



IDROTTPSYKOLOGI



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## THE EFFECTS OF INSTRUCTIONAL AND MOTIVATIONAL SELF-TALK ON SELF-EFFICACY AND PERFORMANCE IN GOLF PLAYERS

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### Abstract

The objectives of this study were: (1) to examine the effects of instructional and motivational self-talk on self-efficacy in elite golf players; and (2) to examine the effects of instructional and motivational self-talk on performance in elite golf players. Participants involved were 9 elite golf players with a mean age of 20.4 years ( $SD = \pm 1.1$ ). A repeated measure design was implemented, and the putting experiment was completed in three sessions. Multiple one-way repeated measure analyses of variance revealed no significant differences across tries regarding self-efficacy and that instructional self-talk significantly improved performance compared to the baseline measure. Qualitative content analysis of after experiment debriefings revealed that participants found the task challenging, thought their self-talk affected their performance, and had issues with the absence of a hole. The results are discussed in relation to theory, previous research, and methodological issues. A revised version of the self-talk framework is suggested. Future research and practical applications of the results are suggested.

Key words: Experimental design, Golf, Instructional self-talk, Motivational self-talk, Performance, Self-Efficacy.

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## Sammanfattning

Syftet med föreliggande studie var: (1) att undersöka effekterna av instruerande och motiverande self-talk på self-efficacy hos elit golfspelare; samt (2) att undersöka effekterna av instruerande och motiverande self-talk på prestation hos elit golfspelare. 9 elit golfspelare deltog med en medelålder på 20.4 år ( $SD = \pm 1.1$ ). En inomgruppsdesign med upprepade mätningar implementerades och puttningsexperimentet genomfördes i tre sessioner. Multipla envägs beroende variansanalyser avslöjade inga signifikanta skillnader mellan mätningar vad gäller self-efficacy och att instruerande self-talk signifikant ökade prestationen jämfört med baslinjemätningen. Kvalitativ innehållsanalys av den efter experimentella debriefingen visade att deltagarna upplevde uppgiften som utmanande, ansåg att deras self-talk påverkade deras prestation, och att frånvaron av ett hål var problematiskt. Resultaten diskuteras i relation till teoretiska ramverk, tidigare forskning, och metodiken i studien. En reviderad version av a framework of self-talk presenteras. Förslag på framtida forskning och praktiska implikationer ges.

Nyckelord: Experimentell design, Golf, Instruerande self-talk, Motiverande self-talk, Prestation, Self-efficacy.

## Introduction

Mental skills such as imagery, relaxation, goal setting and self-talk are often included in mental skills packages and has been shown to collectively enhance performance (Thelwell & Greenlees, 2003). The mental skill of self-talk alone has been promoted by both coaches and athletes as part of performance enhancement. Weinberg, Grove and Jackson (1992) found that coaches believed self-talk to be one of the most influential skills on building confidence within their athletes. Hardy, Hall and Hardy (2004) reported that skilled athletes used self-talk in a more planned and consistent manner and believed their self-talk had a greater impact on their performance than less skilled athletes. Furthermore, Cotterill, Sanders and Collins (2010) found that self-talk was second to imagery in mental skills used within competitive pre-performance routines in elite golf players. Performance enhancements related to self-talk have been reported within several different sports including golf (Johnson O'Connor & Kirschenbaum, 1982). Hardy, Oliver and Tod (2009) acknowledged that the self-talk research have predominately focused on if self-talk effects performance. The main focus researchers have had is problematized by Theodorakis, Hatzigeorgiadis and Chroni (2008) whom argued that in order to accurately explain the self-talk-performance relationship one needs to understand, not if, but how self-talk affects performance. The need to understand potential underlying mechanisms of the phenomenon becomes apparent. Initial research regarding self-efficacy as a mediating mechanism of the self-talk-performance relationship has shown promising results (e.g., Hardy, Hall, Gibbs, & Greenslade, 2005). Furthermore, research on sporting performance supported a positive and moderate relationship to self-efficacy (Moritz, Feltz, Fahrbach, & Mack, 2003). Self-efficacy has been argued to be a key to optimal performance (Bandura, 1997) and perceived efficacy has consistently distinguished successful athletes from less successful athletes (Highlen & Bennett, 1983). Drawing a conclusion from this an investigation on self-efficacy and self-talk within elite performers, such as golf players, could reveal interesting results and advance the knowledge of the field.

Therefore, this study aims to investigate the effects of motivational and instructional self-talk on self-efficacy and performance in elite golf players.

### *Key Terms*

#### *Self-talk*

Hardy, Jones and Gould (1996) argued that a fundamental issue within the self-talk literature was coming to a consensus regarding a definition of self-talk. Conroy and Metzler (2004) identified that a well-established definition of self-talk was not in fact established within the sport psychology literature. Although, several definitions have been presented. 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). In a critical review of the self-talk literature Hardy (2006) problematized the use of many and imprecise definitions and for 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 also identified several overlapping dimension representing the nature of self-talk (e.g., what self-talk is). These included a frequency dimension, that self-talk can be employed more or less often. A self-determined dimension, that self-talk can be assigned or freely chosen. As well as an overtness dimension referring to that self-talk can be verbalized as either as small voice inside once head (covert self-talk) or out loud so that others potentially can hear what is said (overt self-talk). That content of self-talk can range from positive to negative was incorporated within a valence dimension. Positive self-talk is said as a form of praise (e.g., “well done you!”) and negative self-talk is said as a form of criticism (e.g., “you fool!”) (Moran, 1996). Furthermore, a motivational interpretation dimension was included, referring to whether individuals view their self-talk as motivating or de-motivating for themselves (Hardy, Hall, & Alexander, 2001). The final dimension, functions of self-talk, refers to reasons why athletes use self-talk, first recognized by Hardy, Gammage and 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. In line with his recommendations, Hardy (2006) proposed a working definition of self-talk based on the abovementioned dimensions that stated.

Self-talk should be defined as: (a) verbalizations or statements addressed to the self; (b) multidimensional in nature; (c) having interpretive elements association 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).

This definition of self-talk will be used as the basic one in this paper.

### *Self-efficacy*

In relation to self-talk, the construct of self-efficacy has been sufficiently defined from the beginning. “Perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3). 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. Feltz, Short and Sullivan (2008) summarized it with the following phrase: “what one thinks one can do right now”. Weinberg and Gould (2007) explained it as a situation-specific variation of self-confidence, although, self-efficacy and self-confidence (Vealey, 1986) should not simply be view as the same. Self-efficacy is situation-specific which self-confidence do not necessarily have to be. However, when self-confidence is measured as what individuals perceive they can do rather what they have or are doing, it fits with Bandura's (1997) definition and can 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 judgments about the outcomes that come from a performance, and not judgment of the capability (efficacy) to execute such a performance (Bandura, 2006).

### *Theoretical frameworks*

The self-talk research has been criticized of not being theory-based (Hardy, 2006). In an attempt to stimulate future research, Hardy proposed a number of applicable theories with relation to self-talk. Hardy suggested that the theory that holds particular relevance to the study of self-talk is Bandura's self-efficacy theory (1997) since it can be applied to both the instructional and motivational functions of self-talk. The self-efficacy theory, part of social

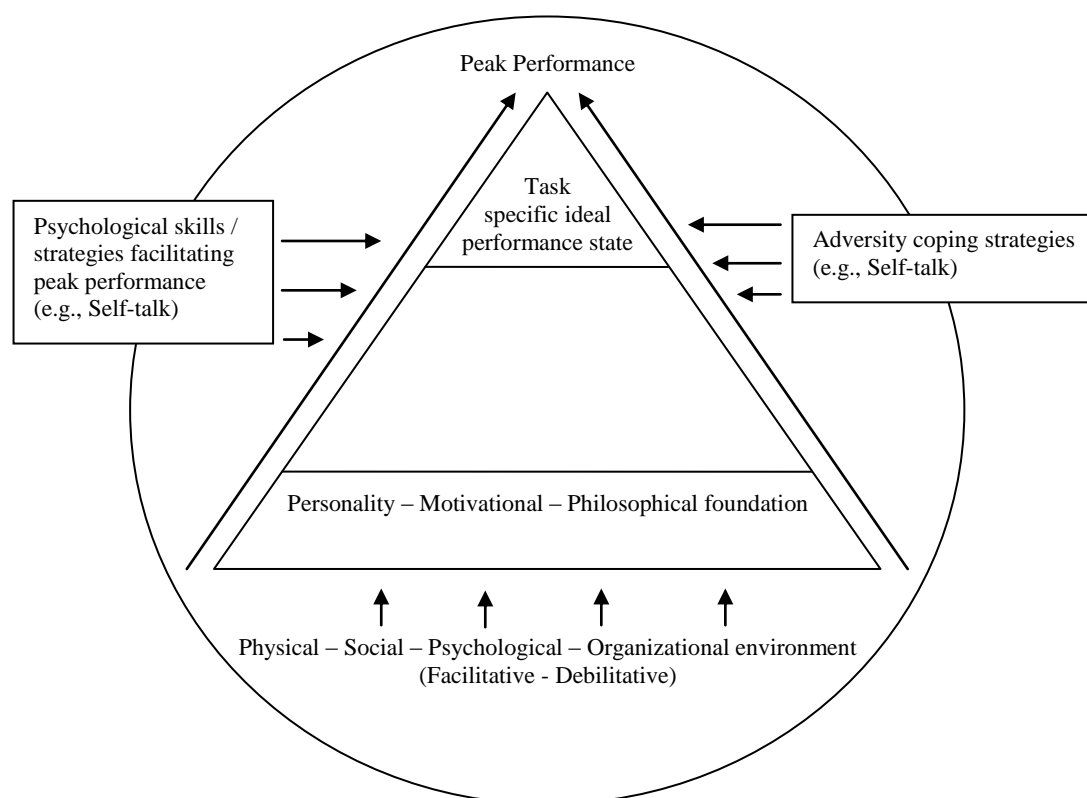
cognitive theory, will be presented below. Although, first Hardy et al.'s. (1996) model of psychological preparation for peak performance is presented to show a possible explanation of how self-talk is related to performance. This is followed by a framework of self-talk (Hardy et al., 2009) which illustrates the, to date, complete picture of the self-talk-performance relationship research.

*Model of psychological preparation for peak performance*

Hardy et al. (1996) stressed the fact that athletes are complex human beings operating in a complex social and organizational environment. With this in mind Hardy et al. (1996) presented the model of psychological preparation for peak performance (see Figure 1) to illustrate this complex relationship that needs to be combined to achieve peak performance.

According to Hardy et al. (1996), 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) (Hardy et al., 1996).

Hardy et al. (1996) included self-talk 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 to reach peak performance.



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

### *A framework of self-talk*

Hardy et al. (2009) proposed a framework of self-talk (see Figure 2) to illustrate the, to date, self-talk-performance relationship research to help better understand its complete picture. According to Hardy et al. there are two potential general antecedents of self-talk: personal (e.g., belief in self-talk), and situational (e.g., task difficulty). The use of self-talk is proposed to produce performance-oriented consequences (e.g., increased strength), and four possible underlying mechanisms (cognitive, motivational, behavioral, and affectual) are also included in the framework as to how self-talk might influence sporting performance (Hardy et al., 2009).

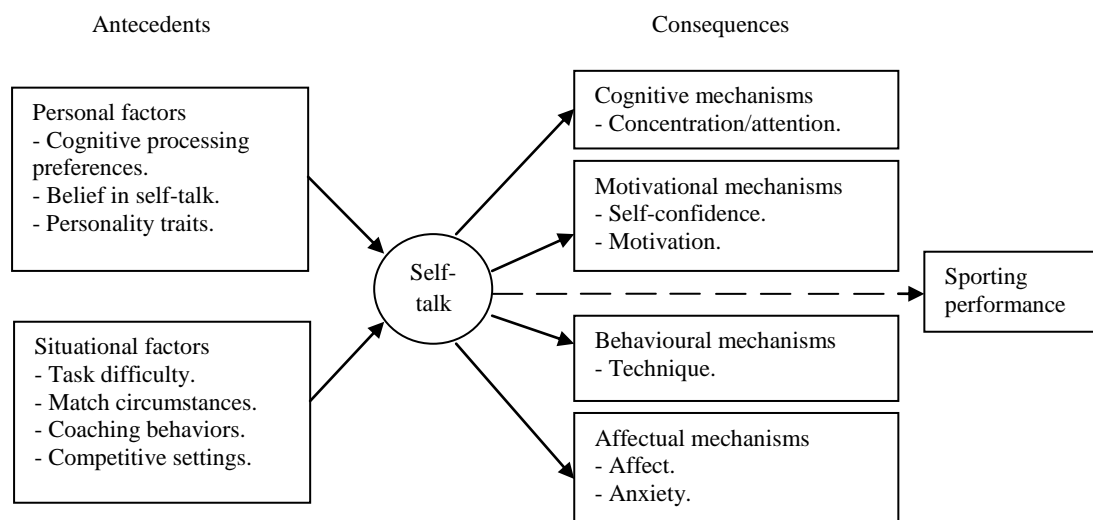


Figure 2. A framework of self-talk (Hardy et al., 2009).

