EXPLORING SELF-EFFICACY AS A MEDIATING MECHANISM IN THE SELF-TALK-PERFORMANCE RELATIONSHIP - A STUDY OF ELITE GOLF-PLAYERS

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Author note

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Lukas Linnér

Abstract

The objectives of this study were to examine: (1) the effects of instructional and motivational self-talk verbalized overtly or covertly on self-efficacy and performance in elite golf players; and (2) the preference of motivational and instructional self-talk and how this relates to performance in elite golf players. Participants were 30 elite golf-players, with a mean age of 17.38 (± 0.94) years. A mixed model repeated measures design was implemented. The self-talk overtness manipulation failed in the overt self-talk group, and baseline differences between the groups were detected. Consequently, the original design could not be implemented. With regards to performance, preference, and self-efficacy in the covert self-talk group no significant results were revealed, although there were potentially interesting patterns within the data. Content analysis of after performance debriefing interviews provided insights into participants’ self-talk use and experimental experiences. The results are discussed in relation to theory, previous research, and methodological issues. Future research and applications are suggested.

Key words: Experiment, Framework, Golf, Performance, Self-efficacy, Self-talk.

**Sammanfattning**


Nyckelord: Experiment, Framework, Golf, Prestation, Self-efficacy, Self-talk.
Introduction

“…with a good self-talk I perform better”

The abovementioned quote is taken from Linnér’s (2010, p. 19) investigation of golf putting performance and self-efficacy in elite golf players. Upon inspection, four interesting things can be extracted from the quote. First, the player uses self-talk, and secondly, self-talk affects the performance. It is generally known that athletes use self-talk (e.g., Hardy, Hall, & Hardy, 2004), and in a recent meta-analysis of self-talk interventions Hatzigeorgiadis, Zourbanos, Galanis, and Theodorakis (in press) confirmed self-talk as an effective strategy for enhancing task performance in sport. As such, the first two things in relation to the quote above are not surprising. The third point of interest in relation to the quote is the word “good”. The athlete performs better with a good self-talk, but what is good self-talk? Good self-talk for the particular athlete is probably idiosyncratic and contextualized, in other words, what is good for this athlete in this situation might not be good in a different situation or for someone else.

The logic path of science is to first describe a phenomenon, then explain it, and then use it in interventions. Self-talk has been described (Hardy, 2006). Self-talk is used within interventions (e.g., Thelwell & Greenlees, 2003). However, as Theodorakis, Hatzigeorgiadis, and Chroni (2008) argued, to accurately explain the self-talk-performance relationship one needs to understand, not if, but how self-talk affects performance. Self-talk has been regarded by coaches as one of the most influential skills athletes can use to increase their self-efficacy (Vargas-Tonsing, Myers, & Feltz, 2004; Weinberg, Grove, & Jackson, 1992). The forth point of interest in relation to the quote above, and the focus of the present investigation, is the hidden question of “how” the use of self-talk makes the player perform better. It is still unclear how self-talk actually influences performance. Hardy, Oliver, and Tod (2009) summarized the existing self-talk literature in relation to performance and suggested four possible mediating mechanisms (e.g., self-efficacy) explaining how self-talk influences performance. Self-efficacy has been argued to be a key to optimal performance (Bandura, 1997), and initial research regarding self-efficacy as one possible mediating mechanism of the self-talk-performance relationship has shown promising results (e.g., Hardy, Hall, Gibbs, & Greenslade, 2005).

If we can explain how self-talk influences performance, we can improve our understanding of what is “good” for athletes, provide more advanced recommendations for the sporting field, and as a result deliver better interventions. Therefore, this study aims to investigate the effects of different types of self-talk on self-efficacy and performance in elite golf players to further develop the knowledge in how self-talk influences performance.

Defining key terms

Self-talk

Several definitions of self-talk have been proposed in the literature. Theodorakis, Weinberg, Natsis, Douma and Kazakas (2000) defined self-talk as “what people say to themselves either out loud or as a small voice inside their head” (p. 254). Williams and Leffingwell (2002) meant that “self-talk occurs whenever an individual thinks, whether making statements internally or externally” (p. 82). An alternative definition that has regained some interest from researchers originates from Hackfort and Schwenkmezger (1993) whom stated that: “in an internal dialogue the individual interprets feelings and perceptions, regulates and changes evaluations and convictions, and gives him/herself instructions and reinforcement” (p. 355).
Hardy, Jones, and Gould (1996) and Conroy and Metzler (2004) argued that a fundamental issue within the self-talk literature was coming to a consensus regarding a definition of self-talk.

In a critical review of the self-talk literature Hardy (2006) problematized the use of many and imprecise definitions emphasized the importance of creating a definition that captures the whole phenomenon. In this critical review Hardy recognized self-talk as distant from other cognitive processes (e.g., imagery), being statements athletes say to themselves. These statements can occur automatically or in a more planned manner, such as the technique of thought-stopping (Hardy et al., 2009). Hardy identified several overlapping dimensions representing the nature of self-talk (e.g., what self-talk is). The nature of self-talk was considered to include: (a) a frequency dimension, that self-talk can be employed more or less often; (b) a self-determined dimension, that self-talk can be assigned or freely chosen; (c) an overtness dimension, that self-talk can be verbalized as either a small voice inside one’s head (covert self-talk), or out loud so that others potentially can hear what is said (overt self-talk); (d) a valence dimension, that content of self-talk can range from positive to negative. Positive self-talk is said as a form of praise (e.g., “well done you!”) (Moran, 1996), and keeps the athlete focused on the present, not on past errors or future expectations (Weinberg, 1988). Negative self-talk is said as a form of criticism (e.g., “you fool!”) (Moran, 1996), and gets in an athlete’s way by being inappropriate, irrational, counterproductive or anxiety-producing (Theodorakis et al., 2000). Hardy also included (e) a motivational interpretation dimension, that individuals can view their self-talk from motivating to de-motivating for themselves (Hardy, Hall, & Alexander, 2001); and (f) the functions of self-talk dimension, which refers to reasons why athletes use self-talk, first recognized by Hardy, Gammage, & Hall (2001) as cognitive and motivational. The term cognitive has been replaced with the term instructional in later research (e.g., Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004; Hardy, 2006). In accordance with the progress of the field, the term instructional will be used from here on after. Based on the abovementioned dimensions Hardy proposed a working definition of self-talk, which will be used as the central one in this paper, that stated.

Self-talk should be defined 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) is somewhat dynamic; and (e) serving at least two functions; instructional and motivational, for the athlete (Hardy, 2006, p. 84).

**Self-efficacy**

According to Bandura (1997) “perceived self-efficacy refers to beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (p. 3). Efficacy judgments are concerned “not with the skills one has but with the judgments of what one can do with whatever skills one possesses” (Bandura, 1986, p. 391). Self-efficacy is an individual’s judgment of his or her capability as of right now to perform a task that produces an anticipated outcome. The belief in one’s capabilities can vary along three dimensions: level, strength, and generality (Bandura, 1997). Level of self-efficacy relates to people’s expected performances at different levels of difficulty. For example, golf players with different levels of self-efficacy in putting would judge how many putts they could make (e.g., 1 out of 10 up to 10 out of 10). Strength refers to the belief of certainty in attaining these different levels of performance, from totally uncertain to totally certain. Phrased differently, two players might believe they can make 7 of 10 putts, but one is more certain of this belief than the other. The concept of generality is rarely studied in relation to sporting performance (Feltz, Short, & Sullivan, 2008). Even so, it relates to the transferability of an individual’s
efficacy judgments across different tasks, such as from one sport to another or from competitive situations within sports to competitive situations in non-sport contexts.

Self-efficacy is not an overall global trait, but a specific belief to distinct domains of functioning (Feltz, et al., 2008). As Cervone and Pervin (2008) stated, self-efficacy is “people’s appraisals of what they are capable of accomplishing in a given setting” (p. 461). Weinberg and Gould (2007) explained self-efficacy as a situation-specific variation of self-confidence, although, self-efficacy and self-confidence (Vealey, 1986) should not simply be viewed as the same. Self-efficacy is situation-specific, which not self-confidence necessarily is. However, when self-confidence is measured as a judgment of present capabilities to accomplish a particular goal in sport, rather than a measure of what athletes have done or will do (Feltz, et al.), it fits with Bandura’s (1997) definition and can arguably be viewed as the same. Bandura (2006) also distinguished self-efficacy from other constructs like self-esteem, locus of control, and outcome expectancies. Self-esteem is a judgment of self-worth whereas self-efficacy is a judgment of capability. Locus of control is not a judgment of capability, but a belief of whether outcomes are determined by actions of oneself or actions outside of one’s control. Outcome expectancies are “a person’s estimate that a given behavior will lead to certain outcomes”, whereas “an efficacy expectation is the conviction that one can successfully execute the behavior required to produce the outcome” (Bandura, 1977, p. 193).

Theoretical frameworks
The self-talk research has been criticized of not being theory-based (Hardy, 2006). Therefore, Hardy proposed a number of applicable theories with relation to self-talk to stimulate future research. Hardy suggested that a theory that holds particular relevance to the study of self-talk is Bandura’s self-efficacy theory (1977; 1986; 1997). The self-efficacy theory, part of social cognitive theory, will be presented below. However, first Hardy et al.’s (1996) model of psychological preparation for peak performance is presented to show how self-talk can be included in a holistic view of performance. Then, Hardy et al.’s (2009) framework of self-talk is presented, followed by Linnér’s (2010) framework of the self-talk-performance relationship, which is based on the Hardy et al. (2009) framework.

Model of psychological preparation for peak performance (Hardy, Jones, & Gould, 1996)
Hardy et al. (1996) stressed that athletes are complex human beings operating in a complex social and organizational environment and reaching peak performance is not unidimensional, but rather a complex recipe of cognitions, emotions, and physiological factors. The model of psychological preparation for peak performance (see Figure 1 in Appendix 1) illustrates this complex relationship, where several factors interplay to achieve peak performance. The model consists of five components: (1) fundamental attributes, such as motivation and personality (basis); (2) psychological skills facilitating peak performance (left side); (3) adversity coping strategies athletes use to handle negative stressors (right side); (4) the task-specific ideal performance state (top of triangle); and (5) the social, physical, psychological and organizational environment the athlete acts within (area within the circle). Self-talk is included in the model as both a facilitating psychological skill and a coping strategy to deal with negative stressors that can be detrimental to performance. This highlights self-talk as one potential resource part of reaching peak performance.

A framework of self-talk (Hardy, Oliver, & Tod, 2009)
Hardy et al. (2009) summarized the, to date, existing literature of the self-talk-performance relationship in a framework of self-talk (see Figure 2). The framework considers two general antecedents of self-talk, namely personal factors (e.g., cognitive processing preferences), and
situational factors (e.g., task difficulty). The antecedents precede the use of self-talk, and the use of self-talk promotes performance-oriented consequences. These consequences are summarized into four possible underlying mechanisms (i.e., cognitive, motivational, behavioral, and affectual). Although presented separately, these mechanisms are proposed to work in tandem in mediating the self-talk-performance relationship.

**Figure 2. A framework of self-talk (Hardy et al., 2009).**

A framework of the self-talk-performance relationship (Linnér, 2010)

Linnér (2010) argued that the Hardy et al. (2009) framework was unclear in its logical way. In Hardy et al’s framework it is proposed that using self-talk produces performance-oriented consequences, summarized into mechanisms, which mediate how self-talk affects performance. However, it can be argued that self-talk is linked to these mechanisms, which however are not linked to each other or to sporting performance, and that self-talk is linked directly to performance, although illustrated by a dotted line (see Figure 2). As such, a new framework of the self-talk-performance relationship was proposed (see Figure 3), based on Hardy et al. The framework is different from Hardy et al. in three ways. First, mechanisms are illustrated in a circular manner to more sufficiently show how mechanisms most likely work together to influence performance. Second, the framework is extended to include the dimensions proposed by Hardy (2006) in what self-talk is. This was done to include the what (i.e., Hardy’s dimensions), why (i.e., to influence performance), and how (i.e., the mediating mechanisms) of the self-talk-performance relationship in the framework. Third, it was proposed that influencing performance might re-affect the use of self-talk (i.e., the dotted line in Figure 3). For example, facilitative self-talk enhances performance, and the enhanced performance might then also produce facilitative self-talk.

**Social cognitive theory**

The social cognitive theory explains human functioning as a triadic reciprocity (Bandura, 1986). The assumption is that behavior (e.g., effort), personal factors (e.g., efficacy), and the external environment (e.g., feedback) all operate as interacting determinants of each other in explaining motivation and behavior. For example, positive feedback from a coach can make an athlete believe more in him/herself (i.e., higher efficacy), which can affect the effort of that athlete. The effort can then be seen by the coach, which influences the reaction to the athlete (Feltz et al., 2008). The social cognitive theory views individuals as generative and proactive agents in regulation of their cognitions, motivation, actions, and emotions, and not just reactors to the environment (Bandura, 1986, 1997). The nature of humans is explained in the
agentic perspective of social cognitive functioning, which addresses the issue of what it means to be human. To be an agent is to act with intention, and according to the theory people are capable of using forethought, self-reflection, and self-regulation to influence their own functioning (Bandura, 2001). Among the mechanisms of personal agency, perceived self-efficacy is regarded as the key agentic factor in determining people’s behavior (Bandura, 1997). As Bandura (2001) stated: “whatever other factors may operate as guides or motivators, they are rooted in the core belief that one has the power to produce effects by one’s actions” (p. 10).

Figure 3. A framework of the self-talk-performance relationship (Linnér, 2010; based on Hardy et al., 2009).

**Self-efficacy theory**
Bandura (1997) suggested that self-appraisal information and people’s subsequent thought patterns, emotions, motivation, and behavior are mediated through the cognitive mechanism of self-efficacy. According to Feltz et al. (2008), such motivated behaviors and thought patterns are important contributors to sporting performance.

It is thought that efficacy beliefs, accurate or faulty, are formed through a complex process of self-appraisal and self-persuasion via cognitive processing involving selection, interpretation, and integration of sources of efficacy information. According to Bandura (1997) there are four basic sources of information that produces efficacy beliefs. These are performance accomplishments, vicarious experiences, verbal persuasion, and physiological states. Maddux (1995) added emotional states and imaginal experiences as sources of efficacy, but Bandura included these aspects within his four original sources (see Figure 4). These sources of efficacy information are not mutually exclusive in terms of the information they provide, however some are more influential than others (Feltz et al., 2008).
Hardy (2006) argued that self-talk might influence self-efficacy as a self-delivered type of verbal persuasion. Effort, persistence and performance might be influenced through this increase in self-efficacy (Hardy, 2006). Although, verbal persuasion has been proposed to be a limited source of efficacy, it has been suggested that persuasive statements can be a useful adjunct efficacy source (Bandura, 1997). Bandura also pointed out that the debilitating effects of persuasion seem more powerful than the enabling effects. Furthermore, Bandura argued that when confidence in the persuader is high, such as a significant other, the effect of the persuasion is greater. Also, people are more likely to trust evaluation of their capability by those (self) that possess knowledge, skill and experience in the activity it regards. However, as Bandura stated: “most people believe they know themselves and their predicaments better than others do” (p. 104). In line with this, Hardy argued that elite athletes are more likely to benefit from self-delivered verbal persuasion as they possess great knowledge, skill, and experience in their activity and themselves.

