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Self-talk effectiveness and attention

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Self-talk interventions in sport have been receiving increased research attention in recent years. The findings have provided robust support that self-talk strategies enhance sport performance. Identifying the mechanisms that explain the beneficial effects of self-talk is important for developing a comprehensive self-talk theory and informing practice. Among the mechanisms proposed to explaining the effectiveness of self-talk, is its attentional effects. This article reviews the literature considering the effects of self-talk on attention. The findings suggest that self-talk can help enhancing attentional focus and attentional performance, but also help countering the aversive effects of distraction and ego depletion. The present evidence suggests that attention is a potential key mechanism in the self-talk performance relationship.

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In recent years self-talk has been receiving increased attention in the sport psychology literature and the research developments have provided exciting prospects for the study of the relationships between cognition and behavior in sport. These developments are evident in a plethora of book chapters (e.g. [1••,2••]) and articles presenting systematic reviews (e.g. [3••]) and introducing conceptual advances (e.g. [4,5•]). In the most cited definition, Hardy [6] defined self-talk as '(a) verbalizations or statements addressed to the self; (b) multidimensional in nature; (c) having interpretive elements associated with the content of statements employed; (d) being somewhat dynamic; and (e) serving at least two functions; instructional and motivational, for the athlete' (p. 84). In the sport self-talk literature a distinction between two research perspectives has been made, namely automatic and strategic self-talk [2]. On the one hand, automatic self-talk is described as phrases of cue words athletes address to themselves, which can vary on continuums from less to more conscious, and from less to more intentional [4]. Such automatic self-talk can be (a) goal-directed and rational, that is, statements reactive or proactive in nature, employed for solving problems or making progress on a task, or (b) spontaneous and intuitive, that is, unintended, non-instrumental statements that come unbidden and effortlessly. On the other hand, strategic self-talk refers to cues or statements that are used based on a pre-determined plan serving specific performance purposes. Strategic self-talk involves the use of cue words aimed at enhancing performance through the activation of appropriate responses. The principle underlying the use of cues is that athletes provide to themselves instructions for action, and subsequently execute the appropriate action by simply following the self-instruction (instructional self-talk), or reinforce themselves to achieve a desired outcome (motivational self-talk) [7].

Given the focus of sport on performance and subsequently the demand for performance enhancing strategies, the direct applied value of strategic self-talk becomes apparent. Accordingly, self-talk research in sport has predominantly focused on the investigation of strategic self-talk through self-talk interventions as a means to investigate the effectiveness of self-talk for improving performance. Overall, the results have provided robust support for the effectiveness of self-talk strategies for improving performance on fundamental motor drills (e.g. vertical jump) [8], performance on isolated components of sport (e.g. tennis volleying) [9], sport performance in non-competitive context (e.g. cross-country running) [10], and competitive sport performance (e.g. swimming at competition) [7]. The effectiveness of self-talk on performance has been more emphatically supported through a systematic review [11] and a meta-analysis [3••]. The meta-analysis showed a moderate positive effect size (d = .48); furthermore, the examination for possible moderators showed that self-talk was more effective in fine motor tasks and novel tasks compared to gross motor tasks and learned tasks, as well as in interventions including self-talk training compared to interventions where participants were asked to use self-talk without prior practice.

Overall, the literature has provided strong support for the beneficial effects of self-talk on performance; however, the variety of effects in different settings and populations has forwarded three matching hypotheses, reflecting individual characteristics, contextual and situational parameters that should be considered for developing effective self-talk strategies. In particular, it has been suggested that for self-talk strategies to be more effective one

should consider first, the type of task, with instructional self-talk considered more effective for fine motor tasks, and motivational self-talk for gross motor tasks [12]; second, the skill level or learning stage of the athletes, with instructional self-talk considered more effective at the early learning stages and for beginners, and motivational self-talk for mastered performance and experts [13]; and finally the performance setting, with instructional self-talk considered more effective for training sessions, and motivational self-talk for competitive settings [14]. The identified moderators and the different matching hypotheses that have been suggested highlighted the need to comprehend the mechanisms underlying the effectiveness of self-talk. Understanding the mechanisms of self-talk is significant because it will help developing theory, but also improving interventions to match situational demands and individual needs.