### *Social cognitive theory*

In the social cognitive theory individuals are viewed as proactive agents, not passive reactors to the environment (Bandura, 2001). According to the theory, people use forethought, self-reflection, and self-regulation to influence their own functioning which Bandura refers to as the agentic perspective of social cognitive functioning. The assumption of the theory, as seen in Figure 3, is that agentic 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 (Bandura, 1997). For example, positive feedback from a coach can make an athlete believe more in him/herself (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 self-efficacy is part of personal factors outlined by social cognitive theory, and perceived self-efficacy is regarded as a core agentic factor playing a pivotal role in determining people's behavior (Bandura, 1997).

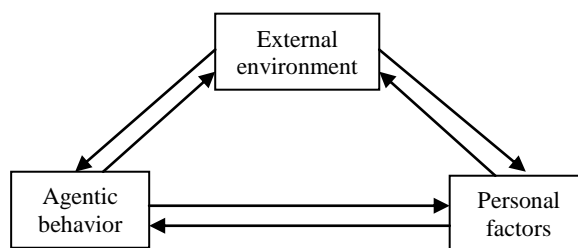


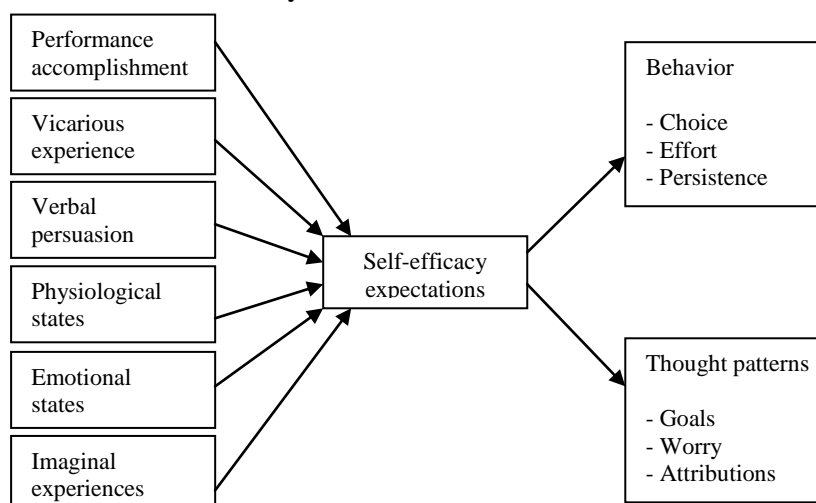
Figure 3. The relationship between the classes of determinants in triadic reciprocal causation (Bandura, 1986).



### *Self-efficacy theory*

Working within the framework of social cognitive 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. The key component of the self-efficacy theory is the belief in one's capabilities, which 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 et al., 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 sport contexts to competitive situations in non sport contexts (e.g., in business).

According to Bandura (1997) people use four basic sources of information to produce their efficacy beliefs. These are performance accomplishments, vicarious experiences, verbal persuasion, and physiological states. Others have added emotional states and imaginal experiences as sources of efficacy (e.g., Maddux, 1995), but Bandura included these aspects within his four sources. The source with relevance to self-talk is verbal persuasion. 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 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 states: "most people believe they know themselves and their predicaments better than others do" (p. 104). Hardy (2006) argued that elite athletes are more likely to benefit from self-talk as they possess great knowledge, skill and experience in their activity.



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

### *Previous research*

#### *Self-talk overtness*

Research within the overtness dimension of self-talk is sparse. Hardy (2006) concluded that a direct comparison of effectiveness between overt and covert self-talk in relation to performance has yet not been investigated. Most of the self-talk research has examined overt and covert self-talk as one, not separating them (e.g., Hatzigeorgiadis, 2006). However, a few studies have made a distinction, but then examined only overt self-talk (e.g., Van Raalte, Brewer, Rivera, & Petitpas, 1994; Van Raalte, Cornelius, Brewer, & Hatten, 2000) or covert (e.g., Hardy, Hall, Gibbs et al., 2005), and never both. In descriptive research Hardy, Hall and Hardy (2005) reported that content of athletes' self-talk is generally positive, abbreviated, and expressed covertly. Furthermore, Hardy, Hall and Hardy (2005) found that male athletes used significantly more negative, less covert and more overt self-talk than female athletes did.

#### *Functions of self-talk*

As previously reported, Hardy, Gammage et al. (2001) examined reasons why athletes talk to themselves and identified two main functions of self-talk, instructional and motivational. Instructional self-talk was further divided into: *cognitive-specific* self-talk that assists the athlete in learning and executing individual skills and *cognitive-general* self-talk that helps the athlete to focus on overall performance and carry out strategies (Hardy, Gammage et al., 2001). Motivational self-talk was subdivided into three: motivational mastery, arousal and drive. *Motivational mastery* self-talk is composed of four themes: mental readiness, focus, self-confidence and coping with difficulties, all required if athletes are to successfully master their circumstances (Hardy et al., 2009). *Motivational arousal* self-talk helps athletes in controlling their arousal-levels, psyching themselves up and for relaxation purposes. *Motivational drive* self-talk is associated with maintaining or increasing drive and effort levels and keeping on track in achieving goals (Hardy, Gammage et al., 2001).

#### *Instructional self-talk*

Instructional self-talk (e.g., "split, turn", "arms straight") have been shown to significantly improve performance within several sports including tennis (Landin & Hebert, 1999), sprint (Mallet & Hanrahan, 1997), soccer (Johnson, Hrycaiko, Johnson, & Halas, 2004) and golf (Harvey, Van Raalte, & Brewer, 2002). In the golf study Harvey et al. (2002) reported that athletes using instructional self-talk performed consistently better than athletes using negative self-talk and the control group. Theodorakis, Chroni, Lapidis, Bebetos and Douma (2001) examined the use of a task-relevant (e.g., "relax") instructional and a task-irrelevant (e.g., "fast") instructional self-talk cue in a basketball shooting task. Results showed that participants using the task-relevant cue performed significantly better than participants using the task-irrelevant cue and the control group (Theodorakis et al., 2001). In examining instructional self-talk on basketball skills (dribbling, passing and shooting) Perkos, Theodorakis and Chroni (2002) reported that the experimental group performed significantly better on dribbling and passing but not shooting. A subsequent study supported the findings of Perkos et al. (2002) in that instructional self-talk was perceived as helpful in executing the right technique when passing (Chroni, Perkos, & Theodorakis, 2007). The positive effects of instructional self-talk on skill acquisition or learning (technique) has been acknowledged by Hardy (2006) and further supported in a tennis experiment where instructional self-talk participants performed significantly better than participants receiving performance feedback (Cutton & Landin, 2007).

### *Motivational self-talk*

Descriptive studies have shown that athletes use self-talk more in competitive settings compared to practice settings (Hardy, Hall, & Hardy, 2005). Furthermore, Hardy, Hall and Hardy reported that the use of motivational self-talk pertaining to “psyching-up” and “mentally prepare” are used most often in practice and competition, respectively. Within a qualitative study of six elite golf players Linnér and Sandström (2010) reported that motivational self-talk was used almost exclusively while playing. In a basketball experiment Chroni et al. (2007) reported that athletes preferred the use of motivational self-talk while dribbling and shooting and that the motivational self-talk was a significant help for their concentration, confidence and relaxation when executing shots (Chroni et al., 2007). Hatzigeorgiadis (2006) examined perceived functions of self-talk and found that the use of a motivational cue had greater effect on effort than the use of an instructional cue, whereas the effects were similar between cues for attention, confidence, anxiety control and automaticity. Motivational self-talk has been shown to improve performance (e.g., Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009). In a tennis intervention study, Hatzigeorgiadis, Zourbanos, Goltsios and Theodorakis (2008) reported that participants using motivational self-talk (e.g., “I can”, “Go”) significantly improved their performance whereas no changes were reported in the control group. Hatzigeorgiadis et al. (2004) argued that the content of positive self-talk and motivational self-talk in many cases is comparable. Research on positive self-talk was initiated before the term of motivational self-talk was acknowledged. Reviewing research of positive self-talk that could be characterized as motivational self-talk provides further evidence that motivational self-talk can enhance performance (Hatzigeorgiadis et al., 2004).

### *Nature of the task and self-talk*

Theodorakis et al. (2000) examined motivational and instructional self-talk strategies on four different motor tasks (soccer accuracy, badminton serve, sit-up, and isokinetic knee extension). They 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 tasks requiring more skill, timing and precision. Whereas, motivational self-talk would be beneficial for tasks requiring more strength and endurance. Instructional self-talk did enhance performance for tasks involving fine execution (soccer and badminton), whereas for tasks requiring strength and endurance (sit-up and knee extension) both instructional and motivational self-talk were effective. It was concluded that instructional self-talk seems to be superior in tasks requiring skill, timing and precision (Theodorakis et al., 2000).

In two water polo experiments Hatzigeorgiadis et al. (2004) examined the effects motivational and instructional self-talk had on one precision and one power motor tasks. Results showed that on the precision task both types of self-talk improved performance compared with the baseline measure, but instructional self-talk improved performance slightly more than what motivational self-talk did. On the power task only motivational self-talk significantly improved performance. It was also reported that the use of both instructional and motivational self-talk reduced the occurrence of interfering thoughts which was interpreted as enhancement of concentration on the task. Hatzigeorgiadis et al. concluded that matching self-talk with the demands of the task, first identified by Landin (1994), seems important if self-talk is to improve performance. Regarding the task-demand hypothesis, Hardy et al. (2009) recognized that instructional self-talk for fine motor-skill tasks seems to be more supported in research than motivational self-talk for gross motor-skill tasks. However, more research is needed (Hardy et al., 2009).

### *Relationship between self-efficacy and self-talk*

There is preliminary evidence regarding several different mechanisms in understanding self-talk, making it, by definition, a multidimensional phenomenon. Hardy et al. (2009) proposed four main underlying mechanisms in the framework of self-talk, categorized as cognitive, motivational, behavioral, and affectual (see Figure 2).

Initial evidence regarding self-efficacy as a motivational mechanism comes from Hardy, Hall, Gibbs et al.'s. (2005) investigation of instructional and motivational self-talk on self-efficacy and performance in a sit-up task. It was reported that both types of self-talk were positively related to self-efficacy, and self-efficacy was positively related to performance, but self-talk was not related to performance. Although the experiment lacked the graduation of challenge aspect of self-efficacy, argued as important in measuring efficacy beliefs (Bandura, 2006), Hardy, Hall, Gibbs et al. were first to document a significant positive relationship between self-talk and self-efficacy. Within a five session tennis forehand stroke intervention study Hatzigeorgiadis et al. (2008) reported that using motivational self-talk increased self-efficacy and performance 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 may be a possible mechanism explaining the self-talk-performance relationship. Furthermore, Hatzigeorgiadis et al. recommended that self-talk needs to be thoroughly practiced and mastered if the benefits of its use are to be maximized. As shown in the study of Cumming, Nordin, Horton and Reynolds (2006) when examining self-talk and imagery use, the use of self-talk do not always produce a change in self-efficacy. Imagery and self-talk did produce an increase in performance, but no changes were reported in self-efficacy (Cumming et al., 2006). Weinberg and Gould (2007) explained self-efficacy as a situation-specific variation of self-confidence. Although not examining self-efficacy, studies reporting an increase in confidence according to athletes perception can be seen as additional support of a motivational mechanism as part of explaining the self-talk-performance relationship (e.g., Mamassis & Doganis, 2004; Perkos et al., 2002; Thelwell & Greenlees, 2003).

### *Summary and objectives*

Instructional and motivational self-talk has been shown to enhance performance. However, it can be concluded that the research interest today do not concern if self-talk improves performance, but how it improves performance. Initial research shows that self-efficacy might be one mechanism capable of explaining the, if yet only partly, self-talk-performance relationship. Golf players have been shown to use self-talk within their pre-performance routines and they spend a lot of their time alone while competing, which leads to suspect that self-talk could be part of their daily routine. In addition, the game of golf is a self-phased sport where performance is easily operationalized. Descriptive studies report that elite athletes use self-talk more consistent and believes that self-talk impacts their performance. In relation to self-efficacy, self-talk has been argued to affect elite athletes more as they are competent within their activity. Therefore, according to the progress of the field, the objectives of this study are: (1) to examine the effects of instructional and motivational self-talk on self-efficacy in elite golf players; and (2) to examine the effects of instructional and motivational self-talk on performance in elite golf players.

