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The effect of overt and covert self-talk on the performance of force-production task

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ABSTRACT

The purpose of the present research was to study the effect of overt and covert self-talk on the performance of a Force-production Task. Thus, 47 participants (22.4±1.89 years old) voluntarily participated in the research and performed a Force-production Task under three conditions: overt self-talk, covert self-talk, and control. In overt self-talk, the participants uttered the sentence "I can do it" out loud before performing the task. In covert self-talk, this sentence was uttered mentally before performing the task. Finally, under control conditions no sentence was uttered before the task was performed. The Force-production Task consisted of 5 sets of trials and each set included 3 trials. Repeated measure ANOVA with F (1.78, 80.41) =8.496 showed that both overt and covert self-talk led to improved performance in the Force-production Task (P< 0.05), and there was no significant difference between the effectiveness of these two types of self-talk (P = 0.472). It appears that overt and covert self-talk have a similar effect on performance. Therefore, coaches are recommended to let their athletes be free to choose either overt or covert self-talk.

Keywords: overt self-talk, covert self-talk, motor performance, force production

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INTRODUCTION

Various interventional methods have been employed to improve athletes' performance, satisfaction, and individual growth. In particular, cognitive strategies were developed to positively influence mental and emotional patterns, including self-talk, goal setting, mental imagery, and relaxation training. Self-talk is one of the most common of these interventional methods [13]. Research has shown that athletes widely use self-talk to increase their motivation. Researchers have argued that self-talk improves performance through enhancing skill acquisition, creating confidence and efficiency, changing bad habits, and controlling efforts [17, 18]. Weinberg and Gould (2007) argue that self-talk can be employed in different conditions and for different purposes [16]. Self-talk has many forms including positive (with praise), negative (with criticism), and neutral self-talk, motivational and instructional self-talk, and overt and covert self-talk [2]. Many studies have used these types of self-talk for comparing their effectiveness with different tasks, conditions, and athletes. It seems that using positive utterances prior to performing a task increases physical and mental readiness due to encouraging, motivating, and guiding the athlete [18]. One

aspect of self-talk is its internal or external utterance and is associated with how an athlete expresses themselves. Overt self-talk is when the utterance can be heard by others; while covert self-talk is an intrapersonal communication that occurs in the mind in the form of little murmurs that cannot be heard by others. Reviews of the literature on self-talk reveals that there has not been a study that directly compares overt and covert self-talk in the context of sports. A mainstream psychology finding, however, reported by Hayes et al. (1985) suggests that coping self-statements in a laboratory setting were only effective when they were publicly known (i.e. overt). The literature on goal setting reflects the same results. A meta-analysis conducted by Kyllo and Landers' (1995) on goal setting in sport and exercise found that public goals were found to have a significantly larger effect size than semi-private and private goals. It has been argued that there is an overlap between the internal and external aspects of self-talk [2]. For example, learning new sentences happens at a similar rate and pattern regardless of what type of self-talk is used (overt or covert). However, there are strange, interesting differences between these two types of self-talk and there are many examples in pronunciation of letters and words that reflect these differences. For example, the auditory aspects of overt self-talk are seemingly absent in covert self-talk [9]. Also Mackay (1992) argued that a person engaged in overt self-talk can change the pitch of their voice, while this does not happen in covert self-talk. Similarly, during overt self-talk the individual can successfully pretend to be another person, while this cannot happen in covert self-talk. A final illustration of the differences between overt and covert self-talk is moving the tongue while expressing words that occurs only in overt self-talk [9]. These differences made the researcher wonder what the effect of these two types of self-talk on performance would be, since no study has so far examined whether overt or covert self-talk is more effective for athletic performance.

MATERIALS AND METHODS

Participants

47 male, right-handed, non-athlete participants with no experience in Force-production Task volunteered for this study (22.4 ± 1.89 years old). The research protocol was fully elaborated for the participants before they filled out the consent form.

