduced new criteria for the success of athletes one of them is self-talk.

Self-talk is the same internal conversation with oneself. Self-talk or personal conversation describes and explains different situations and ends with a decision. Being positive or negative affects inner speech or self-talk. Simply put, the more optimistic you are, the more positive your self-talk is and the more pessimist and negative you are, the more negative your self-talk is. Self-talk affects performance. According to Mohammadi et al. (2022), it can be said that positive self-talk can improve performance and have a more positive impact on the results obtained. Positive self-talk encourages and motivates a person to do work, achieve success and positive results, and ultimately internal motivation. One of the most important and positive situations for athletes is self-talk on the field. When an athlete has positive self-talk, they keep their focus on the present moment and keep the past in the past. Self-talk in athletes includes memorizing, correcting movements, and correctly performing with oneself or repeating motivational statements such as I can, I will do it, and I win. When an athlete has positive self-talk, it becomes easier for them to perform movements and tasks. Self-talk has a great positive effect on endurance sports, throwing, skating, basketball, and volleyball (Abdoli & Akradi, 2012). In this regard, Mohammadi et al., (2022) concluded in their article that combined exercises have a significant effect on the self-talk of taekwondo athletes. In addition to having positive and negative aspects, self-talk has two main functions which are motivational and cognitive. It seems that the motivational function of self-talk facilitates performance due to inspiring more effort and creating a positive mood and self-confidence and its cognitive function is the reason for starting the desired actions with proper focus and attention, improving technical and tactical information. Implementation options to investigate the two main functions of self-talk which include motivational and cognitive, research has been conducted that has reached contradictory results (Zourbanos et al., 2010).

Self-talk is a conversation with oneself through which a person interprets feelings and perceptions. Adjust and modifies assessments and requirements and provide training and reinforcements. Self-talk is defined as an internal conversation that can be done loudly or slowly and silently through which a person interprets his thoughts and feelings, changes his evaluations and beliefs, and educates himself. It gives or strengthens itself. People often experience an inner dialogue in everyday life situations. Self-talk is used to communicate with oneself. The feelings of a person depend on oneself. Self-talk has a massive effect on thoughts and behaviors. As people stated self-talk affects behaviors and strategies in mental processes.

Self-talk is one of the cognitive strategies that is used a lot in sport psychology to improve performance and movement skills and its positive effects (Davoudi et al., 2017).
In their article, they concluded that psychological needs are the strongest anticipation of positive self-talk and thoughts during the competition (Perko, 2014). They also concluded that instructional self-talk can be a technique for beginner volleyball players. On the other hand, self-talk (internal conversation, interpersonal communication, inner or hidden speech, and self-communication) is one of the most common and reliable strategies for athletes to improve sports performance (Galanis et al., 2022). Previous research shows that the use of words or phrases helps athletes to pay attention, learn, learn, correct mistakes, develop competition plans, change or quite bad habits, create and change emotions and mood, think positively, strengthen expectations, create and increase self-esteem, motivation and achieving high levels of performance (Weinberg & Gould, 2011).

Presented the definition of the function of self-talk by supplementing the previous definitions, the most important points are: (A) verbalizing or stating a series of phrases to oneself, (B) the existence of multi-aspect nature of self-talk, (C) having interpretive elements related to the content of the expressions (being dynamic) and (D) existence of at least two cognitive and motivational for athletes. The effectiveness of self-talk on human performance largely depends on the content of self-talk (Hardy et al., 2001). In their conceptual, they proposed that the content of self-talk (what athletes say to themselves) can be classified into four specific aspects under the heading of nature, perspective (clarity), structure, and personality. The aspect of nature implies positive or negative self-talk (Hardy et al., 2005). Positive self-talk consists of positive expressions and encouraging phrases that people repeat to themselves. On the other hand, negative includes negative phrases, inhibiting and reflecting anger and frustration (Hardy et al., 2005). The aspect of perspective (clarity) emphasizes overt and hidden (inner and outer) self-talk. This aspect refers to how athletes express themselves. In another classification, self-talk is divided into three separate parts. Some believe that self-talk can be expressed loudly and clearly, whispered but not expressed openly or completely internally. Although only overt self-talk requires vocal production. Some researchers emphasize that overt and covert self-talk are similar in all aspects (Hardy, 2006)