## Method

### *Participants*

There were 9 participants involved in the present study (6 were men and 3 were women). Their mean age was 20.4 (SD = ± 1.1) years. Participants had been playing golf for an

average of 12.7 years ( $SD = \pm 2.4$ ). All participants were elite golf players. Six participants were competing on national level, two on junior elite level, and one on sub-national level in Sweden. All participants were students of the Scandinavian School of Golf Program at Halmstad University and had some previous knowledge of sport psychology.

### *Ethical aspects*

In every stage of the study, from initial contact to the start 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. The intention of the researcher to publish the study on the Halmstad University database was mentioned and 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. Participants agreed to partake by signing a written informed consent (see Appendix 1), and permission to record interviews was gained from each individual it concerned.

### *Instruments*

#### *Self-efficacy*

Self-efficacy is a multifaceted phenomenon, Feltz et al. (2008) identified different types of efficacy beliefs used in sport psychology measurements and argued that an efficacy belief is dependent on the research question being studied. According to this, for the purpose of the study, a performance self-efficacy measure was adapted. 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 for this study (see Appendix 2). The scale included eight items asking participants: how certain are you right now that you can hit all three putts within... (a) 50 cm from the target line, (b) 40 cm from the target line, (c) 30 cm from the target line, (d) 20 cm from the target line, (e) 15 cm from the target line, (f) 10 cm from the target line, (g) 5 cm from the target line, and (h) 1 cm from the target line. 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 eight 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. Cronbach’s alpha of the three scales implemented in this study were .925 (baseline), .897 (motivational self-talk), and .912 (instructional self-talk).

#### *Performance*

To evaluate performance a golf putt performance test was developed. The putting surface did not include a hole. This was implemented because the feeling of length can be argued as more difficult than the feeling of direction. Hitting a golf ball into a hole can be done at different levels of speed whereas hitting a golf ball to a target line on a given distance only is achieved if the speed of the putt is hit with perfect accuracy. Furthermore, regarding the experience level of the participants it can be argued that hitting a golf ball straight is not a challenging and difficult task. A pilot test of the most appropriate technique to measure performance was carried out. The pilot test was done by the researcher himself since he has previous experience

as an elite golf player on similar level as participants within the study. It was initially intended that the putting surface would include point zones of approximately 10 centimeters in width; closer to the target line would indicate more points and a better performance. The pilot test indicated that this was not in fact sensitive enough, so the idea of zones was omitted. Furthermore, the pilot test indicated that alternating the length of the putts would make the exercise more difficult and feel more lifelike. According to this, the following putt test to measure performance was implemented within the present study.

A six meter long, two meter in width, green indoor synthetic grass putting surface was used (see the design in Appendix 3). The speed of the putting surface was measured using a stimpmeter (United States Golf Association, n.d.) and it revealed a speed of 13 feet, which is very fast according to golf green standards. The indicated target line was painted white, 3 mm in dimension and drawn across the width of the surface 1 meter from the back end of the putting surface. Five training putts were hit from the other end of the putting surface (3.5 meter from the target line) followed by three experimental putts from various distances (4m, 3m, and 4.5m). The performance score of each experimental putt was measured with an accuracy of a half centimeter from before or after the target line. Measuring was carried out by the researcher using a tape measure in between every putt. The performance score was the total score of all three putts added together. Lower scores indicated closer to the target line and thus higher performance (see performance form filled out by the researcher in Appendix 4).

#### *Manipulation checks*

Three manipulation checks were implemented in the present study. One issued after the baseline measure, one after the first experimental try and one upon completion of the last try.

The baseline manipulation check was implemented to reveal whether or not participants used any type of self-talk during the baseline measure (see Appendix 5). 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 might 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 after the first experimental try included questions pertaining to the five training putts and the three experimental putts (see Appendix 6). Participants were asked to indicate (a) how often they used the intended self-talk during the five training putts and (b) how often they used the intended self-talk during the three experimental putts. Answers were given on a 10-point scale (1 = not at all, 5 = couple of times, and 10 = all the time). Furthermore, participants were to indicate (c) if they said anything else to themselves during the three training putts, using a yes or no format. Followed by an open 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).

The manipulation check upon completion of the last try included the same questions as stated above in the manipulation check after the first try as well as two additional questions (see Appendix 7). These two questions were included since the baseline manipulation check revealed that all participants used some type of self-talk during the baseline measure. The two questions were: (a) several people reported using self-talk during the first occasion. Do you believe you have used self-talk in a more structured manner in later occasions, and (b) several

people reported using self-talk during the first occasion. Do you believe you have used self-talk in a more effective manner in later occasions. Answers were given on a 10-point scale (1 = do not agree, 5 = somewhat agree, 10 = totally agree).

#### *After experiment debriefing guide*

An after experiment debriefing, conducted as a semi-structured interview was implemented (see Appendix 8). The first part of the interview involved questions pertained to self-talk. Participants were asked to indicate what they said to themselves when using instructional or motivational self-talk. Participants were asked if it was easy to combine self-talk while executing the putting task. Furthermore, participants were asked if they believed their self-talk had an impact on their performance, and if their self-talk changed during the execution of the exercise. The second part involved questions about the experimental procedure. Participants were asked if they experienced the putting task as easy or hard. How it felt like putting to a target line and not a hole. How participants experienced that the researcher measured their performance in between putts. Participants were asked about the forms, papers and instructions given, if they were easy to understand. Furthermore, participants were asked how they experienced the experiment as a workshop. And finally, if there was anything participants wanted to explain or something they had thought about during execution which related to the experiment itself.

#### *Procedure*

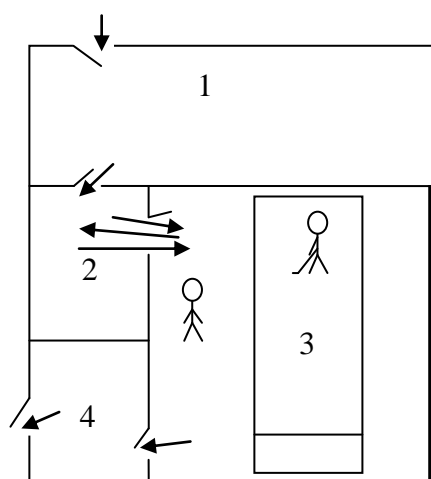
##### *Recruiting participants*

Students of the Scandinavian School of Golf Program at Halmstad University represent a sample of elite golf players originating from different parts of Sweden. These students were selected as a strategic sample for answering the research objectives within the study. Participants within this strategic sample who voluntarily wanted to participate in the study were then sought. Initial contact was taken with the program administrator. The researcher then visited a lecture and informed potential participants about the study, ethical aspects, and when and where the experiment was going to take place. The same information was later sent by email (see Appendix 9) via the administrator to all students within the program. Two class representatives and tutors of the program was briefly informed and used to remind, not force, potential participants about dates and time of the study.

##### *Experiment*

The experiment was completed in three sessions. 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 an after experiment debriefing interview was held with five participants individually. The experiment took place on three consecutive days during middle of the day in a behavioral studies lab at Halmstad University. The lab consists of four rooms (see Figure 5), which are sealed off with doors. In room one (1) participants waited and could use computers while doing so. Room two (2), the instruction room, was approximately a two by two meter closed space where participants sat alone filling out forms in privacy. Participants rated their self-efficacy in the instruction room to reduce the social evaluation concern (Bandura, 2006). Room three (3) was the experiment room (6x5 meters) where the execution of the putting task was carried out by participants. The bolded line in Figure 5 indicates a window. It was possible that during task execution people could walk by and look into the experiment room. Participants were on purpose positioned with their back against this window during the execution of the task. Room four (4) was the instruction room alike. Participants sat in a closed space and could fill out forms in privacy.

The experiment procedure (see Appendix 10) consisted of six steps (indicated by arrows in Figure 5). Step one included people waiting for their turn (in room 1). In step two, participants entered the instruction room (2) where the self-talk instruction (see Appendix 11 & 12) was given during the two experimental tries, but not on the baseline measure. In step three, participants entered the experimental room (3) and hit five training putts. In step four, participants went back into the instruction room (2) and filled out the self-efficacy instrument (see Appendix 2). In step five, participants re-entered into the experimental room (3) and hit three experimental putts. In step six, participants entered room four (4) to fill out the manipulation check. Participants then exited room four (4) and walked around the lab and back into room one (1). To save time and be more efficient, two participants were tested simultaneously. For example, when participant one executed the five training putts in room three, participant two was given the instruction to be followed in room two. These participants then changed place, so when participant two hit the five training putts, participant one filled out the self-efficacy instrument. These two participants then changed place once again, when participant two had hit the five training putts this person went back into room two and participant one, done filling out the self-efficacy instrument, went back into room three to hit the three experimental putts. When participant one was finished with the experimental putts, he or she entered room four and filled out the manipulation check and participant two could re-enter room three to hit the three experimental putts.



*Figure 5.* Illustration of the behavioral studies lab where the experiment took place. Numbers indicate the rooms and arrows indicate how the participants carried out the experiment.

#### *Putting task*

The putting task (see design in Appendix 3) included two parts with a short break in between when participants filled in the self-efficacy instrument. The first part was the five training putts. The second part was the three experimental putts. The procedure of the two putting task parts was the same except for the number and length of the putts executed. This was implemented to minimize the possible increases in performance due to practice. Participants hit five training putts from an indicated dot (painted black) 3.5 meters from the target line. The three experimental putts were hit from various distances. Putt number one was hit 4 meters from the target line, putt number two 3 meters from the target line, and putt number three 4.5 meters from the target line. The researcher stood completely still, not making any sound, and was positioned in front of and besides the putting surface, in relation to the participant while he or she executed the putts (as seen in Figure 5 above). Participants were instructed to try to stop the ball on the target line, behave as if it was a real putt (e.g., go



through their routine), and step behind an indicated line in the floor beside the putting surface in between every putt. The ball was replaced on indicated dots (painted black) by the researcher and participants only touched the ball when hitting it with their putter. These steps were implemented in an attempt to make the putts more 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).

Participants had four putters to choose from and decided themselves which one to use. There was one putter intended for left-handed players which was 35 inch long and three putters intended for right-handed players, one was 33 inch long, one was 35 inch long, and one was a chest-putter. The golf ball used in the experiment was a Titleist ProV1.

### *Session 1*

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

All participants were gathered and welcomed in room one. The experiment was briefly explained as strategies within putting and that the experiment was designed as a workshop where participants were intended to learn as the experiment progressed. Participants were shown around inside the lab, from room to room. Participants were informed of what to expect in each room, and how they would go from the instruction room, to the experiment room, back to instruction room, into the experiment room again, and finally exit through room four. The execution of the putting task was explained in detailed as reported above in the putting task section.

The information proceeded with ethical aspects and participants were asked if they had any questions and encouraged to not discuss the experiment with their co-participants. Background information and written informed consent (see Appendix 1) was then collected. Participants then wrote their name on a numbered list that the researcher used to randomly assign participants and to structure all the information participants gave throughout the experiment.

Session two then proceeded with the execution of the six steps of the experiment procedure for all the participants (as explained above) without any instruction pertaining to self-talk. Participants were only instructed to do their best.

Session one ended with a lecture introducing participants to self-talk which was carried out in room one. Participants sat down around a big round table and the researcher stood in front of them talking with a PowerPoint presentation (see Appendix 13) guiding 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 of self-talk and the individuality of self-talk. The lecture intended to stimulate participants, making them reflect upon and discuss their own self-talk. Participants were encouraged to really think about their use of instructional and motivational self-talk before returning for session two the next day. As Zinsser, Bunker and Williams (2006) argued, the first step in taking control of one's self-talk is to become aware

of it. This was the goal of the lecture, to become aware. The lecture lasted approximately 30 minutes.

### *Session 2*

Session two included the execution of the six steps of the experimental procedure. Using the numbered list collected with participants names from session one the researcher randomly assigned participants into two groups according to Mitchell and Jolley (2010, p. 338). The manipulation of the self-talk instruction was counterbalanced. Five participants were given an instructional self-talk instruction and four participants were given a motivational self-talk instruction to follow during session two.

The self-talk instructions (see Appendix 11 & 12) gave a short definition of self-talk and then asked participants to use either an instructional or motivational self-talk and to verbalize it covertly. Examples of self-talk cues were given. Instructional self-talk cues that were given as examples included “hit the line”, “straight back, straight forward”, “like a pendulum”, and “right distance”. The instructional self-talk cues were modified from previously reported self-talk in golf (Linnér & Sandström, 2010) and based on own golf experiences of the researcher. Motivational self-talk cues that were given as examples included “come on”, “you know this”, and “I can”. The motivational self-talk cues have been reported and used previously within elite golf players or self-talk research (Linnér & Sandström, 2010; Theodorakis et al., 2000). Apart from the examples participants were encouraged to use their regained knowledge from the lecture and produce their own self-talk cues. For example, if a participant was more comfortable to say “I” instead of “You” the participant was encouraged to modify the examples given or if already normally using an instructional or motivational self-talk encourage to use that cue respectively.

