**Research**

Inquiries in Sport & Physical Education
Volume 20 (2), 86 – 93
Released: July 2022

Αναζητήσεις στη Φυσική Αγωγή & τον Αθλητισμό
Τόμος 20 (2), 86 – 93
Δημοσιεύτηκε: Ιούλιος 2022

www.pe.uth.gr/emag

ISSN 1790-3041

# From Training to Competition: The Effects of a Strategic Self-Talk Intervention on Pre-Competition Anxiety and Self-Confidence in Young Swimmers

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## Abstract

The purpose of the present study was to investigate the effects of a strategic self-talk intervention on young swimmers' pre-competition anxiety and self-confidence in actual competitive conditions. Participants were 38 swimmers (16 males and 22 females) with a mean age of 14.71 (± 1.39) years and mean competitive experience 6.15 (± 1.74) years. The intervention took place in-between two qualifying for the national championship competitions, which were scheduled in the national calendar eight weeks apart one from the other. Pre-competition anxiety and self-confidence were assessed in these competitions. Accordingly, the intervention lasted eight weeks during which the experimental group was educated and trained in the use of strategic self-talk, while the control group received the same swimming training but without self-talk. Overall, the results showed that in the competition following the intervention, for the experimental group cognitive anxiety was reduced and self-confidence was increased, whereas no changes were observed for the control group. The findings suggest that strategic self-talk is an effective strategy for regulating anxiety and self-confidence in competitive settings, and provide support for postulations that anxiety regulation may be among the mechanisms explaining the facilitating effects of self-talk on performance.

Keywords: *applied sport psychology, competitive conditions, self-talk mechanisms, swimming*

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**Ερευνητική**

# Από την Προπόνηση στον Αγώνα: Η Επίδραση μίας Παρέμβασης Στρατηγικής Αυτο-Ομιλίας στο Προ-Αγωνιστικό Άγχος και στην Αυτοπεποίθηση Νεαρών Κολυμβητών/τριών

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**Περίληψη**

Σκοπός της παρούσας έρευνας ήταν να εξετάσει τις επιδράσεις ενός παρεμβατικού προγράμματος στρατηγικής αυτο-ομιλίας στο προ-αγωνιστικό άγχος και την αυτοπεποίθηση νεαρών αθλητών κολύμβησης σε πραγματικές αγωνιστικές συνθήκες. Στην έρευνα συμμετείχαν 38 αθλητές/τριες αγωνιστικής κολύμβησης (16 αγόρια, 22 κορίτσια) με μέσο όρο ηλικίας στα 14.71 (± 1.39) έτη και αγωνιστική εμπειρία 6.15 (± 1.74) έτη. Η παρέμβαση πραγματοποιήθηκε ανάμεσα σε δύο προκριματικούς για το εθνικό πρωτάθλημα αγώνες, οι οποίοι ήταν προγραμματισμένοι στο εθνικό καλεντάρι με απόσταση οκτώ εβδομάδων. Το προ-αγωνιστικό άγχος και η αυτοπεποίθηση αξιολογήθηκαν σε αυτούς τους αγώνες, Αντίστοιχα, η παρέμβαση είχε διάρκεια οκτώ εβδομάδων, κατά τις οποίες η πειραματική ομάδα διδάχτηκε και εξασκήθηκε στη στρατηγική της αυτο-ομιλίας, ενώ η ομάδα ελέγχου ακολούθησε το ίδιο πρόγραμμα προπόνησης αλλά χωρίς αυτο-ομιλία. Οι αναλύσεις έδειξαν ότι η πειραματική ομάδα παρουσίασε μειωμένο γνωστικό άγχος και αυξημένη αυτοπεποίθηση στον αγώνα μετά την παρέμβαση, ενώ δεν παρατηρήθηκαν αλλαγές για την ομάδα ελέγχου. Συνολικά τα αποτελέσματα ανέδειξαν τη σημασία της αυτο-ομιλίας ως μια αποτελεσματική στρατηγική για την ρύθμιση του άγχους και της αυτοπεποίθησης σε αγωνιστικές συνθήκες και υποστηρίζουν θεωρήσεις ότι η ρύθμιση του άγχους μπορεί να είναι ένας από τους μηχανισμούς που ερμηνεύουν τα ευεργετικά αποτελέσματα της αυτο-ομιλίας στην αθλητική απόδοση.

