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INSTRUCTIONAL AND MOTIVATIONAL SELF-TALK: AN INVESTIGATION ON PERCEIVED SELF-TALK FUNCTIONS

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Abstract: The aim of the study was to investigate perceived functions of self-talk. Twenty six physical education students participated in an intervention study using an experimental task in swimming. The study lasted five consecutive days. On the first day participants were tested on a breaststroke leg drill. For the three following days participants practiced the use of different types of self-talk on breaststroke arm drills. On the last day participants repeated the test of the first day, using instructional and motivational self-talk, and reported their perceptions regarding the functions of self-talk. The results revealed that according to participants' perceptions both types of self-talk helped them mainly to improve their attention to the task. Furthermore, participants reported that the motivational self-talk cue had greater impact on effort, than the instructional self-talk cue, whereas effects on attention, confidence, anxiety control, and automaticity were similar when using instructional and motivational cues. The results suggest that the effectiveness of self-talk is attributed mainly to its attention function, at least in the case of novel tasks. Furthermore, preliminary evidence suggests that different types of self-talk serve different functions depending on the content of the self-talk cues.

Key words: Instructional self-talk, Motivational self-talk, Self-talk functions.

In the sport psychology literature research on self-talk (ST) has justifiably focused on the effects of ST on performance. Studies employing various research designs and tasks have thoroughly supported that ST can be an effective cognitive strategy for performance enhancement. In particular, the effectiveness of ST has been supported in studies using experimental tasks (e.g., Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004; Theodorakis, Weinberg, Natsis, Douma, & Kazakas, 2000), intervention studies (e.g.,

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Johnson, Hrycaiko, Johnson, & Hallas, 2004; Perkos, Theodorakis, & Chroni, 2002), and studies employing single-subject multiple-baseline designs (e.g., Landin & Hebert, 1999; Thellwell & Maynard, 2003). Furthermore, the use of ST has been found to have positive effects on performance on tasks involving golf (Johnson-O'Connor & Kirschenbaum, 1982), endurance (Weinberg, Smith, Jackson, & Gould, 1984), basketball (Hamilton & Fremour, 1985), skiing (Rushall, Hall, Roux, Sasseville, & Rushall, 1988), and dart throwing (Dagrou, Gauvin, & Halliwell, 1992; Van Raalte et al., 1995).

Van Raalte et al. (1994) argued that the use of ST may be more influential to learning new skills usually employed in experimental studies than to performance of well learned tasks, such as in field studies. Nevertheless, evidence exists suggesting that the use of ST can facilitate performance of skilled athletes, if they are carefully designed, implemented, practiced, and evaluated (e.g. Johnson et al., 2004; Landid & Hebert, 1999; Mallett & Hanrahan, 1997; Thelwell & Maynard, 2003).

Summarising the above research it becomes evident that ST can be an effective cognitive strategy for performance enhancement. Nevertheless, there is a dearth of research regarding the likely functions through which ST affects performance. Towards the development of effective ST plans it is important to identify why ST is effective and what are the functions underlying its effectiveness. Identifying the ways ST functions could facilitate the development of effective ST plans.

Results from studies comparing different types of ST in different tasks point out the need to explore the functions of ST. Theodorakis et al. (2000) argued that the effectiveness of ST depends on the nature of the performed task. Instructional ST should be more beneficial for tasks characterized by precision because the execution of such skills can be aided through increased attention focus on technical parts of the execution. In contrast, motivational ST should be more beneficial for tasks characterized by strength and endurance, because execution of such skills can be aided through increased effort. They subsequently investigated the effectiveness of instructional and motivational ST in four experimental tasks. In two of the tasks –a passing accuracy test in soccer and a serving accuracy test in badminton– instructional ST had a positive effect on performance, whereas motivational ST did not have an effect on performance. In the other two tasks, a sit-up endurance test and a knee extension power test, both types of ST facilitated performance.

In a similar study Hatzigeorgiadis et al. (2004) examined the effectiveness

of instructional and motivational ST in two experimental water-polo tasks. In a precision task both instructional and motivational ST were effective, with the instructional ST being more effective, whereas in a power task only the motivational ST was effective. Based on the above findings Hatzigeorgiadis et al. (2004) suggested that «the relative significance of the task-element highlighted by ST to performance is crucial in determining how effective the use of ST can be for each task» (p. 148).

