

## **Effects of Self-Talk and Mental Training Package on Self-Confidence and Positive and Negative Affects in Male Kickboxers**

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**Abstract:** *The objective of the present study was to examine the effects of mental training strategies on self-confidence and positive and negative affects in male kickboxers. Forty five male amateur kickboxers (age,  $22 \pm 2.3$  years; height,  $1.74 \pm 0.08$  m; body mass,  $65 \pm 10.2$  kg) participated in the present study. Participants were randomly assigned to three conditions: motivational self-talk (M-ST,  $n = 15$ ), mental training package (M-ST plus imagery,  $n = 15$ ), and control condition (physical training,  $n = 15$ ). Mental training package, M-ST and physical training groups performed three times per week (~90-min per session) in alternative days for 12 weeks (36 sessions in total). Kickboxers completed the State Sport Confidence Inventory (SSCI) and the Positive and Negative Affect Schedule (PANAS) before and after each condition. The results have shown that mental training package had higher self-confidence and positive affect (PA) than M-ST and control conditions after the training period. It seems that, whereas both motivational self-talk and mental training package are effective in enhancing self-confidence and managing emotions, some advantage may be derived from combined mental strategies.*

**Keywords:** *Mental training; self-talk; mental training package; self-confidence; affective states; combat sports*

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### **I. Introduction**

Kickboxing is one of the modern combat sports. Typically, kickboxers are required to have well developed physical and physiological attributes, combined with a wide range of technical and tactical skills. Thus, psychological skills are also the most important factors that are related to performance for most combat sports such as motivation, self-confidence, and mental toughness (Devonport, 2006; Taylor, 1995). Emotional control was deemed to be critical for success during a fight, in particular the control of aggression, fear and anxiety (Devonport, 2006). This means that building and maintaining self-confidence and managing emotions are the primary goals for intervention in kickboxing. For instance, the integration of mental training within kickboxing training may help ensure quality practice and facilitate the effective transfer of mental skills into competition (Devonport, 2006).

Researchers have revealed that the use of psyching-up strategies may optimize training sessions and athletic performance (Edwards *et al.*, 2008), and this beneficial effect would be due to enhanced arousal, self-confidence and focused attention, thereby leading to specific changes in the motor unit recruitment within

muscles (Cumming and Williams, 2012). In the last two decades, the applied sport psychology literature has seen an increase in the number of experimental studies examining the effect of mental training on sporting performance. Within this increase, several studies have examined the effects of single psychological skill training (Devonport, 2006; Hatzigeorgiadis *et al.*, 2004; Ranganathan *et al.*, 2004), while others have investigated the effects of mental skills training package (Cumming *et al.*, 2006; Thelwell and Maynard, 2003).

On the one hand, sport psychologists have proposed different psyching-up strategies, such as self-talk or imagery (Devonport, 2006; Tod *et al.*, 2011). Self-talk, defined as "...a dialogue in which an individual interprets feelings and perceptions, regulates and changes evaluations and convictions, and gives himself or herself instructions and reinforcement" (Tod *et al.*, 2011), is supposed to interfere with ongoing action. Studies have found that motivational self-talk (M-ST), referring to a dialogue building self-efficacy and motivation (Hardy, 2006) and improved sports performance (Tod *et al.*, 2011). On the other hand, additive effects seem to occur when imagery and ST strategies are combined relative to using each one independently (Cumming *et al.*, 2006). In addition, some studies have examined the effects of combined M-ST and imagery strategies, and revealed that, relative to single strategy, combined strategies were more beneficial for effects on sports performance (Hatzigeorgiadis *et al.*, 2011). In this view, the recent meta-analysis of Hatzigeorgiadis *et al.* (2011) showed that the studies where some sort of training was implemented had greater effect than studies without training.

As has been highlighted thus far, there has been an increase in the number of investigations examining the effects of cognitive strategies on sporting performance. Despite such developments, there remains a limited knowledge base as to the effects of psychological skills training within combat sport setting. Even though it is documented that mental training can be beneficial to performance, no study has attempted to investigate possible mechanisms through which mental training strategy affects performance. Nevertheless, several explanations have been put forward. Hardy (2006) proposed that ST may enhance performance through increases in confidence and anxiety control. Furthermore, the aim of the present study was to examine the effects of mental training strategies on self-confidence and positive and negative affects in male kickboxers.