Protocol and measurements

The present research is of a within-group design where the participants performed a Force-production Task under three conditions: overt self-talk, covert self-talk, and control. The participants in this study were tested in a Force-production Task by fingers using an electric dynamometer (ED-100N YAGMI). Each participant performed five sets of trials. In each trial set, the participant was asked to perform three maximum repetitions with 100% intensity. The participants were instructed that the overall work from the three repetitions in each trial set would be considered as a measure of their performance in kilograms [14]. Since the participants were not familiar with the functioning of the dynamometer, they were first instructed how to use the dynamometer. For this task, the participants were asked to generate force while their dominant arm was fully extended and at their side. After becoming familiar with the device, the participants warmed up for performing the task and the warm-up included 5 minutes of stretching exercises in the dominant arm, opening and closing the fingers, and three times of force production with fingers. The participants were asked not to put too much effort into the warm-up trials. Afterwards, in the overt self-talk condition, the participants were instructed to repeat the motivational sentence "I can do it" out loud before every trial so that the researcher would hear it. In the covert self-talk condition, the participants were instructed to repeat the same sentence in their minds before each trial. Finally, in the control condition, no sentence was used before or during the task. 5 sets of trials were performed under each of these conditions and each set included three trials with a 5-minute rest between each two trial sets. The rest was meant for the recovery of the athletes and to prevent fatigue. The average maximum force in these 5 trial sets was calculated as each participant's score [14]. There were 6 conditions for choosing the order of self-talk levels for each participant and self-talk interventions were counterbalanced to avoid any order effects. Finally, a manipulation check survey was provided to the participants that addressed the use of self-talk by the groups. This protocol ascertains if the proposed self-talk manipulation has been successful [3]. The participants in the experimental condition were asked to describe on a 10-point scale (1) how many times they used their selected self-talk sentence, (2) whether they used any other type of self-talk, (3) if so, what they told themselves, and (4) how frequently they used the sentence. In the control condition, the participants were asked to describe on a 10-point scale (1) whether they used any type of self-talk, (2) if so, what they told themselves, and (3) how frequently they used the sentence [6].

Data analysis

SPSS 18 was used for statistical analysis of the data. Repeated measure analysis of variance was applied for data analysis, but due to the violation of the sphericity assumption, the adjusted Huynh-Feldt test was used. Moreover, Bonferroni test was applied to determine the source of variance.

RESULTS

Figure 1 displays the mean scores of the participants in the Force-production Task (strength in kilograms). The results of repeated measure ANOVA showed that self-talk significantly affects performance in the task (F1.78, 80.41=8.496; $P< 0.05$). The results of the pairwise comparison of the means using Bonferroni test showed that there is a significant difference between the mean force production scores in the overt self-talk condition and control ($P< 0.05$). In other words, overt self-talk led to improved performance in the task. Moreover, there was a significant difference between the scores in the covert self-talk condition and control ($P< 0.05$); that is, covert self-talk improved performance in the Force-production Task. However, there was no significant difference between the mean scores in overt and covert self-talk conditions ($P = 0.472$). In other words, overt and covert self-talk have the same effect on performance in the Force-production Task.