Considering the results from studies examining the effectiveness of ST it could be argued that ST might serve different functions depending on the content of ST cues and the characteristics of the task. Several explanations have been proposed regarding the mechanisms through which ST functions. Landin (1994) maintained that the effectiveness of ST could be attributed to its effects on attention, indicating that ST can be used to enhance attention focus and direct or redirect attention to task relevant cues. Zinsser, Bunker, and Williams (2001) suggested that ST is serving to regulate effort and enhance confidence, whereas Hardy, Jones, and Gould (1996) speculated in addition that ST could also be effective in controlling anxiety and triggering appropriate action.

Preliminary evidence regarding the functions of ST have emerged from studies investigating the effectiveness of ST. Van Raalte et al. (1994) examined observable and self-reported ST in junior tennis players and categorized ST in higher order themes. With regard to positive ST they identified three broad functions; self-motivation, calming, and strategy use. With regard to negative ST they identified a general negative/frustration function, a fear of failure, and a negatively expressed self-instruction function. Even though this particular study was limited to a relatively small sample of tennis players, Van Raalte et al. (1994) provided useful evidence for the exploration of ST functions.

In a study using a single-subject multiple baseline design Landin and Hebert (1999) examined the effectiveness of ST in skilled female tennis players. After the implementation of an intervention programme participants reported that the use of ST increased their confidence and helped them direct their attention efficiently. Similar results using single-subject multiple baseline designs were reported by Johnson et al. (2004) in a study with young female soccer players, and Thelwell and Greenlees (2003) in a study with male triathletes. Perkos et al. (2002) examined the effectiveness of a ST intervention programme in novice basketball players. After the conclusion of

the intervention participants reported that ST helped them increase their confidence, enhance concentration and control anxiety. Finally, Hatzigeorgiadis et al. (2004) in one of the few studies aiming to explore the attentional function of ST reported that the use of ST in an experimental water-polo task reduced the occurrence of interfering thoughts, thus enhancing concentration to the task at hand.

Hardy, Gammage, and Hall (2001) in a qualitative study examined the reasons why the athletes use ST. Raw data themes were organized into cognitive and motivational dimensions. The cognitive dimension included higher order cognitive specific and cognitive general categories, whereas the motivational dimension included higher order motivational mastery, motivational arousal and motivational drive functions. Both dimensions included process, but also outcome functions, however these functions were not discriminated. Outcome functions included skill development, strategy improvement and performance enhancement, whereas process functions referred to enhancing focus, regulating arousal, maximizing effort, building confidence, and increasing mental readiness.

In an attempt to further the understanding of the mechanisms underlying the effectiveness of ST, Theodorakis, Hatzigeorgiadis, and Chroni (2005) developed an instrument for the assessment of ST functions according to individuals' perceptions. Based on theoretical propositions, empirical evidence and raw data, five dimensions of ST functions were identified. Accordingly it was suggested that ST could be used to increase confidence, trigger automatic execution, control anxiety levels, enhance attention focus, and regulate effort. Confirmatory factor analysis supported the factor structure of the questionnaire and provided evidence for the psychometric properties of the instrument. Furthermore, preliminary analyses indicated that athletes reported using ST mainly to enhance concentration and regulate effort.

In a subsequent study Hatzigeorgiadis, Zourbanos, and Theodorakis (in press) examined the ST functions. Participants were tested on a water-polo precision task. After a three-day program during which participants practiced ST on swimming drills, they were tested again on the experimental task, using attention and anxiety control ST cues. Participants' performance improved considerably. The results revealed that ST mostly helped participants to improve their attention on the task. In addition, participants reported that the use of ST had an impact on effort, anxiety control, confidence, and automatic

execution. Furthermore, it was revealed that the anxiety control ST cue had greater impact on anxiety control, than the attention ST cue, whereas effects for attention, effort, confidence, and automaticity were similar when using attention and anxiety control cues. Hatzigeorgiadis et al. (in press) argued that the effectiveness of ST for the employed task could be mostly attributed to attention effects. Moreover, they speculated that the use of different types of ST might serve different functions depending on the content of the employed cues.

