Relationship between belief in self-talk and motor performance

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ABSTRACT

The present study aims to investigate the effect of instructional and motivational self-talks on motor performance in basketball passing and dribbling tasks. The study also purports to investigate the relationship between belief in self-talk and motor performance in basketball passing and dribbling tasks. A number of 57 participants ranging in age from 20 to 26 were randomly assigned into an instructional self-talk group (N=19), a motivational self-talk group (N=19) or a control group (N=19). During the training program, instructional subjects used the phrase "short move" in dribbling task and "finger-goal" in passing task. Motivational subjects used the phrase "I can" in either task. The control subjects made no self-talk but participated in both the pre- and post-test. The results of one-way ANOVA showed that both instructional and motivational subjects outperformed the control subjects in either task (P≤0.05). There was no significant difference in passing task performance between motivational and instructional subjects. However, instructional subjects outperformed motivational subjects in dribbling performance. The results of statistical analysis showed no significant correlation between belief in self-talk and basketball passing and dribbling performance.

Keywords: Motor Performance, Belief in Self-Talk, Athletes

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INTRODUCTION

For long, various interventions have been made to improve performance, satisfaction and personal growth in the athletes. In this regard, different cognitive approaches such as self talk, goal setting, mental illustration, relaxation training and motivational control have been proposed to help improve psychological and thought patterns in the athletes. Self talk is a specific type of these interventions, which is a strategic technique whereby the individual speak to themselves vocally or subvocally [20].Research has shown that athletes extensively use self talk techniques to generate and enhance motivation and to create signs of physical performance [26]. Weinberg and Gould reported that athletes benefit from self talk techniques in a variety of ways including new skill acquisition, elimination of bad

953

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habits, motivation enhancement, attention control, change in mood and self- confidence build-up [27]. Thus, self talk may be used in different situations and for different purposes.

Different categorizations have been proposed for self talk, one of which assigns self talk into two types, namely, instructional and motivational. Several studies have investigated the effect of different types of self talk on different tasks, situations and athletes. Some researchers contend that motivational self talk facilitates performance through encouraging higher levels of endeavor, creating a positive mood and enhancing self confidence, whereas in instructional self talk, task-related training statements improve performance through calling for favorable activities using concentration and performance strategy [5].Several studies have investigated the effect of different types of self talk on athletic performance before training tasks or competitions, but they have yielded contradictory results. Some studies reported improvements in athletic performance in swimming, 100-meter dash, golf and tennis tasks through instructional self- talk [7,11, 15,17]. Some researchers contend that both types of self talk may improve performance [19]. Research has also shown that there is a relationship between self talk efficacy and the nature of the task [13]. Before having athletes resort to self talk, the type of the task should be examined so as to determine whether it is an open or closed task or a simple or complex task [16]. Landin contends that task complexity affects the efficacy of self talk in improving performance.

For example, Perkos and colleagues (2002) showed that instructional self-talk did not affect passing and dribbling performance as a complex task whereas Chroni (2007) reported that motivational self-talk improved basketball shooting performance [16, 3]. In contrast, Boroujeni (2011) showed that instructional self-talk may improve basketball shooting performance [2]. Chroni (2007) reported that motivational subjects outperformed instructional subjects in dribbling performance while Sabonchi et al (2008) showed that instructional subjects significantly outperformed motivational ones in the same task [19, 3].

Belief in self talk is one of the influential factors affecting the efficacy of self talk in enhancing performance. Belief in self talk has been defined as the individual's belief in and perception of self talk in improving performance [3]. Research has shown that belief in self talk affects the strength and efficacy of self talk in improving performance [3]. Van Raalte and colleagues reported that there is a positive correlation between belief in and efficacy of self talk in tennis players so that players with belief in self talk outperformed players with no such belief [25]. Hardy and colleagues showed that skilled athletes hold stronger belief in self talk comparing with novice athletes [4]. Thus, the findings suggest that belief in self- talk affects the self- talk efficacy [3]. However, Araki and colleagues found no significant correlation between belief in self talk and athletic performance [1]. In this regard, there are contradictory results as to the findings on belief in and efficacy of self talk. The present study aims to investigate not only the effect of self talk on basketball passing and dribbling performance but also the correlation between belief in self talk and motor performance so that both athletes and coaches may gain better understanding of self talk utility in improving athletic performance.

MATERIALS AND METHODS

Participants
A number of 57 participants at the age range of 20-26 years old (Mean=22.3, SD=1.7) were randomly assigned into an instructional self talk group (N=19), a motivational self talk group (N=19) and a control group (N=19). Based on the statistical power of 0.8 (the common statistical power in behavioral sciences) and the effect size of 0.62 (as reported by Meyers for cognitive approaches to motor performance), the sample size of 19 was considered sufficient at 95% confidence level.