Λέξεις κλειδιά: *εφαρμοσμένη αθλητική ψυχολογία, αγωνίστηκες συνθήκες, μηχανισμοί αυτο-ομιλίας, κολύμβηση*

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**Introduction**

Emotions have been identified as an integral part of competitive sport (Jones, 2003). In a high achievement level, most of the times, the interaction between the content (functional or dysfunctional) and the intensity (low or high) of a specific emotion determines the effects of the emotion on sport performance (Hanin, 2007). Therefore, emotions have the power to lead athletes to success but also to plunge them into a poor performance (Jekauc, 2018). In a recent attempt to map emotional processes during sport competitions, Fritsch and Jekauc (2020) explained through the "cycle of emotions" how an event (positive or negative) can activate a series of bodily reactions, feelings, and cognitions; thus, highlighting the important role of emotion regulation.

Similarly to cognitions, the automatic psychological processes following an emotional change, are not always efficiently regulated; hence, sport performance can be negatively influenced (Fritsch & Jekauc, 2020). To minimize ongoing negative emotional pressure during competitions, self-regulation strategies should be adopted. In the sport psychology literature, self-talk seems to hold an important role in athletes' emotion experience and regulation (Fritsch & Jekauc, 2020; Latinjak et al., 2017).

The new conceptualization of self-talk (Latinjak et al., 2019), which distinguish between organic (spontaneous and goal-directed) and strategic self-talk, provides a valuable platform for the evaluation of the relationships between self-talk and other psychological constructs, including emotions (Latinjak et al., 2014). In the one hand, organic spontaneous self-talk is often reflective of emotional processes, as studies have shown that the content of spontaneous self-talk often involves evaluating performance or predicting future outcomes, thus revealing emotional connotations (Latinjak et al., 2014). In the other hand, organic goal-directed and strategic self-talk, which share the characteristic of serving a purpose (Galanis & Hatzigeorgiadis, 2020), often have an emotion regulation function (Fritsch et al., 2022), through either organic rational process (goal-directed self-talk) or the use of predetermined self-talk cues (strategic self-talk).

Most of the research in the sport self-talk literature has focused on strategic self-talk interventions and its positive effects on sport performance (Hatzigeorgiadis et al., 2011). Nevertheless, the anxiety regulating potential of self-talk has been investigated in some studies. Hatzigeorgiadis et al. (2007) examined whether different, in terms of content, self-talk cues serve different functions. Among the different functions that were examined based on participants self-reports it was found that anxiety control cues were more effective in regulating anxiety compared to attention directing cues. Subsequent research has examined the effects of strategic self-talk interventions on state anxiety. Hatzigeorgiadis et al. (2009) tested the effects of strategic motivational self-talk on self-confidence and anxiety in young tennis players performing a tennis stroke under anxiety evoking experimental conditions before and after a three-day self-talk intervention. The results showed a significant decrease for cognitive anxiety and an increase for self-confidence for the experimental group, with changes in self-confidence being related to increases in task performance.

Finally, Walter et al. (2019) examined the effects of a short- (one week) and a long-term (eight weeks) strategic self-talk intervention on young athletes' state and trait competitive anxiety, assessed three times before and after the intervention. The results showed that both the short- and the long-term interventions significantly reduced the levels of somatic anxiety and that this decrease remained stable over time. Unlike the Hatzigeorgiadis et al. (2009) study, no effects were found for cognitive anxiety.

Considering the above findings but also the importance of competitive anxiety in sport and the limited number of intervention studies, the present study aimed to further explore the effectiveness of a strategic self-talk intervention on pre-competition anxiety. In addition, to address the need for more ecologically valid designs supporting the effectiveness of strategic self-talk in field settings, the purpose of the study was to examine the effects of a strategic self-talk intervention on pre-competitive anxiety and confidence through an intervention implemented between important for young swimmers' competitions. Based on the preliminary evidence, it was hypothesized that the intervention would reduce pre-competitions anxiety and increase confidence for the experimental, strategic, self-talk whereas no changes were expected for the control group.