**Figure 4.** The relationship between sources of efficacy information, efficacy judgments, and consequences (Feltz & Chase, 1998).

**Previous research**

*The overtness dimension of self-talk*

Sports related research of the self-talk overtness dimension is sparse. Generally, researchers has examined overt and covert self-talk as one, without separating them (e.g., Hatzigeorgiadis, 2006). Although, some studies has examined only overt self-talk (e.g., Van Raalte, Brewer, Rivera, & Petitpas, 1994), and it has been reported that some participants have found the use of overt self-talk awkward and distracting (e.g., Masciana, Van Raalte, Brewer, Brandon, & Coughlin, 2001). As a result, some studies has implemented the use of only covert self-talk (e.g., Hardy, Hall, Gibbs, et al., 2005), and some has provided participants with the choice of using either overt or covert self-talk (e.g., Harvey, Van Raalte, & Brewer, 2002). In a recent meta-analysis of self-talk interventions Hatzigeorgiadis et al. (in press) reported no significant difference between assigned or self-selected overtness use. Although, as Hatzigeorgiadis et al. argued, the effect of free selection could have been balanced because researchers has assigned the overtness type that participants has preferred (i.e., researchers have mostly assigned covert self-talk, which seems mostly preferred by participants). In line with this, Hardy, Hall and Hardy (2005) reported that athletes’ self-talk was generally covert and that male athletes used significantly less covert and more overt self-talk than female athletes did. All in all, Hardy (2006) concluded that a direct comparison of effectiveness between overt and covert self-talk in relation to performance has yet not been investigated.
Within the general psychology literature, much of the research on overt and covert self-talk has revolved around Vygotsky’s theory of cognitive development (Vygotsky, 1986). The present investigation focuses on performance and not on cognitive development, therefore it is Vygotsky’s theory not reviewed here, although some things are worthy of mentioning. Winsler, Carlton, and Barry (2000) showed that overt self-talk reduces as children grow up, especially when in larger groups, and around teachers and peers, until eventually occurring only when the children are alone. Even though the use of overt self-talk decreases, it is present in young adults (Kronk, 1994). Kronk reported a profound observer’s effect associated with the lack of overt self-talk use. Kronk suggested that there are social learning effects of the use of overt self-talk, and that overt self-talk use may be situation-specific. This is in line with predictions of Vygotsky’s theory, that overt self-talk occurs more in demanding and challenging situations (e.g., when under pressure) (Vygotsky, 1986).

The instructional and motivational functions of self-talk

Hardy, Gammage et al. (2001) identified two main functions of self-talk, instructional and motivational. Instructional self-talk includes focusing or directing attention (e.g., “target”), providing technical instruction (e.g., “arms straight”), strategic instructions (e.g., “all the way”), and kinesthetic attributes (e.g., “smooth”). Motivational self-talk cues includes controlling arousal, to psych up or to relax (e.g., ”cool down”), maximizing effort (e.g., ”give it all”), building confidence (e.g., ”you can do it”), creating positive moods (e.g., ”I feel good”), and coping with difficulties (e.g., “you’re not tired”) (Hardy, Gammage, et al.; Hatzigeorgiadis, et al., in press).

Both instructional (e.g., Landin & Hebert, 1999), and motivational (e.g., Kolovelonis, Goudas, & Dermitzaki, 2011) self-talk have been shown to improve performance. Cutton and Landin (2007) also reported that instructional self-talk participants performed significantly better than participants receiving performance feedback. In a study of golf shots Harvey et al. (2002) reported that using self-selected instructional self-talk was associated with better golf consistency than the use of negative self-talk and the control condition. In an experimental study Linnér (2010) examined the effects of instructional and motivational self-talk on performance in golf putts hit to an indicated target line. Instructional self-talk significantly improved performance compared to the baseline measure. However, Linnér reported that participants had issues with the absence of a hole. One participant stated:”if there had been a hole, it would have been easier to think like ‘make it’, for me it would have been easier with ‘you can do it’ and not so much the distance…”. Linnér concluded that the characteristics of the task (i.e., putting to a target line and not a hole) was somewhat unnatural for participants and might have made the use of instructional self-talk more appropriate for the experimental task, but according to participants maybe not for natural golf putting (i.e., putting to a hole).

In a basketball experiment Chroni, Perkos, and Theodorakis (2007) reported that adolescent athletes preferred the use of motivational self-talk while dribbling and shooting. Furthermore, Goudas, Hatziidimiriou, and Kikidi (2006) reported that amateur shot put athletes preferred the use of motivational self-talk over instructional self-talk in a throwing experiment. In relation to golf, Linnér and Sandström’s (2010) qualitative study of six elite golf players showed that motivational self-talk was used almost exclusively while playing compared to instructional self-talk.

Theodorakis et al. (2000) hypothesized that the performance effects of different self-talk types would depend on the nature of the task. Instructional self-talk would be beneficial for fine tasks requiring more skill, timing and precision (e.g., golf putting). Whereas, motivational
self-talk would be beneficial for gross tasks requiring more strength and endurance (e.g., running). Hatzigeorgiadis et al. (in press) showed partial support for the task-demand hypothesis in their meta-analysis of self-talk interventions. It was shown that interventions were more effective for tasks involving relatively fine, compared to relatively gross motor demand tasks. Furthermore, instructional self-talk was more effective than motivational self-talk for fine tasks and instructional self-talk was more effective for fine tasks compared to gross tasks. For gross task motivational self-talk was not significantly different from instructional self-talk, however the trend was in the direction of the task-demand hypothesis. Hatzigeorgiadis et al. argued that since most studies has used fine tasks and instructional self-talk, more studies using gross tasks and motivational self-talk is warranted to enable a conclusion regarding the hypothesis. All in all, Hatzigeorgiadis et al. concluded that “for self-talk strategies to be effective, selecting appropriate type and content of self-talk in relation to the characteristics of the task and the need of the individuals may be key” (p.16).

**Self-efficacy and self-talk**

A considerable amount of research exists around self-efficacy and sporting performance (see Feltz et al., 2008 for a review). The general conclusion that can be derived is that research supports a positive moderate relationship between self-efficacy and sporting performance (Moritz, Feltz, Fahrbach, & Mack, 2003), and perceived efficacy has consistently distinguished successful athletes from less successful athletes (Highlen & Bennett, 1983). Past performance accomplishments are considered, and supported as (Feltz et al.), the most influential source of efficacy information, because they are based on mastery experiences (Bandura, 1997). Wise and Trunnell (2001) examined the influence of different sources of efficacy information on self-efficacy strength. Results supported the propositions above, and showed that a verbal persuasion message delivered by the researcher (i.e., not self-talk) affected efficacy beliefs the most when promoted after a performance accomplishment.

Weinberg and Gould (2007) explained self-efficacy as a situation-specific variation of self-confidence. When self-talk has been included in multimodal interventions, it has been shown to increase confidence in athletes (e.g., Hanton & Jones, 1999; Thelwell & Greenlees, 2003). Furthermore, according to athletes’ perceptions, self-talk has been reported to increase confidence (e.g., Mamassis & Doganis, 2004; Perkos, Theodorakis, & Chroni, 2002). Hatzigeorgiadis, Zourbanos, Mpoumpaki, and Theodorakis (2009) examined the impact of motivational self-talk on self-confidence, anxiety, and task performance. It was reported that performance improved, self-confidence increased, and anxiety decreased, for participants employing self-talk, whereas no changes occurred in the control group. Furthermore, correlation analysis revealed that changes in performance were moderately related to changes in self-confidence. Hatzigeorgiadis et al. (2009) concluded that increased self-confidence could be regarded as an explanation of how self-talk affects performance. Although the abovementioned studies do not explain self-efficacy as a mediating mechanism in the self-talk-performance relationship, these studies provide preliminary evidence of a confidence/efficacy to self-talk relationship. As a result, Hardy et al. (2009) and Linnér (2010) included self-efficacy as a part of possible motivational mechanisms mediating the self-talk-performance relationship (see Figures 2 and 3).

Zinsser, Bunker, and Williams (2006) argued that self-talk can be used to build efficacy in athletes. Hardy, Hall, Gibbs et al. (2005) investigated the effects of instructional and motivational self-talk on self-efficacy and performance in a sit-up task. Hierarchical regression analysis revealed that self-efficacy significantly predicted performance, but adding self-talk as predictors did not increase the variance already explained by self-efficacy alone.
Furthermore, correlation analysis showed that both types of self-talk were moderately and positively related to self-efficacy, and self-efficacy was positively related to performance, but self-talk was not related to performance. The study lacked the level dimension of efficacy beliefs (Bandura, 2006), but still Hardy, Hall, Gibbs et al. was first to document a positive relationship between self-talk and self-efficacy. Within a tennis intervention study Hatzigeorgiadis, Zourbanos, Goltos, and Thedorakis (2008) reported that using motivational self-talk increased self-efficacy and performance of a forehand ground stroke, whereas no changes were reported in the control group. Moreover, correlation analysis showed that the increases in self-efficacy were positively related to increases in performance. Hatzigeorgiadis et al. concluded that self-efficacy can be seen as a possible mechanism explaining the self-talk-performance relationship.

It should be noted that not all studies investigating self-efficacy and self-talk has shown promising results. Cumming, Nordin, Horton, and Reynolds (2006) investigated the impact of facilitative and debilitating imagery and self-talk on self-efficacy and performance in a dart-throwing task. Analysis of variance revealed that performance, but not self-efficacy, changed as a function of experimental conditions (Cumming et al., 2006). In Linnér’s (2010) repeated measure of golf putting study the effects of instructional and motivational self-talk were examined on performance and self-efficacy. No changes were found across tries regarding self-efficacy. Linnér reported that the absence of efficacy change may have been because participants were overconfident in the baseline measure, thus affecting the subsequent measures and the overall result. Additionally, Linnér suggested that using a task that is familiar to participants, in which they can relate their capabilities without trying the task before being tested possibly can be used to deal with the baseline overconfidence issue. Furthermore, Hatzigeorgiadis et al. (2008) recommended that self-talk needs to be thoroughly practiced and mastered if the benefits of its use are to be maximized. Additionally, Hatzigeorgiadis et al. (in press) showed that interventions including training had greater effects on performance than interventions lacking training. Linnér’s study lacked such a training phase.

**Summary and objectives**

It has been shown that athletes use self-talk. Self-talk as a strategy has been promoted by coaches, and both experimental studies and a recent meta-analysis has confirmed self-talk as an effective strategy to influence performance. Still, it is unclear how self-talk actually influences performance. Therefore, the self-talk-performance relationship needs to be explained. Initial support exists of a confidence/efficacy to self-talk relationship, and self-efficacy as a possible mediating mechanism in the self-talk-performance relationship. As such, self-efficacy was included in the framework of the self-talk-performance relationship (Linnér, 2010; based on Hardy et al., 2009). Additionally, it has been concluded that no study has yet compared overt and covert self-talk in relation to performance, and that participants generally have preferred the use of covert and motivational self-talk.

As part of retrieving the logic path of science, Linnér (2010) examined self-efficacy as a possible mediating mechanism in the self-talk-performance relationship in an elite golf sample and reported experimental design issues (e.g., absence of a hole, and lack of training). Therefore, this study aims to further the knowledge of Linnér’s investigation considering its lessons learned. Based on the abovementioned research the present study will examine: (1) the effects of instructional and motivational self-talk verbalized overtly or covertly on self-efficacy and performance in elite golf players; and (2) the preference of motivational and instructional self-talk and how this relates to performance in elite golf players.
Method

Participants
Participants involved initially were 37 students of two golf affiliated senior high schools in Sweden representing an elite sample of golf playing youths. A total of 7 participants dropped out throughout the experiment due to scheduled competitions or illness. As a result, the subsequent analysis was based on the data from 30 participants. Participants had a mean age of 17.38 years, had been playing golf for an average of 9.28 years, had an average golfing handicap of 1.37, and competed within the Swedish junior golf tours. For detailed information of respective school (i.e., group) see Table 1.

The two schools represent two demographically similar samples which obey under the same admission condition system. As such, the sample of participants of the two schools was strategically selected for the implemented research design and study objectives. Initial contact was sought through email (see Appendix 2) with the respective school administrators. Through an informative dialogue with representatives of the two schools and the Swedish golf foundation was access to the present sample granted.

Table 1
Descriptive data of the two groups

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<tr>
<td>Woman</td>
<td>9</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>17.38</td>
<td>0.94</td>
<td>17.38</td>
</tr>
<tr>
<td>Years played</td>
<td>9.28</td>
<td>2.64</td>
<td>9.75</td>
</tr>
<tr>
<td>Handicap</td>
<td>1.37</td>
<td>1.73</td>
<td>2.03</td>
</tr>
<tr>
<td>Tour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional</td>
<td>9</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Sub-national</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>National-elite</td>
<td>9</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

*9 participants reported tour, but not level of competition.

*1 participant stated competing on international level, apart from the involvement in a Swedish junior golf tour.

Ethical aspects
When access to the two schools had been established, information regarding the experiment was sent out by email to the two schools and to the parents of the participants involved (see Appendix 3). Throughout the process, from initial contact to the start and end of the experiment, ethical aspects were pointed out. Participants were informed that their involvement in the study was voluntary. That they, at any time, could withdraw from participation without being asked for the reason why. That all information provided would be treated with confidentiality, that nothing could be traced back to a single individual. Participants were informed that the paper could be provided to them upon completion if they were interested. The experiment was explained as an investigation of different strategies
within putting in golf to provide participants with a general understanding of the experiment before agreeing to participate.

Written informed consent was not collected from parents. However, within the information letter parents were given contact information directly to the researcher if questioning the experiment. None of the parents contacted the researcher. Written informed consent was collected from the main persons in charge of the two schools respectively (see Appendix 4). Furthermore, all participants signed a written informed consent (see Appendix 5), and permission to record interviews was gained from each individual it concerned.

Experimental design
To answer the study objectives a mixed model repeated measures design was implemented (see illustration in Appendix 6). The two schools were placed as between subject variables, participants of each school corresponding to one type of self-talk overtess, thus creating one overt self-talk (i.e., OST) group, and one covert self-talk (i.e., CST) group. To decide what group (i.e., school) did what type of self-talk overtess a coin was flipped. Furthermore, self-talk functions (instructional and motivational) were placed as within subjects variables and were counterbalanced among participants.