Instrument
Dribbling test: Harrison Basketball Dribbling Test was used to examine the accuracy and speed of dribbling. To do the test, a participant should dribble cones and receive one score for each successful dribbling. The reliability of the test has been estimated to be 0.95 [11, 13].

Passing test: Stubbs Ball Handing Test was used in the present study. In this test, three circles with a diameter of 30 centimeters are drawn in a vertical order with 1.6 meter distances on a flat wall. The first circle is 1.51 meters high, the second is 1.21 meters high and the third is 1.36 meters high. A participant should stand behind a line with 450 centimeters from the wall. On hearing the impetus "go", the participant should throw the ball at the first circle, and having received the rebounded ball, he throws it at the second and the third circles successively. The participant

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repeats the throws for 30 seconds and receives one score for every throw which hits the circles. The reliability of this test is calculated to be 0.74 [11, 13].

Belief in Self talk Questionnaire: This is a standardized scale with the reliability coefficient of 0.85 [1]. The questionnaire consists of 8 items on a 6-point Likert scale ranging from strongly disagree (0) to strongly agree (5). The total score on the questionnaire ranges from zero to 40 [1].

Manipulation Check Protocol: This protocol addresses the participants' use of self talk. Indeed, this protocol is to guarantee the accuracy of experimental conditions created by the researcher [4]. The experimental subjects were asked to specify on a 10-point Likert scale (a) how many times they had used selective self talk, (b) whether they had used other types of self talk and (c) if so, what they had told themselves and (d) how often they had used it. The idea of self talk was also explained to the control subjects. Subsequently, they were asked to indicate on a 10-point Likert scale (a) whether they had ever used self talk and (b) if so, what they had told themselves and (c) how often they had used it [9].

Procedure
From among the population, a number of 114 participants, who were novice basketball players at the specified age range and who suffered no mental or physical disorder, were selected randomly using a personal information questionnaire. Participants were independently assigned each into three groups: instructional, motivational and control groups (4 experimental and 2 control groups). Before the study was started, the researcher met the program coach a few times to explain to him the research method and test procedures. Based on a time table, every group came to the sports hall separately. Following the jogging and stretch training**,** the participants were asked to do 10 minute warm-up basketball training. Then the pretest was performed. In the pretest, Passing and dribbling tasks were examined in both the experimental and control groups without using self talk. Subsequently, self talk techniques were explained to the experimental subjects who were to use them in their task performance. The experimental subjects were asked not to talk to their teammates during task performance but to repeat either vocally or subvocally the specified self talk phrase before doing the task [11]. The instructional self talk subjects were asked to repeat the phrase "low, rhythm" to focus their attention on variations in the direction of movement and maintain a low body position before dribbling, the phrase "fingers, target" to get a better ball control and focus their attention on the target before ball handling. The motivational self talk subjects were asked to repeat the phrase "I can" in doing all the three tasks. The control subjects did similar tasks without self talk. Upon the completion of every task, the participants took a one-minute rest during which they prepared for the next task. The same coach trained all the groups. Immediately upon the completion of tasks, the participants filled in the manipulation check questionnaire [11].

Data analysis
Using descriptive statistics, the mean and standard deviation of research variables were calculated and tables and figures were drawn. Factorial ANOVA was used to determine the effect of the type of self talk on motor performance and the post hoc Tukey's test was run to examine between-group differences. Besides, Pearson correlation formula was run to examine the relationship between belief in self talk and motor performance.

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RESULTS

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The results of one-way ANOVA of basketball passing performance showed a significant difference among instructional, motivational and control subjects $F_{(2,54)}=139.16$, $P \leq 0.05$) so that either experimental group outperformed the control group (Table 1). The results of post-hoc Tukey's test of basketball passing task for paired comparison of means showed a significant difference between instructional and control subjects as well as between motivational and control subjects so that either experimental group outperformed the control group ($P \leq 0.05$). However, no significant difference was found in basketball passing performance between instructional and motivational subjects (Table 2).

The results of one-way ANOVA of basketball dribbling performance showed a significant difference among instructional, motivational and control subjects $F_{(2,54)}=25.89$, $P \leq 0.05$) so that either experimental group outperformed the control group (Table 1). The results of post-hoc Tukey's test of basketball dribbling task for paired comparison of means showed a significant difference between instructional and control subjects as well as between motivational and control subjects so that either experimental group outperformed the control group ($P \leq 0.05$).

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Besides, there was a significant difference in dribbling performance between instructional and motivational subjects (P≤0.05). In other words, instructional subjects outperformed motivational ones in dribbling performance (Table 2).