## Method

### *Participants*

A convenience sampling was implemented. Fifty-five national-level competitive swimmers with no prior experience in psychological skills training originally agreed to participate in the study; eventually, 38 (16 males and 22 females) completed all study requirements (26 for the experimental group and 12 for the control); i.e., participating in the two competitions where the baseline and the final assessment took place. The mean age of the swimmers was 14.71 ($SD$= 1.39) years and the mean competitive experience was 6.15 ($SD$= 1.74) years. All participants were training between five and six days per week ($M$= 5.86, $SD$= 0.62 days) for an average of 14.02 ($SD$= 3.26) hours. One-way MANOVA analysis revealed no significant differences between the groups (intervention and control) in any of the above demographic variables, $F(4, 33)= 1.06$, $p= .38$. Additionally, chi-square analysis revealed no significant differences in the number of male and female swimmers for the two groups, $\chi^2(1)= .44$, $p= .50$.

### *Procedures*

Ethical approval was granted from the institution's ethics board. All participants received detailed information regarding the requirements of the research protocol and they asked to participate in the intervention. Consent by coaches were obtained, and written informed consent was signed by swimmers' parents before the onset of the study. Participants were informed that participation was voluntary and that they could withdraw anytime they wished.

The data were collected from two official competitions organized by the Hellenic Swimming Federation. The competitions were qualifiers for the winter national championship. On the day of each competition, prior to the onset of the races, participants completed a form with demographic data and a control measure assessing perceived competition importance. Pre-competition anxiety and self-confidence were assessed approximately 15-minutes before the main race of each participant. Upon the completion of this same race, participants completed a typical self-talk use manipulation check.

### *Intervention*

*Experimental group:* Swimmers of the experimental group participated in an 8-week intervention program. In order to follow specific plans during the intervention, swimmers were divided in five groups according to main competitive swimming style: freestyle, backstroke, breaststroke, butterfly, medley. After an introductory meeting that included a presentation regarding the strategic self-talk and its application in sport settings, each group was planned to meet with the supervising researcher once a week. All swimmers were informed that it would be important to attend all the scheduled training sessions.

Firstly, in every training session, swimmers were receiving information about the purpose and the content of the strategic self-talk plans. Specifically, detailed instructions were provided with regard to the cues to be used but also the timing (when to use them) and their meaning (the purpose of the cues).

Overall, the purpose of the intervention was to educate and allow swimmers to practice self-talk in order to be able to develop their own competitive strategic self-talk plans and apply them effectively in the upcoming competition (post-intervention competition). In the first two weeks, swimmers and coaches cooperated with the supervising researcher in order to recognize important technical aspects of each group (swimming style) and developed appropriate instructional strategic self-talk plans. For the third and the fourth week, swimmers followed strategic self-talk plans aiming to regulate anxiety and increase self-confident. Specifically, swimmers were instructed to recognize spontaneous and non-productive self-talk and replace them with cues aiming to increase positive feelings, provide useful directions and regulate emotions. For the remaining four weeks, swimmers identified and combined the most helpful instructional and motivational self-talk cues previously practiced and were subsequently guided to create their own pre-competition and during-race self-talk plans. During this period particular emphasis was placed on self-talk cues for regulating mood and anxiety in order to use them before the upcoming competition. These plans were consistently practiced in training up to the days of the final assessment competition. Throughout the intervention period, participants were asked after the completion of each training session, to report how frequently they were using the strategic self-talk cues during the session.

*Control group:* Swimmers of the control group followed their usual training program. They were informed that training attendance and their performance in the final assessment competition would be recorded and were told

that it would be important to attend all the scheduled training sessions. After the completion of the study, swimmers of the control group were debriefed and offered to attend the strategic self-talk intervention program.

***Measures***

*Competition importance:* A short scale was devised to assess the degree to which the two competitions were personally important for participants. This included two items asking how important and how crucial the competition was for them. Responses were given on a 10-point scale from 1 (not at all) to 10 (very much).

