

The Effect of a Hypnosis Intervention on Performance and Flow State of an Elite Golfer: A Single Subject Design

John Pates and Andrew Cowen

University of Derby

This study examined the effects of a hypnosis intervention on the performance and flow state experiences of an elite European Tour male golfer. The experimental effect was assessed during 11 competitive golf events. Performance and flow data were analyzed using a single-subject design combined with a procedure to monitor the golfer's internal experience (Wollman, 1986). The results indicated there were two overlapping data points between baseline and intervention for his performance score and one overlapping data point for his flow score. The qualitative data revealed hypnosis may help golfers self-regulate on the golf course during competition.

Keywords: golfers, hypnosis, flow, performance

In the field of applied sports psychology, hypnosis based interventions are rarely used as a performance enhancing technique. This is surprising because there are a number of controlled studies that indicate hypnosis interventions have a notable performance enhancing effect on different athletic populations. For example, research conducted by Barker and Jones (2005, 2006, 2008) has highlighted that hypnosis can be used to enhance the performance of footballers, cricketers and martial artists. In addition, other researchers have discovered hypnosis improved the performance of badminton players (Pates & Palmi, 2002), cyclists (Lindsay, Maynard & Thomas, 2005), golfers (Pates & Maynard, 2000; Pates, Oliver & Maynard, 2001) and basketball players (Pates, Cummings, & Maynard, 2002; Pates, Maynard, & Westbury, 2001).

Pates and his colleagues obtained positive results using a hypnosis intervention consisting of a hypnotic induction phase designed to create a state of deep relaxation, a hypnotic regression phase designed to help athletes relive an earlier life experience of their optimal performance, and a trigger control phase designed to bring athletes' ideal performance state under the control of a stimulus (Pates et al., 2002; Pates & Maynard, 2000; Pates et al., 2001; Pates & Palmi, 2002). Interestingly, all of the researchers employing this intervention strategy observed that many of their participants experienced elevations in both performance and a psychological state described by Csikszentmihalyi (1975) as flow.

The positive effects of hypnosis on flow have far reaching implications for elite athletes because flow states are strongly associated with their best performances (Catley & Duda, 1997; see Cohn, 1991). Indeed, a countless number of elite athletes report flow is the crucial factor that separates winners from losers (Unestahl, 1983). These findings imply elite athletic populations may have the most to gain from adopting hypnotic interventions into their mental training regimes.

With the notable exception of Lindsay et al. (2005) who investigated the effects of hypnosis on flow states and the performance of elite cyclists, studies supporting this proposition are not published. The current study aimed to investigate the effects of hypnotic intervention upon flow states and the performance of elite golfers in the ecological valid environment of actual Tour events. Using Pates and colleagues intervention strategy, it was expected that during hypnosis the golfers experience of flow and peak performance could be conditioned to a natural trigger (the grip on the golf club). It was then expected that after conditioning, the player would be more likely to experience a state of flow and lower golf scores.

An AB single-subject design was deemed the most appropriate method to study the effects of the intervention because it allowed the analysis of an intervention that cannot be withdrawn or "turned off" (Hrycaiko & Martin, 1996). Based on the recommendations of Wollman (1986) and other researchers who have used single-subject designs (e.g., Lerner, Ostrow, Yura, & Etzel, 1996; Smith, 1988; Swain & Jones, 1995), the current study also applied a procedure that monitored the internal experience of the player.

Method

Participant

The participant in this study was a male golfer aged 22 years. He was in his first year of playing on the European Professional Golf Tour. The participant had a swing coach and over the past five years he had received only technical training. Although this golfer reported the training had been successful and it had helped him become a professional athlete, he had never won a professional tour event. This was his main goal; however, he felt during competitions he could not achieve this objective because he could not get into flow. It was therefore deemed appropriate to give this golfer an intervention that may help him control flow and improve his performance. This golfer had no experience of hypnosis training administered by a qualified practitioner. The golfer gave his consent to take part in the study and received no other training during this experiment.

Experimental Design

A single-subject AB design was implemented to examine the effects of a hypnosis-based intervention on flow states and golf performance. This type of design allows the participant to serve as his own source of control for the experiment (Barlow & Hersen, 1984; Hrycaiko & Martin, 1996). This format was also most appropriate because it facilitates the analysis of the effects of an intervention that could not be withdrawn from the participant due to the ethical reason of withholding a potentially positive intervention from an elite participant (see Robson, 1994). The design

required the observation of baseline performance and an intervention phase for the player. The intervention was introduced when a stable baseline or a trend in the opposite direction of the change anticipated became apparent for the participant. Based on the recommendations of Barlow and Hersen (1973, 1984) and Kazdin (1992), data were collected on 11 occasions over 12 weeks of tournament golf.

Dependent Variables

Performance Analysis. Stroke average was selected as the performance indicator because it represents a global measure of the participant's overall performance. Stroke average is the average score taken from two, three or four rounds of stroke-play golf. A round of stroke-play golf consists of 18 holes wherein the participant records the number of strokes taken to complete each hole. At the end of the round, the scores from each hole are summed to give a total stroke-play score.

The reliability of the stroke play scores was assessed by comparing the judgments of the participant against an independent observer, who was the participant's playing partner. The reliability assessment took place after each round and resulted in a correlation of 1.00 for the scores of the participant and the independent observer. It is worth noting that a failure to score stroke play correctly would result in a disqualification of the participant from the tournament. Scores were obtained from the official championship scorekeeper.