The essence of the design was a procedure in the shape of a workshop. Participants first tried a putting task (the baseline measure), then a lecture in self-talk was held to educate and stimulate participants to reflect upon their self-talk. Then participants trained and were tested while using the two self-talk functions respectively (i.e., the experimental tries). Finally, upon completion of the workshop, after performance debriefing interviews were conducted with a limited number of participants, to gain knowledge into their experience of the experiment and use of self-talk.

Instruments
Self-efficacy
To investigate for self-efficacy changes a performance self-efficacy (Feltz et al., 2008) measure was adapted similar to the one used in Linnér (2010). The belief of participants as of right now regarding their capability to achieve a certain performance level of the putting task to be performed was measured. Following recommendations of Bandura (1997; 2006), and Feltz et al., a hierarchical task-specific scale using “can do” phrasing with graduation of challenge was designed (see Appendix 7). The scale included ten items asking participants: how certain are you as of right now that you can make… (a) 1 out of 10 putts, (b) 2 out of 10 putts, (c) 3 out of 10 putts, (d) 4 out of 10 putts, (e) 5 out of 10 putts, (f) 6 out of 10 putts, (g) 7 out of 10 putts, (h) 8 out of 10 putts, (i) 9 out of 10 putts, and (j) 10 out of 10 putts. Answers were given on a 0-100 point response scale from 0 (not at all certain), 50 (moderately certain), to 100 (totally certain). The implementation of a 0-100 response scale followed recommendations of Pajares, Hartley and Valiante (2001) that argued a 0-100 response scale as a stronger predictor of performance than a 5-interval scale. Responses of the ten items were average to produce the performance efficacy score, with higher scores indicating higher self-efficacy for achieving higher performance scores on the putting task.

Performance
To evaluate performance a golf putt performance test was developed. Previous research of golf putting has consistently used an “archery target” design where participants putt to an indicated target (e.g., Beilock, Bertenthal, Hoerger, & Carr, 2008; Vine, & Wilson, 2010). The golf putt performance test in the present study used the archery model of measuring
performance, but with some alterations. In line with the lessons learned of Linnér (2010), the golf putt performance test in the present study included a hole to promote a more naturalistic interpretation of the task. A pilot test was carried out by two male participants which were similar in age (M = 19; SD = ± 1), and golf handicap (M = 0.3; SD = ± 0.1) to the sample of participants used in the present study. The pilot test was used to decide the most appropriate length and number of putts. According to the pilot study, putting statistics of the PGA Tour (n.d.), and Karlsen’s (2010) dissertation in golf putting performance, the following putt test to measure performance was implemented within the present study.

Participants hit 10 putts from an indicated dot 4 meters from the target hole. The putts had a slight right-to-left drop. Participants were not allowed to try the putt before testing was initiated. The performance score of each participant was measured in three ways (see performance measure form in Appendix 8). Namely, how many putts were made, performance in centimeters (with an accuracy of a half centimeter from the edge of the hole), and scatter plots indicating where each putt ended up. Measuring was carried out by the researcher using a tape measure in between every putt (i.e., there were not an archery target painted on the putting surface, thus, the participants only had the hole as their target). The centimeter performance score was the total score of all ten putts added together, where lower scores indicated closer to the hole and thus higher performance. Whereas, for the putts made performance score, higher scores indicated higher performance.

Manipulation checks
Three manipulation checks were implemented in the study. One issued after the baseline measure, one after each experimental try, and one upon completion of the experiment.

The baseline manipulation check was implemented to reveal whether or not participants used any type of self-talk during the baseline measure (see Appendix 9). Self-talk was briefly defined as verbalizations or statements addressed to yourself that can be said either as a small voice inside once head or out loud so that others can hear. Participants were then asked (a) if they said something to themselves using a yes or no format, (b) if so, what did they say to themselves, and (c) in that case, how often did they say this, using a 10-point scale (1 = very few times, 5 = couple of times, and 10 = all the time).

The manipulation check implemented after each experimental try (instructional and motivational) included questions pertaining to participants’ use of self-talk during the putting task, and their use of self-talk during their one week training phase (see Appendix 10). Participants were asked to indicate what self-talk (i.e., what they said) they practiced with during the training phase and used during the putting task. Participants were then asked (a) to what extent they used the intended self-talk when they trained putting during the last week. Answers were given on a 10-point scale (1 = not at all, 5 = couple of times, and 10 = all the time). Participants then answered (b) how often they used the intended self-talk during the putting task. Answers were given on a 10-point scale (1 = very few times, 5 = couple of times, and 10 = all the time). Furthermore, participants were to indicate (c) if they said anything else to themselves during the putting task, using a yes or no format. Followed by an open ended question, (d) if so, what did they say to themselves, and (e) in that case, how often did they say this, using a 10-point scale (1 = very few times, 5 = couple of times, and 10 = all the time). Participants then answered two questions pertaining to self-talk overtiness, namely, (f) to what extent they used the intended self-talk (e.g., voice inside head) during the putting task, 1 Scatter plots of where the ball ended up was measured to provide the schools with valuable information regarding putting performance of their students and was not included in the analyses.
and (g) to what extent they used the opposite self-talk (e.g., out loud) during the putting task. Answers were given on a 10-point scale (1 = not at all, 5 = couple of times, and 10 = all the time). Corresponding to each self-talk group (i.e., overt or covert), the clarifying words in the brackets were switched. Lastly, participants were to indicate (h) how much they trained with self-talk during the last week, expressed in minutes.

Within the manipulation check upon completion of the experiment (see Appendix 11) participants were to indicate (a) how naturalistic (i.e., lifelike) they believed the putting task to be, and (b) how difficult they experienced the putting task to be. Answers were given on a 10-point scale (1 = not at all, 5 = moderate, and 10 = very). Since the baseline manipulation check revealed that almost all participants used some type of self-talk during the baseline measure two questions were added in the present manipulation check. Namely, (c) several people reported using self-talk during the first occasion. Do you believe you have used self-talk in a more well planned manner in later occasions, and (d) several people reported using self-talk during the first occasion. Do you believe you have used self-talk in a more facilitative manner in later occasions. Answers were given on a 10-point scale (1 = do not agree, 5 = somewhat agree, 10 = totally agree). Furthermore, participants indicated (e) what type of self-talk they preferred using during the putting task, by checking a box for either no preference, motivational self-talk, or instructional self-talk. In addition, participants after checking the box, circled to what extent they preferred their selection on a 10-point scale (1 = less preferred, and 10 = more preferred). Finally, participants indicated (f) when they talked to themselves during the putting task, by checking the corresponding boxes: being behind the ball (reading the line), approaching the ball (after reading the line), standing over the ball (just before the shot is hit), during the swing, and in between shots. Three open boxes named “other” were included so participants could indicate when they talked to themselves other than the examples given.

After performance debriefing guide
The after performance debriefing, conducted as semi-structured interviews, revolved around two main subjects. Namely, participants self-talk during the putting task, and participants´ experiences in relation to the experiment procedure (see Appendix 12).

With regards to participants self-talk during the putting task, participants were asked if it was easy to combine self-talk with the execution of the putting task, if they believed their self-talk had an impact on their performance, and if their self-talk changed in between putts. Furthermore, participants were asked to indicate how they experienced talking to themselves while putting, and how they believed their self-talk changed, if it changed, from the first occasion, through the lecture, to the last occasions.

With regards to participants’ experiences of the experiment, they were asked to describe how naturalistic (i.e., lifelike) they experienced the putting task to be, and how they experienced estimating their capability (i.e., rating of self-efficacy) for the first time, before the baseline measure. Furthermore, participants were asked how they experienced that the researcher measured their performance in between putts, and if all the forms, papers and instructions given were easy to understand. The participants were then asked to describe how they had trained with self-talk during the training phases, and how they experienced the overall experimental procedure as a workshop. Finally, participants were asked if there was anything they wanted to explain or clarify, and if they had any questions.
**Experimental procedure**

The experiment was carried out twice, once for every group. The experiment took place in the middle of the week on the respective schools indoor putting facilities with green synthetic grass surfaces\(^2\) during regular training hours. For each group the experiment was completed in three sessions, with one week in between each session (i.e., the training phases). The procedure was kept the same throughout the three sessions, but on completion of session one a lecture in self-talk was held, and on completion of session three after performance debriefing interviews were conducted.

Although the training facilities of the respective schools were not entirely the same, the characteristics of the experimental procedure were the same. For both groups, the experiment was executed in three rooms, completed in five steps (see illustration in Figure 5), and the researcher was alone with each participant. Step one (1) included participants waiting for their turn while training golf as usual (in room 1). In step two (2), participants entered the experiment room (room 2), and were informed of the putting task to be executed (see section below). After receiving information participants familiarized themselves with the putting task (i.e., without trying the actual task), before continuing to step three (3) (room 2) where participants filled in the self-efficacy instrument in privacy. This was done to reduce social evaluation concerns (Bandura, 2006). However, the researcher was positioned in the opposite end of the room, enabling participants to ask questions if needed. In step four (4) participants executed the putting task (in room 2). After putting task execution the participants continued to the third room and the fifth step (5), filling in the manipulation checks in privacy. Participants then exited the third room and resumed their usual golf training in room one.

**Putting task**

The putting task included execution of the golf putt performance test developed for the study. Participants were instructed to make as many putts as possible out of their 10 tries. Furthermore, participants were instructed to behave as if it was a real putt (e.g., read the line, place the ball as they usually do), and step behind an indicated line in between every putt (see illustration in Figure 5). These steps were implemented in an attempt to make the putts more naturalistic (i.e., lifelike), making it a one-shot-one-chance situation, and to prevent that the putts were hit in a repetitive manner in which performance can be improved on a short run. That the feel of the putt remains within the working memory and that the motor movement is just a replication of what was done a moment ago (see Schmidt & Wrisberg, 2008, for an in-depth explanation). Upon completion of each putt, the researcher measured the performance, and gave the ball back to the participant, who then started over from the starting position behind the indicated line. During putting execution, the researcher stood completely still, not

\[^2\] The OST group putted on their schools putting surface, and the CST group putted on their schools putting surface. Although this promotes a difference between the groups, since the participants of each group was used to their schools putting surface, was this not seen as problematic in the design.
making any sound, and was positioned as seen in Figure 5. Participants used their own putter and golf ball.

Session 1 – the baseline measure and the lecture in self-talk

Session one included initial information, the baseline execution of the experiment, and ended with a lecture in self-talk.

Before executing the baseline measure, participants read an information letter welcoming them to the experiment, explaining ethical aspects, and informing them on what to expect during the experiment procedure (see Appendix 13). Participants then signed a written informed consent\(^3\) (see Appendix 5). Participants then wrote their name on a numbered list that the researcher used to randomly assign participants and to structure all the information participants provided throughout the experiment.

Session two then proceeded with execution of the five steps of the experiment procedure for all of the participants (as explained above) without any instruction pertaining to self-talk.

Before initiating the lecture in self-talk which ended session one, background information (see Appendix 14) was collected. A PowerPoint presentation (see Appendix 15) was used to guide the lecture. The lecture was based on Hardy (2006) dimensions of self-talk (e.g., what self-talk is), and descriptive research pertaining to how self-talk is used by athletes and what athletes have been reported to say to themselves (Hardy, Gammage et al., 2001; Hardy, Hall, & Hardy, 2005). The main focus of the lecture was functions and overtness of self-talk. The lecture intended to stimulate participants, making them reflect upon and discuss their own self-talk. As Zinsser, Bunker, and Williams (2006) argued, the first step in taking control of one’s self-talk is to become aware of it. In line with an idiosyncratic view of self-talk the participants used their regained knowledge from the lecture and produced their own self-talk cues. Participants chose one motivational, and one instructional self-talk cue which they would train and be tested with during the continuation of the experiment. Although self-selecting cues were promoted, in line with lessons learned in Linnér (2010) study, providing examples and reflecting the importance of the golf hole were important and implemented in the present lecture. Each participant was informed in what order they would train and be tested using each corresponding self-talk function (e.g., first train with motivational self-talk, to be tested on that in session two, to then train with instructional self-talk, to be tested on that in session three, or the other way around). This was counterbalanced using the numbered list collected and randomly assigning participants into two groups according to Mitchell and Jolley (2010, p. 338). Participants were then thoroughly informed that they were supposed to use overt self-talk (i.e., covert self-talk for the opposite group). Furthermore, were participants encouraged to train putting with their corresponding self-talk at an goal intensity of 20 minutes per day in between experimental session. Finally, participants were informed that a couple of participants would be asked to participate in an interview upon completion of the experiment. The lecture lasted one hour.

Session 2 – the first experimental try

Session two only included the execution of the five steps of the experimental procedure. Participants were reminded about the putting task procedures, and to use the self-talk that they had trained with during the last week, before executing the putting task. Upon completion of session two, participants were reminded that they now were to change their use of self-talk

\(^3\) Due to communication difficulties participants in the CST group signed a written informed consent first after the baseline measure. However, no participants refused to participate.
function (instructional or motivational) and train with the opposite function until the following week. Furthermore, intended participants for the after performance debriefing interviews were prompted with the question to partake during session three.

**Session 3 – the second experimental try and the after performance debriefing**

Session three included the execution of the five steps of the experimental procedure, and after performance debriefing interviews with a total of seven participants.

The five steps of the experimental procedure were carried out in the same manner as the session before apart from one thing. Participants who used instructional self-talk during session two used motivational self-talk in session three, and vice versa (i.e., counterbalancing the self-talk manipulation). Participants were reminded about the putting task procedures, and to use the self-talk that they had trained with during the last week, before executing the putting task.

Upon completion of the experiment, after performance debriefing interviews (see Appendix 12) were conducted with four participants of the CST group, and three participants of the OST group, all randomly selected. The interviews of participants in the OST group were carried out in the same room as the experiment, and for participants in the CST group interviews were conducted in the comfort of their homes in all but one case, which was conducted in a conference room at the school. All interviews were conducted face-to-face, approximately one meter apart, with a tape-recorder placed to the side, recording what was said. Participants were informed of ethical aspects, and that only the researcher would be the one knowing who said what. Permission to record was given by all participants. The interviews were in between 15 and 30 minutes long.

**Analyses**

The analyses were conducted in 6 steps.

In step 1 descriptive statistics were computed for the background information.

In step 2 descriptive statistics were computed for when participants used self-talk, and what self-talk participants used in the baseline and experimental conditions. Additionally, were descriptive statistics computed of frequencies and perceptions of participants in relation to manipulation checks implemented in the study.