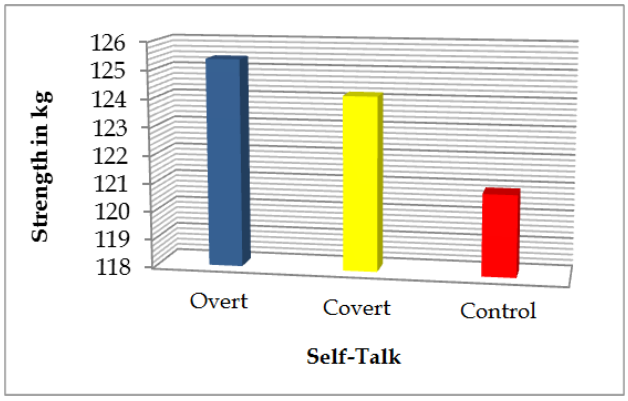

Figure 1. Mean scores of Force-production Task in three conditions

DISCUSSION AND CONCLUSION

The purpose of the present research was to examine the effect of overt and covert self-talk on performance in a Force-production Task. The results showed that both overt and covert self-talk lead to improved performance in the task. Research has generally reported the beneficial effects of self-talk on motor learning and performance in different contexts such as novice athletes in Perkos et al. (2002), skilled athletes in Landin and Herbert (1999), learned skills in Harvey et al. (2002), and new skills in Hatzigeorgiadis et al., 2008), and in different sports such as sprints in Mallet and Hanrahan (1997), skiing in Rachelle et al. (1998), tennis in Landin and Herbert (1999), and basketball in Perkos and Chroni (2007) and Theodorakis et al. (2001). Thus, the results of the present research are consistent with the findings of the mentioned studies. In an attempt for further investigation of self-talk, self-talk sentences were divided into two categories: instructional and motivational. Motivational self-talk consisted of sentences such as “I can do it” and “calm down”, while instructional self-talk included such sentences as “look at the target” and “do it smoothly”. Subsequently, researchers examined and compared the effectiveness of these two types of self-talk on performance. The findings indicated that motivational and instructional self-talk may have different effects on performance. For example, Theodorakis et al. (2000) showed that instructional self-talk is more effective when the task requires fine motor movements, for it focuses attention on task-related cues; however, when a task mainly requires strength and endurance, both motivational and instructional self-talk strategies are effective [14]. This conclusion led to a hypothesis which was later developed by Hardy et al. (2009) and was called “task-demand-oriented matching hypothesis”. According to this theory, instructional self-talk is more effective for tasks that require accuracy and timing, while motivational self-talk is more effective for tasks that require strength and endurance. Since in the present research motivational self-talk was used in the Force-production Task, the results support the task-demand-oriented matching hypothesis based on the requirements of the task. In general, it seems that motivational self-talk contributes to performance through enhancing self-confidence, effort, energy, and moods

[5, 14, 16]. Reviewing the literature on self-talk in sports reveals that most studies have not made a distinction between overt and covert self-talk. This aspect of self-talk includes internal or external communication and is associated with how an athlete expresses the self-talk sentences [2]. According to Theodorakis et al. (2000), self-talk can be either overtly or covertly expressed. At first, researchers (e.g. Ming and Martin, 1996; Hardy et al., 1996; Van Raalte et al., 1996) preferred overt self-talk, for it assured them that the participants had really used self-talk. However, feedback from participants showed that using self-talk leads to distraction [15]. As a result, later studies recommended participants to use covert self-talk [3]. Although learning new sentences happens at a similar rate and pattern regardless of what type of self-talk is used (overt or covert), there are strange, interesting differences between these two types of self-talk. For example, the auditory aspects of overt self-talk are seemingly absent in covert self-talk [9]. Mackay (1992) argued that a person engaged in overt self-talk can change the pitch and loudness of their voice, while this does not happen in covert self-talk. Another difference between overt and covert self-talk is moving the tongue while expressing words that occurs only in overt self-talk [9]. Despite these differences, the results of the present research showed that both overt and covert self-talk strategies have a similar effect on the performance of the Force-production Task. The results of the present research are seemingly consistent with Vygotsky's theory of self-regulation (1986). Vygotsky distinguished between at least two forms of language: social speech and private speech. Based on Vygotsky's theory, overt self-talk creates a link between private and social speech. As a child grows, they increasingly use self-talk which is more concise and internal. In fact, covert self-talk involves a more complex level of cognitive functions than overt self-talk. This does not mean that adults never use overt self-talk in their daily lives; rather, they use it in certain circumstances. It was found that tennis players used overt self-talk in stressful conditions such as receiving a serve or losing a point [15]. Vygotsky suggests similarities between covert and overt self-talk in that they are both speech to oneself and they incorporate abbreviation [2]. Therefore, considering the results of the present research, it is better to allow athletes to use either overt or covert self-talk as they wish.

Following the model of manipulation check protocol in self-talk studies [1], the participants completed a survey to report what they did while performing the skills. More than 95% of the participants in the overt and covert conditions reported that they used self-talk and this percentage is acceptable [17]. Moreover, we arrived at similar results when the data were analyzed without considering the data from those participants who reported that they had not used self-talk. Further, the participants in the control condition reported that they did not use self-talk during the tasks. Finally, considering the type of task used in the present research, it is recommended that future research examines the effect of overt and covert self-talk on other tasks and skills such as basketball shooting or dart throwing. Also the overt and covert self-talk sentences in the present research were motivational. Therefore, future studies can examine the effect of this classification on motor performance based on the instructional aspect of self-talk.

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