## **II. Methods**

### **Participants and procedures**

Forty five male amateur kickboxers (age,  $22 \pm 2.3$  years; height,  $1.74 \pm 0.08$  m; body mass,  $65 \pm 10.2$  kg) participated in the present study. The participants were carefully recruited: (a) from all weight categories, (b) follow a balanced program of sleep and nutrition before tests and during training, (c) not to consume any supplements or drugs, (d) not to be involved in official competitions during the training program period, and (e) no severe cognitive impairment. They were randomly assigned to three conditions: motivational self-talk (M-ST,  $n = 15$ ), mental training package (M-ST plus imagery,  $n = 15$ ), and control condition (physical training,  $n = 15$ ). Mental training package, M-ST and physical training groups performed three times per week (~90-min per session) in alternative days for 12 weeks (36 sessions in total). The difference between both mental strategies (Mental training package and M-ST) and control condition (physical training) was in the activities performed during the rest periods immediately after physical practice (mental strategies and neutral cognitive task for both mental groups and control group, respectively. Particularly, the neutral tasks being selected to never involve the

abilities needed to form mental images). No information about the purpose of the study was given to the participants until they completed the experiment. Finally, the study conformed to the recommendations of the Declaration of Helsinki, and participants gave voluntary written informed consent to participate in the experiment, which was approved by the local institutional research ethics committee.

## **Training programs**

### ***Physical training***

The kickboxing training protocol for the control condition lasted 12 weeks. Three training sessions of 90 min per week, on alternate days, were performed. Each training session began with a 15 min warm-up, and ended with a 15 min period of free cool down and stretching. Kickboxing training session consisted of three phases that lasted for 45 min each; (a) enhancing specific physical fitness components (muscular power, strength performance, sprint and agility), (b) advanced technical skills (offensive and defensive movements) and (c) sparring bouts.

### ***Mental training protocol***

Following familiarization, the participants in M-ST and mental training package groups had three 20 min sessions, in which they received instruction and training on how to perform M-ST and mental package exercises, respectively. This was followed by an intervention period of 12 weeks, during which the participants in the both intervention groups had three sessions a week (36 in total). The duration of each session was about 20 min ( $\pm 5$ ) in both mental groups, which along with physical training (45 min), with one day between sessions. Both psyching-up strategies were designed and conducted under supervision of an experienced certified sport psychologist.

### ***Motivational self-talk (M-ST) training***

A self-talk refers to verbalization or statement addressed to the self. In that regard, it may have considerable impact on affective and motivational. M-ST was conducted before and after each physical training session. As a result, each session of M-ST training program was composed of two steps: The kickboxers had to seek (a) to identify and write negative self-talk statements occurred before, during and after the kickboxing training protocol and (b) to change in positive and motivational statements. Thus, participants selected their M-ST' sentences in order to preserve their perceived autonomy.

### ***Mental training package (M-ST plus imagery)***

This training program consisted in completing sessions of physical training and imagery incorporate with M-ST. During each training session, participants were instructed to perform physical training and used the imagery technique to imagine specific exercises (kicking and punching actions and simulated combats). For instance, this mental exercise was not simply a visualization of oneself performing the task (internal imagery); rather, the performers were instructed to adopt a kinesthetic imagery approach, in which they urged the muscles to contract maximally, and this was accompanied by significantly elevated physiological responses (Ranganathan *et al.*, 2004). Particularly, participants performed both cognitive general (CG) and motivational general-mastery (MG-M) imagery. For instance, CG imagery involves mentally rehearsing competition plans

and strategies of match. While, MG-M imagery is used to imagine being in control and feeling confident. Thus, as in the M-ST group, M-ST was also conducted before and after each physical training session.

### **Measures**

Pre-test and post-test trials were conducted in the afternoon, exactly between 5:30 and 7:00, in order to avoid any influences of diurnal fluctuation, and consisted in recording self-confidence and positive and negative affects.