In step 3, experimental condition analyses were conducted with regards to the original design and the integrity of the experimental conditions. The manipulation checks of participants’ use of self-talk functions and overtness were analyzed along the following demands. The working definition of self-talk was self-talk used intentionally as a strategy in relation to shot execution (i.e., what participants said to themselves as a reaction to what happened was not considered as a strategic self-talk use and was therefore not considered in the analysis). Furthermore, unintended self-talk (i.e., strategically using instructional self-talk when instructed to use motivational self-talk, using motivational self-talk when instructed to use instructional self-talk, using covert self-talk when instructed to use overt self-talk, or using overt self-talk when instructed to use covert self-talk) was not to be used to a frequency of more than 3 out of 10, and intended self-talk not to a frequency of less than 7 out of 10.

In step 4 independent samples t-tests were computed to test for potential differences between the two groups.
In step 5 analyses regarding performance, preference in relation to performance, and self-efficacy, were computed by comparing experimental conditions using paired sample t-tests, independent sample t-test, and analyses of variance.

In step 6 content analysis was conducted to acquire a deeper understanding of participants’ self-talk, and experiences of the experiment reported in the after performance debriefing interviews. The interviews were transcribed, and then read thoroughly. Relevant raw data units pertaining to each interview question were marked and irrelevant data was omitted. The raw data units were extracted from the text and translated into English. Because of the straightforward nature of the questions, standard content analyses procedure was not conducted. Patterns among participants within each question were sought and summarized in the text.

Results

In line with the thesis main subject (i.e., self-talk) results regarding basic characteristics of participants’ self-talk (i.e., what and when) are presented first. Then, to answer the objectives of the study, results regarding the integrity of the original design are considered, followed by the performance, preference, and self-efficacy results. Finally, to provide a more comprehensive impression of the experiment, reflections of participants reported in the after performance debriefing interviews are presented.

Basic characteristics of participants’ self-talk

Self-talk content - what participants said

All but 4 participants used self-talk during the baseline measure (see appendix 18), with an average frequency of 7.38 (SD= ± 2.66) in regards to the OST group, and 5.54 (SD= ± 2.11) in regards to the CST group. The motivational self-talk cues “make it” (N=11), and “come on now” (N=11), were used the most during the baseline measure (see Table 2 in Appendix 16).

With regards to the experimental conditions the most common instructional self-talk cue used was “grip pressure” (N=6), whereas for motivational self-talk the most common were “come on now” (N=15), “get it in” (N=9), and “make it” (N=7). Additionally, one participant reported using an idiosyncratic memory cue stating: “I reminded myself of good memories saying ‘Skandia cup’ to myself”. See Table 3 in Appendix 17 for detailed information of the instructional and motivational self-talk cues used by participants.

Self-talk timing - when participants used self-talk

As seen in Table 4, the most common time when participants used self-talk was when standing over the ball (N=28), and only 4 participants used self-talk during their swing.

Table 4

When participants used self-talk

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>CST group</th>
<th>OST group</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td></td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Over the ball (just before the shot is hit)</td>
<td>28</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Behind the ball (reading the line)</td>
<td>17</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Approaching ball (after reading the line)</td>
<td>12</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>In between shots</td>
<td>9</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>During swing</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
**Integrity of the original design**

With regards to the integrity of the original design the experimental condition analyses revealed the following results (see Appendix 18). Of the CST group (N=16) 5 participants did not meet the demands regarding functions of self-talk, and out of these 5 participants were 2 participants together with 1 more participant problematic in their use of self-talk overtness (e.g., using intended and unintended self-talk to the same degree). Of the OST group (N=14), 1 participant did not meet the demands regarding functions of self-talk, 4 participants did not meet the demands regarding functions and overtness of self-talk, and 5 participants did not meet the demands regarding overtness of self-talk. As a result, the manipulation in the OST group was considered as a failure (i.e., 9 participants did not use the intended self-talk overtness, and as such only 5 participants was left to analyze).

On top of the manipulation failure, there were significant differences between the two groups in the baseline measure of performance and self-efficacy, the putting surface (i.e., speed of the green), the average minutes of training during the two weeks, participants golfing handicap, and the OST group scored significantly higher than the CST group in two of the three manipulation check questions pertaining to self-talk use, and experience of self-talk. With regards to the third question of past training in self-talk the result approached significance (see details in Table 5). Due to the manipulation failure, and the differences between the two groups, the OST group was excluded completely from further analyses. Consequently, the original mixed model repeated measure design and objective of comparing self-talk overtness and functions could not be answered. As a result of the exclusion, the analysis that follows is based solely on the CST group.

Table 5
*Descriptive data and independent sample t-tests of differences between the two groups*

<table>
<thead>
<tr>
<th></th>
<th>CST group</th>
<th></th>
<th>OST group</th>
<th></th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance putts made</td>
<td>2.87</td>
<td>1.68</td>
<td>5.64</td>
<td>1.55</td>
<td>-4.75</td>
<td>28</td>
<td>0.001</td>
</tr>
<tr>
<td>Performance in cm (original)*</td>
<td>646.25</td>
<td>253.33</td>
<td>233.62</td>
<td>86.53</td>
<td>3.80</td>
<td>28</td>
<td>0.01</td>
</tr>
<tr>
<td>Performance in cm (stimp)</td>
<td>420.06</td>
<td>164.67</td>
<td>233.62</td>
<td>86.53</td>
<td>3.80</td>
<td>28</td>
<td>0.01</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>44.00</td>
<td>9.22</td>
<td>70.78</td>
<td>16.17</td>
<td>-5.67</td>
<td>28</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Surface</strong></td>
<td>22.30</td>
<td>14.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training in minutes</td>
<td>45.00</td>
<td>23.45</td>
<td>76.96</td>
<td>31.15</td>
<td>-3.20</td>
<td>28</td>
<td>0.01</td>
</tr>
<tr>
<td>Handicap</td>
<td>2.03</td>
<td>1.39</td>
<td>0.55</td>
<td>1.80</td>
<td>-2.50</td>
<td>27</td>
<td>0.05</td>
</tr>
<tr>
<td>Use of self-talk today</td>
<td>6.31</td>
<td>1.54</td>
<td>7.85</td>
<td>1.57</td>
<td>-2.65</td>
<td>27</td>
<td>0.05</td>
</tr>
<tr>
<td>Experience of self-talk</td>
<td>4.81</td>
<td>1.87</td>
<td>6.46</td>
<td>2.15</td>
<td>-2.21</td>
<td>27</td>
<td>0.05</td>
</tr>
<tr>
<td>Past training in self-talk</td>
<td>3.75</td>
<td>2.35</td>
<td>5.54</td>
<td>2.44</td>
<td>-2.00</td>
<td>27</td>
<td>0.055</td>
</tr>
<tr>
<td>Naturalistic (i.e., lifelike)</td>
<td>5.69</td>
<td>2.09</td>
<td>6.57</td>
<td>1.60</td>
<td>-1.29</td>
<td>28</td>
<td>0.21</td>
</tr>
<tr>
<td>Task difficulty perception</td>
<td>5.06</td>
<td>1.91</td>
<td>4.78</td>
<td>2.00</td>
<td>0.39</td>
<td>28</td>
<td>0.70</td>
</tr>
</tbody>
</table>

---

*Groups are not to be compared in this variable. To compare see the ‘performance in cm (stimp)’ variable where the surface differences has been taken into consideration.

**The speed of the putting surface was measured using a stimpmeter (United States Golf Association, n.d.).**
Results of the covert self-talk (CST) group

Manipulation check

With regards to using self-talk while training participants reported an average frequency of 6.97 (SD= ± 2.16), which was considered as adequate in relation to previous research (e.g., Hatzigeorgiadis et al., 2008). Furthermore, according to participants’ perceptions, was their use of self-talk after the lecture in self-talk more well planned (M=7.44, SD= ± 2.47), and moderately facilitating to performance (M=5.69, SD= ± 2.41), compared to their use of self-talk in the baseline measure (i.e., before the lecture).

Performance

In the CST group 3 participants were problematic in their use of covert self-talk. Following the experimental condition demands all three participants could have been dropped. However, due to the limited number of participants left to analyze, a closer inspection of their scores was carried out. Two of the three participants did not report an intended use of covert self-talk above the demand of 7 out of 10, and was therefore excluded. The third participant did use the intended covert self-talk to a frequency of 10 out of 10 (i.e., all the time), although at the same time using the unintended overt self-talk (i.e., frequency of 7 out of 10). The third participant was included in the analyzed sample on the premises of carrying out the intended task, although supplementing this with unintended use. As a result, the analyses of performance involved 12 participants.

Table 6
Paired sample t-tests comparing baseline to performance using instructional self-talk

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th></th>
<th>Instructional</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Performance in putts made</td>
<td>2.92</td>
<td>1.73</td>
<td>2.50</td>
<td>1.83</td>
</tr>
<tr>
<td>Performance in cm(^a) (original)</td>
<td>671.71</td>
<td>261.96</td>
<td>594.92</td>
<td>185.86</td>
</tr>
</tbody>
</table>

\(^a\)lower centimeter (cm) scores means higher performance (i.e., closer to the hole)

Tables 6 and 7 presents the paired sample t-test conducted to test for performance differences in between experimental conditions (i.e., baseline to instructional, baseline to motivational), and in the two performance measurements (i.e., performance putts made, and performance in cm).

Table 7
Paired sample t-tests comparing baseline to performance using motivational self-talk

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th></th>
<th>Motivational</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Performance in putts made</td>
<td>3.00</td>
<td>1.76</td>
<td>3.83</td>
<td>2.08</td>
</tr>
<tr>
<td>Performance in cm(^a) (original)</td>
<td>644.29</td>
<td>288.48</td>
<td>532.63</td>
<td>225.13</td>
</tr>
</tbody>
</table>

\(^a\)lower centimeter (cm) scores means higher performance (i.e., closer to the hole)

As seen in Tables 6 and 7, although the differences in focus could not reach statistically significant values, inspection of mean scores reveals potentially interesting patterns in
performance putts made, and performance in centimeters. Since considerable effect sizes were detected (see below), these patterns will be explained next. Readers are encouraged to interpret the results with caution due to the small sample size and results not being statistically significant.

While using instructional self-talk (see Table 6) participants made less putts (M= 2.50, SD= ± 1.83), compared to baseline (M= 2.92, SD= ± 1.73), but overall performance in centimeters improved (i.e., closer to the hole) while using instructional self-talk (M= 594.92, SD= ± 185.86), compared to baseline (M= 671.71, SD= ± 261.96).

While using motivational self-talk (see Table 7) participants made 0.83 (SD= ± 2.76) more putts for every 10 putts (M= 3.83, SD= ± 2.08), compared to baseline (M= 3.00, SD= ± 1.76), and overall performance improved (i.e., closer to the hole) by 111.66 centimeters (SD= ± 254.23) while using motivational self-talk (M=532.63, SD= ± 225.13), compared to baseline (M=644.29, SD= ± 288.48). Additionally, a repeated measure analyses of variance with Greenhouse-Geisser correction revealed, although not significant (F_{1,11} = 2.315, p = 0.156), a partial eta^2 value of 0.17, with regards to performance in centimeters and use of motivational self-talk compared to baseline. Likewise repeated measure analyses of variance with Greenhouse-Geisser correction in relation to performance in putts made and use of motivational self-talk compared to baseline (F_{1,11} = 1.096, p = 0.318), revealed a partial eta^2 value of 0.09.

**Preference**

With regards to preference in the CST group (N=16), 13 participants preferred motivational self-talk with an average frequency of 8.85 out of 10 (SD= ± 1.34), and 3 participants preferred instructional self-talk with an average frequency of 9.33 out of 10 (SD= ± 1.15).

Independent samples t-test of participants’ preference of motivational or instructional self-talk in relation to participants’ performance improvements from baseline to experimental tries revealed no significant results. However, inspection of mean scores reveals potentially interesting patterns in performance putts made. These patterns will be explained next. Readers are encouraged to interpret the results with caution due to the small sample size and results not being statistically significant.

When participants used instructional self-talk, participants preferring instructional self-talk (N=2) increased performance with an average of 2 more putts made (SD= ± 1.41), while participants preferring motivational self-talk (N=10) decreased their performance with an average of 0.90 less putts made (SD= ± 2.85).

When participants used motivational self-talk, participants preferring motivational self-talk (N=10) increased performance with an average of 0.90 more putts made (SD= ± 3.03), and participants preferring instructional self-talk (N=2) increased their performance with an average of 0.50 more putts made (SD= ± 0.71).

**Self-efficacy**

In relation to self-efficacy paired sample t-test revealed no significant differences in between the instructional condition (M=44.82, SD= ± 7.17), and the motivational condition (M=43.73, SD= ± 7.32). Furthermore, correlation analyses revealed that the hours of training with self-talk was not related to the self-efficacy of participants. All in all, the experimental conditions did not change the self-efficacy beliefs of participants.
Results of the after performance debriefing
Since the OST group was completely excluded from further analyses, the results of the after performance debriefing interviews will be presented separately for each group.

Reflections of participants in the OST group
Combining self-talk and putting
Two participants did not report any difficulties regarding combining self-talk and putting with one stating: “I have used it quite a lot before/…/ so it comes naturally”. However, one participant did state: “I was a little unsure /…/ when it was best to use the words”.

With regards to differences between instructional and motivational self-talk, all three participants preferred the use of motivational self-talk, with one stating: “I get more psyched up and motivated with motivational self-talk /…/ that suites me much better”. All participants reported in line with what one participant stated as a difference: “especially in putting. I think it is a big difference, because I do not want this instructional/…/ I do not want to know what I will do all the time, but more, think that the ball is in, not to think about how I should do”.

Self-talk and performance
All participants thought their self-talk affected their performance, with one stating: “maybe not that I have made the putts but that I have made it with a better focus and that I have done it in a better way sort of”.

Stability of self-talk
Regarding if self-talk changed during the execution of the task all but one participant reported not changing their self-talk, the one stating that self-talk change reported that: “I cannot stick to only instructional, it becomes, a lot of other thoughts come to mind as well”.

Self-talk overtness
Regarding using overt self-talk all participants reported issues, with two participants disliking the use when stating: “it does not feel natural”, and “it is not pleasant to say it out loud, it feels artificial”. Additionally, one participant stated: “I think it suits putting more to have it in the mind” referring to covert self-talk. Furthermore, regarding not liking the use of overt self-talk one participant stated: “I can keep it for myself /…/ I do not have to share it with everyone”. Nevertheless, two participants also stated: “it becomes more clear when saying it out loud compared to inside you head”, although at the same time one participant stated: “but it is almost like I put more pressure on myself” when using overt self-talk.

How participants self-talk changed throughout the workshop
Regarding how participants believed their self-talk changed, if it changed, from the first occasion, through the lecture, to the last occasions, two participants experienced more structured with one participant stating: “it became better, more structured and little more control of it”, and one participant thought the difference was using self-talk more often when stating: “I have used self-talk before, but not to any great extent”.