Independence cognition strongly anticipates focus, control, anxiety, and instructions that are followed by anticipated skill. For example, it anticipates self-confidence with another method. Psychologists increasing the performance of athletes more important in recent years. Some sports head and technical coaches mistrust sports psychological methods that are not only useless but also weakens their power. Nevertheless, in the description of sport psychology, Olympic winners have reduced mistrust and doubts over time (Schunk & Zimmerman, 2013). In this regard, in research by (Mohammadi et al., 2022); they investigated the effect of combined exercises on the cognitive self-talk and impulsivity of Taekwondo athletes. It showed that it has a significant effect on the self-talk and impulsivity of athletes. Mansouri et al., (2022) compared cognitive and motivational self-talk on the learning of basic handball skills and it showed that regardless of the type of self-talk by changing cognition, it has facilitating effect on motivation and performance. Therefore, self-talk can stimulate the pivotal methods of skill pattern by drawing comprehensive attention to the task and improving skill. Latinjak et al. (2019) concluded in their article that athletes' self-talk can improve their specific performance

with psychological needs experienced in any situation. Also, Nicolas et al., (2019) in their article about swimmers concluded that the group with cognitive self-talk had more scores in focus, endeavor, and self-confidence and a lower score in emotional control and independence. Therefore: cognitive self-talk can play a role as an educational tool for sports performance and increase the focus, and self-confidence of athletes. Recently a meta-analysis of 35 randomized and controlled trials showed that psychological interventions have a positive effect on sports performance (Brown and Fletcher, 2017).

Being mentally prepared is highly important in competitions, and athlete mental health is a basic part of an athletic career (Henriksen et al., 2020). There is a positive relationship between mental health and performance and physical state (Ayala et al. 2022) On the other hand psychological studies show that there are similarities between overt and covert self-talk. This means that certain brain structures such as the left inferior gyrus, known as the Broca area are involved in both (Van Raalte et al., 2016). The structure aspect includes keywords, phrases, and complete sentences and finally, the personal aspect refers to self-talk in the first person (I can perform) or second person (you can do). According to the above, considering that weightlifting is one of the Olympic medal-winning disciplines and our country has brought many honors from these disciplines. On the other hand, there have been many problems in these disciplines in recent years and the importance and necessity of this research felt more. For this reason, the researcher seeks to answer the question of whether self-talk (cognitive or motivational) is different in the snatch, clean, and jerk movements in elite weightlifters.

METHODS

Study Design and Participants

The purpose of this research is practical, and it is comparative and cross-sectional in terms of data collection. The statistical population of the present study included adolescent and adult weightlifters who have at least 5 years of regular activity in the relevant sports field and membership in the selected teams of the province. Eligible people who volunteered to participate in the study were selected based on 5 to 10 times the questions. 130 weightlifters in the youth section and 140 weightlifters in the adult section were randomly selected.

Ethical Approval

The study participants provided informed consent. The International University of Imam Reza Board provided ethical approval for this study (23.05.2022/ Protocol no: 695939).

Data Collection Tools

The research tool was the standard questionnaire of self-talk in sports by Zervas et al., (2007). This questionnaire has 11 questions, and its purpose is to evaluate different aspects of self-talk in sports (cognitive or motivational). Its scoring scale is based on a 5-point Likert scale. First, the content of the questionnaire was provided to sports science professors and researchers (sports psychology and management) to confirm validity.

Statistical Analysis

After the approval of 12 experts, the questionnaire was distributed. Also, the reliability of the questionnaire was examined by using Cronbach`s alpha. It got 0.83 points for the cognitive function component and 0.91 for the motivational function component which is a high value. The method of data analysis in this research was using multivariate analysis of variance and structural equation modeling. It should be noted that analyzes were performed in SPSS and Amos software environments.

FINDINGS

In Table 1 the information related to the demographic characteristic of the research sample was reported on the indicators of group membership, age, and activity history.