The aim of the present study was to extend the Hatzigeorgiadis et al.'s (in press) preliminary findings and further explore whether the type of ST moderates the participants' perceptions regarding the functions of ST in an experimental swimming task. Two different types of ST were selected, one involving an instructional ST cue and one involving a motivational ST cue. The study examined differences between perceived ST functions for each ST cue, and differences in function between the two ST cues that were used. In particular, differences in perceived ST functions when using instructional ST, differences in perceived ST functions when using motivational ST, and differences in perceived ST functions when comparing instructional and motivational ST were examined.

METHOD

Participants

Twenty six female swimming-class students of physical education and sport sciences volunteered to participate in the study. Their mean age was 19.84 years (SD = .78). Participants at the time of the study had been taking swimming classes twice a week for a period of five months. None of the participants had prior experience in the use of structured ST strategies.

Instrument

To assess the ST functions the Functions of Self-Talk Questionnaire (FSTQ; Theodorakis et al., 2005) was administered. The instrument consists of 25 items assessing five ST functions: (a) Confidence (e.g., "The use of this self-talk cue made me feel more confident on my abilities"). (b) Automaticity

(e.g., "The use of this self-talk cue made me execute automatically"). (c) Effort (e.g., "The use of this self-talk cue made me try harder"). (d) Anxiety control, (e.g., "The use of this self-talk cue made me feel more relaxed"). (e) Attention (e.g., "The use of this self-talk cue made me concentrate on what I had to do"). Participants were asked to respond on a 7-point scale (1 = not at all, 7 = very much). Preliminary evidence has provided support for the psychometric integrity of the instrument. Confirmatory factor analysis supported the hypothesized 5-factor solution (Non-Normed Fit Index = .94; Comparative Fit Index = .95; Incremental Fit Index = .95; Standardized Root Mean Squared Residual = .04; Root Mean Square Error of Approximation = .05). Furthermore, Theodorakis et al. (2005) provided evidence of concurrent validity, and reported satisfactory internal consistency (Cronbach's alphas ranging from .76 to .87). Cronbach's alpha coefficients for this study ranged from .87 to .96 (Table 1).

Table 1. FSTQ mean scores (and standard deviations) for the instructional and motivational ST cues

	Instructional ST		Motivational ST			
	alpha	*M* (*SD*)	alpha	*M* (*SD*)	*F* (1, 25)	η^2
Confidence	.96	5.11 (1.47)	.88	5.22 (1.26)	.40	.02
Automaticity	.95	4.08 (1.48)	.92	4.22 (1.48)	.20	.01
Effort	.91	5.58 (1.13)	.92	5.86 (.97)	4.94*	.17
Anxiety control	.89	4.47 (1.46)	.87	4.45 (1.37)	.02	.01
Attention	.92	5.95 (1.08)	.87	6.05 (.93)	.35	.01

Note: $^*p < .05$.

Tasks - Procedure

Tasks. Two tasks were employed for the experimental procedures. The first task, which was used for the initial and the final testing, involved a leg-kicking drill. For each execution participants were asked to cover a swimming pool length (25m) using the breaststroke leg technique. To isolate the movement of the legs kickboards were used. The second task, which was used for the practice sessions, involved an arm-pulling drill. For each execution participants were asked to cover a swimming pool length using the breaststroke arm technique. To isolate the movement of the arms pull buoys were used.

Initial testing (Day 1). The first day, on arrival at the swimming pool for the initial testing participants were briefed about the experiment. Participants were informed that the experiment will last five consecutive

days and were ensured that they could withdraw without penalty if they were unable to assign the amount of time necessary. They were also informed that at the end of the experiment, class credit would be given. Informed consent and demographic variables were obtained from participants before the beginning of the experimental procedures. Subsequently, they were asked to get ready to perform the initial test and they were allowed ten minutes to warm up in the swimming pool. After the warm-up they were given instructions regarding the technique of the drill, and a research assistant demonstrated the execution. Participants performed a familiarization trial and two sets of two trials, which were timed. Five minutes of rest were allowed between each set. At the end of the session the next day meeting was arranged. The procedure involved four or five participants per session, however each participant was timed individually, and the whole procedure for each group lasted approximately 60 minutes.