Naturalistic experience of the task
With regards to the naturalistic experience of the putting task the participants found it to be moderately naturalistic. Two participants found it to be close to reality, with one participant stating: “similar to competition settings”, although at the same time pointing out “I do not like hitting the same putt over and over”. In line with this the third participant stated: “it’s not very
realistic when you stand and hit the same putt all the time, that's the only deficiency I see /.../ I still think it's been pretty good to do this, it is difficult to get it much more naturalistic”.

**Estimating capability for the first time**

With regards to participants’ experiences of estimating their capability (i.e., rating of self-efficacy) for the first time, before the baseline measure, all participants reported difficulties, with one participant stating: “I thought it was very difficult to estimate”. One participant also stated: “the task looked easy, but when up there it was not as easy as I thought it was”, followed by “if I had hit the putt once before, I would never have estimated so high”. Two participants reported initially estimating too high, with one participant stating: “you want to believe you are going to make all of them”.

**Measuring performance**

Regarding if the researcher while measuring performances in between putts interfered with participants it was reported by one participant to initially “promote some pressure”, but in the end all participants reported it as something they did not think of, with two participants stating: “that was nothing I noted”, and “I did not think of it at all”.

**Instruments**

Overall participants reported finding the instruments, instructions, and forms easy to understand, however one participant did report not finding the self-efficacy instrument very appealing when stating: “I did not like the one to ten because that was hard”.

**Training of self-talk**

In relation to how participants had trained with self-talk during the training phases it was reported by all participants that they had included self-talk in usual putting drills and competitions. One participant stated: “I have trained starting the ball and done competitions”. Two participants reported spending less time training with self-talk, with regards to why one participant stated: “prioritized physical workout because of injury, and studying for exams”.

**Experiment as a workshop**

Participants’ experiences regarding the experiment as a workshop were positive. Two participants reported specific thoughts about the lecture, with one saying: “the lecture was really good I think”, and another participant saying: “when you had talked about it, it became quite clear how I had done it before and what could be changed, so that approach I thought was really good”.

**Reflections of participants in the CST group**

**Combining self-talk and putting**

All participants reported no difficulties combining self-talk with putting, with one participant stating: “it has been easy because it feels natural to use it”. However, one participant did also report that sometimes the self-talk use “could feel a little forced”.

With regards to differences between instructional and motivational self-talk, two participants stated: “I find motivational more difficult to use /.../ probably because I do not use it as often as instructional”, and “my instructional was ‘pace’, but that is too lame, motivational works better for me”.
Self-talk and performance
All participants thought their self-talk affected their performance, with one participant stating: “I feel I get higher self-confidence”. With regards to motivational self-talk one participant also stated: “I believe this (self-talk) like motivates, that you can feel this extra confident feeling that you think you will make the putt”. The same participant also stated that instructional self-talk: “creates a little more focus” in relation to performance.

Stability of self-talk
Regarding if self-talk changed during the execution of the task all participants reported no changes, however one participant did report that: “the first time, before we had gone through anything, then it was some variety, but after that I have kept to what I should say”.

Self-talk overtness
Regarding using covert self-talk three participant stated:”it feels good, but still a little different, it is something you have to train a little more with”, “I think it is better to keep it to oneself, quiet, you get more calm with this”, and “it feels more focused to say it inside the head, if I say it out loud it feels like it disappears somehow and have no meaning”.

In the CST group two participants reported employing overt self-talk after bad shots, with one saying: “when I hit a bad putt, then I say it out loud”. Both participants made a similar explanation to why they employed overt self-talk after a bad shot, with one stating: “you want others to know that you can hit it better, but really it is just yourself you should convince, because you know deep down inside that you can hit it much better”. Regarding overt self-talk two participants stated: “it is mostly embarrassing /…/ get everyone else to know instead of motivating yourself”, and “in one way it feels more clear /…/ like you mean it a little more”.

How participants self-talk changed throughout the workshop
Regarding how participants believed their self-talk changed, if it changed, from the first occasion, through the lecture, to the last occasions, all participants concurred that they had become more aware of their self-talk, and their self-talk was more structured. In line with this two participant stated: ‘before you did not think of it, the first time /…/ I thought different things in my head all the time, but now I have one or two things I always think”, and “now I have said one thing, and focused on that, before I only said what I felt like saying”.

Naturalistic experience of the task
Participants did experience the task as moderately naturalistic. Two participants thought it was similar to competitions, with one participant stating: “all the things you should do all the time, routine and concentrate on every putt / ... / that was reality because you do that on competitions too”. The main thing that was pointed out as less naturalistic by two participants was hitting the same shot over and over, which one participant relates to when saying: “in the end you knew the putt”.

Estimating capability for the first time
All but one participant thought estimating their capability for the first time was difficult, with one participant stating: “it was hard to know before, because you had not done it before, so you had nothing to compare with”. The one participant not reporting the estimation as difficult, stated: “I filled in low percentages, thought it would be harder to make them”. In relation to how the participant came to his/her conclusion, the participants stated: “thought about statistics and how I usually putt outdoors”. Two participants reported being
overconfident in their estimation, with one stating: “I estimated higher than what I managed the first time”. In relation to this one participant stated; “of course you should believe you will make a lot, the other way around would be wrong”.

**Measuring performance**
In relation to if the researcher while measuring performances in between putts interfered with participants it was reported that two participant did not think of it, while two participants did, with one stating: “I thought of it /.../ but it was not like a big distraction or anything”.

**Instruments**
All in all participants reported finding the instruments, instructions, and forms easy to understand, with one participant stating: “it has not been any problem”.

**Training of self-talk**
In relation to how participants had trained with self-talk during the training phases it was reported that participant had mostly trained putting at home, as one participants explains: “I have put up shoes to simulate holes, and then tried to make it as realistic as possible while still at home”. One participant stated: “you get into it quite easy, using it, so when on the tests you have not had to think so much of implementing it, it has come quite natural”. Two participants reported spending less time training with self-talk. The main reason why is in line with what one participant stated saying: “it has been a lot in school, it is hard to take the time to do it”.

**Experiment as a workshop**
Participants’ experiences of the experiment as a workshop were overall positive, with one participant stating: “what is good is that I feel I got something out of it too”. Participants were especially positive towards the lecture in self-talk, with two participants stating: “I have had the knowledge, but you changed my perception of the things I knew”, and “when you talked about it after the first time, I thought I learned stuff, that it is actually good for us to use this”.

**Discussion**
The objectives of the present study were to examine: (1) the effects of instructional and motivational self-talk verbalized overtly or covertly on self-efficacy and performance in elite golf players; and (2) the preference of motivational and instructional self-talk and how this relates to performance in elite golf players.

**Summary of results**
With regards to the original design, the self-talk manipulation in the OST group failed, and as such self-talk functions and self-talk overtness could not be compared in relation to performance. With regards to performance, preference, and self-efficacy in the CST group there were no significant results, although there were potentially interesting patterns within the data. Since all but three participants in the CST group used some type of self-talk in the baseline measure, experimental condition results were not significant, and the study did not include a control group, readers are encouraged to interpret the results with caution.

Furthermore, the after performance debriefing interviews provided insights into athletes’ self-talk use and experiences of the experiment. It was reported that athletes thought their self-talk affected their performance, and that the task was experienced as at least moderately naturalistic. Participants of the OST group had issues with their use of overt self-talk, whereas participants of the CST group had no issues employing covert self-talk. Furthermore, six out of the seven participants interviewed reported issues estimating their capability (i.e., rating of self-efficacy) for the first time before the baseline try.
Self-efficacy as a mediator in the self-talk-performance relationship

Self-talk has been regarded as a self-delivered type of verbal persuasion (Hardy, 2006), argued capable of building efficacy in athletes (e.g., Zinsser, Bunker, & Williams, 2006). With regards to verbal persuasion Bandura (1997) stated that people are more likely to trust evaluation of their capability by those that possess knowledge, skill, and experience in the activity it regards. Having knowledge, skill, and experience can be summarized as possessing competence within an activity. In other words, the higher competence the athlete perceives the persuader to possess, the more successful will the persuasion become. In line with this, Hardy argued that elite athletes are more likely to benefit from self-delivered verbal persuasion since they have high competence in their activity.

Consequently, Linnér (2010) investigated the effects of self-talk on golf putting performance and self-efficacy in a sample of elite golf players. No changes in self-efficacy were reported, which Linnér accounted to experimental design issues (i.e., participants being overconfident in the baseline measure). To deal with overconfidence Linnér suggested that one may use a task that is familiar to participants, in which they can relate their capabilities without trying the task before being tested. This would also deal with efficacy beliefs possibly mirroring performance (Linnér). Hatzigeorgiadis et al. (2008) supported self-efficacy as a possible mediating mechanism in the self-talk-performance relationship within a tennis intervention study. Although Hatzigeorgiadis et al. also explained that their results might just be a mirroring of performance, since participants were allowed to try the task once for familiarization before rating their self-efficacy of the task.

In the present study elite golf players estimated their capability on a well-known task (i.e., 4 meter putt), and in a context where they are used to practicing, without trying the task prior to testing. The analyses revealed that the experimental conditions did not change the self-efficacy beliefs of participants. The present study design (e.g., the training phase not being controlled, and relatively short in time), might be a reason for the absence of efficacy changes, that changing efficacy beliefs of elite level athletes that have high perceived competence is not as easy as changing the beliefs of lower level athletes which do not possess as high level of competence, such as in Hatzigeorgiadis et al. (2008). Furthermore, as in Linnér (2010), were there issues with baseline efficacy estimations in the present study. Six out of the seven participants interviewed reported issues estimating their capability for the first time before the baseline try. One participant stated: “it was hard to know before, because you had not done it before, so you had nothing to compare with”. Although the task and context was familiar, the participants did not seem to be able to accurately relate their capabilities. This could arguably question the accuracy of the generality dimension of efficacy beliefs, that participants could not transform previous experiences in the same context to accurately estimate their capability in the putting task. However, this may not be the most important thing in understanding how self-efficacy might mediate the self-talk-performance relationship, as proposed by Hardy et al. (2009).

Verbal persuasion has been proposed to be a limited source of efficacy, although it has been suggested that persuasive statements can be a useful adjunct efficacy source (Bandura, 1997). In line with Bandura’s proposition, verbal persuasion can produce supplemental information to the complex cognitive process of forming efficacy beliefs, where past performances is the strongest source of information (Feltz, et al.). Thus, in line with the theory, it is possible to assume that it is difficult to discover the supplemental information that self-talk might provide to efficacy beliefs, if the strongest source is removed (as in the present design). In other words, participants seem to need the past performance to more accurately relate their
capabilities, which then enables access to the small but adjunct effect self-talk might have on self-efficacy.

Maybe participants had not been overconfident if a past performance had been implemented (e.g., a familiarization try). In line with this, one participant stated: “the task looked easy, but when up there it was not as easy as I thought it was”, followed by “if I had hit the putt once before, I would never have estimated so high”. High self-efficacy, or high self-confidence, is regarded as a positive quality in elite athletes, something they aim to be. In relation to being overconfident one participant stated: “of course you should believe you will make a lot, the other way around would be wrong”.

Within the social cognitive theory to be an agent means to act with intention, and people can influence their own functioning by using forethought, self-reflection, and self-regulation (Bandura, 2001). Why not view self-talk as a vehicle of self-reflection? Maybe it is single-minded to view self-talk as only a part of verbal persuasion. Self-talk can probably be a mediator of stronger predictors of self-efficacy, such as past performance, being that people can remind themselves of past performances. Such as one participant stated in the present study, when reporting using an idiosyncratic memory cue: “I reminded myself of good memories saying ‘Skandia cup’ to myself”. Even though it would be the past performance raising the efficacy belief of the person, self-talk would be used as the strategy to promote such a change. Self-talk cues of past performances may work better when athletes perform better, when their perceived competence is high, whereas if setbacks occur and perceived competence is reduced an athlete may not be as susceptible to this type of self-talk, as a result, self-talk may then potentially not be as effective. However, it may also be the opposite. Since the self-talk cue of the past performance potentially capable of increasing an athlete’s self-efficacy is used, the athlete does not experience this reduced belief in his/her abilities when adversity arises. The more dependable the source of information is the more likely it changes the perceived efficacy (Bandura, 1997). According to Bandura nothing is more dependable than a mastery experience, and as Bandura stated: “most people believe they know themselves and their predicaments better than others do” (p. 104). Thus, a self-talk cue reflecting a past performance is probably a strong source of efficacy information.

Although the present investigation could not determine or further acknowledge self-efficacy as a possible mediating mechanism in the self-talk-performance relationship (Linnér, 2010), there were qualitative results supporting the proposition. One participant stated “I believe this (self-talk) like motivates, that you can feel this extra confident feeling that you think you will make the putt”. The participant expressed the experience of using motivational self-talk which promoted a boost of confidence in the situation, which made the participant think he or she would make the putt. By definition (Bandura, 1997), the participant expressed an efficacy affect, while using motivational self-talk, supporting the claim that efficacy might be a possible mechanisms explaining how self-talk influences performance.

The argument of Hardy (2006) that elite athletes are more likely to benefit from self-delivered verbal persuasion might be true, but there is no research to support it so far. To this date, the study of Hatzigeorgiadis et al. (2008) is the strongest support of self-efficacy as a mediator in the self-talk-performance relationship. More research overcoming the mirroring issue, and the overconfidence issue, is warranted to further the knowledge of self-efficacy as a mediator in the self-talk-performance relationship.
Self-talk and performance

Self-talk has been proposed as a strategy athletes can use to reach peak performance (Hardy, et al., 1996). All participants interviewed in the present study thought that their use of self-talk affected their performances. Instructional and motivational self-talk have been shown to improve performance (e.g., Landin & Hebert, 1999; Kolovelonis, et al., 2011), and it has been concluded that no study has yet compared overt and covert self-talk in relation to performance (Hardy, 2006). Therefore, the present study sought to investigate the overtness and functions of self-talk and their effects on golf putting performance. With regards to self-talk overtness the manipulation failed and as such overt and covert self-talk could not be compared in relation to performance. Instead the performance analysis was based solely on the CST group.

In relation to golf, Harvey et al. (2002) showed that instructional self-talk improved shot consistency compared to negative self-talk and the control group. In Linnér’s (2010) golf putting experiment instructional self-talk improved performance compared to the baseline measure. However, Linnér reported that athletes had issues with the absence of a hole and that the use of instructional self-talk might have been more appropriate for the experimental task, but according to participants not for natural golf putting (i.e., putting to a hole). Regarding the characteristics of the task in Linnér’s study one participant stated: “if there had been a hole, it would have been easier to think like ‘make it’, for me it would have been easier with ‘you can do it’ and not so much the distance...”. The present investigation aimed to further the knowledge of Linnér (2010) by including a hole to make the task more naturalistic (i.e., closer to natural golf putting). Promoting a more naturalistic task was considered as achieved with all participants reporting the task as at least moderately naturalistic (see Table 5), with one participant stating it was: “similar to competition settings”.