Table 1. The result of homogeneity of the covariance matrix (box)

Variables	Classification	Frequency of people
Membership	Adolescent	130
	Adult	140
	Total	270
Adults	18 – 20 years	44
	21 – 25 years	56
	26 – 30 years	40
Adolescent	15 years	44
	16 years	49
	17 years	37
Activity history of adults	4 – 6 years	45
	6 - 8 years	60
	8 – 10 years	35
Activity history of adolescent	2 years	39
	3 years	53
	4 years	38

In the following, the components of self-talk (cognitive and motivational) of elite weightlifters have been compared based on the snatch, clean, and jerk movements of the multivariate analysis test (MANOVA). The results related to the implementation of this test and the examination of its assumptions are presented below.

Table 2. Description of the frequency of demographic characteristics of the research sample

Box`s M	F	df1	df2	Significance level
7.738	2.558	3	1566891.22	0.053

As seen in Table 2, the significance level of the box test is equal to 0.053. Since this value is greater than the significance level (0.05) to reject the null hypothesis, the null hypothesis is confirmed based on the homogeneity of the covariance matrix.

Table 3. The result of Levine`s test to check the homogeneity of variances

Variable	F	Degree of Freedom 1	Degree of Freedom 2	Significance level
Motivational	0.455	1	268	0.500
Cognitive	0.631	1	268	0.428

As shown in Table 3 the results of Levine`s test are not significant in any variables. Therefore, the null hypothesis for the homogeneity of the variables is confirmed.

Table 4. The results of the Kolmogorov-Smirnov test to check the normality of the distribution of scores

Variable	Z Kolmogorov-Smirnov	Significance level
Motivational	0.155	0.531
Cognitive	0.162	0.331

Table 4 shows the results of the Kolmogorov-Smirnov test to check the normality of the distribution of variable scores. Based on the results listed in the table, the statistical significance level calculated for all variables is greater than 0.05, so the assumption of normal distribution of scores is accepted.

Table 5. The results of multivariate analysis of variance to compare the self-talk of elite weightlifters based on snatch, clean, and jerk movements

Effect	Tests	Amounts	F	Degree of freedom effect	Error degree of freedom	Significance level	Effect size
Groups	Pillai`s trace	0.424	38.606	2	267	0.001	0.224
	Wilks`s Lambda	0.776	38.606	2	267	0.001	0.224
	Hoteling's trace	0.289	38.606	2	267	0.001	0.224
	Roy`s largest root	0.289	38.606	2	267	0.001	0.224

As can be seen, the significance level of all four relevant multivariate statistics, namely Wilks`s Lambda, Hoteling`s trace, and Roy`s largest root is less than 0.01 ($p<0.01$). In this way, the statistical null hypothesis is rejected, and it is determined that there is a significant difference between the self-talk of elite weightlifters based on snatch, clean, and jerk movements.

Table 6. Test of between-subject effects to compare the components of self-talk of elite weightlifters based on the snatch, clean, and jerk movements

Variable	Source	sum of squares	Degree of freedom	mean square	F	Significance level	Effect size
Motivational	Between groups	469.451	1	469.451	50.618	0.001	0.159
	Errors	2485.516	268	9.274			
Cognitive	Between groups	913.785	1	913.785	50.967	0.001	0.160
	Errors	4804.920	268	17.929			

Table 6 shows the results of the between-subjects to compare the components of self-talk (cognitive and motivational) in elite weightlifters based on the snatch, clean, and jerk movements. According to the results presented in Table 6, the F values obtained at the alpha level of 0.01 are significant ($p<0.01$). Therefore, the null hypothesis that there is a difference between the components of self-talk (cognitive

and motivational) in elite weightlifters based on single and double movements is confirmed. We can see by comparing the average scores of the two groups that the average self-talk in double movements are higher than in single movements. In the following, confirmatory factor analysis was used to examine the factor structure of the self-talk questionnaire, and the results obtained were reported below.

SPSS and Amos software environment.

Figure 1 shows the confirmatory factor analysis model of the self-talk questionnaire in the mode of standard coefficients. The parameter value estimated for each of the variables indicates the power of the factor of each variable on the factor related to it.