During session one all participants were divided into smaller groups of two or three people and given a time to show up for the next session. This was done to make participants involvement in the experiment less time consuming. The six steps of the experimental procedure were therefore carried out in approximately fifteen minutes for every two participants in session two.

### *Session 3*

Session three included the execution of the six steps of the experimental procedure, after experiment debriefing with five participants, and an informal oral debriefing with all other participants.

Like in session two, participants were divided into smaller groups in session three. The six steps of the experimental procedure were carried out in the same manner as sessions before apart from one thing. Participants who received an instructional self-talk instruction during session two received a motivational self-talk instruction in session three to counterbalance the treatment manipulation.

Five participants were randomly selected for the after experiment debriefing. Upon completion of the experiment procedure participants re-entered the experiment room (3) and was asked if it was ok to interview them about the experiment and if it was ok to record the interview. Participants were reminded that only the researcher would have access to the recordings. All five participants agreed to partake in the interview and that it was ok to record what was said. The after experiment debriefing (see Appendix 8) was carried out standing by a high desk in the experiment room, besides the putting surface. The researcher and

participant each stood on one side of the table, approximately one meter apart, with a laptop computer folded down in between on the table recording what was said. The interviews were approximately six to twelve minutes long. An oral debriefing was carried out with all the participants not being interviewed. Even though not recorded or structured these oral debriefings touched upon the same subjects as the interviews did, but the conversations were based more on what participants wanted to tell or ask. Upon completion of the after experiment debriefing or the informal oral debriefing participants were thanked for their participation and the experiment was explained and participants were able to ask questions.

### *Analyses*

The analyses were conducted in four steps.

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

In step 2 analyses of the manipulation checks implemented with regards to four main issues in the study was conducted. Descriptive statistics were computed for the spontaneous use of self-talk during the baseline measure followed by descriptive statistics of frequency of self-talk use throughout the experimental stages (baseline, instructional training, instructional experimental, motivational training and motivational experimental). Subsequently, a one-way repeated measure analysis of variance was computed to investigate for differences in frequency of self-talk use throughout the experiment. Two paired-sample t-tests were computed to investigate for differences between instructed self-talk use and spontaneous self-talk use. Finally, descriptive statistics were computed with regards to participants answers of structured and effective use of self-talk upon completion of the experiment.

In step 3 main analyses to answer the objectives of the study were computed. The low number of participants prevented the use of regression analysis, so to examine changes in self-efficacy and performance two one-way repeated measure analyses of variance were conducted. Through information provided in the manipulation checks the main analysis progressed to investigate performance changes with a subsequent one-way repeated measure analysis of variance excluding two participants and a mixed model analysis of variance to investigate if participants reporting a more effective self-talk use performed significantly better than participants reporting a lower effective use of self-talk. Finally, a one-way repeated measure analysis of variance was conducted with regards to a potential training effect.

In step 4 content analysis was conducted to acquire a deeper understanding of participants self-talk and experiences of the experiment reported in the after experiment debriefing. First, the interviews were transcribed and then read thoroughly. Secondly, relevant raw data units pertaining to each interview question was marked and irrelevant data was omitted. The raw data units were extracted from the text and translated into English. Because of the straight forward 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

It was found that one participant had misinterpreted instructions given and this participant was therefore excluded from the analysis. As a result, the analysis was based on the data from eight participants.

### Manipulation checks

Regarding the first issue, if participants used self-talk spontaneously during the baseline measure, it was revealed that all participants used some type of self-talk with an average frequency of 4.75 (SD =  $\pm$  2.49). Following recommendations of Hardy, Gammage et al. (2001) in what constitutes as instructional or motivational self-talk the researcher concluded that three participants used instructional self-talk (e.g., “routine”, “focus on my exhale”), three participants used motivational self-talk (e.g., “come on now”, “you know this”), and two participants used both instructional and motivational self-talk (e.g., “hit it to the line... you know this”). Regarding the second issue, if participants used self-talk during their training putts, it was revealed that participants used self-talk adequately with a mean of 7.44 (SD =  $\pm$  2.70) throughout the two training phases. Regarding the third issue, if participants used self-talk during their experimental putts, it was revealed that participants used self-talk with a mean of 8.0 (SD =  $\pm$  2.83) during instructional self-talk execution and 7.86 (SD =  $\pm$  1.96) during motivational self-talk execution. One-way repeated measure analysis of variance, by Greenhouse-Geisser correction when Mauchly's test proved to be significant, revealed a significant difference ( $F_{1,93, 13.508} = 4.357, p < .05, \text{partial } \eta^2 = .38$ ) regarding frequency of self-talk use throughout the stages of the experiment (baseline, instructional training, instructional experimental, motivational training, and motivational experimental). However, multiple comparison Bonferroni post-hoc test revealed no significant differences in frequency of self-talk use throughout the experiment. As seen in Figure 6 one would suspect there to be a difference in frequency of self-talk use between the baseline measure and the four experimental stages (Means and Standard deviations are shown in Figure 6). It is possible that the low number of participants (N=8), and the significance-level use in Bonferroni post-hoc tests is why frequency of self-talk use was not proven significant in the present study.

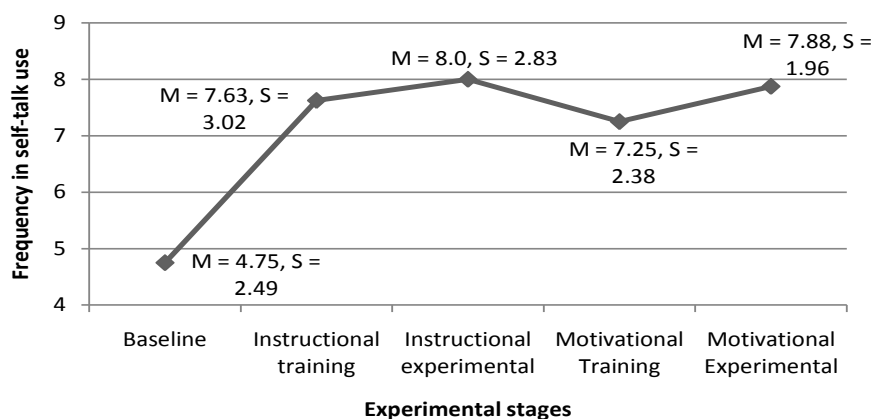


Figure 6. Illustration of frequency of self-talk use throughout the experimental stages.

The fourth issue pertained to if participants followed the instruction given or if other types of self-talk were used spontaneously during the experimental putts. With regards to the motivational self-talk instruction, five participants reported also using a different type of self-talk spontaneously (e.g., “just hit the ball”, “trust your feeling”). A paired-sample t-test revealed a difference,  $t(4) = 3.64, p < .05$ , in the frequency of self-talk use between instructed and spontaneous self-talk use. The motivational self-talk instruction was used more frequently (M = 7.60, SD =  $\pm$  1.52) compared to participants’ spontaneous self-talk use (M = 2.4, SD =

$\pm 1.95$ ). With regards to the instructional self-talk instruction, two participants reported also using motivational self-talk spontaneously (e.g., “come on now” “you know this”). A paired-sample t-test revealed no significant difference, although it approached significance,  $t(1) = 5.0$ ,  $p < .126$ , in frequency of self-talk use comparing instructed and spontaneously used self-talk.

Upon completion of the experiment participants reported that their self-talk during the experimental tries compared to the baseline measure had been used in a more structured ( $M = 7.86$ ,  $SD = \pm 3.04$ ) and effective manner ( $M = 6.5$ ,  $SD = \pm 3.74$ ).

### Quantitative results

#### Self-efficacy

The one-way repeated measure analysis of variance conducted to investigate for changes in self-efficacy compared to the baseline measure revealed no significant differences. The percentage of self-efficacy means of participants of the baseline, instructional, and motivational experimental stages were 53.28 ( $SD = \pm 15.81$ ), 52.03 ( $SD = \pm 11.63$ ), and 53.25 ( $SD = \pm 7.99$ ) respectively (see Figure 7).

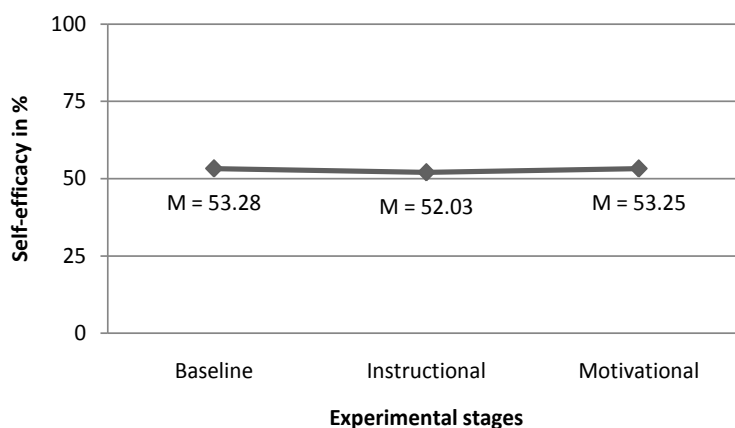
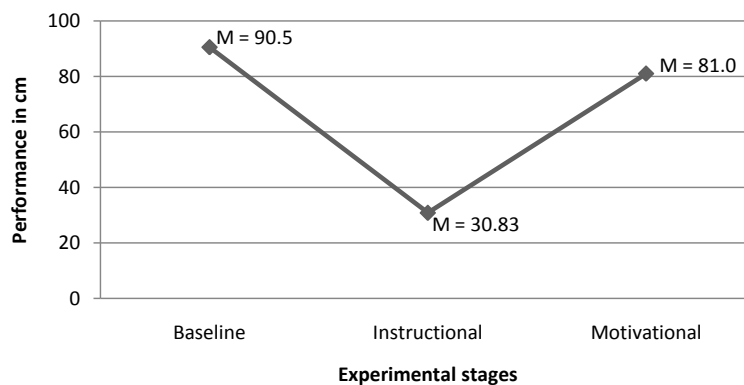


Figure 7. Illustration of participants self-efficacy means throughout the experimental stages.

#### Performance

Regarding performance, the one-way repeated measure analysis of variance revealed a significant difference ( $F_{2, 14} = 8.599$ ,  $p < .01$ , partial  $\eta^2 = .55$ ) between experimental stages. Multiple comparison Bonferroni post-hoc test revealed that participants performed significantly better using instructional self-talk ( $M = 34.69$ ,  $SD = \pm 17.89$ ) compared to the baseline measure ( $M = 87.31$ ,  $SD = \pm 25.63$ ). No other significant difference was found.

As reported in the manipulation check results section two participants reported using motivational self-talk when instructed to use instructional self-talk. A one-way repeated measure analysis of variance excluding these two participants revealed a significant difference ( $F_{2, 10} = 10.871$ ,  $p < .01$ , partial  $\eta^2 = .69$ ) between experimental stages. Subsequent, multiple comparison Bonferroni post-hoc test revealed that participants performed significantly better using instructional self-talk ( $M = 30.83$ ,  $SD = \pm 15.49$ ) compared to the baseline measure ( $M = 90.5$ ,  $SD = \pm 25.76$ ) and compared to using motivational self-talk ( $M = 81.0$ ,  $SD = \pm 32.01$ ). The performance means of the three experimental stages are displayed in Figure 8.



*Figure 8.* Illustration of performance throughout the experimental stages (N = 6). Lower scores indicate higher performance.

Regarding a potential training effect throughout the three experimental stages, a one-way repeated measure analysis of variance was performed excluding the counterbalancing and revealing a significant difference ( $F_{2, 14} = 4.99, p < .05, \text{partial } \eta^2 = .42$ ). Bonferroni post-hoc test revealed that participants performed significantly better in the last experimental stage ( $M = 40.44, SD = \pm 11.33$ ) compared to the baseline measure ( $M = 87.31, SD = \pm 25.63$ ) and thus identifying a training effect. No other significant difference was found.

As reported in the manipulation check results section, participants reported using self-talk more effectively in experimental tries than during the baseline measure. On closer inspection the sample of participants could be divided in two groups of four participants, one group reporting a lower amount ( $<5$ ) of effective use of self-talk and the other group reporting a higher amount ( $5 >$ ) of effective use of self-talk throughout the experiment. A mixed model repeated measure analysis of variance was conducted, with effective use of self-talk as a between subject variable and self-talk as a within subject variable. No significant differences were found pertaining to performance when reporting a higher or lower effective use of self-talk.