In the present study a limited small improvement (not significant) was found supported by a high effect size. Patterns within the data showed that participants made 0.83 more putts (SD=± 2.76) while using motivational self-talk (M= 3.83, SD=± 2.08) compared to baseline (M=3.00, SD=± 1.76), indicating a 27.6 percentage of increase in performance. Furthermore, participants made less putts (not significant) while using instructional self-talk compared to baseline. Due to results not being statistically significant, high standard deviations, small sample, the baseline use of self-talk, and the design not including a control group, readers are encouraged to interpret these results with caution. As such, the present study does not disconfirm previous research regarding instructional self-talk and golf performance. However, participants included self-talk into their normal training and were elite athletes in which it is not easy to change performance from one day to another. Therefore, a small improvement found can still be considered as meaningful and interesting.

In line with results presented it is also relevant to consider preference. Previous research has reported a preference of motivational self-talk over instructional self-talk in athletes (e.g., Goudas, et al., 2006; Linnér & Sandström, 2010). In the present sample 13 out of 16 elite golf players preferred motivational self-talk. The present investigation showed that participants preferring motivational self-talk made more putts when using motivational self-talk, and that participants preferring instructional self-talk made more putts while using instructional self-talk. It should be noted that these results were not statistically significant, and it may be the outcome determining the preference, and not the preference determining the outcome. Nevertheless, why did the elite athletes mostly prefer motivational self-talk. Although results of the present investigation should be interpreted with caution they promote a potentially interesting contradiction with the self-talk research.
Linnér (2010) reported that instructional self-talk improved golf putting performance, which is in line with the assumption of the task-demand hypothesis (Theodorakis, et al., 2000), that in a fine motor demand task like golf putting instructional self-talk would be more beneficial to use. Hatzigeorgiadis et al. (in press) supported this part of the task demand hypothesis in their meta-analysis of self-talk interventions stating that instructional self-talk was more effective than motivational self-talk for fine motor demand tasks.

In the present study four participants reported in line with what one participant stated: “especially in putting, I think it is a big difference, because I do not want this instructional/…/ I do not want to know what I will do all the time, but more, think that the ball is in, not to think about how I should do”. Maybe the nature of instructional self-talk, being that it provides instructions, is good at improving the performance of lower level athletes, but when athletes reach a higher level (e.g., elite), instructions are no longer desirable as the task or movement is well-learned. In Linnér’s (2010) study instructional self-talk improved performance, but maybe this was because the task was unnatural. Linnér reported that the participants experienced the task as unnatural (i.e., putting to a target line instead of a hole), and as a result maybe instructional self-talk helped their performance, even though they were elite level athletes. In the present study, a hole was included, the task was closer to reality, and participants were therefore familiar and well-learned in relation to the task, and as such maybe participants did not need instructions (i.e., instructional self-talk). Maybe the task-demand hypothesis should include an experience level aspect. Although this is speculation, it does not explain how some participants of the present study preferred motivational, but some instructional (N=3), although still at the same level and performing better within their preferred function (i.e., some elite athletes preferred and performed better with instructional self-talk). Hatzigeorgiadis et al. (in press) also concluded that interventions including training had greater effects on performance than interventions lacking training. Maybe this last part is the most important factor, as one participant stated “I find motivational more difficult to use /…/ probably because I do not use it as often as instructional”.

Whether or not elite golf players are more or less helped to improve their putting performance by implementing instructional or motivational self-talk cannot be established by the present investigation. Although, the patterns within the data together with the overall motivational preference shed light to Linnér’s (2010) assumption that for natural golf putting his results may have been simplified. Consequently, additional research is promoted within the field.

The self-talk overtness dimension
Due to the experimental condition analyses revealing that participants of the OST group did not sufficiently employ overt self, overt and covert self-talk could not be compared in relation to performance. However, insight into athletes’ perceptions of using overt and covert self-talk was gained through the after performance debriefing interviews.

A question that can be raised is why participants of the OST group did not commit to the use of overt self-talk. All participants interviewed in the OST group had issues with their use of overt self-talk. It was reported that “it does not feel natural”, “it is not pleasant to say it out loud, it feels artificial”, and “I can keep it for myself /…/ I do not have to share it with everyone” which is in line with previously reported research where participants have found the use of overt self-talk awkward and distracting (e.g., Masciana, et al., 2001). In contrast, participants of the CST group had no issues employing covert self-talk, with one participant explaining the use as: “it has been easy because it feels natural to use it”. Previous research has reported a preference of covert self-talk in athletes (Hatzigeorgiadis et al., in press; Hardy,
Hall, & Hardy, 2005). Although it might appear as overt self-talk was not desirable by the athletes, the experimental condition analyses revealed that there were athletes of the CST group employing overt self-talk, similar to the way participants of the OST group employed covert self-talk. As such, from the present investigation overt self-talk cannot be considered as completely undesirable, even though it generally might be less preferred than covert self-talk. Instead, it seems that it is a matter of personal preference and something that appears to come naturally for participants.

Within the after performance debriefing it was also reported that some athletes employed overt self-talk mainly after bad shot, with one stating “when I hit a bad putt, then I say it out loud”. That overt self-talk is used more after bad shots is in line with predictions of Vygotsky (1986), that overt self-talk occurs more in demanding and challenging situations (e.g., when under pressure). With regards to using overt self-talk after bad shots, two participants reported a similar explanation with one participant stating: “you want others to know that you can hit it better, but really it is just yourself you should convince, because you know deep down inside that you can hit it much better”. The quote highlights a social comparison side to the use of overt self-talk. Zourbanos, Hatzigeorgiadis, Goudas, Papaioannou, Chroni, & Theodorakis (in press) recently reported that perceptions of support received from the coach were positively related to athletes’ positive self-talk dimensions and negatively to athletes’ negative self-talk dimensions, thus stressing the need to further consider the role of social factors in relation to athletes’ self-talk. Kronk (1994) suggested there are social learning effects to the use of overt self-talk. To better understand the antecedents of self-talk, as proposed by Hardy et al. (2009) and included in the framework of the self-talk-performance relationship (Linnér, 2010), maybe the role of social factors should be considered in relation to athletes use of self-talk overtness. As Zourbanos et al. revealed can coaches have an effect on athletes’ positive and negative self-talk. Perhaps there are similar social factors effecting athletes use of self-talk overtness, such as the coach or fellow athletes, competitors or teammates. Furthermore, perhaps these social effects are different between team sports and individual sports.

The self-talk overtness-performance relationship remains unclear. Maybe overt self-talk can be effective if it is sufficient trained, or maybe covert self-talk is more effective as this is what athletes seem to prefer. A general conclusion that can be drawn is that self-talk overtness use cannot be controlled by investigators. Consequently, when investigating it, it might be better to let the participants decide, to make their self-talk overtness use more natural, as some people seem to employ both types of self-talk overtness.

**Self-talk as an idiosyncratic phenomenon**

The self-talk field of research is progressing. Hatzigeorgiadis et al. (in press) recently confirmed self-talk as an effective intervention strategy for enhancing task performance in sport. Within their analyses Hatzigeorgiadis et al. also concluded that “for self-talk strategies to be effective, selecting appropriate type and content of self-talk in relation to the characteristics of the task and the need of the individuals may be key” (p.16). What is appropriate in relation to the task and the needs of the individual can arguably be seen as highlighting the essence of idiosyncratic.

There were several things within the present investigation that arguably support the view of self-talk as being idiosyncratic. In following the progression of the field the present investigation had participants choose their own self-talk cues to use. As seen in Tables 2 and 3 (Appendixes 16 and 17) there were great variety within the cues used, suggesting individual preference in content. In line with this previous research has considered motivational
interpretation of self-talk (Hardy, Hall, et al., 2001), which made Hardy (2006) include it as a dimension explaining what self-talk is. As Hardy explains, the concept is taken from imagery research, that it is possible for two individuals to imagine the same image, but have different interpretations of that image. The meaning behind individuals self-talk can arguably be the same (Hardy, 2006). With regards to overt self-talk and meaning two participants expressed the same thing, but with opposite beliefs. On the subject of using overt self-talk one of the participants stated: “in one way it feels more clear /…/ like you mean it a little more”, whereas another participant stated: “it feels more focused to say it inside the head, if I say it out loud it feels like it disappears somehow and have no meaning”. Additionally, the present investigation found an individual effect regarding preference in relation to performance. Participants improved their performance more within their preferred self-talk function. This effect was not significant, and it might be the performance determining the preference and not the preference determining the performance. Nevertheless, as discussed earlier in relation to performance, were athletes on the same level, although preferring differently, and performing better within their preferred self-talk function.

The core purpose of using self-talk has been to improve performance within athletes. Self-talk is arguably idiosyncratic. As such, there is a need of an idiosyncratic approach enhancing our understanding of self-talk on individual level. The use of a first-person individualized approach, have been emphasized in the study of emotion-performance relationships (i.e., IZOF model; Hanin, 2000). Although emotions and self-talk are arguably very different, there are structural ideas in Hanin’s idiosyncratic view of intra-individual emotional experiences that can be applied to self-talk research. More specifically, Hanin classified emotions in relation to hedonic tone (i.e., pleasant or unpleasant) and suggested that positive and negative emotions can both impair and enhance performance. Research regarding positive and negative self-talk is equivocal (i.e., the valence dimension; see Hardy, 2006 for a review) and undertaking an approach similar to the one of Hanin could possibly sort out this area of research. Additionally, Hanin argued that the same athlete might experience emotions of different content at different stages of the task-execution, as well as in different tasks or events, and that the emotion-performance relationships is reciprocal (i.e., inter-effect each other). This is arguably very related to self-talk. Additionally, in relation to being idiosyncratic, Hanin (2007) explained the term meta-experience of an emotion, an athlete’s specific knowledge, beliefs, preferences, and attitudes towards an emotional experience. This can be related to the motivational interpretation of self-talk (Hardy, Hall, et al., 2001), although a meta-experience of self-talk (i.e., a person’s interpretation of one’s self-talk) would arguably be broader than just motivational aspects. An idiosyncratic self-talk approach could be an individual profile of self-talk, which would underscore the needs of the individual, in relation to the concerning task, as proposed in the quote of Hatzigeorgiadis et al. (in press) above. Coming back to the epigraph opening in the introductory part, this would clarify what is “good self-talk” for the particular athlete and empower the individual in its strategic use of self-talk.

Methodological discussion
The present study aimed to further the knowledge of Linnér (2010) with its lessons learned. Most of these lessons learned have already been discussed, such as the inclusion of a hole, using a familiar task, and participants choosing their self-talk cues themselves. Choosing cues themselves required knowledge to be able to differentiate between instructional and motivational self-talk, as such, a lecture in self-talk was held. As in Linnér’s study an overall workshop procedure was used. Participants’ experiences of the lecture and experiment as a workshop were overall very positive, with one participant stating: “when you had talked about
it, it became quite clear how I had done it before and what could be changed, so that approach I thought was really good”. With regards to how participants self-talk changed throughout the workshop the main effect reported was experiencing more structure and awareness, which one participant refers to when saying: “it became better, more structured and little more control of it”. Even though the present investigation could not establish any generalizable results, it did produce knowledge for participants to bring outside of the study, therefore benefitting the participants involved, as seen in the statement of one participant: “what is good is that I feel I got something out of it too”.

In the present study participants were instructed to behave as if they were executing golf putts in reality. In line with this, some loss of internal validity was accepted (e.g., participants placing the ball on the indicated dot themselves) to make the experiment more naturalistic. This loss of validity is not considered to have affected the outcome of participants putting performances. However, it is considered to have positively affected the participants’ naturalistic experience of the task. As such, promoted an enhanced experimental investigation in relation to ecological validity.

As in Linnér (2010), the qualitative results gained from the after performance debriefing interviews supplemented the quantitative results from the experiment to create a comprehensive impression of participants’ self-talk use and its consequences. This is thought to have had a facilitating influence in making the right interpretations of the data. With regards to participants estimating their capability (i.e., filling in the self-efficacy instrument) the researcher was positioned within the same room to make it possible for participants to ask questions if needed. Several participants did consult with the researcher and this decision is thought to have positively affected the outcome of these estimations.

During the experimental condition analyses cross validity triangulation was conducted by the researcher in cooperation with a supervisor to conclude regarding the information. In contrast, the qualitative content analysis was carried out by the researcher alone. The content analysis did however follow prearranged guidelines and the absence of triangulation is therefore not considered as a disadvantage of this analysis.

**Ethical issues**

Participants of the CST group signed their written informed consent first after the baseline measure. This can be considered as an ethical slip within the study, however, participants were informed of ethical principles ahead of the baseline measure, and written informed consent was collected from the main person in charge of the school before the baseline measure. Consequently, even though this could have been carried out more appropriately, all participants agreed to take part and showed no signs of disagreement.

**Limitations**

As Mitchell and Jolley (2010) explained can “participants serve double duty by being in both the control and experimental conditions” (p. 475) when using a repeated measures design, as such reducing the number of participants needed for an investigation. Using a repeated measure design increases the power of the investigation, but creates order effects (Mitchell & Jolley). In the present investigation, order effects were balanced out by counterbalancing the treatment conditions. However, it was also revealed that almost all participants used self-talk in the baseline measure. As a result, since self-talk was the treatment implemented in the experimental conditions, the baseline measure could be considered to not represent an
adequate control condition. Thus, since there was no conventional control group implemented in the study, all results of the present investigation should be interpreted with caution.

Although the present investigation included a training phase, one of the lessons learned from Linnér (2010), it should be noted that this was not a typical intervention. In other words, the training was not controlled by the researcher. Participants trained by themselves, with the goal intensity of 20 minutes per day (i.e., 100 minutes in one week). The actual training carried out by the covert sample was an average of 45 minutes per week ($SD = \pm 23.45$), as such not reaching the goal intensity.

Regarding hitting the same putt over and over, which some participants considered as the main thing not making the experimental task completely naturalistic, one participant stated: “in the end you knew the putt”. Since participants were elite level athletes and they carried out the same task several times, it cannot be ruled out that some might have figured out how to hit the putt to make it go in. However, steps were taken within the design supported by research (see putting task section within the method part) to make the task a one-shot-one-chance situation, and to prevent that putts were hit in a repetitive manner, in which performance can be improved in the short run (e.g., remember how to hit the putt).