*Pre-competition anxiety and confidence:* The Greek version of the Competitive State Anxiety Inventory-2 revised (CSAI-2R; Kakkos & Zervas, 1996) was used to assess pre-competition anxiety and self-confidence. The questionnaire comprises 15 items assessing the intensity of cognitive anxiety (e.g., "I am concerned about performing poorly"), somatic anxiety (e.g., "My body feels tense") and self-confidence (e.g., "I am confident of coming through under pressure"). Responses were given on a four-point Likert scale from 0 (not at all) to 3 (very much so). Cronbach's alphas for the pre-intervention competition ranged from .74 to .85, and for the post-intervention competition ranged from .60 to .88.

*Self-talk manipulation check:* The use of self-talk strategies was examined in training and competition through a standard manipulation check (Hatzigeorgiadis et al., 2014). Specifically, the participants of the experimental group were asked to indicate on a 10-point scale how frequently they use the instructed cues (1 = not at all, 10 = all the time) after each training session, while after the competitions, they were asked (a) to indicate on a 10-point scale the degree to which they used the cue they selected (1 = not at all, 10 = all the time), (b) to report whether they used any other cue, (c) if so, what this cue was, and (d) if so, the degree to which they used this other cue (1 = not at all, 10 = all the time). The participants of the control group were asked (a) to indicate whether they purposely used with consistency any form of self-talk during the competition, (b) if so, what was that, and (c) if so, to what degree (1 = not at all, 10 = all the time).

## Results

***Manipulation checks***

*Competition importance:* A two-way (2×2) ANOVA with one repeated factor (time) and one independent factor (group) was performed to test for differences between the pre- and post-competition in perceived competition importance for the two groups. The analysis revealed a non-significant main effect for time, Pillai's Trace= .02, $F(1, 36)= 0.73$, $p= .39$, $\eta^2= .02$, and a non-significant group by time interaction, Pillai's Trace= .06, $F(1, 36)= 2.33$, $p= .13$, $\eta^2= .06$. The descriptive statistics for the importance measures in the two competitions are presented in Table 1.

*Baseline differences:* A one-way MANOVA was performed to examine for differences between the two groups in anxiety and confidence for the baseline competition. The analysis revealed a non-significant multivariate main effect for group, $F(3, 34)= 1.11$, $p= .35$, $\eta^2= .08$. The descriptive statistics for the baseline differences are presented in Table 1.

*Use of self-talk in training and competition:* The mean score for the use of self-talk in training was 5.69 ($SD= 1.50$) and for competition was 7.92 ($SD= 0.91$), suggesting that athletes made adequate use of the self-talk cues. For the competition, seven of the swimmers in the experimental group reported relatively inconsistent (<7 out of 10) use of self-talk and three swimmers in the control group reported a consistent (≥7 out of 10) use of self-talk. In order to ensure the integrity of the study, seven swimmers from the experimental group and the three swimmers from the control group were excluded from the subsequent analyses.

**Table 1.** Descriptive statistics for the pre-competition variables for the two groups.

| | Experimental group | | | | Control group | | | |
|---|---|---|---|---|---|---|---|---|
| | Competition 1 | | Competition 2 | | Competition 1 | | Competition 2 | |
| | M | SD | M | SD | M | SD | M | SD |
| Competition importance | 5.67 | 1.90 | 5.88 | 1.51 | 6.50 | 1.73 | 5.75 | 1.27 |
| Cognitive anxiety | 1.46 | 0.60 | 1.18 | 0.43 | 1.08 | 0.57 | 1.26 | 0.39 |
| Somatic anxiety | 1.02 | 0.62 | 0.77 | 0.52 | 0.85 | 0.66 | 0.70 | 0.54 |
| Self-confidence | 1.56 | 0.56 | 1.46 | 0.57 | 1.65 | 0.47 | 1.86 | 0.64 |