### *Qualitative results*

The after experiment debriefing of five participants contained two main topics, the participants' self-talk during the experiment and participants' experiences of the experiment itself. Results within these two topics are presented below and followed by the researchers' remarks in regards to the oral debriefings conducted.

#### *Self-talk*

##### *Self-talk cues used by participants*

Instructional and motivational self-talk cues used by participants in the present study are presented in Table 1 below.

Table 1  
*Instructional and motivational self-talk cues used*

Instructional self-talk cues	n	Motivational self-talk cues	n
Rhythm	1	Come on now	3
Putt carefully	1	You know this	1
Right distance now	1	I've succeeded before	1
Routine	1	I can do it	1
Hit the line	1		

n = number of participants using the self-talk cue.

#### *Combining self-talk and putting*

Regarding combining self-talk with the putting task four participants reported no difficulties with one participant describing it as: “no problem at all”. Furthermore, four participants reported using self-talk on a regular basis, with two participants declaring: “used to using it so it did not feel hard”, and “I've been doing this for a long time”. However, one participant stated: “I think it's been a little hard, I usually don't do it” regarding combining self-talk with the putting task. One participant referred to the use of motivational self-talk when saying: “it feels like more is at stake and the pulse goes up” which was negative for the participant, described as: “that is not how I perform my best”. One participant reported using instructional self-talk to prompt his/her routine while standing behind the ball saying the cue: “routine”. The same participant means that after the cue his head gets empty by stating: “then I got into it”. One participant wanted to include both instructional and motivational cues while putting, otherwise as the participant stated: “if I only think you know this, then I get worried that I won't think of the length /.../ and that's something I feel I want to include”. Two participants made a distinction between instructional and motivational self-talk, with one participant stating: “with motivational, you get like pumped up, feeling I can do this, you get more psyched up /.../ with rhythm (instructional self-talk) I get more relaxed”.

#### *Self-talk and performance*

All participants thought that their self-talk affected their performance, with one participant stating: “with a good self-talk I perform better” and another participant stating: “I become more focused” pertaining to the use of self-talk.

#### *Self-talk and training*

Regarding if more training with self-talk would affect the outcome two participants reported: “it's possible” and “absolutely, I think so”.

#### *Stability of self-talk*

Regarding if self-talk changed during the execution of the task four participants reported that their self-talk was stabile, one participant described it as: “if you stick to one thing I think it becomes easier”. One participant reported difficulty to stick to one thing, stating: “I babble sentence over sentence instead of sticking to one word only”.

#### *Experiment*

##### *Task difficulty*

All but one participant experienced the task as challenging, with one participant stating: “it was not easy stopping it on that line”. Furthermore, one participant states that: “I think it

should be this hard /.../ if the line was made a decimeter wide it would not be the same thing". Two participants referred to the absence of a hole and that this made the task more difficult. One participant described it as: "it becomes more difficult, with a hole you can always make it anyway, even if hit to hard but on the right line it can go in".

#### *Task training*

One participant brought up the training sequence when stating: "I probably would have needed a bit more than five training putts to perform better". Furthermore, regarding training, two participants acknowledge that they were performing better the last day compared to the first day. One participant described it as a "very big difference from the first day, it sticks, third day you find it, I hit two of the five into the wall the first day, I probably would not do that today, and that's still a couple of days ago".

#### *Experience of putting to a target line and not a hole*

Regarding putting to a target line one participant stated: "when I train putting distance I train like this". One participant further highlights the characteristics of the task by stating: "it's so obvious that it is all about distance". Furthermore, one participant described it as: "it was really strange /.../ it was all distance, focus was more on execution /.../ to get it to stop, same tempo, same swing each time, instead of focusing on the target."

Several participants made reference to their focus in relation to a hole with one participant stating: "it is easier to focus when there is a hole", and "it becomes more concrete when you have a hole". Two participants meant that a hole gave them more feedback saying "I'd probably received better feedback if there had been a hole", and "you see the result right away". However, regarding absence of a hole and receiving feedback, one participant stated: "if you managed to get one close you got even more filled because it is a smaller target".

One participant made reference to the normal way of thinking when stating: "you could think, that one was not that good, but with a hole it might have gone in anyway, even though it was not that good". Furthermore, one participant, with regards to the characteristics of the task 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, because then I know it does not matter hitting it 30 cm pass, but now it was like, ooh, I want it the right length, focus is on distance, instead of having a hole which it can roll into".

Overall, all but one participant, had issues with the absence of a hole with one participant clearly stating: "I actually thought about it" followed by "should have had a hole or maybe a dot instead". Regarding aiming at a dot instead of a target line, one participant described it as: "better, but not good, because if you are to stop the ball on the dot, that's nothing you do on the course, there the putt should pass the hole".

#### *Measuring performance*

Regarding if the researcher while measuring performances in between putts interfered with participants it was reported synonymously as something they had not thought about. Two participants stated: "I did not think about that at all, you did your routine, stepped behind the yellow line and started over", and "I did not think about it, I only thought step behind the line and focus on the next putt". Furthermore, one participant stated: "I train like this, so I'm used to it".



### *Instruments*

Overall participants reported finding the instruments, instructions, and forms easy to understand, apart from one participant which therefore was excluded from the analysis. Regarding the self-efficacy instrument, one participant stated: "I did not understand completely", finding the instructions in relation to filling in the self-efficacy percentages a bit odd and vague. Furthermore, one participant found that the three experimental putts from various distances was more difficult than first expected and realized that when filling in the baseline self-efficacy measure the participant might have been too overconfident by saying: "you got fooled a little when hitting the first five /.../ you were a bit overconfident first I think, but it got a bit harder". The participant further explained it as: "I went a little on the past, I think, unconsciously, how it would go".

### *Experiment as a workshop*

Participants' experiences regarding the experiment as a workshop were positive. Four participants reported gaining some insight into their own self-talk. One participant referred to the functions of self-talk when stating: "I understand the differences". One participant referred to the lecture in self-talk and the past way of interpreting self-talk when stating: "it's been interesting, the PowerPoint you had, that negative can be positive, I've always seen negative as negative, but that it can be positive /.../ that's interesting, I've put some thought into that". One participant stated that: "I have not thought about it that much before, what you do before you putt, but I have done it now /.../ don't think it is going to help me /.../ I'm going to do it as I've done before, because that works for me". Furthermore, one participant reported usually using self-talk, but still thought a workshop design was positive when stating: "I think this is really good for those who have not worked with it before, but I have been doing this for so long".

### *Oral debriefing*

In general, participants thought the experiment was interesting, that they had gained more insight into self-talk and that the putting task was challenging.

One participant reported having trouble finding the right length of the putts, but while using the instructional self-talk cue "hit the line" the participant could rearrange his/her focus to a target and not the execution which was positive. Another participant felt similar by using "nice and easy" (i.e., motivational arousal self-talk) which the participant though improved putting performance. Both participants, upon discussion implied that the insight into their putting and self-talk would help them, that they could modify what they had learned and use it on the golf course. For example, using the instructional self-talk cue "hit the line" could be modified to "hit the hole" which was positive for that participant. Furthermore, one participant reported including both instructional and motivational self-talk will putting, which according to that participant worked best for him/her.

## Discussion

The objectives of the present study were: (1) to examine the effects of motivational and instructional self-talk on self-efficacy in elite golf players; and (2) to examine the effects of motivational and instructional self-talk on performance in elite golf players.

### *Summary of results*

The main results of the present experimental investigation can be summarized as follows. No significant effects were revealed regarding self-efficacy. Instructional self-talk enhanced performance. Participants used self-talk in a more structured (i.e., well-planned) manner

throughout the experiment. Additionally, qualitative data revealed that participants experienced the task as challenging, thought their self-talk affected their performance, and had issues with the absence of a hole.

#### *Self-talk - self-efficacy relationship*

Self-efficacy, a core factor within social cognitive theory, has been argued to be a key to optimal performance (Bandura, 1997). Following the definition of self-efficacy, a high belief in one's capabilities more likely promotes a better performance than a low belief in one's capabilities. Hardy (2006) argued that self-talk could be a self-delivered variation of verbal persuasion, one of the sources of efficacy beliefs suggested by Bandura (1997). Bandura referred to verbal persuasion as a limited but adjunct source of self-efficacy. Such beliefs are important contributors to sporting performance according to Feltz et al. (2008). This promotes the idea that self-efficacy could be a key to optimal performance and that self-talk might affect these efficacy beliefs.

The present investigation revealed no significant differences in self-efficacy across trials and could not further establish self-efficacy as a potential mediating mechanism of the self-talk-performance relationship. However, previous research has shown promising results (Hardy, Hall, Gibbs et al., 2005; Hatzigeorgiadis et al., 2008), and sporting performance research has shown a positive and moderate relationship to self-efficacy overall (Moritz et al., 2003). Hardy (2006) argued that elite athletes, as used in the present study, are more likely to benefit from self-talk. Therefore, no differences in efficacy across trials in the present study were somewhat surprising. This raises the question why self-efficacy effects were not shown.

Bandura (1997) stated that to promote and measure self-efficacy the task needs to be experienced as a challenge. All but one participant experienced the task as challenging with one participant saying: "I think it should be this hard /.../ if the line was made a decimeter wide it would not be the same thing" which reflects the proposition of Bandura. One should not reject the possibility that the task, although experienced as a challenge, was not challenging enough to promote efficacy changes. However, the mean of self-efficacy was approximately 50 percent throughout experimental stages which is rather low implying that it was a challenge and that there was a window of improvement that could have shown efficacy differences.

Generality of self-efficacy relates to the transferability of an individual's efficacy judgments from one task to another (Bandura, 1997). Bandura stated that "generalization of perceived efficacy has been studied as a function of the degree of similarity of qualitative features of activities and the skills they require" (p. 51). Even though the putting performance task was carried out within a lab setting, hitting these artificial golf putts requires the same skills as hitting golf putts in natural settings. An interesting observation is that participants might have been overconfident in the baseline measurement of self-efficacy. One participant stated: "you got fooled a little when hitting the first five /.../ you were a bit overconfident first I think, but it got a bit harder". Participants were not given a chance to test the three experimental putts from various distances prior to the baseline measure of self-efficacy. This might have affected how they interpreted the difficulty of the task and therefore estimated their capability higher than what they might have done if they had tested the experimental putts before the estimation. However, in Hatzigeorgiadis et al. (2008) tennis intervention study self-efficacy was estimated after participants performed the task once for familiarization. Doing so, the effects of self-talk on self-efficacy might just mirror those on performance (Hatzigeorgiadis et al.). This can be related to what one participant stated in the present study regarding the

baseline self-efficacy estimation: “I went a little on the past, I think, unconsciously, how it would go”. The need for a research design overcoming these issues is vital to more accurately explain self-efficacy as a mediating mechanism. One possibility is to use a task that is familiar to participants in which they can more accurately relate their capabilities without trying the task prior to execution.

Hatzigeorgiadis et al. (2008) recommended that the use of self-talk should be thoroughly practiced and mastered to maximize its benefits. The most plausible reason why self-efficacy was not affected might be because an adequate training phase was not included. The research design was implemented on purpose, to see if a very limited amount of practice using self-talk would affect self-efficacy, which it proved not to do. However, as predicted, several participants reported using self-talk on a regular basis with one participant stating: “I’ve been doing this for a long time”. Although using self-talk regularly, it was found that participants used self-talk in a more structured (i.e., well-planned) manner throughout the experiment after the lecture compared to the baseline measure. As such, including a training phase might also have caused a different outcome. As one participant stated: “I probably would have needed a bit more than five training putts to perform better” and two participants did report to believe that training in self-talk would affect the outcome with one stating: “absolutely, I think so”.

That self-efficacy can be promoted through the use of self-talk is not disproven through this investigation. Instead, careful forethought in the implementation of a research design is promoted. Within the present study steps were taken to promote a real life one shot-one chance reality, but the investigation was still carried out within a lab setting. Self-efficacy changes previously reported in Hatzigeorgiadis et al. (2008) might have emerged because of a more natural setting. Hitting a forehand on a tennis court could be argued as more natural than hitting a golf putt to an indicated target line on a synthetic carpet indoors.

#### *Self-talk – performance relationship*

Hardy et al. (1996) included self-talk within the model of psychological preparation for peak performance among psychological skills facilitating peak performance (see Figure 1). Furthermore, Hardy, Hall and Hardy (2004) reported that skilled athletes believed that self-talk affected their performance. In line with previous research the participants within the present study all reported to believe that what they said to themselves affected their performance. One participant stated: “with a good self-talk I perform better” inferring that self-talk is part of reaching peak performance lending support to the model of Hardy et al.