Kronk (1994) reported an observer’s effect associated with the lack of overt self-talk use. Participants of the OST group may have been affected by the presence of the researcher and as such used less overt self-talk. However, this simulates lifelike situations. If participants were affected by the researchers presence, they will probably be affected by the presence of fellow competitors as well, and therefore not comfortably use overt self-talk.

**Application**

With regards to combining self-talk and putting participants reported some issues with overt self-talk (i.e., self-talk said out loud), but not with covert self-talk (i.e., self-talk said inside one’s head). Additionally, all participants thought their self-talk affected their performances. As such self-talk appears to be a strategy golf players can use to influence their performance.

With regards to self-talk overtness (i.e., how self-talk is verbalized) there is no research suggesting that overt self-talk is better than covert self-talk at improving performance. It might be true that if you train, both ways of verbalizing one’s self-talk can be effective, but this is still not known. In relation to this, and the fact that some participants reported overt self-talk to be awkward or unnatural, there is no support to suggest that athletes should train with overt self-talk to make it feel more natural. Instead, in line with what was revealed in the present study, it is suggested that athletes should use the self-talk overtness type that suites them the best (i.e., feels natural to use). Whether this is overt or covert self-talk seems to be personal, and it appears that in some cases it can be both overt and covert self-talk used simultaneously.

This investigation could not establish whether or not elite golf players are more or less helped to improve their putting performance by implementing instructional or motivational self-talk, although patterns within the data suggested motivational self-talk. For natural golf putting and elite golf players there was a preference of motivational self-talk, although individual differences existed. In line with individual differences, participants seemed to perform better within their preferred function (i.e., instructional or motivational), although this could not be verified by the present investigation.
All in all, it is suggested that self-talk should be viewed within an individualized approach. Athletes should be given opportunities to train different ways of verbalizing their self-talk, and test both instructional and motivational functions of self-talk. In relation to this, it should be emphasized that training is key. This way, athletes can themselves become aware and make their self-talk facilitating on individual level.

Future research

It should be noted that although the framework of the self-talk-performance relationship (Linnér, 2010; based on Hardy et al., 2009) has helped to structure the research within the area, its propositions has yet to be tested. For example, although four mediating mechanisms are proposed, and promising results exist in relation to each mechanism, none of them has been confirmed as an actual mechanism mediating the self-talk-performance relationship. Linnér also evolved Hardy et al.’s framework to consider that influencing performance through self-talk might re-affect the use of self-talk (i.e., the dotted line in Figure 3). As such, future research should test the assumptions in the framework of the self-talk-performance relationship.

In relation to self-efficacy as a mediating mechanism in the self-talk-performance relationship there are lessons learned from the present and former studies which future research should aim to overcome. Such as, self-efficacy beliefs mirroring performance and participants being overconfident in the baseline measure. Additionally, as proposed earlier, can self-talk probably be a mediator of stronger predictors of self-efficacy (e.g., past performances). Future research could make participants construct their own idiosyncratic memory cue of a past performance, and use this as their self-talk cue to trigger efficacy changes. In relation to this, future research should consider the generality dimension of efficacy beliefs (i.e., such past performance self-talk cues probably need to be similar in task and situation to influence efficacy beliefs of a person). Furthermore, future research is recommended to consider the competitive level of intended participants in relation to the planned intervention, as it is more difficult to produce efficacy changes in elite athletes compared to lower-level athletes.

For natural golf putting and elite golf players results of the present study and the results of Linnér (2010) are somewhat contradictory. Linnér showed that instructional self-talk improved performance, but argued that this might have been different if the task had been more naturalistic. The present study implemented a task that was considered more naturalistic, and participants preferred the use of motivational self-talk. However, no results were significant in relation to performance. Therefore, future research should try to verify the assumption that for natural golf putting and elite golf players, motivational self-talk is more effective than instructional self-talk at improving performance.

In relation to self-talk overtness, the present study showed that overall participants did not seem to like the use of overt self-talk, although it appears that there may be individual differences. In line with these results, it is recommended that the best way to deal with self-talk overtness seems to be providing participants with the choice of using their preferred overtness type. Additionally, as proposed earlier, can future research consider social factors in relation to athletes’ use of self-talk overtness. Future research can investigate how the coach and fellow competitors or teammates influence athletes’ use of self-talk overtness, and if athletes use of self-talk overtness is different from individual sports to team sports.

The nature of when self-talk is used, and when it should be used, in relation to task execution to most appropriately influences performance is one dimension still overlooked in research. In
the present investigation it was shown that the most common time when participants used self-talk was when standing over the ball (N=28), and only 4 participants used self-talk while executing their swing movement. One participant highlighted this issue when stating: “I was a little unsure /.../ when it was best to use the words”. Although this is a difficult area to conduct research, as self-talk is difficult to control in participants, future research could first aim to understand when athletes verbalize their self-talk (see Table 4 for a golf example), to then aim to understand when in relation to task execution it is best to actually verbalize one’s self-talk.

As proposed earlier in this thesis self-talk should be viewed as an individualized strategy, therefore is an idiosyncratic approach to enhance our understanding of self-talk on individual level promoted. One such strategy could be an individual profile of self-talk, which focuses on a particular person’s self-talk use to promote a facilitating strategy to enhance performance on individual level. Although the self-talk field of research is progressing, and understanding how self-talk influences performance is important, an idiosyncratic approach, could possibly propel the field even further. As one could express it, self-talk is within a person, and arguably very personal, as such, research should also take on this point of view.
References


Index of appendixes

Appendix 1: Model of psychological preparation for peak performance
Appendix 2: Initial email sent to the schools
Appendix 3: Information email sent to parents
Appendix 4: Written informed consent (in regards to main person in charge of each school)
Appendix 5: Written informed consent (in regards to participants)
Appendix 6: The experimental design
Appendix 7: Self-efficacy instrument
Appendix 8: Performance measure form
Appendix 9: Manipulation check (issued after baseline try)
Appendix 10: Manipulation check (issued after each experimental try)
Appendix 11: Manipulation check (issued upon completion of the experiment)
Appendix 12: After performance debriefing guide
Appendix 13: Information letter to participants (issued before baseline try)
Appendix 14: Background information form
Appendix 15: PowerPoint presentation used in the lecture of self-talk
Appendix 16: Illustration of what was said during baseline (Table 2)
Appendix 17: Illustration of what participants said while using motivational and instructional self-talk (Table 3)
Appendix 18: Experimental condition analyses
Model of psychological preparation for peak performance

*Figure 1.* Model of psychological preparation for peak performance (Hardy et al., 1996, p. 240).
Hej XXX,

Lukas Linnér heter jag och studerar idrottspsykologi vid Högskolan i Halmstad. Jag påbörjade mina studier hösten 2008 efter att innan dess satsat mina unggomsår på att bli bra på golf vilket tog mig till college i USA där mina mål och förutsättningar av olika anledningar förändrades vilket också förändrade mig själv och min syn på golf som helhet. Allt detta sammantaget lede mig senare till Högskolan i Halmstad där jag nu lägger en ny grund att stå på med idrottspsykologisk ankoppling till golf. XXX och jag har flertalet gånger talat kring ämnet och han är också den som gav mig era email adresser och även talat om för mig att ni likt mig själv har varit studenter på Högskolan i Halmstad.

Jag håller just nu på att planera min kandidat (Höst 2010) och därefter uppföljande magisteruppsats (Vår 2011) som jag ämnar sammankoppla. Ändamålet med uppsatserna är att experimentellt undersöka kopplingar mellan elitgolfares self-talk och upplevd self-efficacy (Jag förklarar inte begreppen vidare här eftersom jag tror att ni har full koll på dessa men om så önskas berättar jag gärna mer ingående om dem). Delar av studien är replikeringar av tidigare resultat för att vidare belysa kopplingar mellan begreppen samtidigt som studien är nytänkande i ett antal kopplingar vilket förhoppningsvis leder till nya intressanta rön. Mitt mål är att undersöka dessa kopplingar på studenter vid Sverige mest elitsatsande skolor, det vill säga XXX hos er i XXX, i XXX och på XXX vid Högskolan i Halmstad. Riktigt hur detta kommer att arrangeras beror på flera faktorer, men först och främst vill jag veta om ni är intresserade av att delta vilket jag verkligen hoppas!

Då jag är en aspirerande student till European Masters programmet vill jag poängtera att detta är en studie som är fullt seriös och som jag hoppas kan generera kunskaper för fältet som ni senare kan ta del och använda er av.

Att vidare förklara mer ingående vad experimentet går ut på känns i ett sådant här första mejl lite väl utdraget. Jag berättar jätte gärna mer om hur och vad det går ut på i ett vidare samtal när jag vet om ni finner intresse i studien vilket jag verkligen hoppas att ni gör?!

Förhoppningsvis har jag med detta mejl skapat ett intresse hos er och att vi kommer träffas vid senare tillfälle för att genomföra detta vilket jag hade tyckt vore väldigt kul och inspirerande!

Jag besvarar med glädje alla frågor ni har, per mejl eller telefon.

Med förhoppning av att vi hörs och ses!

Lukas Linnér
Student Högskolan i Halmstad
Hej alla föräldrar,

Lukas Linnér heter jag och studerar idrottspsykologi på magisternivå vid Högskolan i Halmstad. Nu under våren genomför jag en studie kring golf och puttning.

Sveriges XXX samt XXX, Svenska golf förbundet, och Riksidrottsförbundet står bakom studiens genomförande och vill ta del av vad studien kommer att komma fram till. Ledande forskare inom det vetenskapliga fältet det berör har även menat på att denna studie verkar väldigt intressant och relevant för dess deltagare.

Under tre onsdagar i de kommande veckorna (X,X,X) kommer era barn att ges möjlighet att delta i ett experiment kring olika strategier vid puttning som genomförs på XXX golfgymnasium. Precis som all forskning, är det frivilligt för era barn att delta, de kan när dem vill avbryta utan att behöva förklara varför, samt att all information som samlas in kommer behandlas konfidentiellt.

Jag kan inte gå in på detalj i vad experimentet går ut på utan att på så vis förstöra själva experimentet. Det som går att säga är att det går ut på att försöka sätta så många puttar som möjligt från ett bestämt avstånd, samt utifrån detta svara på några enklare frågor och påståenden.

Förutom att frambringa ett vetenskapligt resultat så är ett stort mål med denna studie också att främja lärande för ungdomarna som är involverade. Därav är experimentet uppbyggt som en workshop, där ungdomarna kommer att fundera, diskutera, och lära sig under experimentets gång. På så vis får vi både en vetenskaplig och praktisk nytta av studien i dess genomförande och i dess resultat.

Har ni några frågor eller funderingar så svarar jag gärna på dessa via e-post.

Lukas Linnér
European Masters student
Högskolan i Halmstad
Written informed consent (in regards to main person in charge of each school)

Skriftligt informerat samtycke angående XXX golfgymnasiums medverkan i experiment kring golfputtning, self-talk, och self-efficacy.


Allt deltagande är frivilligt. Deltagandet kan avbrytas när som helst utan påföljd. All information behandlas konfidentiellt.

Riksidrottsförbundet och Svenska Golfförbundet stödjer denna studie.

Huvudansvarig för studien är Lukas Linnér. Handledare för studien är Professor Natalia Stambulova. Frågor rörande studien hänvisas till huvudansvarige.

___________________________________________________________________________
Ort/Datum
___________________________________________________________________________
Namnunderskrift huvudansvarige för studien
___________________________________________________________________________
Namnförtydligande huvudansvarige för studien
___________________________________________________________________________
Vi (XXX golfgymnasium) har informerats om studien, om hur informationen samlas in och hur den bearbetas. Vi har även informerats om att deltagandet är frivilligt och att alla deltagare, när de vill, kan avbryta deras medverkan utan att ange orsak. Vi samtycker härmed till att medverka i detta experiment kring golfputtning, self-talk, och self-efficacy.

___________________________________________________________________________
Ort/Datum
___________________________________________________________________________
Namnunderskrift ansvarig för XXX golfgymnasium
___________________________________________________________________________
Namnförtydligande ansvarig för XXX golfgymnasium
Written informed consent (in regards to participants)

Skriftligt, informerat samtycke angående medverkan i studie kring olika strategier inom puttning i golf.

Jag har blivit informerad om studien, om hur informationen samlas in och att informationen kommer behandlas konfidentiellt (dvs. vad som sägs kommer ingen veta att just du har sagt). Jag har även informerats om att mitt deltagande är helt frivilligt och att jag, när jag vill, kan avbryta min medverkan utan att ange orsak. Jag samtycker härmed till att medverka i denna studie kring olika strategier inom puttning i golf.

Ort/Datum___________________________________________________________________

Namnunderskrift_____________________________________________________________

Namnförtydligande__________________________________________________________
The experimental design

<table>
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<th>Between subject variable</th>
<th>Overt self-talk</th>
<th>Baseline</th>
<th>Motivational self-talk</th>
<th>Instructional self-talk</th>
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<td>Baseline</td>
<td>Motivational self-talk</td>
<td>Instructional self-talk</td>
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(Counterbalanced)

Lecture in self-talk

Within subject variable

After performance debriefing interviews
Self-efficacy instrument

Deltagare # ________________________

Vänligen fyll i med hjälp av procentskalorna hur säker du är just nu på att du kan utföra den beskrivna uppgiften. Välj det svarsalternativ som bäst stämmer in på dig genom att sätta ett kryss i vald ruta på respektive fråga. Tänk igenom det noga!

Till exempel, om du är fullständigt säker på att du kommer klara uppgiften väljer du förmodligen **100%**. Om du däremot inte alls är säker på att du kommer klara uppgiften väljer du förmodligen **0%**.

**Hur säker är du just i detta nu att du kan sänka…**

<table>
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<tr>
<td>... 10 av 10 puttar</td>
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Ex: På fråga 3, om du väljer att svara 100 %. Då är du fullständigt säker på att du kan sänka minst 3 av 10 puttar. ”Sänka” = att bollen slås direkt i hål.
Performance measure form

Deltagare # ________________

**Baslinjen**

<table>
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<th>Putt#</th>
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<th>3</th>
<th>4</th>
<th>5</th>
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<th>8</th>
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Scatter plot: ◯

**Instruerande self-talk**

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Scatter plot: ◯

**Motiverande self-talk**

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Scatter plot: ◯
Manipulation check (issued after baseline try)

Deltagare # ____________________

Self-talk är uttalanden eller påståenden riktade mot dig själv som kan sägas som en liten röst i ens huvud eller högt så att andra kan höra det. Utifrån detta…

Sa du något till dig själv under puttuppgiften? Ja Nej
(ringa in ditt svar)

Om Ja, vad sa du till dig själv?
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

Och i så fall, hur ofta sa du detta?
(ringa in ditt svar)

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Tack för dina svar!
Manipulation check (issued after each experimental try)

Deltagare # ______________________

Nedan beskrivs ett antal frågor. När det hänvisas till ”den tänkta self-talk instruktionen” menas det self-talk som du valde under föreläsningen, som kan vara antingen instruerande eller motiverande beroende på i vilken ordning just du gör detta.