The instrumental use of self-statements to change behavior has been central to the development of cognitive behavior modification used in clinical psychology. Meichenbaum [15] identified the important role of self-instructional training for treating cognitive disorders and regarded self-statements as indices of individuals' beliefs. According to his framework statements addressed to oneself can influence individuals' attentional and appraisal processes, thus regulating behavioral performance. Furthermore, he proposed that self-instructions can direct individuals' attention to task-relevant stimuli, maintain useful information in short-term memory, and protect individuals from experiencing disturbing thoughts. Meichenbaum's approach makes explicit reference to the attention-related outcomes as mediators between self-talk and behavior. The developments in self-talk research in sport led Hardy and colleagues [1••] to suggest a conceptual model describing four types of mechanisms that may explain the effects of self-talk on performance, among which cognitive mechanisms referring to aspects such as information processing, concentration, attentional control, and attentional style.

Even though research focusing on self-talk mechanisms is still sparse, there is reasonable evidence suggesting that the effects of self-talk on attention are (partly) responsible for the effectiveness of self-talk strategies. Preliminary evidence regarding the attentional effects of self-talk has been offered by athletes following self-talk interventions, in which they acknowledged that self-talk strategies helped them to improve their concentration and to direct their attention efficiently [16–18]. Further testimonials regarding the beneficial effects of self-talk on attention have been reported in qualitative studies [19,20] and in case studies [21]. Finally, studies focusing more directly on the attentional effects of self-talk have provided more substantial evidence. This evidence is described below and can be categorized in two different, yet strongly related, types: first, findings supporting that self-talk can enhance attentional focus and improve attentional performance, and second, findings supporting that self-talk can help countering the aversive effects of distraction and ego depletion.

Attentional focus and attentional performance

Self-talk enhances attentional focus

In considering Nideffer's [22] model of attention style, Hardy and colleagues [1••] argued that self-talk strategies can help to improve the focus of attention required to perform a specific skill. Furthermore, considering the dynamic nature of sport and the sport environment, where different attentional styles may be required, Hardy and colleagues suggested that self-talk can also help shifting attentional focus. In one of the early self-talk studies, the effectiveness of a four-step self-talk strategy on tennis groundstrokes was tested, with each step reflecting a part of a movement requiring a different attentional style, ranging from narrow external to broad internal [23]. Similarly, in a study with sprinters a 100 m race was split into segments, and a race plan using self-talk cues to direct attention to appropriate stimuli depending on the segment of the race was developed [24]. In both studies the use of self-talk strategies facilitated performance. The above findings supported the effectiveness of the self-talk strategy, and at the same time provided indirect support, based on behavioral evidence, for the hypothesis that self-talk helped shifting attention; yet without actually assessing focus of attention.

In a study considering attentional focus in addition to performance [25•] the effects of a self-talk strategy in skilled golfers were examined. Three different attention foci were induced through respective self-talk cues, reflecting an internal, proximal external and distal external focus. The results revealed better performance for the distal external focus self-talk, compared to the internal and proximal external focus self-talk. In addition, better performance was revealed for the proximal external focus compared to the internal focus. Importantly, the examination of attentional focus through self-reports showed that participants in the three conditions reported greater attention to the type of focus induced by the manipulation, thus supporting that self-talk influenced the strength of the focus.

Self-talk improves attentional performance

Sturm [26], based on the earlier theorizing by Posner and Petersen [27] and van Zomeren and Brouwer [28], proposed a taxonomy of attention dimensions reflecting different functions of attention. The model describes three different dimensions of attention and their corresponding neuropsychological attention domains: first, intensity, which includes alertness, sustained attention, and vigilance, second, selectivity, which includes selective, focused and divided attention, and third, spatial attention. Based on Sturm's taxonomy of attentional dimensions, a