Although participants in general thought that their self-talk affected their performance, the present investigation revealed that only the use of instructional self-talk significantly improved performance. Instructional self-talk associated with improved golf performance has been reported previously by Harvey et al. (2002) where golf pitching consistency was improved using instructional self-talk. This study, like studies before (e.g., Johnson et al., 2004, Perkos et al., 2002), supports the use of instructional self-talk to improve performance.

However, there are some limitations which should be accounted for when interpreting the results of the present study. As suspected, all participants used self-talk during the baseline measure which is in line with Hardy, Hall and Hardy (2004), that skilled athletes use self-talk more consistently. However, no overall preference in a self-talk function (instructional or motivational) was identified during the baseline measure and participants reported using self-talk in a more structured manner throughout the experiment compared to the baseline measure. Furthermore, a training effect was identified within the analysis, stating that

participants did perform better on the last try compared to the baseline measure. One participant referred to a training effect when stating: “very big difference from the first day, it sticks, third day you find it”. However, steps were taken to prevent a training effect within execution of putts in that participants were to step behind an indicated line in the floor in between putts, and training putts were not hit from the same length as the experimental putts were. The experimental procedure was also counterbalanced, half of the sample carried out instructional self-talk day two, and the other half on day three. Therefore should the results of the present study not be discarded because of the identified training effect or the baseline use of self-talk. Thus, changes in performance should be accounted to the use of self-talk. Additionally, when re-analyzing performance and omitting two participants reporting to use motivational self-talk when instructed to use instructional self-talk the support of instructional self-talk was strengthened. Upon inspection, the effect size of the analysis increased in the latter analysis (partial  $\eta^2=.69$ ) compared to the original analysis (partial  $\eta^2=.55$ ). Instructional self-talk still improved performance significantly compared to the baseline measure, but now also compared to when using motivational self-talk. This implies that instructional self-talk is better than motivational self-talk at enhancing performance when it comes to golf putting execution.

The result of the present study that motivational self-talk did not improve performance significantly contradicts research of Hatzigeorgiadis et al. (2004; 2008; 2009). However, the present study does not disconfirm motivational self-talk as a performance enhancing strategy. There were participants using motivational self-talk who reported believing it helped their putting execution. Theodorakis et al. (2001) found that participants using a task-relevant self-talk cue performed significantly better than participants using a task-irrelevant self-talk cue. In line with this two participants described the use of motivational self-talk when saying: “with motivational, you get like pumped up, feeling I can do this, you get more psyched up” and “it feels like more is at stake and the pulse goes up” and this was not helpful for the participant, expressed as: “that is not how I perform my best”. Hardy, Hall and Hardy (2005) reported that the use of motivational self-talk pertaining to “psyching-up” is used most often within practice settings. To boost your arousal level by psyching yourself up is often positive, but in relation to golf putting it seems to be unwanted (i.e., task-irrelevant). However, motivational self-talk is not only arousal increasing, it can also have a decreasing effect on arousal. As reported in the oral debriefing one participant thought the cue “nice and easy” (i.e., motivational arousal self-talk) improved performance. It seems that a motivational self-talk that increases arousal is task-irrelevant, and on the opposite, a motivational self-talk that decreases arousal seems more task-relevant. This is in line with Landin’s (1994) identification that matching self-talk with demands of the task is important to improve performance.

That instructional self-talk within the present study improved performance of golf putting, argued as a precision task, further support the task-demand hypothesis of Theodorakis et al. (2000). Theodorakis et al. stated that for tasks requiring more skill, timing and precision instructional self-talk would be more beneficial. Hatzigeorgiadis et al. (2004) tested the prediction of the task-demand hypothesis and found that both instructional and motivational self-talk improved performance on a water polo precision task, although instructional self-talk did improve performance slightly more. In the present study, only instructional self-talk significantly improved performance. However, there was a difference in performance between the baseline measure and the use of motivational self-talk that might have been proven significant if the number of participants had been greater. Furthermore, the nature of the task in Hatzigeorgiadis et al.’s. study might have been more suited for the use of motivational self-talk than in the present study. A water polo precision throw could be argued as a less fine-

motor movement than a golf putting stroke, motivational self-talk might therefore have had an effect, this however is only speculation and further research is clearly needed in this area.

Some participants had used self-talk before, but showed no preference to either instructional or motivational self-talk in the baseline measure. That instructional self-talk improved performance with that low amount of training does imply that very limited practice using self-talk still can have significant performance effects.

Two participants wanted to include both instructional and motivational self-talk while putting. In line with this one participant reported a relaxation effect when using the self-talk cue “rhythm”. The participant did refer to this self-talk as instructional, focusing on his/her putting stroke, executing a pendulum action. Even though this participant used the cue with an instructional focus, repeating the cue “rhythm” gave a relaxation effect, which according to Hardy, Gammage et al. (2001) can be categorized as a motivational arousal self-talk. One participant stated: “I babble sentence over sentence instead of sticking to one word only”. Keeping self-talk short is in line with previous findings of Hardy, Hall and Hardy (2005) regarding that content of athletes’ self-talk tends to be short phrases (i.e., abbreviated). Maybe including both instructional and motivational self-talk enhances performance more and furthermore, using self-talk cues which include both instructional and motivational effects is even better.

The results of the present study indicating that instructional self-talk is better than motivational self-talk in improving golf putting performance should be interpreted with caution. Because the characteristics of the task might have influenced the results and this will be discussed in the following section.

#### *Characteristics of the task and self-talk*

The characteristics of the task were highlighted by one participant when stating: “it's so obvious that it is all about distance”. The purpose of the putting performance task design making participants hit putts to an indicated target line and not a hole was implemented to make the task more difficult. The essence of the idea was captured in a statement of one participant saying: “it becomes more difficult, with a hole you can always make it anyway, even if hit too hard but on the right line it can go in”. It is possible that the characteristics of the task might have influenced the results in that instructional self-talk was more suited for the task itself.

The absence of a hole might have affected the participants. As seen in the statements of two participants the golf hole seems to have big importance for the players: “it is easier to focus when there is a hole”, and “I'd probably received better feedback if there had been a hole”. It appears that the golf hole adds another dimension to the golf putting execution. Without the hole something that seems very important in the natural setting of golf putting execution is lost and the situation is therefore also different. With regards to the characteristics of the task 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. Could it be that motivational self-talk, like the participant referred to (i.e., “you can do it”), influences golf players and performance to a greater extent if there is a hole present, but not when putting to an indicated target line. That the characteristics of the task being somewhat unnatural made the use of instructional self-talk more appropriate. A conclusion that can be drawn from this is that the putting performance task did not sufficiently represent natural golf putting in an appropriate manner. The results cannot therefore be implied to represent what

self-talk that is appropriate to use while putting in natural settings. As such, implying that instructional self-talk is better at enhancing performance than motivational self-talk within golf putting is done only for experimental conditions used in the present study.

Although the task might have suited instructional self-talk one cannot rule out the possibility that instructional self-talk can be more suited for golf putting execution in natural settings. The task-demand hypothesis (Theodorakis et al., 2000) would suggest it to be so. This however does not imply that motivational self-talk is not useful within golf. Could it be that the use of instructional self-talk is better at enhancing performance than motivational self-talk when it comes to golf putting, but that the use of motivational self-talk is better than instructional self-talk in between shots to enhance total performance. A qualitative study of six elite golf players indicated that motivational self-talk was used almost exclusively throughout a golfing round (eighteen holes of play) (Linnér & Sandström, 2010). Linnér and Sandström speculated that this was because a golfing round is time consuming and players needed to keep motivating themselves to maintain their performance level. Maybe instructional self-talk is facilitating in relation to shot execution, but motivational self-talk plays a part in making athletes ready to execute these shots.

What can be concluded from the present study is that when golf players face a putt where distance is most important, such as a long putt where sinking the putt is less likely and the goal is to get it close, the use of instructional self-talk seems more appropriate in improving the outcome of that putt.

#### *A framework of self-talk revised*

Hardy et al. (2009) proposed a framework of self-talk to illustrate and help to understand the complete picture of the self-talk-performance relationship (see Figure 2). The framework was used to guide readers within Hardy et al.'s review of the self-talk-performance relationship research. There is one issue pertaining to how Hardy et al. illustrated the potential mechanisms mediating the self-talk-performance relationship. In the framework one could argue that self-talk is linked directly to performance, although it is illustrated with a dotted line it is unclear in its logical way. The relationship between self-talk and potential mediating mechanisms of performance is more complex. Within the review Hardy et al. did suggest that the potential mechanisms are likely to work in tandem, although presented separately. Hardy et al.'s framework of self-talk is a good start to structure the research within the field, but it needs some alterations to more sufficiently illustrate how potential mechanisms mediate the self-talk-performance relationship.

The goal of implementing an illustration is to take something that is un-comprehensive through text and make it more comprehending through the illustration. Hardy et al.'s (2009) framework of self-talk as it stands does not illustrate how potential mechanisms act in a mediating manner. From a didactical standpoint, the framework does not produce the right learning effect, in other words, the framework does not graphically show what the research and text are suggesting. Therefore, as seen in Figure 9, is a revised version of a framework of the self-talk-performance relationship presented. The framework is different to Hardy et al. in three ways. It proposes to more sufficiently illustrate the mediating effects the potential mechanisms have on the self-talk-performance relationship. Mechanisms are illustrated in a circular manner inferring that they most likely work together to mediate performance. The use of self-talk is not considered to directly affect performance. Instead, performance is influenced through the surrounding mechanism (i.e., cognitive, motivational, behavioural, and affectual), which are affected by the use of self-talk. Furthermore, influencing performance

might re-affect the use of self-talk (i.e., illustrated by the dotted line). It is possible that self-talk affects performance, but then performance affects self-talk. For example, a facilitating self-talk enhances performance, but the performance also produces a facilitating self-talk. Perhaps even more interesting, a debilitating self-talk produces a poorer performance, the poorer performance might lead to a more debilitating self-talk. The framework also includes the dimensions proposed by Hardy (2006) to explain what self-talk is. This is included in an attempt to didactically illustrate the what, why, and how of the self-talk-performance relationship. To guide readers in what self-talk is, its potential use in improving performance (i.e., why use it), and how this is accomplished through possible mediating mechanisms is thought to improve people's understanding of the field and promote further research.

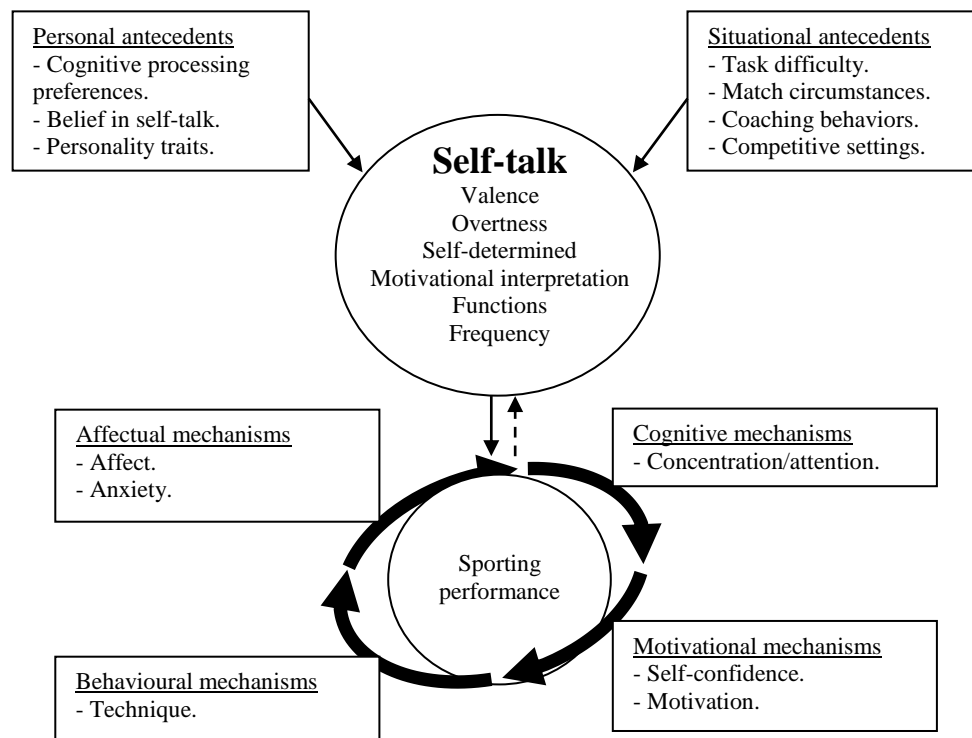


Figure 9. A framework of the self-talk-performance relationship.