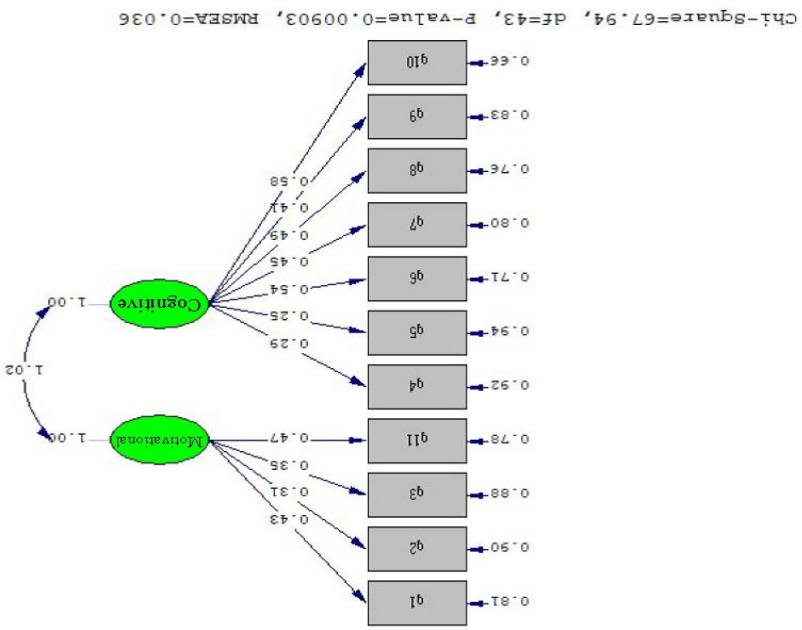

Figure 1. Confirmatory factor analysis of the self-talk questionnaire in the mode of standard coefficients

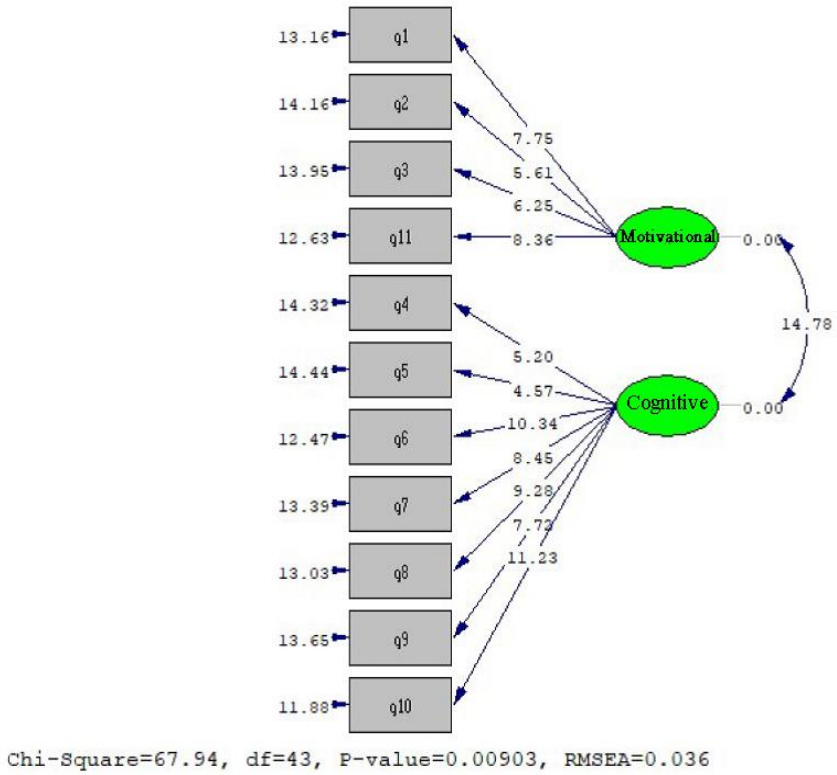

Figure 2. Confirmatory factor analysis of self-talk questionnaire in the mode of significant coefficients

Figure 2 shows the confirmatory factor analysis of the self-talk questionnaire in the mode of significant coefficients. The number on the paths indicates the t value for each path. For the factor to be significant, the t-value of each path must be higher than 1.96. Based on obtained results, the t-values for all questions were higher than 1.96.