***Main analysis***

A two-way (2×2) MANOVA with one repeated factor (time) and one independent factor (group) was performed to examine for differences in cognitive anxiety, somatic anxiety, and self-confidence between pre- and post-competition for the two groups. The analysis revealed a non-significant multivariate main effect for time, $F(3, 34)= 1.82$, $p= .16$, $\eta^2= .13$, and a significant multivariate group by time interaction, $F(3, 34)= 3.00$, $p< .05$, $\eta^2= .21$. Examination of the univariate statistics revealed significant time by group interaction for cognitive anxiety, $F(1, 36)= 7.14$, $p< .05$, $\eta^2= .16$, and self-confidence, $F(1, 36)= 4.96$, $p<.05$ , $\eta^2= .12$, and a non-significant time by group interaction for somatic anxiety, $F(1, 36)= 0.33$, $p= .56$, $\eta^2= .009$. Pairwise comparisons revealed that in the final assessment participants of the intervention group compared to the baseline assessment reduced cognitive anxiety ($p< .01$), somatic anxiety ($p< .01$), and self-confidence ($p< .05$), whereas no changes were revealed for the control group ($p= .20$, $p= .28$, and $p= .31$, for cognitive anxiety, somatic anxiety and self-confidence, respectively). The descriptive statistics for pre-competition anxiety and self-confidence in the two competitions are presented in Table 1, whereas the changes of the two groups across competitions are displayed in Figure 1.

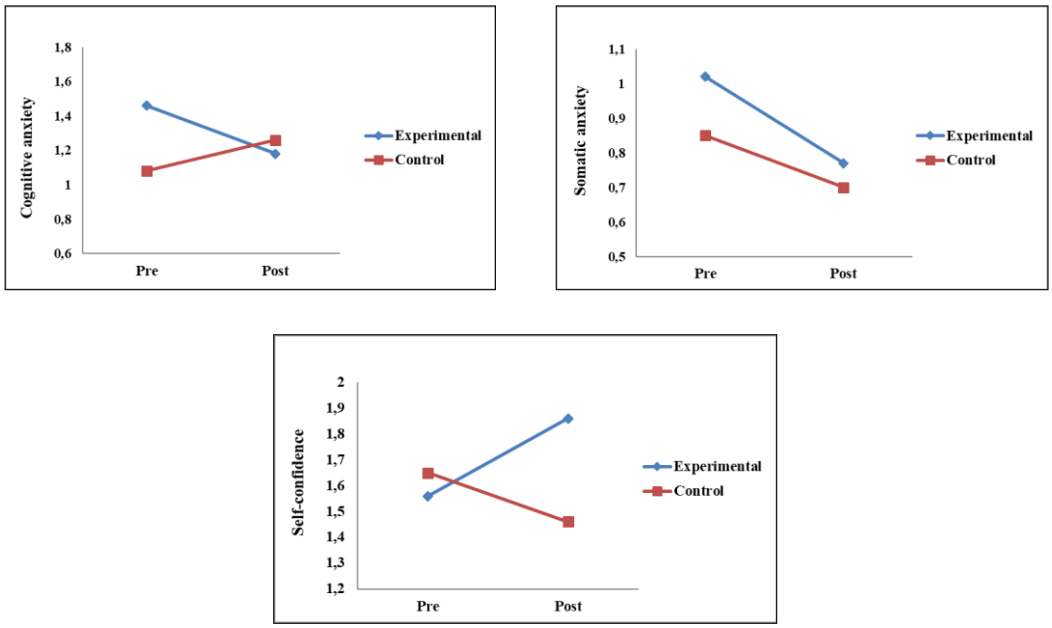


**Figure 1.** Changes in anxiety and confidence for the two groups across competitions.

## Discussion

In the sport literature, strategic self-talk has been recognized as an effective tool for enhancing sport performance both in laboratory (e.g., Tzormpatzakis et al., 2022) and field (e.g., competition, Hatzigeorgiadis et al., 2014) settings. Although the effect of strategic self-talk on anxiety is regarded as a potential mechanism for its effect on sport performance (Galanis et al., 2016; Hardy et al., 2009), and preliminary studies have provided supportive evidence, the effectiveness of strategic self-talk for regulating pre-competition anxiety in a real competitive environment has not been tested. Accordingly, the purpose of this study was to examine the effects of strategic self-talk on anxiety and self-confidence among young swimmers in the unpredictable competitive environment. Overall, it was found that the strategic self-talk intervention was effective in reducing swimmer's cognitive and somatic anxiety and increasing self-confidence prior to the competition.