#### ***State Sport Confidence Inventory (SSCI)***

Sport confidence was assessed using the State Sport Confidence Inventory (SSCI; Vealey, 1986). The inventory is administered prior to a "simulated combat (3×2-min with 1-min rest in-between)" in order to assess the athletes' degree of confidence that they would be successful in that competition. Each item is measured on a 9-point Likert scale, ranging from 1 (low) to 9 (high).

#### ***Positive and Negative Affect Schedule (PANAS)***

The Positive and Negative Affect Schedule (PANAS) is a widely used measure of emotional experience (Gaudreau *et al.*, 2006). The PANAS is a 20-item scale that measures positive and negative affects. It contains ten positive mood adjectives such as "proud" and ten negative mood adjectives such as "scared". Participants were asked to report the extent to which they had experienced these moods using a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (very much).

### **Statistical analyses**

Data are presented as mean  $\pm$  standard deviation (SD). Two-way repeated measures ANOVA (training program type: M-ST, mental training package, and physical training)  $\times$  2 (time: pre-training and post-training) were applied on the key dependent variables to test our hypotheses. Bonferroni test was used to conduct post-hoc comparisons. Effect size was determined by using eta squared calculations ( $\eta^2$ ). A significance level of  $p \leq 0.05$  was used for all analysis. All statistical analyses were carried out using the statistics package for social science (SPSS Inc., Chicago, IL, USA, version. 16.0).

## **III. Results**

A significant main effect of training program types on self-confidence was found ( $F_{(2,42)} = 14.14$ ;  $p < 0.001$ ;  $\eta^2 = 0.40$ ). A main effect of time was also found ( $F_{(1,42)} = 178.31$ ;  $p < 0.001$ ;  $\eta^2 = 0.80$ ), in the sense that self-confidence scores was higher in the post- than in the pre-training period. A main effect of time was also found ( $F_{(2,42)} = 46.05$ ;  $p < 0.001$ ;  $\eta^2 = 0.68$ ). Post-hoc comparisons revealed that, at the post-training period, self-confidence was higher in the mental training package ( $p < 0.001$ ) and M-ST ( $p = 0.03$ ) conditions than in the control condition. Thus, self-confidence was also higher in the mental training package than in the M-ST condition ( $p = 0.03$ ) after the training period (Table 1).

The results revealed that, at the post-training period, positive affect was higher in the mental training package ( $p < 0.001$ ) and M-ST ( $p < 0.01$ ) conditions than in the control condition. Positive affect was also higher in the mental training package than in the M-ST condition ( $p = 0.01$ ) after the training period. While, the

findings showed that negative affect was lower in the mental training package ( $p < 0.001$ ) and M-ST ( $p = 0.01$ ) conditions than in the control condition, as well as, lower negative affect scores in the mental training package than in the M-ST condition ( $p = 0.004$ ) after the training period (Table 1).

**Table 1.** Mean  $\pm$  SD of self-confidence and positive and negative affects before and after each training program.

Variables	Period	Mental training package	Self-talk	Control group
<b>Self-confidence</b>	Before	$3.7 \pm 0.9$	$3.8 \pm 0.8$	$3.6 \pm 0.8$
	After	$7.1 \pm 1.0^{**\#\dagger}$	$5.4 \pm 1.1^{*\dagger}$	$4.0 \pm 0.9$
<b>Positive affect</b>	Before	$2.7 \pm 0.6$	$2.5 \pm 0.5$	$2.4 \pm 0.5$
	After	$4.2 \pm 0.9^{**\#\dagger}$	$3.4 \pm 0.7^{*\dagger}$	$2.6 \pm 0.6$
<b>Negative affect</b>	Before	$3.9 \pm 0.8$	$4.1 \pm 0.9$	$4.3 \pm 0.8$
	After	$2.1 \pm 1.1^{**\#\dagger}$	$3.2 \pm 0.8^{*\dagger}$	$4.0 \pm 0.9$

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\*: Significant difference at post-training compared with pre-training at  $p < 0.05$ ; \*\*: Significant difference at post-training compared with pre-training at  $p < 0.001$ ; #: Higher values for the mental training package at post-training compared to the self-talk at  $p < 0.05$ ; †: Higher values for the mental training package/self-talk at post-training compared to the control group at  $p < 0.05$ .