Table 7. Factorial model fit indices

Fit index	Accepted domain	Observed value	Evaluation of fit index
X^2/df	≤3	1/58	Appropriate
IFI	>0/9	0/97	Appropriate
RMSEA	<0/08	0/036	Appropriate
SRMR	<0/08	0/040	Appropriate
CFI	>0/9	0/97	Appropriate
GFI	>0/9	0/97	Appropriate
NNFI	>0/9	0/96	Appropriate

The chi-square ratio to the degree of freedom (df/2χ) confirms the fit of the model. Df/2χ which is less than 3. It means that the model fits the data. The root means the square error of approximation (RMSEA) is equal to 0.036. The root means square residual (SRMR) is equal to 0.040, which is smaller than the standard value (0.08) and thus confirms the fit of the model. Finally, IFI, CFI, NNFI, and GFI indices are also larger than the desired criterion (0.9). In general, considering the sum of the calculated fit indices, the fit of the factor model and the construct validity of the self-talk questionnaire are confirmed.

DISCUSSION AND CONCLUSION

The current research aimed to analyze self-talk (cognitive and motivational) in the snatch, clean, and jerk movements of elite weightlifters. The findings of the research showed that the average cognitive and motivational scores of weightlifters in double movement are better than single movement, in explanation of this result, it can be said that athletes in double movement have more opportunity for self-talk and because there is more pause when lifting the barbell. Yes, double athletes use self-talk to increase their concentration and try to maintain weight. In this regard, Bandura's socio-cognitive theory (1986), in examining human behavior, Bandura's social model has described the interaction between behaviors, individual and environmental factors, which reflects the interaction between cognition, emotions, and physiological state. Bandura's (1997) self-efficacy in his proposed framework partially explains the effects of self-talk on performance. In the initial formulation of his theory, Bandura considered the role of verbal encouragement more important than other sources. Then, Hardy (1996) paid attention to the importance of self-encouragement through self-talk regarding the source of verbal encouragement. Zimmerman (2000), in his self-regulation perspective, has specifically addressed the role of self-talk. In his self-regulation theory, Zimmerman (2000) introduced three cyclic stages including prediction, performance, and self-reflection. Self-talk in weightlifters can be used to improve concentration, increase self-confidence, regulate effort, control cognitive and emotional reactions, and stimulate automatic execution.

Next, to investigate the motivational-cognitive scores in the snatch, clean, and jerk movements of weightlifters, it was determined that the cognitive-motivational scores in the clean and jerk movements are higher than the snatch. In the explanation of the above question, it can be said,

self-talk or soliloquy is an internal dialogue that we use to explain situations and communicate with ourselves. This inner voice includes a combination of conscious thoughts, beliefs, and unconscious biases that can effectively interfere with brain function and daily life processes and its importance lies in the role it plays in self-regulation and can affect cognition (information processing and attention). Motivation (self-confidence and motivation), behavior (change of movement and behavior pattern), and emotion (regulation of emotions and feelings). In clean and jerk, athletes need more confidence and more motivation due to more pauses and more weight and mental pressure they endure. Therefore, it is logical that self-talk is more in athletes who use clean and jerk. On the other hand, self-talk is also related to active memory and Vygotsky (1986) considers it a consequence of normal development. In the sport psychology literature, self-talk has been advocated as a key performance enhancement tool. Some researchers believe that questioning self-talk compared to informative self-talk leads to more motivation for action and finally targeted behavior leads to internal motivation and greater willingness of participants to start or continue working, using questioning self-talk. "Can I?" Without imposed thoughts and conscious awareness or the participant's intention to use this phrase, questioning self-talk in a specific way and with a specific goal or repetition and practice can lead to improved performance, hence it seems to be an efficient solution to improve movement performance. Therefore, it is clear that the use of motivational self-talk can lead to the use of more effort to perform skills through improving self-confidence, creating a positive mental state, energy expenditure, regulating effort, and motivating people to try harder. Generally paying attention to the amount of self-talk in athletes, the use of self-talk before and during skill execution, the use of positive, negative, and neutral self-talk, the amount of use of open, hidden, and subliminal self-talk, the use of single-word and multi-word self-talk, the amount and the reason for using self-talk in training and competition, the rate of using self-talk with a combination of mental imagery, the rate of using self-talk in physical exercises, the rate of using self-talk alone, the rate of using expressions similar to self-talk during training and competition, many types of research on Its effectiveness has been emphasized on performance.