Table 1. Results of one-way ANOVA of passing and dribbling performance in experimental groups

	Variable	Location of difference	df	SS	MS	F	P
1	Passing	Between-group	2	180.66	90.33	139.16	<0.001
		Within-group	54	35.05	0.649		
		Total	56	215.71			
2	Dribbling	Between-group	2	102.87	51.43	25.89	<0.001
		Within-group	54	107.26	1.98		
		Total	56	210.14			

Table 2. Results of paired comparison of instructional, motivational and control groups using post-hoc Tukey's test

	Variable	Self-talk groups	P
1	Passing task	Instructional self-talk	0.343
		Motivational self-talk	<0.001
		Control group	
		Instructional self-talk	0.343
		Motivational self-talk	<0.001
		Control group	
2	Dribbling task	Instructional self-talk	<0.001
		Motivational self-talk	<0.001
		Control group	
		Instructional self-talk	<0.001
		Motivational self-talk	0.021
		Control group	

The results of Pearson correlation analysis showed no significant relation between belief in instructional self-talk and passing performance r(19)=0.09, P=0.689) as well as between belief in motivational self-talk and passing performance r(19)=0.35, P=0.137). The results also showed no significant relationship between belief in instructional self-talk and dribbling performance r(19)=0.23, P=0.33) as well as between belief in motivational self-talk and dribbling performance r(19)=0.21, P=0.372).

DISCUSSION AND CONCLUSION

The present study aimed to investigate the effect of instructional and motivational self-talks on basketball passing and dribbling task performance with an emphasis on the role of belief in self-talk. The results showed that both instructional and motivational self-talks resulted in better basketball passing and dribbling performance so that either experimental group outperformed the control group. Comparison of instructional and motivational self-talks showed no significant difference in passing performance between instructional and motivational subjects. As well, comparison of dribbling task performance between instructional and motivational subjects showed that instructional subjects outperformed motivational ones. The results of correlation analysis showed no significant relationship between belief in self-talk with passing and dribbling performance. Previous research has typically supported the positive effects of self talk on motor learning and performance in regard to various variables including novice athletes [16], skilled athletes [10], learned skills [7], new skills [8], and different sports including sprints [15], skiing [18], tennis [10], basketball ball handling, shooting and dribbling [16, 3, 22]. Therefore, the present findings correspond to previous results. Generally speaking, it seems that instructional self talk improves athletic performance through increasing concentration and athletic techniques whereas motivational self talk helps improve performance via enhancing self confidence, endeavor, energy and good temperament [27, 5, 23].

Recent research has focused on the comparison of instructional and motivational self talk as well as testing the matching hypothesis based on specific task demands. The results have shown that different types of self talk may exert variable effects on performance. For example, studies on different tasks including the accuracy of football shots and badminton serving test [23], pass accuracy [2] and golf strokes [14] showed significant improvements in performance in the instructional subjects comparing with motivational subjects. However, some studies on other tasks including push-ups [12] and the speed of basketball pass [2] showed that motivational self talk subjects

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outperformed instructional subjects. Still, some studies on chest pass [14], goalball penalty task [21], crunch and knee extensor training [23] and basketball pass [3] showed that though motivational subjects outperformed instructional ones, the difference was not statistically significant between the two groups. The conclusion to be drawn is that since self talk is employed to improve performance, it is necessary to match self talk with task demands. Based on this conclusion, Theodorakis and colleagues formulated a hypothesis which was later called task-demands matching hypothesis by Hardy and colleagues [23,6]. According to this hypothesis, instructional self talk is more effective in the tasks which require accuracy and timing while motivational self talk is more effective in the tasks which require strength and endurance [6]. Overall, these findings suggest that different types of self talk exert variable effects on performance based on the type of self talk and the task. Hatzigeorgiadis and colleagues contend that with different types of self talk having variable effects on performance, it may be better to draw upon different types of self talk for different functions [9]. According to the abovementioned discussion, studies have been conducted on different tasks resulting in different findings. For instance, Theodorakis and colleagues studied the effects of self talk on football task performance, on badminton serving, on crunch exercise and on knee extensor training [20]. The task-demands matching hypothesis was inspired by these findings.

The results showed that instructional subjects outperformed motivational ones in dribbling performance. This is consistent with the findings of Theodorakis et al (2001) in basketball shooting performence and Boroujeni et al (2011) in basketball passing accuracy but inconsistent with the findings of Sabonchi et al (2008) in shooting, passing and dribbling, Chroni et al (2007) in dribbling, passing and shooting performance, and Boroujeni et al (2011) in speed passing [22, 2, 19, 3]. The results showed no signifcant difference in basketball passing performnace between instructional and motivational subjects. This is consistent with the findings of Chroni et al (2007) in basketball passing performance and Sabonchi et al (2008) in passing and dribbling performance. However, it is inconsistent with the findings of Sabonchi et al (2008) in shooting task, Chroni et al (2007) in dribbling and shooting performance, Boroujeni et al (2011) in basketball passing accuracy and speed passing, and Theodorakis et al (2001) in basketball shooting performance [19, 3, 2, 22].