### Methodological discussion

As Hardy, Hall, Gibbs et al. (2005) recognized true, pure control groups are not generated when investigating self-talk. Controlling participants' use of self-talk is impossible. Therefore was a within subjects repeated measure design implemented in the present study. A repeated measure of the same individual raises the sensitivity of the measure making it possible to detect smaller differences (Mitchell & Jolley, 2010). However, it also causes order effects, which can and was reduced using counterbalancing and as such increasing the internal validity of the investigation. The design, although having abovementioned limitations, is still an interesting design because it measures intra- and inter-individual differences, which suites an idiosyncratic phenomenon like self-talk.

Mitchell and Jolley (2010) argued that an investigation should always aim to maximize the benefits for participants involved. The first step in controlling one's self-talk is to become aware of it (Zinsser, Bunker, & Williams, 2006). The study procedure as a workshop and a learning experience, including a lecture in self-talk, was met with positivity from participants with one stating: "I think this is really good for those who have not worked with it before".

The workshop design is believed to have maximized the benefits for participants involved, with one participant stating: “I have not thought about it that much before” which echoes Zinsser et al’s. proposition. The use of a workshop design, empowering participants through stimulation and discussion, is thought to have enhanced their motivation to take part in the experiment and given them knowledge to bring outside of the study. Hence, the benefits for the participants involved and the experiment procedure itself were enhanced.

The combination of both quantitative and qualitative methodology in the present study is thought to have been facilitating in the interpretation of the results. It takes both quantitative and qualitative research to expand the understanding of a phenomenon. Specifically, some elements appear in the qualitative research that does not appear in the quantitative, and vice versa. Things can be bypassed and the results can be misinterpreted if not everything is taken into consideration. As Hardy et al. (1996) argued; athletes live in a complex environment, and are also themselves complex individuals. The results of the present study could be interpreted quite differently if the qualitative part had not been included. That the absence of a hole had issues for the participants would not have been identified. This would have made the results indicating that instructional self-talk is better than motivational self-talk seem different. It is possible that the results would have been reported as true, although they were in fact problematic. To gain a qualitative understanding of the procedure and how it is experienced is perceived to have a positive influence in making accurate interpretations of the quantitative data.

#### *Ethical issues*

With regards to ethical issues two things could have been accomplished more appropriately. The planned timeframe was shorter than the actual time the experimental procedure took which could have made participants bored while waiting and therefore affected the outcome. The participants however showed great patience and it is assumed not to have affected the outcome of this study. Furthermore, the after experiment debriefing was not mentioned in the opening experiment information to participants. When prompted with the question to partake or not, no one decline to participate. However, pre-warning that some participants would be asked to partake in an interview upon completion of the experiment would have been more ethically appropriate.

#### *Limitations*

Some limitations have already been mentioned and discussed above, such as the baseline use of self-talk, the identification of a training effect, the possibility of participants being overconfident in the baseline measure of self-efficacy, the absence of a training phase, the absence of a hole and how the characteristics of the task might have influenced the results.

Due to the small, specific sample (e.g., age, students) chosen and the implemented design revealing issues with ecological validity (i.e., putting task not representing golf putting appropriately) results should be interpreted with caution and generalizing the results of the present study is not recommended. Furthermore, to accurately suggest that instructional self-talk is superior within golf putting a bigger sample investigation is needed.

Two participants were tested simultaneously to save time and be more efficient in the experiment procedure. This is not believed to have affected the outcome, if anything, it decreased tension among the participants which, if so, was beneficial for the study.



One advantage of the present study was that the self-efficacy instrument was based on recommendations of Bandura (1997; 2006) and Pajares et al. (2001). Previous attempts to investigate the mediating effects of self-efficacy in the self-talk-performance relationship have not followed these guidelines in the same way. Hardy, Hall, Gibbs et al. (2005) did not implement the graduation of challenge aspect of self-efficacy, which Bandura (2006) argued as important when measuring efficacy beliefs. Hatzigeorgiadis et al. (2008) did implement the graduation of challenge aspect, but used a 5-interval scale, which Pajares et al. argued as a less sensitive predictor of performance than a 0-100 response scale, which was used in the present study. Due to procedural limitations of the present study, the results do not disconfirm previous research, even if following abovementioned recommendations more appropriately. Although not a limitation of the present study there were two participants who misinterpreted the self-efficacy instrument used. If duplicating the present study it is suggested that the instrument is made simpler to understand.

The qualitative analysis was performed by the researcher alone and did not include any triangulation. The analysis did however follow prearranged guidelines and no interpretations were made, as such, absence of triangulation is not considered a disadvantage of this analysis.

#### *Application*

Overall, participants of the present study had no problems combining self-talk with the task, inferring that self-talk can be part of enhancing putting performance. With regards to performance, instructional self-talk seems superior when distance is a key. As such, when a golf player faces a long putt the use of instructional self-talk is promoted. Motivational self-talk that increases arousal is not recommended to use while putting since this appears to be counterproductive in its natural way (i.e., feeling relaxed is more desirable). Due to the apparent importance of the hole, self-talk cues referring to the hole (e.g., “make it”, “hit the hole”, or “make it drop”) is suggested to have greater positive effect for golf players.

With regards to self-efficacy the present investigation provided no applicable results. Nevertheless, in accordance with previous findings self-talk could be viewed as an adjunct source of efficacy. It is plausible that self-efficacy mediates performance, as such; working with the self-delivered subjective beliefs of an athlete’s capabilities is promoted as a potential part in enhancing performance through self-talk.

#### *Future research of self-efficacy theory*

Qualitative data of the present study showed that participants perceived competence contributed to their evaluation of self-efficacy for performing the putting performance task (e.g., overconfident in the baseline measure because they overestimated their competence). It is recommended that future research aim to verify the generality dimension of self-efficacy theory.

#### *Future research of the self-talk phenomenon*

The use of an inside voice (i.e., covert self-talk) is something that all people seems to be able to relate to, something that everyone seems to do, at least to some extent. If everyone does it, finding out how it influences performance is arguably an important research question.

There is a positive influence within the field, initiated with Hardy’s (2006) critical review, to structure the research of this complex phenomenon. One of the steps in structuring the research was taken by Hardy et al. (2009) when presenting the framework of self-talk, which is included and has been revised in the present study. Future research should try to evolve this

work and test the predictions of this framework. Do mechanisms interact and work in tandem to affect performance? What are the antecedents of self-talk? Is self-talk re-affected by performance? The continuation of the work will help to understand how self-talk affects performance. In addition, future research should view self-talk within a broad perspective (i.e., not only in relation to performance in sports) as it is shown in Hardy et al.'s (1996) model of psychological preparation for peak performance. A comprehensive framework of self-talk including more than its relationship to performance is warranted since self-talk arguably is a part of much more in human life.

Mediating mechanisms in the self-talk-performance relationship are supposed to work in tandem. Arguably, if mechanisms work in tandem, investigations of such mechanisms should try and investigate them in tandem too. Such investigations are promoted in future research, but given the lack of research investigating mechanisms altogether, it is recommended that mechanisms should first be confirmed as mediating mechanisms before studied in tandem with other confirmed mechanisms.

Given the lack of research investigating and confirming self-efficacy as a mediating mechanism in the self-talk-performance relationship, that the present investigation was the first of its kind in relation to golf, further research will be pursued.

There are some lessons learned from the present study which will be implemented in the follow-up study to promote a more methodologically sound study. Participants will choose their own self-talk cues to promote an idiosyncratic investigation. This does, however, require knowledge of individuals to be able to distinguish between instructional and motivational self-talk. In line with this one participant in the present study said "I understand the difference" indicating that the lecture in self-talk gave knowledge. Thus, a workshop design will be implemented. A golf hole will be included in the putting task as it appears to add another dimension to the execution. Furthermore, some loss of internal validity will be accepted in making the experiment more natural, for example will participants place the ball themselves since this is a natural part of a golf players putting routine. Although self-selecting cues are promoted, providing examples is important. When it comes to golf players, the golf hole seems very powerful and examples provided will try and reflect this. Finally, with regards to self-efficacy, will a task that is familiar to the participants in which they can relate their capabilities without trying the task before being tested be used, and a training phase will be included to maximize the benefits of self-talk.

There is an interest within the field as Hardy (2006) concluded that there has not been a direct comparison of effectiveness between overt and covert self-talk in relation to performance. Given the gender and preference differences within the overtness dimension (Hardy, Hall, & Hardy, 2005) a closer inspection of the overtness dimension is clearly needed.

The follow-up study will include a larger sample of elite golf players and investigate self-efficacy as a mediating mechanism in the self-talk-performance relationship. A mixed-model design, with self-talk overtness and functions of self-talk as independent variables and self-efficacy, performance, and preference as dependent variables will be implemented.

The present study and the future study being pursued both involve elite golf players. Nevertheless, future research should investigate different sports or contexts, ages, and experience levels to extend the knowledge of the phenomenon. Since self-talk arguably can be seen as something most people does or can do, finding out how self-talk influences

performance not only helps golf players execute putts more proficiently, but in the long run it can help every single one of us in performance related situations, which we encounter more often than we first might think. Performance does not only relate to sporting arenas, but to scholar exams, to sales presentation or scoring a job through an impressive interview. Performance is all around us, and self-talk is inside all of us. This illustrates the importance of answering the research question of how self-talk affects performance. Which we will.

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Background information and written informed consent

**Bakgrundsinformation**

Kön? Man Kvinna

Hur gammal är du? \_\_\_\_\_

Hur många år har du spelat golf? \_\_\_\_\_

Vilken tävlingsnivå tävlar du på? \_\_\_\_\_

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

Jag har informerats om studien, om hur informationen samlas in och hur den bearbetas. Jag har även informerats om att mitt deltagande är frivilligt och att jag, när jag vill, kan avbryta min medverkan utan att ange orsak. Jag samtycker härmed till att medverka i detta experiment kring olika strategier inom puttning i golf.

Ort/Datum \_\_\_\_\_

Namnunderskrift \_\_\_\_\_

Namnförtydligande \_\_\_\_\_

## Self-efficacy instrument

Deltagare # \_\_\_\_\_

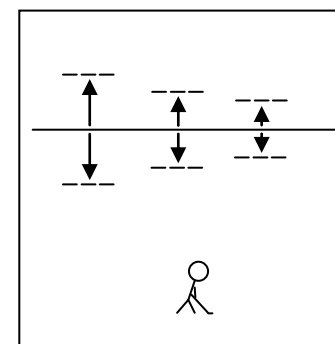
Vänligen indikera med hjälp av procentskalorna hur säker du är just nu på att du kan utföra den beskrivna uppgiften. Välj det svarsalternativ som bäst stämmer in på dig genom att sätta ett kryss i vald ruta på respektive fråga.

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%**.



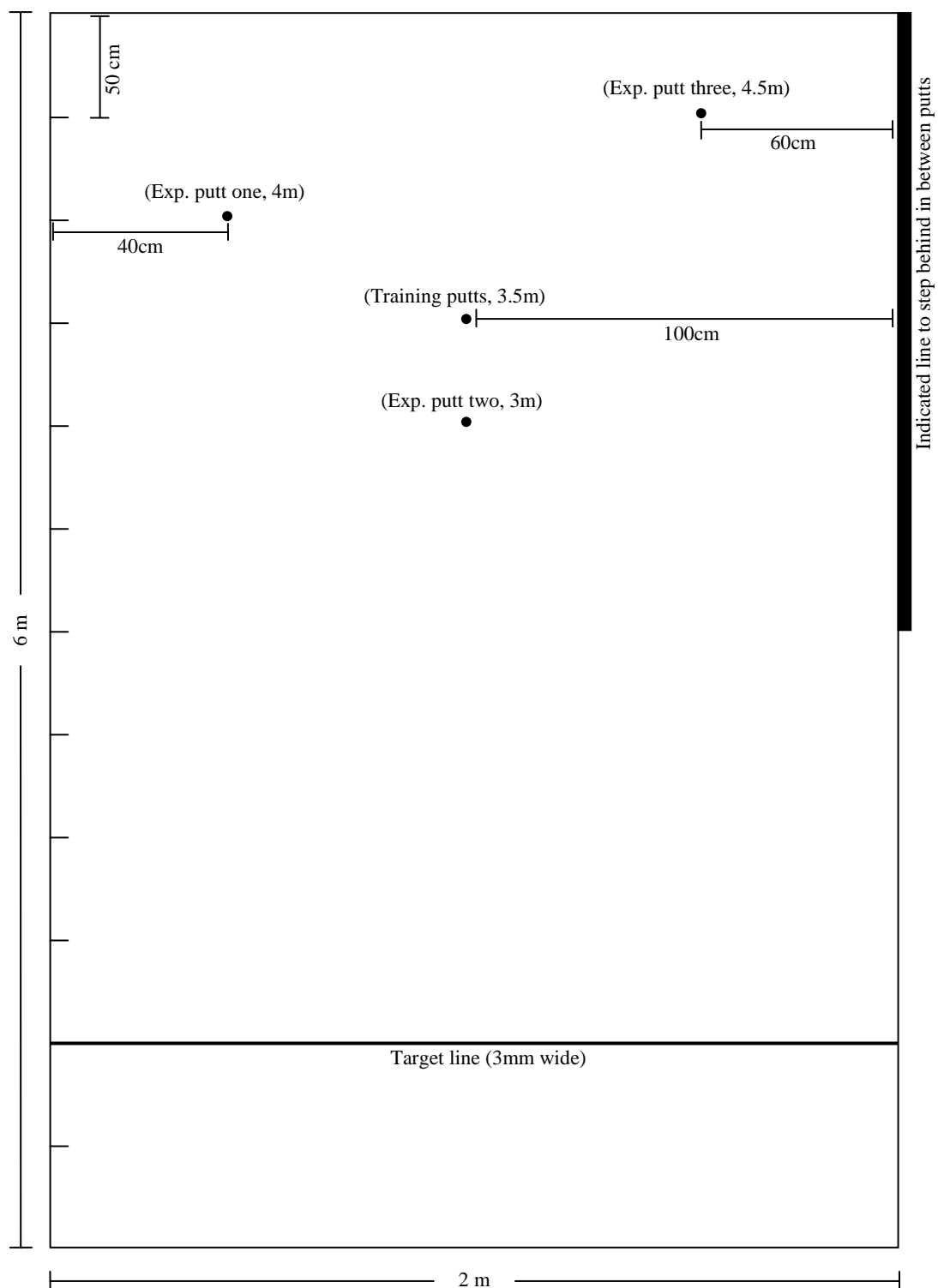
Hur säker är du just i detta nu att du kan slå...