In accordance with the limited previous findings, the use of strategic self-talk helped athletes to regulate their emotions. Hatzigeorgiadis et al. (2009) in a study with competitive young tennis players implemented a three-day motivational self-talk program in order to examine changes in anxiety (cognitive and somatic), self-confidence, and tennis stroke performance under anxiety inducing evaluative conditions in a field experiment. The results showed that for the experimental group the cognitive anxiety decreased and the self-confidence increased, whereas for the control group the cognitive anxiety increased and the self-confidence remained unchanged.

The results of the present study are in line with the above findings regarding the effects of strategic self-talk

have on anxiety and self-confidence, but provided in addition positive effects with regard to somatic anxiety. The present study is innovative as it is to our knowledge the first to examine the effects of a long-term strategic self-talk intervention program on anxiety and self-confidence in competitive settings. Thus, the study adds valuable ecologically valid evidence regarding the anxiety regulating potential of strategic self-talk in the complex and unpredictable competitive environment.

Even though swimming performance was not assessed in this study, it could be speculated that anxiety and self-confidence may be a viable mechanism explaining the facilitating effects of self-talk on sport performance. Self-talk research on the potential mechanisms that may explain the relationship between self-talk and performance, is valuable to enhance our understanding of the self-talk phenomenon and allow us to develop individually tailored self-talk strategies to address the competitive situation and the needs of the athletes (Hardy, 2006; Hatzigeorgiadis, et al., 2007). Focusing on motivational and affective mechanisms, it can be argued that self-talk can influence emotions in general, and help regulate anxiety in particular (Bernard et al., 2006). Specifically, studies assessing strategic self-talk interventions have shown that the planned use of self-talk cues can decrease anxiety, but also increase self-confidence and self-efficacy (Hatzigeorgiadis et al., 2007, 2009; Walter et al., 2019). The above findings indicating strategic self-talk as a regulatory strategy for anxiety and self-confidence levels that athletes experience during the achievement, both in controlled experiment settings (e.g., Hatzigeorgiadis et al., 2009) and in real competitive environment considering the results of the present study.

The requirements that athletes have to deal with in training and competitions are totally different both physically and psychologically. Competitive settings differ from training settings in a number of characteristics, such as the environment, the coaching behavior, the opponents, the presence of spectators, the importance to achieve high performance, and subsequently, the cognitive and emotional charges. According to Martin et al. (2005), studies conducted in non-competitive settings can only provide initial guidance for strategies in order to increase sport performance, while these results cannot be considered to be transferable to the competitive settings. The present study, in an attempt to counter the above limitation of the experimental studies, provides evidence for the effectiveness of the strategic self-talk in regulating anxiety and self-confidence in competitive settings, thus increasing the external validity of previous experimental research.

To ensure the integrity of the experimental conditions, several manipulation checks were considered. The study showed that the swimmers of the experimental group made adequate use of the strategic self-talk in both training and competition, and this is something that can be attributed to the extended period of practice. In addition, no systematic use of the self-talk strategy was reported by the swimmers of the control group. Finally, it was found that there were no significant differences in the significance of the two competitions for the two groups. These measures enhance our confidence in the results, despite the relative lack of methodological control over environment that characterizes field intervention studies within realistic competitive settings.

***Future research***

The lack of research in the unpredictable competitive environment creates the need for further research in such settings, in both individual and team sports, to further confirm the present findings. Also, despite the difficulties that arise from designs in realistic settings, the need for research with larger samples as well as longer intervention programs should be identifies. In addition, conducting strategic self-talk research exploring in parallel effects on motivational/affective parameters (e.g., anxiety and self-confidence) and sport performance, would be important to further support the assumptions regarding self-talk mechanisms. Finally, in light of the present findings, further research of the effects of strategic self-talk have on motivational/affective mechanisms, could be important to take into consideration personal and situational moderators.

**Significance for Sport**

The study of the self-talk mechanisms is a very exciting field of research. Understanding the mechanisms will contribute to the development of effective interventions, considering personal and environmental factors. From an applied perspective, the results of the present study encouraging coaches and sport psychology consultants to develop strategic self-talk plans in order to regulate athletes' negative emotional charges during competitions. Overall, the present study attempted to extent research regarding the emotional regulation effects of strategic self-talk in the complex environment of competition.

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