On the other, It seems that motivational self-talk can have a greater effect on psychological variables such as effort, self-confidence, and anxiety, especially in athletes at higher levels, and most of the research conducted in the field of self-talk has used the motivational function. Skilled athletes are based on the theory of processing efficiency and the model of recognition of the mechanisms involved in the effectiveness of self-talk, which belongs to Galanis et al. (2016). Cognitive and motivational scores are higher in double weightlifting, this reason can be stated. Also, regarding cognitive self-talk, it can be said that the higher cognitive scores in double weightlifters is also due to focusing on a specific technical point or creating related tactical measures; However, it should be noted that receiving this technical and tactical information is related to the skill level of athletes and the level of ability of people to receive technical and tactical features is a function of their skill level; Therefore, it seems that since the clean and jerk movement in weightlifting requires more training, training self-talk is a more effective psychological factor. Also, in the snatch movement, athletes have less opportunity for self-talk and all their self-talk is focused on the time of moving towards the desired weight, but in the clean and jerk movement, the weightlifter has more opportunity for self-talk and reviewing tactics, techniques and saying training sentences to oneself. Therefore, this finding seems reasonable. In general conclusion, it should be stated that in weightlifting, self-talk will

improve performance, and this effect is seen twice more in weightlifters; Therefore, the following suggestions can be useful:

- Weightlifting coaches should pay attention to the mental skills of weightlifters and teach them the concept of self-talk to stimulate their nerves and increase their concentration.
- It is suggested that weightlifters consider self-talk skills during the double weightlifting movement at the beginning of the movement and motivational self-talk while lifting the weight.
- It is suggested that weightlifters pay more attention to motivational self-talk to reduce their anxiety during one-stroke movement.

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REFERENCES

Abdoli, B., & Akradi, M. (2012). *Self-talk in athletes, publications of the Institute of Physical Education and Sports Sciences.* Physical Education Organization of the Islamic Republic of Iran. https://doi.org/10.1016/j.psychsport.2015.08.004

Anoushiravani, S., Jafarnezhadgero, A., Abdollahpour, M., & Yousefi, O. (2021). The Effect of Fatigue on the lower limb muscle electromyography frequency spectrum in teen weightlifters during the Snatch and the Clean and Jerk Lift. *Sports Physiology & Management Investigations, 12*(4), 115-124.

Ayala, E., Nelson, L., Bartholomew, M., & Plummer, D. (2022). A conceptual model for mental health and performance of North American athletes: A mixed methods study. *Psychology of Sport and Exercise, 61*, 102176. https://doi.org/10.1016/j.psychsport.2022.102176

Bandura, A. (1986). *Social foundations of thought and action: A Social cognitive theory*. Prentice-Hall, Inc.

Bandura, A. (1997). *Self-efficacy: Exercising control*. Freeman.

Brown, D. J., & Fletcher, D. (2017). Effects of Psychological and Psychosocial Interventions on Sport Performance: A Meta-Analysis. *Sports Medicine, 47*(1), 77–99. https://doi.org/10.1007/s40279-016-0552-7

Davoudi, M., Shetabbushehri, S.N., & Abedanzadeh, R. (2017). *The Effect of the Frequency of educational self-talk and Age on the Learning of basketball chest passing skills.* Master's thesis. Shahid Chamran University.