Vilken self-talk instruktion valde du att använda denna vecka? (Vänligen skriv vad du sagt)
___________________________________________________________________________
___________________________________________________________________________

I vilken utsträckning har du använt den tänkta self-talk instruktionen när du har tränat puttning den senaste veckan?
(ringa in ditt svar)

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Hur ofta använde du dig av den tänkta self-talk instruktionen under puttpuppgiften (de 10 puttarna du precis genomfört)?
(ringa in ditt svar)

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</table>

Sa du någonting annat till dig själv förutom den tänkta instruktionen under puttpuppgiften (de tio puttarna du precis genomfört)? (ringa in ditt svar)

Ja Nej

Om Ja, Vad sa du till dig själv?
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

Och i så fall, hur ofta sa du detta? (ringa in ditt svar)

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Din instruktion var att använda self-talk som uttalas högt så att andra kan höra vad som sägs. Self-talk kan också uttalas som en inre röst i huvudet.

I vilken utsträckning använde du den tänkta instruktionen (högt så andra kan höra) under puttuppgiften (de tio puttarna du precis genomfört)?

(ringa in ditt svar)

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I vilken utsträckning använde du det andra sättet (tyst i huvudet) under puttuppgiften (de tio puttarna du precis genomfört)?

(ringa in ditt svar)

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Vänligen ange hur mycket du tränat puttning med self-talk under den senaste veckan. Svara i antal minuter. (ex: 20 minuter per dag i fem dagar blir 100 minuter).

Jag har tränat ___________ minuter totalt den senaste veckan.

Tack för dina svar!
Manipulation check (issued upon completion of the experiment)

Deltagare # __________________

Hur verklighetstrogen anser du att puttuppgiften har varit? (de 3x10 puttarna du genomfört).
(ringa in ditt svar)

1 2 3 4 5 6 7 8 9 10
Inte alls Medel Helt verklighetstrogen

Hur svår anser du att puttuppgiften har varit? (de 3x10 puttarna du genomfört).
(ringa in ditt svar)

1 2 3 4 5 6 7 8 9 10
Inte alls Medelsvår Väldigt svår

Flera personer använde self-talk under första tillfället. Anser du att du använt self-talk mer välplanerat under senare tillfällen?
(ringa in ditt svar)

1 2 3 4 5 6 7 8 9 10
Instämmer Instämmer Instämmer
inte alls delvis helt

Flera personer använde self-talk under första tillfället. Anser du att ditt self-talk varit mer främjande för din prestation under senare tillfällen?
(ringa in ditt svar)

1 2 3 4 5 6 7 8 9 10
Instämmer Instämmer Instämmer
inte alls delvis helt

Vilken typ av self-talk har du föredragit att använda under puttuppgiften? (de 3x10 puttarna du genomfört) Kryssa för endast ett alternativ! Ange sen i vilken utsträckning du föredrar detta med hjälp av siffrorna, 1-10, där 1 = mindre föredraget, och 10 = mer föredraget.

☐ Inget föredraget
☐ Motiverande self-talk 1 2 3 4 5 6 7 8 9 10
☐ Instruerande self-talk 1 2 3 4 5 6 7 8 9 10

Vänligen ange när du har talat till dig själv under puttuppgiften? (de 3x10 puttarna du genomfört) Kryssa för alla de alternativ som stämmer in på dig, kan vara mer än ett!

☐ När jag står bakom bollen (kollar linjen)
☐ När jag är på väg fram till bollen (efter kollat linjen)
☐ När jag står över bollen (precis innan slaget slås)
☐ Under swingen (säger något när du swingar)
☐ Mellan slagen
☐ Annat: ____________________________
☐ Annat: ____________________________
☐ Annat: ____________________________
Appendix 12

After performance debriefing guide

Etik
Informanten delges att
- den kan avbryta när som helst utan påföljder
- samtliga svar behandlas konfidentiellt
- intervjun ämnas att spelas in. Är detta okej?
Har du några frågor innan vi börjar?

Self-talk under puttuppgiften
Har det varit enkelt eller svårt att kombinera self-talk med utförandet av puttuppgiften?
- Är det olika mellan instruerande och motiverande?
- Tror du det varit annorlunda om du fått träna mer på att använda self-talk?

Tror du att det du sa påverkade din prestation?
- Om ja, på vilket sätt?
- Om nej, varför inte?
- Tror du det varit annorlunda om du fått träna mer på att använda self-talk?

Förändrades ditt self-talk mellan puttarna? Till exempel att du började säga en sak men sen började säga något annat?

Kan du beskriva hur det känns att tala till dig själv i samband med när du puttar?
- Det finns två sätt att uttala sitt self-talk, tror du de påverkar olika?
- Vad är skillnaden mellan dessa upplever du?

Vid första mätningen använde de flesta någon typ av self-talk. Sen genomfördes föreläsningen där ni fick lära er, fundera och välja self-talk att använda under senare tillfällen. Kan du beskriva hur ditt self-talk förändrats från första mätningen till de senare mätningarna?
- Har det varit någon skillnad mellan mätningarna?
- Kan du precisera vad det är som förändrats?

Informantens upplevelser i relation till experimentets utförande
Hur verklighetstrogen har du upplevt att puttuppgiften har varit?
- Hur känns det att putta inomhus?
- Varför det?
- Kan du utveckla det?

Vid första tillfället, innan du hade testat puttuppgiften. Hur upplevde du att det var att uppskatta din förmåga att sätta puttarna?
- Svårt/lätt?
- Varför det?

Hur upplevde du att jag mätte puttarna mellan slagen?
- Funderade du på det?
- Tror du det påverkade din prestation?

Har alla formulär och enkäter varit tydliga och enkla att förstå?
- Om inte, vad är det som varit otTydligt eller svårt att förstå?
Kan du berätta om hur du har tränat med self-talk under veckorna?

Hur ser du på experimentets utförande som en workshop?
   - Har det hjälpt med förståelsen för self-talk?
   - Tror du det har påverkat din prestation?

Några frågor eller något du vill berätta eller förtydliga?

**Tack för att du ställde upp!**
Information letter to participants (issued before baseline try)

Informationsbrev

Läs följande text noga, gärna två gånger.
Något som är oklart så fråga, vi svarar gärna!

Välkommen till detta experiment kring olika strategier vid puttning!

Först vill vi påminna dig om att medverkandet i detta experiment är helt frivilligt, att du vid vilket tillfälle som helst kan välja att avbryta utan att förklara varför, och att all information som samlas in kommer behandlas konfidentiellt (dvs. vad som sägs kommer ingen veta att just du har sagt).

Följande kommer att ske under experimentet:
Du kommer vara ensam tillsammans med experimentansvarige (Lukas) när du puttar.
Du kommer putta totalt tio gånger från samma position.
Målet är att sätta så många puttar som möjligt.
Du använder din egen putter och boll.
Under utförandet vill vi att du beter dig på samma sätt som du gör ute på golfbanan. Vi vill att du gör det verkligt, t.ex. läsa greenen, sitta på huk, placera bollen på ditt sätt... etc.
När en putt är slagen kommer Lukas att hämta den och ge den tillbaka till dig. Puttar som inte går i hålet kommer Lukas att mätas i avstånd från hålet av Lukas.
Mellan varje putt vill vi att du går tillbaka till startpositionen och börjar om där ifrån.
Var startpositionen är kommer Lukas att visa när ni kommer in.
Innan du slår första putten kommer du att fylla i ett formulär.
Efter du har slagit samtliga tio puttar kommer du att fylla i ett formulär.

Lycka till!
Appendix 14

Background information form

Deltagare # __________________

Bakgrundsinformation

Kön? (ringa in ditt svar)  Man  Kvinna

Hur gammal är du? ______________________________________________________

Hur många år har du spelat golf? ___________________________________________

Vilken tour tävlar du huvudsakligen på? _____________________________________

Vad är ditt golfhandicap (+/-)? ____________________________________________

Vilken skola går du på? __________________________________________________

I vilken utsträckning anser du att du använder self-talk redan idag?
(ringa in ditt svar)

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I vilken utsträckning anser du att du har erfarenhet av self-talk?
(ringa in ditt svar)

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I vilken utsträckning anser du att self-talk är något du fått träning i?
(ringa in ditt svar)

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Tack för dina svar!
Vad är self-talk

Uttalanden eller påståenden som sägs automatiskt eller medvetet

Är adresserade till sig själv – inte andra

Meningen är att försöka följa dessa för att trigga en handling

Kan uttalas högt så andra hör eller som en inre röst i huvudet

Hur self-talk kan vara uppbyggt

Meningar, fraser eller ord

Första eller andra person

Självbestämt eller angivet
Individuella skillnader

Frekvens varierar

Positivt eller negativt
- Uppskattning ("bra gjort!")
- Kritik ("din idiot!")

Främjande eller hämmande

Motiverande betydelser

Hardy, 2006; Moran, 1996.

Varför idrottare använder self-talk

Höja prestationen

Hantera motgångar

Två huvudsakliga anledningar – instruera & motivera

Hardy, 2006; Hardy, Gammage & Hall, 2001; Hardy, Jones & Gould, 1996.

Instruera & Motivera

Instruerande
- Inlärm och utförande av en uppgift
- Fullfölja strategier

Motiverande
- Mental förberedelse, fokus, självförtroende, hantera svårigheter
- Reglera anspänning
- Bibehålla eller öka ansträngningen (relation till målsättning)

Hardy, Gammage & Hall, 2001.
Instruera & Motivera

"rak arm" (inlämningsmetod)
"som en pendel", "mjuk och oljig" (utförande)
"kom ihåg tummen" (strategi/processmål)

"Nu gäller det" (mental förberedelse)
"Fokusera", "koncentrera dig" (fokus)
"Du är bäst", "Jag äger", "Detta kan vi" (självförtroende)
"Du är inte trött" (hantera svårigheter)
"Jag kan", "Du kan" (motiverande)

"Kom igen nu" (öka anspänning)
"Lugna ner dig" (minska anspänning)

"Du vet vad du vill, kör på!" (bibehålla ansträngning mot mål)
"Nu ökar vi tempot" (öka ansträngningen)

Fundera… hur är mitt self-talk?

Är det mest tyst i huvudet eller högt så andra hör?

Är det meningar, fraser eller ord?

Används Du, Jag, Vi?

Är jag mest positiv eller negativ? Hur påverkar detta mig?

Varför säger jag det som jag säger?

Self-talk hos idrottare

Generellt positivt

Inre röst i huvudet

"Du kan… det här!"

Korta fraser

Andra person

Hardy, Gammage & Hall, 2001; Hardy, Hall & Hardy, 2005.
Välj ditt self-talk
som du vill använda

Utifrån det du lärt dig…
Välj ett instruerande self-talk och ett motiverande self-talk
Fokus på hålet! (ex: ”träffa hålet”, ”sänk den”)
Detta kommer du sedan få träna de nästkommande veckorna

Vem gör vad & varför
Alla använder self-talk som uttalas högt så andra kan höra
Alla tränar dagligen puttning med self-talk (20 min)
När ska det användas? (vid puttring…)
Halva gruppen börjar med instruerande, andra halvan med motiverande - gruppindelning?
Alla kommer göra allt!
Fokusera på dig själv, self-talk är personligt!

Frågor?

Tack för mig 😊
Vi ses om en vecka!
Lycka till!
Illustration of what was said during baseline (Table 2)

Table 2  
*What was said during baseline*

<table>
<thead>
<tr>
<th></th>
<th>Total N</th>
<th>CST group N</th>
<th>OST group N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructional self-talk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start the ball over that dot</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Be careful with the aim</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Moves to the left</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Closer position</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Hands down</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Focus on the pace</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Aim at the shadow</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Motivational self-talk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make it (you will/I will/we will/now)</td>
<td>11</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Come on now</td>
<td>11</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>You are good (at putting)</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>This is in</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You can do it</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>It is an easy putt (this is easy)</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Get it in</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>You know this</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You are awesome</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Believe in yourself</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>This one for the win</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Just hit the ball</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Sings a song to stay in the present</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Note. Participants self-talk was categorized according to Hardy, Gammage et al. (2001) and Hatzigeorgiadis, et al. (in press), in what constitutes as instructional or motivational self-talk.
Illustration of what participants said while using motivational and instructional self-talk (Table 3)

Table 3  
*What was said while using motivational and instructional self-talk*

<table>
<thead>
<tr>
<th></th>
<th>Total N</th>
<th>CST group N</th>
<th>OST group N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructional self-talk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grip pressure</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Pendulum (nice and slow)</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Pace</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Straight back straight forward</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Path of putter (in-to-in, out-in, in-in)</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Towards that dot (in the hole)</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Keep eyes down (gaze down)</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Left shoulder</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1-2-3 (pace)</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Arms tight</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Motivational self-talk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Come on now</td>
<td>15</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Get it in</td>
<td>9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Make it (you will/I will/we will)</td>
<td>7</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>In the hole</td>
<td>5</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>You can (do it)</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>You are awesome</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>I am the best</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I can</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>This is important</td>
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<tr>
<td>Relax</td>
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<tr>
<td>No problem</td>
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<td></td>
</tr>
<tr>
<td>In the center</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>All putts are makeable</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Idiosyncratic memory cue</td>
<td>1</td>
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</tbody>
</table>

Note. Participants self-talk was categorized according to Hardy, Gammage et al. (2001) and Hatzigeorgiadis, et al. (in press), in what constitutes as instructional or motivational self-talk.
## Experimental condition analyses

### Covert self-talk (CST) group

<table>
<thead>
<tr>
<th>Participant</th>
<th>Use of self-talk in baseline</th>
<th>Instructional self-talk condition</th>
<th>Motivational self-talk condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Function</td>
<td>Overtness</td>
</tr>
<tr>
<td>1</td>
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<tr>
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<td>6</td>
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<tr>
<td>7</td>
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<td>EXCLUDED</td>
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<tr>
<td>8</td>
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<tr>
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</table>

Note. The order of the participants has been changed to prevent identification.

### Overt self-talk (OST) group

<table>
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<tr>
<th>Participant</th>
<th>Use of self-talk in baseline</th>
<th>Instructional self-talk condition</th>
<th>Motivational self-talk condition</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Function</td>
<td>Overtness</td>
</tr>
<tr>
<td>1</td>
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<tr>
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<tr>
<td>4</td>
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<td>5</td>
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<tr>
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</tr>
<tr>
<td>Total</td>
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<td>6</td>
</tr>
</tbody>
</table>

Note. The order of the participants has been changed to prevent identification.