Intervention (Days 2-4). The three days that followed constituted the intervention phase. The purpose of the intervention was to practice ST, without practicing the leg task performed on the first day. On arrival at the pool on the second day, students were informed that the study involved the investigation of a cognitive strategy, namely, ST use. A brief presentation of ST was subsequently given and participants were informed that they were going to practice breaststroke arm-drills using ST. For the following three days participants performed ten 25-meter repeats on arm-pulling drills, using various ST cues. The cues involved instructional ST (e.g., stretch, relaxed), and motivational ST (e.g., go, I can). Half of the lengths were performed using instructional ST and the other half using motivational ST cues. All participants used the same ST cues during the practice sessions. Participants were instructed to repeat the selected cues before or during each movement, depending on the content of the cue (breaststroke is particularly convenient for that purpose because of the cyclic nature of the movements). Before the execution of each repeat an assistant was demonstrating the execution. Due to the nature of the task and the environmental conditions participants used internal (quiet) ST. At the end of each length participants were asked to report on a 10-point scale how frequently they were using the ST cue during the execution. Each intervention session was applied to groups of four or five participants, who were executing successively, and lasted approximately 50 minutes.

Experimental testing (Day 5). The final testing took place on the fifth day of the experiment. On arrival at the swimming pool participants were

informed that they were going to repeat the procedures of the first day, only this time they were going to apply the ST strategy, which they had practiced during the previous days. One instructional and one motivational ST cue were used for each of the two sets. Participants were allowed to choose one of the instructional and one of the motivational ST cues that were used during the practice sessions (the one they thought would be most helpful). Participants were instructed to use the indicated ST cue just before each movement-cycle, and an assistant demonstrated the execution. To overcome ordering effects (learning and tiredness), half of the participants used the instructional ST for the first set, whereas the other half used the motivational ST for the first set. After the completion of each length, participants were asked to report on a 7-point scale the degree to which they had used the selected ST cue during the execution of the drill. After the completion of the first set, participants completed the FSTQ with regard to the selected ST cue. Subsequently, they performed the second set and completed again the FSTQ with regard to the selected cue. The procedure involved four or five participants per session, however each participant was timed individually, and the whole procedure for each group lasted approximately 60 minutes.

RESULTS

Descriptive statistics and reliability coefficients for the FSTQ scores are presented in Table 1. To check the degree to which they had used the selected ST cues participants were asked to respond on a 7-point scale. The results indicated that the ST cues were sufficiently used during the execution of the task (M = 5.95 and 6.12 for instructional and motivational ST cues, respectively; range from 4.00 to 7.00 for both instructional and motivational ST).

Differences in functions within each ST cue. To test for differences in ST functions *within* each ST cue, two one-way repeated measures ANOVAs (5 functions) were used, one for each of the two types of ST.

For the instructional ST cue the results revealed a significant multivariate effect, $F(4, 22) = 12.87, p < .01, \eta^2 = .70$. Post-hoc contrasts indicated that scores on the attention function were significantly higher than those on effort, $F(1, 25) = 4.80, p < .05, \eta^2 = .16$, which were significantly higher than those in confidence, $F(1, 25) = 8.06, p < .01, \eta^2 = .24$, which

were significantly higher than those on anxiety control, $F(1, 25) = 9.76, p < .01, \eta^2 = .28$, and automaticity, $F(1, 25) = 12.67, p < .01, \eta^2 = .34$.

For the motivational ST cue the results revealed a significant multivariate effect, $F(4, 22) = 12.87, p < .01, \eta^2 = .70$. Post-hoc contrasts indicated that scores on attention and effort were significantly higher than those on confidence, $F(1, 25) = 12.95, p < .01, \eta^2 = .34$ and $F(1, 25) = 21.16, p < .01, \eta^2 = .46$, which were significantly higher than those on anxiety control, $F(1, 25) = 8.17, p < .01, \eta^2 = .25$, and automaticity, $F(1, 25) = 12.74, p < .01, \eta^2 = .34$.