Galanis, E., Hatzigeorgiadis, A., Charachousi, F., Latinjak, A. T., Comoutos, N., & Theodorakis, Y. (2022). Strategic self-talk assists basketball free throw performance under conditions of physical exertion. *Frontiers in Sports and Active Living, 4*, 1-6. Article 892046. https://doi.org/10.3389/fspor.2022.892046

Galanis, E., Hatzigeorgiadis, A., Zourbanos, N., & Theodorakis, Y. (2016). Why self-talk is effective? Perspectives on self-talk mechanisms in sport. In *Sport and Exercise Psychology Research* (pp. 181-200). Academic Press. http://doi.org/10.1016/B978-0-12-803634-1.00008-X

Hardy, J. (2006). Speaking clearly: A critical review of the self-talk literature. *Psychology of sport and exercise, 7*(1), 81-97. https://doi.org/10.1016/j.psychsport.2005.04.002

Hardy, J., Gammage, K., & Hall, C. (2001). A descriptive study of athlete self-talk. *The sport psychologist, 15*(3), 306-318.

Hardy, J.T., Hardy, J., & Hall, C.R. (2005). Comparison of test-retest reliability using self-talk questionnaire. *Journal of Sport Behavior, 28*, 201-215.

Hardy, L. (1996). A test of catastrophe models of anxiety and sports performance against multidimensional theory models using the method of dynamic differences. *Anxiety, Stress, and Coping: An International Journal, 9*, 69-86. https://doi.org/10.1080/10615809608249393

Henriksen, K., Schinke, R., Moesch, K., McCann, S., Parham, W. D., Larsen, C. H., & Terry, P. (2020). Consensus statement on improving the mental health of high-performance athletes. *International Journal of Sport and Exercise Psychology, 18*(5), 553-560. https://doi.org/10.1080/1612197X.2019.1570473

Latinjak, A. T., Hatzigeorgiadis, A., Comoutos, N., & Hardy, J. (2019). Speaking clearly... 10 years on: The case for an integrative perspective of self-talk in sport. *Sport, Exercise, and Performance Psychology, 8*(4), 353. https://doi.org/10.1037/spy0000160

Mansouri, M., Javdipour, M., & Bagheri, S. (2022). Comparison of the effect of Instructional and Motivational Self-Talk on Performance and Learning of Handball Skills. *Motor Behavior*, *14*(49), 129-154. Http://doi.org/10.22089/mbj.2022.12603.2025

Mohammadi, H., Azimkhani, A., & Tehranchi, A. (2022). The effect of combined exercises on taekwondo practitioners' motivational and impulsive self-talk. *Sports Psychology, Article in Press.* http://doi.org/10.29252/MBSP.2022.223237.1092

Nicolas, M., Vacher, P., Martinent, G., & Mourot, L. (2019). Monitoring stress and recovery states: Structural and external stages of the short version of the RESTQ sport in elite swimmers before championships. *Journal of Sport and Health Science*, *8*(1), 77-88. https://doi.org/10.1016/j.jshs.2016.03.007

Perko, T. (2014). Radiation risk perception: A Discrepancy between the experts and the general population. *Journal of Environmental Radioactivity*, *133*, 86-91. https://doi.org/10.1016/j.jenvrad.2013.04.005

Schunk, D. H., & Zimmerman, B. J. (2013). Self-regulation and learning. In W. M. Reynolds, G. E. Miller, & I. B. Weiner (Eds.), *Handbook of psychology: Educational psychology* (pp. 45–68). John Wiley & Sons, Inc.

Van Raalte, J. L., Vincent, A., & Brewer, B. W. (2016). Self-talk: Review and sport-specific model. *Psychology of Sport and Exercise*, *22*, 139-148. https://doi.org/10.1016/j.psychsport.2015.08.004

Vygotsky, L. S. (1986). *Thought and language*. MIT Press.

Weinberg, R.S., & Gould, D. (2011). *Sports phycology Foundation*. Human Kinetics. (363-393).

Zervas, Y., Stavrou, N. A., & Psychountaki, M. (2007). Development and validation of the Self-Talk Questionnaire (S-TQ) for sports. *Journal of Applied Sport Psychology*, *19*(2), 142-159. https://doi.org/10.1080/10413200601185156

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press. https://doi.org/10.1016/B978-012109890-2/50031-7

Zourbanos, N., Hatzigeorgiadis, A., Tsiakaras, N., Chroni, S., & Theodorakis, Y. (2010). A multimethod examination of the relationship between coaching behavior and athletes' inherent self-talk. *Journal of Sport and Exercise Psychology*, *32*(6), 764-785. http://doi.org/10.1123/jsep.32.6.764