#### IV. Discussion

The purpose of the present study was to examine the influence of cognitive training strategies on self-confidence and positive and negative affects in male amateur kickboxers. Researchers have generally supported the beneficial effects of self-talk on motor learning and task performance in various settings (e.g., novice athletes, highly skilled athletes, new skills) (Hatzigeorgiadis *et al.*, 2004; Perkos *et al.*, 2002), and sports (e.g., basketball, soccer, swimming, ski, tennis) (Johnson *et al.*, 2004; Landin and Hebert, 1999; Rushall *et al.*, 1988; Theodorakis *et al.*, 2001). However, to the authors' knowledge, this is the first study examining the effects of mental training strategies on self-confidence and affective states in male amateur kickboxers. Particularly, the results of the present study have confirmed that self-talk is an effective strategy for increasing sports performance by the enhancement of self-confidence and positive affect. Accordingly, Perkos *et al.* (2002) implemented a 12-week self-talk training program in young basketball players and found that the use of self-talk improved players' dribbling and passing performance. They also showed that the use of self-talk improved their concentration and self-confidence. Thus, other study administered a psychological skills training program in recreational athletes competing at a laboratory based triathlon task. The results showed that self-talk increased participant performance, motivation and self-confidence and enhanced attentional focus in recreational athletes (Thelwell and Greenlees, 2003). Johnson *et al.* (2004) tested the effectiveness of a self-talk intervention program in female soccer players, assessing performance in the low drive shot over a period of three months. Their results

showed that shooting performance improved for two of the three participants, whereas all three participants reported increased self-confidence compared to baseline. Although motivational self-talk has been primarily recommended for gross tasks requiring strength and endurance (Hatzigeorgiadis *et al.*, 2011). Motivational self-talk also improved self-confidence and positive affect may explain why strength and endurance performances improved.

Currently, mental training package increased more self-confidence and positive affect than self-talk and control conditions. Accordingly, previous studies have investigated the interactions between mental imagery and self-talk to achieve athletic success (Hatzigeorgiadis *et al.*, 2011). Other studies reported that mental training package including relaxation, imagery, and self-talk increased specific soccer performance and psychological skills, such as sport confidence and motivation (Thelwell *et al.*, 2006; Weinberg *et al.*, 1981). In contrast, the recent meta-analysis of Hatzigeorgiadis *et al.* (2011) reported that studies implementing mental training packages showed greater effect than studies implementing self-talk interventions, however the difference was not significant. The lack of significance (despite the magnitude of mean differences) may be attributed to the variability of the effects that were identified for the studies implementing mental packages, but also to the small number of such studies (Hatzigeorgiadis *et al.*, 2011). Nonetheless, the seemingly superiority of mental packages over self-talk interventions should be interpreted with extra caution for two more reasons. First, most of the studies implementing mental packages used single-subject multiple-baseline designs. Second, most of the studies implementing mental packages included extended training. Therefore, Hardy *et al.* (2001) suggested that additive effects on physical performance would likely occur when imagery and self-talk are used in combination. Applied practitioners have long acknowledged the importance of combining psyching-up strategies when designing mental training programs, and there is a growing body of research to support the use of two or more psychological strategies for enhancing performance (Tod *et al.*, 2011). In this view, Thelwell and Maynard (2003) indicated that a mental training package containing goal-setting, activation regulation, self-talk, mental imagery and concentration was beneficial in enhancing cricketing performance. Further, according to the action–language–imagination (ALI) model (Annett, 1986) and Paivio’s (1971) dual coding theory, Hall (2001) demonstrated that subjects assigned to an imagery plus verbal cues (self-talk) treatment group learned more movement patterns and increased more motor tasks than subjects performing either strategy separately.

Finally, it is well documented in the literature that motivational self-talk and mental training package can lead to increases in strength and endurance performances. However, the current study has found that psychological factors (self-confidence and affective states) account for improved sports performance with psyching-up (e.g., motivational self-talk and mental training package). These findings also suggest that self-confidence and affective states may mediate the mental training and performance relationship.

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