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The Effect of Motivational Self-Talk on Arousal and Performance in a Force Production Task

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ABSTRACT: The purpose of the present research was to examine the effect of motivational self-talk on arousal and performance in a force production task. 47 healthy volunteers with moderate anxiety participated in the research. The force production task (5 blocks of 3 trials) was measured in self-talk and control conditions. The participants in the self-talk group used the motivational statement, "I can do it" before performing the task. In all the trials skin conductance level was measured as an index for arousal during self-talk and force production task. The results showed that self-talk improved performance and increased arousal. Also a significant relationship was observed between arousal and performance on both groups ($P < 0.05$). Given the effect of arousal on performance in both conditions, it appears that arousal cannot be considered as a mechanism for the relationship between self-talk and performance.

KEYWORDS: Arousal, Motivational Self-talk, Performance, Force Production.

INTRODUCTION

Various interventions have been used to improve performance, satisfaction, and personal growth in athletes. In particular, cognitive strategies such as self-talk, goal-setting, imagery and relaxation have been employed to positively affect thoughts and emotions, including (Sellars, 1997). Research has shown that athletes extensively use self-talk to increase motivation and provide performance cues. Researchers have shown that self-talk improves performance by enhancing skill acquisition, building confidence, changing bad habits, and controlling efforts (e.g. Weinberg and Gould, 2007; Zinsser et al., 1998). Weinberg and Gould (2007) suggest that athletes use self-talk to learn skills, change bad habits, effect moods, build self-confidence, increase motivation, and focus attention. There is an increasing emphasis on identifying the mechanisms through which self-talk affects performance.

In a descriptive research, Hardy, Gammage, and Hall (2001) found that athletes use self-talk for motivational and instructional purposes. The instructional function of self-talk is divided into two parts: cognitive-specific self-talk which assists the athlete in learning and executing individual skills (e.g. a back somersault), and cognitive-general self-talk which helps the athlete to focus on overall performance (e.g. intensify workouts) and carry out strategies (e.g. backward tumble run). The motivational function is further divided into three parts: motivational mastery, arousal, and drive. Motivational mastery is associated with mental toughness, focus, confidence, and mental preparation. The motivational arousal function helps the athlete to relax, "psych" themselves up, and otherwise control their arousal levels. Motivational drive is more global than the other two functions of motivational functions, and is related to keeping the athlete on track to achieving their goals. Hence, this function is associated with maintaining or increasing drive and effort levels.

It has been shown that instructional self-talk focusing on the technical aspects of performance was more effective than motivational self-talk when the task demands included skill, timing, and accuracy. Conversely,

the beneficial effects of motivational self-talk were expected to enhance performance over instructional self-talk when task demands focused on strength and stamina (Theodorakis et al, 2000; Hardy, Oliver, and Tod, 2008). Given athletes' reports of the role of motivational self-talk in adjusting arousal levels and the matching of the task's motor demands with the appropriate self-talk cues (Hardy, Hall & Alexander, 2001), this research aims to explore the use of motivational self-talk in a force production tasks to provide greater insights into the role of self-talk in controlling arousal levels.

MATERIALS AND METHODS

Participants

47 male, right-handed non-athletes with moderate trait anxiety (22.4 ± 1.89 years of age) volunteered to participate in this study. The research protocol was fully explained before the participants signed a consent form.

Protocols and Measurements

The present research had a within-group design where the participants performed a force production task under self-talk and control conditions. Learning effect was controlled by using a counterbalanced design. On the day of testing, electrodes (Procomp5 Thought Technology, Canada) were attached to the ring and index fingers of the participants to measure the skin conductance level (SCL) as an index for arousal (Figure 1).

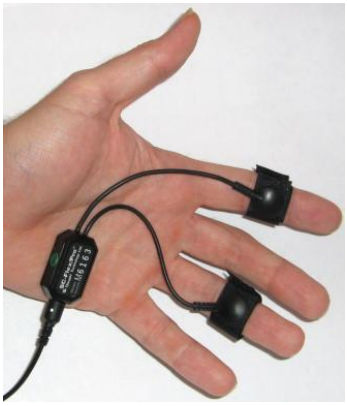

Figure 1. Electrodes used to measure SCL.

After attaching the electrodes, the participants rested for 20 minutes in order to feel comfortable with the electrodes. Before the tests, the participants completed Spielberger State-Trait Anxiety Inventory to ensure that SCL changes are induced by arousal, as they are also affected by anxiety. Accordingly, participants with high level of anxiety (more than 52) would perform the test at a later date under more normal conditions. Arousal levels were measured while the participants performed the force production task along with self-talk (Barry and Sokolov, 1993). It must be noted that SCL levels were measured from 0.5 seconds before the beginning of self-talk until the end of the task and the mean SCL was considered as the level of arousal.

The task involved handgrip force production using a digital dynamometer (ED-100N, YAGAMI Co. Ltd.). Each participant performed 5 blocks of 3 trials. In each block, the participants were asked to perform three trials at 100% one repetition maximum. The participants were informed that the sum of the three trials would be used as a measure of performance in each block (Theodorakis et al., 2000).

Explanations were provided for the participants as how to work the dynamometer. The participants were asked to produce force in standing position with their dominant arm extended and at their side. The warm-up protocol included 5 minutes of stretching exercise in the dominant arm, clenching an unclenching the fist, and 3 force production attempts. The participants were instructed not to put too much effort in these 3 exercise trials. After warm-up, the participants in the self-talk group were instructed to repeat the statement “I can do it” out loud before performing each trial. The control group did not use any self-talk statement before or during the task. The participants performed 3 blocks of 5 trials, with a 5-minute rest between blocks. The purpose of these rests was to prevent fatigue and facilitate recovery. The mean maximum force in these blocks was calculated (Theodorakis et al., 2004). Manipulation checks were performed to ensure the use of self-talk by the participants. The self-talk group was asked to show on a 10-point scale (a) how many times they used the self-talk statement, (b) whether they used any other type of self-talk, (c) if yes, what statements they used, and (d)

how often they used these statements. The control group was asked to show on a 10-point scale (a) whether they used any form of self-talk, (b) if yes, what statements they used, and (c) how often they used these statements (Hatzigeorgiadis et al., 2008).