In regard to the inconsistencies between the present findings and previous ones on passing and dribbling perfromance, a few factors may prove consequential. First, the inconsistencies may relate to the type of the tasks and skill level of participants. Perkos and colleagues contend that task complexity significantly affects the efficacy of self talk in skill acquisition and improved performance [10].Therefore, before deciding on self talk phrases, one has to ensure whether or not the task can be divided into smaller components to facilitate learning and performance. Complex tasks, which require quick and automatic performance, usually cause difficulty to self talk techniques. Thus, task type may be a reason for the present inconsistencies. Second, the inconsistencies may be attributed to the variable functions of self talk phrases so that some phrases may play both instructional and motivational roles. For example, Theodorakis and colleagues found that PE students who used the word "slow" during the three-minute throwing task outperformed those who used the word "quick" [19].Thus, different phrases used in different studies may have led to different results. Tsiggilis and colleagues reported that the type of tasks, number of repeats and the athletes' skill level may account for inconsistencies in research findings on self- belief studies [24].Third, the inconsistencies may as well relate to the performance criteria used in the present study. For example, Boroujeni and colleagues set the speed and accuracy of basketball pass as their criteria [21]. In other words, drawing upon the two criteria of speed and accuracy, they sought to examine the task-demands matching hypothesis in performing basketball tasks. However, the performance criteria in the present study were set based on the successful task performance within specific time limit. Finally, research methodology may also account for inconsistencies between the present and previous findings. For instance, Perkos and colleagues used a within-group study method [10] while a between-group method was used in the present study. Besides, Chroni and colleagues had two coaches train self talk groups separately [11] whereas only one coach trained the subjects in the present study in order to avoid training inconsistencies. In regard to belief in self talk, non-sport studies have suggested that belief in the efficiency of an intervention may be a requisite of its functionality. A review on scarce research on belief in self talk reveals that the participants in laboratory experiments would be able to perceive the importance of belief in self- talk [25]. For example, 70% of the tennis players who answered the questions about belief in self talk contended that self talk affects the result of their competitions. The participants in a study on dynamic balance reported that it is their conviction (32.46 out of 40) that self talk influences their performance [14]. Belief in self talk is an important issue which has been rather disregarded. The present findings revealed no significant relationship between belief in self talk and performance. This is consistent with the findings of Araki and colleagues [14] but inconsistent with the findings of Van Raalte and colleagues [12] who reported that tennis players with belief in self talk outperformed those with lack of such belief. However, Araki and colleagues showed that there is no significant relationship

957

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between belief in self- talk and performance [14]. The inconsistency between the present findings and those of Van Raalte and colleagues may relate to a few factors. First, the mean scores of self belief in different groups showed that every group consists of individuals with a range of strong to moderately strong belief in self talk; therefore, a group with wider range of belief strength may yield different results [14]. Second, the questionnaires used to examine belief in self talk may have been another cause of inconsistencies. The questionnaire may not have been efficient enough to distinguish between the individuals with strong and weak belief in self talk. The two studies drew upon two different questionnaires. Accordingly, Van Raalte and colleagues used a questionnaire with only one item to examine the participants' belief in self talk. The participants who had answered "Yes" were regarded as those who believed in self talk. However, in the present study, a questionnaire with 8 items on a 6-point Likert scale with the score range of zero to 40 was used. Third, the results of Van Raalte and colleagues' study were based on a between-group comparison whereas, in the present study, the relationship between belief in self talk and performance was investigated. Therefore, differences in research method and design may also account for the inconsistencies. Along with other factors such as improper examination of self talk, the small sample size may also account for the rejection of belief in self talk as a prerequisite for the use of self talk. Consistent with self talk studies in using manipulation check protocol [25], a questionnaire was administered to the participants to report on what they though during task performance. Over 95% of the participants in both instructional and motivational groups reported that they used self talk during task performance, which is an acceptable percentage [25]. Excluding the participants who reported they had not used self talk during task performance, the data was analyzed again, which yielded the same results. The control subjects reported that they did not use self talk in doing tasks.

Overall, the present findings are consistent with the existing literature on the efficacy of self talk on performance. Though, no correlation was found between belief in self talk and performance, ;it is recommended that future studies investigate the relationship between belief in self talk and performance in different sports and skills. Besides, considering the type of self talk, it is recommended that future studies investigate the content and potential functions of different types of self talk (e.g. obvious vs. latent, self-selected vs. coach-selected) on motor performance.

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