Differences in functions between the two ST cues. To test for differences in ST functions between the two ST cues, a one-way repeated measures MANOVA was performed. The analysis revealed a nonsignificant multivariate effect, $F(5, 21) = .93, p = .48, \eta^2 = .18$. Nevertheless, examination of the univariate effects revealed that significant differences existed for the effort function, $F(1, 25) = 4.94, p < .05, \eta^2 = .17$. In particular, participants scored higher on the effort function when using the motivational ST cue than when using the instructional ST cue. Nonsignificant differences were found for attention, $F(1, 25) = .35, p = .56, \eta^2 = .01$, confidence, $F(1, 25) = .40, p = .40, \eta^2 = .02$, anxiety control, $F(1, 25) = .02, p = .89, \eta^2 = .01$, and automaticity, $F(1, 25) = .20, p = .66, \eta^2 = .01$. Despite the lack of multivariate effect the difference identified in the effort function was of considerable size and important in relation to the design of the study, and was therefore considered meaningful, yet cautious, for interpretation.

DISCUSSION

The purpose of the present study was to explore the perceived functions of instructional and motivational ST in an experimental swimming task. After receiving training on the use of ST, participants were asked to assess the functions of instructional and motivational ST. Overall, the results indicated that according to participants' perceptions the primary facilitative function of the selected types of ST for the particular task was the enhancement of concentration. Furthermore, it was revealed that motivational ST had a higher effect on effort than instructional ST did.

The instructional ST cue had the highest impact on the perception of the attention function, followed by the effort function, the confidence function, and the anxiety control and automaticity functions. Considering that the

instructional ST cue was meant to increase concentration the results were in the expected direction. The motivational ST cue had similar impact on the perception of attention and effort functions, followed by the confidence function, and the anxiety control and automaticity functions. The patterns for the two ST cues were similar, with an exception for the attention and effort functions. The differences in this pattern between the two ST cues is attributed to the fact that for the motivational ST cue the impact of the effort function increased, whereas the impact of the attention function remained stable.

In the ST literature it has been suggested that instructional ST is the most appropriate type of ST when the goal is to enhance attention focus, whereas motivational ST is the most appropriate type of ST when the goal is to enhance drive (Zinsser et al., 2001). Nevertheless, the results of the present study showed that according to participants' perceptions instructional and motivational ST had similar impact on their concentration. Similar findings have been reported by Hatzigeorgiadis et al. (2004, in press). In particular, Hatzigeorgiadis et al. (2004) examined the attentional function of ST in an experimental study involving two water-polo tasks. Participants were assigned into instructional and motivational ST conditions and were tested on a precision and on a power task. The results revealed that in both tasks the use of instructional and motivational ST deteriorated the occurrence of interfering thoughts, thus enhancing concentration to the task. Hatzigeorgiadis et al. (in press) conducted a study similar to the present one. They examined the functions of ST in a study involving an experimental water-polo precision task. Participants received training similar to the one of the present study and were tested using an attention ST cue and an anxiety control ST cue. The results revealed that both cues had similar effects on concentration. The results of the above studies suggest that the enhancement of attention focus is the primary mechanism explaining the effectiveness of ST, at least in novel tasks, and this was supported through participants' perceptions in the present study.

The assumption that different types of ST may serve different functions was, however, supported by the results regarding effort increase. In particular, participants reported that the motivational ST cue had a greater impact on effort than the instructional ST cue. Considering that the motivational ST cue was employed to enhance drive, this finding seems to support the specificity of ST functions in relation to the content of the selected cues. Furthermore, participants reported that instructional and

motivational ST had similar impact on confidence, automaticity, and anxiety control. Considering that the selected ST cues were not employed to address these functions, these findings seem to provide further support regarding the specificity of ST.

Overall, the present study suggests that according to participants' perceptions ST can be used effectively to enhance concentration, but can also serve different functions depending on the content of the selected cue. The results regarding the attention function provide support for Landin's (1994) propositions, which underlined the effectiveness of ST on regulating attention processes. In addition, the differential effects that emerged between the two ST types for the effort function give preliminary evidence that the effects of ST depend on the content of the specific cues that are selected (Theodorakis et al., 2005).

ST has been documented in the literature as an effective cognitive strategy. Nevertheless, results from studies examining the effectiveness of different types of ST, in combination with the results of the present study examining individuals' perceptions regarding the ST functions, indicate that the development of effective ST plans depends on careful consideration of the requirements of the task and the needs of the person. Considering that the present study is among the first to examine perceived functions of ST, the results provide valuable preliminary information. Further studies are required to test other types of ST cues and the way they actually function. Towards this direction, it would be particularly interesting to examine ST functions when different cues, such as cues referring to confidence, effort, and automatic execution, and task with varying performance requirements are employed.

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