Data Analysis

T-test for correlated samples and Pearson correlation coefficient were used for data analysis at the 0.05 significance level. All the statistical operations were done in SPSS 18.

RESULTS

The results of t-test for correlated samples showed that self-talk improved performance in the force production task ($t_{(46)} = 3.582$; $P < 0.05$). Moreover, a significant difference was observed between the self-talk and control groups in arousal ($t_{(46)} = 3.193$; $P < 0.05$). There was also a significant correlation between arousal levels and performance in the force production task in both self-talk ($r = 0.52$; $P < 0.05$) and control conditions ($r = 0.53$; $P < 0.05$).

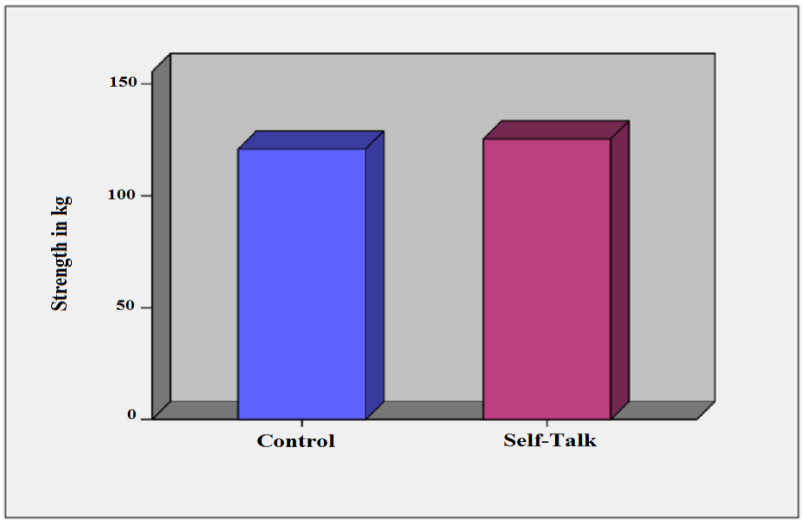

Figure 2. Mean strength in kilograms.

DISCUSSION AND CONCLUSION

In this research, self-talk improved performance in a force production task. Studies have generally supported the beneficial effects of self-talk on motor learning and performance: skill acquisition and performance of novice basketball players in Perkos, Theodorakis and Chroni (2002); performance of skilled female tennis players in Landin and Hebert (1999); golf performance in Harvey, Van Raalte, and Brewer (2002); performance of young tennis players in Hatzigeorgiadis et al, (2004); 100 m sprint performance in Mallett and Hanrahan (1997); skiing performance in Rushall, Hall, and Rushall (1998); and basketball performance in Chroni, Perkos, and Theodorakis (2007).

Positive motivational self-talk ("I can do it") was used in this research. Motivational and positive self-talk statements often improve performance by creating positive mood states, building self-confidence, and increasing effort (Theodorakis et al., 2000). Research is increasingly focusing on identification of mechanisms through which self-talk affects performance. Hardy et al, (2001, 2002) found that controlling arousal levels is one of the mechanisms mediating the relationship between self-talk and performance. Given these findings, skin conductance level (SCL) was used in the present research as a measure of arousal to provide further insights into the role of self-talk in controlling arousal levels. The results showed that self-talk increases arousal levels in the force generation task, but increased arousal levels were observed in both self-talk and control conditions. It appears that increased arousal as a result of motivational self-talk did not have a considerable effect on performance in the force generation task, as a significant relationship was observed between arousal levels and performance in the control group. Thus, arousal may not be a mechanism for explaining the relationship between motivational self-talk and performance. This is inconsistent with the results of Hardy et al. (2001, 2002). Hardy et al, (2001) carried out a descriptive research and found that athletes primarily use self-talk for

motivational and instructional purposes. The motivational function of self-talk was further divided into three parts: motivational mastery, which is associated with mental toughness, focus, confidence, and mental preparation; the motivational arousal function, which helps the athlete to relax, "psych" themselves up, and otherwise control their arousal levels; and motivational drive, which is related to keeping the athlete on track to achieving their goals. This inconsistency can be attributed to the fact that Hardy et al, (2001, 2002) reported the individual perceptions of athletes, but in the present study SCL was used as a measure of arousal.

In the present research, a within-group design was used to study self-talk. A repeated measures design increases the sensitivity of measurements, allowing for identification of small differences. Although learning effect may occur in within-group designs, this issue was controlled by a counterbalanced design, thus increasing the internal consistency of the study. Hardy et al, (2009) argued that while both self-concept and forms of anxiety may be antecedents of self-talk, preliminary evidence suggests that a motivation-based personality disposition, achievement goal orientation, might be another. All these factors were controlled by using a within-group design. Also the results of manipulation checks confirm the appropriate use of self-talk in different conditions. It is unrealistic to expect all the participants to use self-talk exactly as planned by the researcher, but the scores obtained from manipulation checks suggested that the majority of the participants were able to use the self-talk requested for the specific condition (Edwards, Tod & McGuigan, 2008).

Overall, the results of the present research show that motivational self-talk improves performance. However, contrary to previous descriptive studies, the present findings suggested that arousal cannot be considered as a reliable mechanism for the relationship between self-talk and performance.

Conflict of interest

The authors declare no conflict of interest

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