	0%	10	20	30	40	50	60	70	80	90	100%
... alla tre puttningar inom 50 cm från träfflinjen											
... alla tre puttningar inom 40 cm från träfflinjen											
... alla tre puttningar inom 30 cm från träfflinjen											
... alla tre puttningar inom 20 cm från träfflinjen											
... alla tre puttningar inom 15 cm från träfflinjen											
... alla tre puttningar inom 10 cm från träfflinjen											
... alla tre puttningar inom 5 cm från träfflinjen											
... alla tre puttningar inom 1 cm från träfflinjen											



En putt inom t ex. 50 cm från träfflinjen kan innebära att den är **inom 50 cm före eller 50 cm efter** träfflinjen. Se illustration ovan.

## Design of the putting performance task



## Performance measure form

Deltagare # \_\_\_\_\_

Baslinje	centimeter
Putt 1 – 4 m	
Putt 2 – 3 m	
Putt 3 – 4.5 m	
Totalt:	

Instruerande self-talk	centimeter
Putt 1 – 4 m	
Putt 2 – 3 m	
Putt 3 – 4.5 m	
Totalt:	

Motiverande self-talk	centimeter
Putt 1 – 4 m	
Putt 2 – 3 m	
Putt 3 – 4.5 m	
Totalt:	

## Manipulation check (in regards to 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

Om Ja, Vad sa du till dig själv?

---

---

---

Och i så fall, hur ofta sa du detta?

1	2	3	4	5	6	7	8	9	10
Väldigt			Några				Hela		
få gånger			gånger				tiden		

## Manipulation check (in regards to first experimental try)

Deltagare # \_\_\_\_\_

Hur ofta använde du dig av den tänkta self-talk instruktionen **under de fem första** puttarna?  
(ringa in ditt svar)

1	2	3	4	5	6	7	8	9	10
Inte				Några					Hela
alls				gånger					tiden

Hur ofta använde du dig av den tänkta self-talk instruktionen **under de tre sista** puttarna?  
(ringa in ditt svar)

1	2	3	4	5	6	7	8	9	10
Inte				Några					Hela
alls				gånger					tiden

Sa du någonting annat till dig själv förutom den tänkta instruktionen **under de tre sista** puttarna? (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)

1	2	3	4	5	6	7	8	9	10
Väldigt				Några					Hela
få gånger				gånger					tiden

## Manipulation check (in regards to last experimental try)

Deltagare # \_\_\_\_\_

Hur ofta använde du dig av den tänkta self-talk instruktionen **under de fem första** puttarna?  
(ringa in ditt svar)

1	2	3	4	5	6	7	8	9	10
Inte				Några					Hela
alls				gånger					tiden

Hur ofta använde du dig av den tänkta self-talk instruktionen **under de tre sista** puttarna?  
(ringa in ditt svar)

1	2	3	4	5	6	7	8	9	10
Inte				Några					Hela
alls				gånger					tiden

Sa du någonting annat till dig själv förutom den tänkta instruktionen **under de tre sista** puttarna? (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)

1	2	3	4	5	6	7	8	9	10
Väldigt				Några					Hela
få gånger				gånger					tiden

Flera personer använde self-talk under första tillfället. Anser du att du använt self-talk mer strukturerat under senare tillfällen?

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 du använt self-talk mer effektivt under senare tillfällen?

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

## After experiment debriefing guide

### Self-talk

Kan du ge exempel på vad du sa till dig själv under experimentet när du skulle använda instruerande/motiverande self-talk?

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?

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

### Experimentet

Upplevde du puttuppgiften som lätt eller svår?

- Hur kan den göras lättare/svårare?

Hur kändes det att putta till en linje och inte ett hål?

- Tror du detta påverkade ditt resultat?

Hur upplevdes det att jag mätte puttarna mellan slagen?

- Funderade du på det?
- Tror du det påverkade din prestation?

Har formulären varit tydliga och enkla att förstå?

- Om inte, vad är det som varit otydligt eller svårt att förstå?

Hur ser du på experimentets utförande som en workshop?

- Har det hjälpt med förståelsen för self-talk?

Något som du vill att jag ska veta eller tänka på?

**Tack för att du ställde upp!**



Informative email sent to participants

Hej alla golfstudenter!

Jag hoppas att du vill delta i mitt experiment kring olika strategier inom puttning?!

Lukas Linnér heter jag och studerar idrottspsykologi på kandidatnivå här på högskolan. Jag genomför nu under hösten en studie kring golf och puttning. Scandinavian School of Golf samt Svenska Golf förbundet har båda visat stort intresse för vad studie kan komma fram till.

Tisdagen den 30:e november kl. 12.00 startar experimentet. Jag hoppas så många som möjligt av er vill delta. Givetvis är det, precis som all forskning, frivilligt för er att ställa upp, ni kan avbryta när ni vill och all information som ges kommer behandlas konfidentiellt (dvs. vad som sägs kommer ingen veta att just du sa). Med detta sagt hoppas jag att ni vill delta i mitt experiment. Ett experiment som aldrig tidigare genomförts inom det vetenskapliga fältet som det behandlar. Ledande forskare inom fältet har yttrat att denna studie verkar väldigt intressant och relevant för dess deltagare. Så kom igen, häng med på detta!

TISDAGEN 30:e november kl. 12.00

Plats: Labbet i Q-huset (Högskolan i Halmstad)

Första tillfället tar ca 1,5 timme.

Under första tillfället delar vi upp oss i lite mindre grupper. Dessa mindre grupper får sedan en tid då de återkommer under dag 2 och 3.

Onsdag 1:e december. Start första gruppen 12.00

Under detta tillfälle kommer ert deltagande att vara under enbart cirka 20 minuter.

Torsdag 2:e december. Start första gruppen 12.00

Under detta tillfälle kommer ert deltagande att vara under enbart cirka 20 minuter.

Ni behöver inte ta med er något, det enda ni behöver göra är att dyka upp.

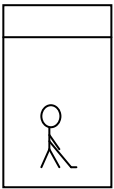
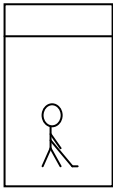
Med stor förhoppning av att du och jag ses den 30:e november kl. 12.00 i labbet!

Lukas Linnér

European Masters student

Högskolan i Halmstad

## The experimental procedure

	Väntrum (1)	Instruktionsrum (2)	Experimentrum (3)	Instruktionsrum (4)	Experimentrum (5)	MC rum (6)
Dag 1	Experimentinfo ges. Etiska aspekter förklaras. Puttuppgiften visas och förklaras. Informerat samtycke erhålls.	Inför baslinjemätningen ges ingen self-talk instruktion. Deltagare instrueras att göra sitt bästa.	Fem träningsputtar slås. 	Fylla i test av self-efficacy (upplevd förmåga att genomföra puttuppgiften) inför sina exp. puttar.	Tre experiment puttar slås. 	Fylla i manipulation check rörande hur self-talk användes.
Senare Dag 1 – Efter det att samtliga deltagare har utfört baslinjemätningen så hålls en föreläsning kring self-talk.						
Dag 2	Sluppmässig fördelning in i två grupper.	Utifrån exp. grupp och sluppmässig fördelning ges skriven instruktion i vilket self-talk som ska användas under utförandet.	Samma tillvägagångssätt som dag 1.	Fylla i test av self-efficacy (upplevd förmåga att genomföra puttuppgiften)	Samma tillvägagångssätt som dag 1.	Fylla i manipulation check rörande hur self-talk användes.
Dag 3	Ingen aktivitet	Samma princip som dag 2 men deltagare som gavs instruktionen instruerande self-talk dag 2 får dag 3 en motiverande self-talk instruktion och vice versa.	Samma tillvägagångssätt som dag 1.	Fylla i test av self-efficacy (upplevd förmåga att genomföra puttuppgiften)	Samma tillvägagångssätt som dag 1.	Fylla i manipulation check rörande hur self-talk användes.
Senare Dag 3 – Fem slumpmässigt utvalda deltagare intervjuas kring experimentet för att ge en kvalitativ bild av genomförandet						

Written instruction (in regards to instructional self-talk)

### INSTRUKTION

Läs följande instruktion noga, gärna två gånger.  
Har du någon fråga så ställ den gärna!

Self-talk är uttalanden eller påståenden som är riktade mot dig själv. Self-talk kan uttalas både som en inre röst i ditt huvud så ingen annan kan höra vad som sägs eller högt så att andra också kan höra det.

Vi vill nu att du under puttuppgiften använder dig av ett instruerande self-talk som du säger som en inre röst i ditt huvud så ingen annan kan höra det. Nedan finner du exempel på instruerande self-talk fraser som du kan välja att använda. Brukar du använda eller kom du under föreläsningen fram till ett instruerande self-talk som du vill använda så gör gärna detta.

”Träffa linjen”

”Rakt bak rakt fram”

”Som en pendel”

”Rätt längd”

På samma sätt som genomförandet under gårdagen är målet att slå en putt sen gå bakom den indikerade linjen för att sedan göra sig redo för att slå nästa putt. Fem träningsputtar slås som följs av tre experimentputtar.

Lycka till!

Written instruction (in regards to motivational self-talk)

## INSTRUKTION

Läs följande instruktion noga, gärna två gånger.  
Har du någon fråga så ställ den gärna!

Self-talk är uttalanden eller påståenden som är riktade mot dig själv. Self-talk kan uttalas både som en inre röst i ditt huvud så ingen annan kan höra vad som sägs eller högt så att andra också kan höra det.

Vi vill nu att du under puttuppgiften använder dig av ett motiverande self-talk som du säger som en inre röst i ditt huvud så ingen annan kan höra det. Nedan finner du exempel på motiverande self-talk fraser som du kan välja att använda. Brukar du använda eller kom du under föreläsningen fram till ett motiverande self-talk som du vill använda så gör gärna detta.

”Kom igen nu”

”Det här kan du”

”Jag kan”

Det är tillåtet att göra frasen mer personlig genom att använda jag istället för du om detta är mer önskvärt. Ex: ”Det här kan jag” eller ”Du kan”.

På samma sätt som genomförandet under gårdagen är målet att slå en putt sen gå bakom den indikerade linjen för att sedan göra sig redo för att slå nästa putt. Fem träningsputtar slås som följs av tre experimentputtar.

Lycka till!

PowerPoint slides of the lecture in self-talk

## Experiment föreläsning

Tisdag 30:e November 2010

Lukas Linnér

## 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

Hardy, 2006; Hardy, Oliver & Tod, 2009;  
Hatzigeorgiadis, Zourbanos, Goltisios & Theodorakis, 2008.

## Hur self-talk kan vara uppbyggt

Meningar, fraser eller ord

Första eller andra person

Självbestämt eller angivet

Hardy, 2006; Hardy, Gammage & Hall, 2001.

## 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

-Inläring 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" (inläring)  
"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)

"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

Korta fraser

Andra person