Flow Analysis. In addition to the performance data, information on the intensity of flow experienced by the participant during tournaments was assessed using the Flow State Scale (FSS-2; Jackson & Eklund, 2002). This 36-item instrument provides a quantitative measure of the nine dimensions of flow outlined by Csikszentmihalyi (1990). Reliability estimates ranged from .80 to .90. A global measure of flow was preferred in this investigation owing to Jackson's (1999) contention that single-factor approaches tend to reveal incomplete information about the total flow experience. The scale was administered to the player at the end of each tournament.

Treatment: The Hypnosis Intervention

The training of the participant in hypnosis took place immediately after the completion of the first baseline and was divided into three stages. In the first stage of the intervention the participant was encouraged to sit in a comfortable position and then was asked to focus on his breathing. Specifically, he was instructed to breathe deeply and to release air slowly while counting backward from the number 10. He was then given a 15-minute session involving progressive muscular relaxation (PMR). The technique originally pioneered by Jacobson (1938), involved the golfer tensing and relaxing parts of his body, while deeply inhaling. Suggestions asking the participant to contrast the differences between the tense and the relaxed muscles were given along with instructions to direct his attention to images of situations that were associated with relaxation. For example, the external image of a warm comfortable beach, or the internal sensation of floating in water.

In the second stage, an Ericksonian hypnosis technique known as a staircase induction (Hammond, 1990) was then applied. The staircase induction consisted of a journey, one step at a time, down a flight of 20 stairs. As the participant took

the journey he was told to see each stair in front of him and feel the stair under his feet. At the bottom of the stairs he was told he would see a door, and beyond the door he would see a room with a comfortable chair. The participant was then asked to sit down in the chair and focus on a small cinema screen on which appeared a relaxing scene. Throughout this stage suggestions were given to reinforce both the experience of the PMR, the deep breathing, and imagery techniques.

In the third stage suggestions were given to help the participant regress, and remember a multisensory experience of his best competitive performance. Specifically he was asked to include visual, auditory, tactile, olfactory, gustatory, and memory of his best performance from an internal perspective. His best performance was then conditioned to be released by a natural trigger. The trigger used was the grip of the golf clubs. The participant was then told to see himself rising from the chair and proceed out of the door and up the staircase. He was also told as he ascended the staircase he would feel refreshed and alert. Once the participant reacclimatized to the environment he was asked to access their ideal performance state by utilizing his trigger. Training was considered complete when the participant felt that an experience of his best performance was under trigger control.

Intervention Procedures

The hypnosis intervention was administered to each of the participants in a small, quiet and comfortable room on the college campus and lasted approximately 40 minutes. The training was composed of three stages: Stage 1—hypnotic induction, Stage 2—hypnotic regression, and Stage 3—trigger control.

After the training, the participant was asked to commit himself to practice the techniques, by playing a 40-minute audiotape recording of the live session, every day, over a seven-day interval between the first baseline and intervention phase of the study. In total, the player was given one live session, and seven audiotape sessions before the intervention phase. To ensure the participant had listened to the audio tape recording, the player was contacted daily. Examining their thoughts, feelings, and cognitions immediately after each session assessed the quality of the player's experience. Finally, it should be noted that during the intervention stage the player was not under hypnosis, instead he was merely using the trigger that was conditioned to the emotions, feelings, and cognitions they experience during their ideal performance.

Practical Assessment Questionnaire

During the 11 tournaments the internal experience of the participant was monitored using an assessment questionnaire that included the following questions: *How did you feel during the performance?*; *What were you thinking during the performance?*; *Were there any outside thoughts distracting you?*; *What was the effect of the intervention?*; *Did you experience any problems?*; *What were your general beliefs about your performance?*; and *How much effort did you put into today's performance?* The participant was asked to respond to these questions using an open-ended question format.

The list of questions was adapted from Kazdin (1992), Kendall, Hrycaiko, Martin and Kendall (1990) and Pates et al. (2001). This information permitted

on-going assessment of the quality of the participants' feelings, thoughts, and cognitions across the baseline and treatment phases. The data were analyzed by comparing the comments obtained in the baseline sessions to the comments obtained during the intervention phase of the experiment.

Social Validation Questionnaire

Following the completion of the intervention phase, the participant was asked a series of questions to assess the social validity of the Hypnosis intervention. The questions were designed to provide information concerning the importance and the effectiveness of the intervention. This was based on the work of Pates et al. (2001), and Thomas, Maynard, and Hanton (2007). The participants were asked the following questions: *Did you perceive the intervention to be important?*; *Are you satisfied with the results?*; *Do you consider the changes in performance to be significant?*; and *How satisfied were you with the intervention?* The participant was asked to respond to these questions using an open-ended question format.

Data Analysis

The performance scores and global FFS-2 scores were plotted onto two graphs. Based on the guidelines put forward by Hrycaiko and Martin (1996) an experimental effect was analyzed through a visual inspection of the plotted data. According to these researchers the intervention had an effect when: (a) baseline performance is stable or in a direction opposite to that predicted for the effects of treatment; (b) the greater the number of times that an effect is replicated within the subjects data (c) the fewer the number of overlapping data points between baseline and treatment phase; (d) the sooner the effect occurs following the introduction of treatment; and, (e) the larger the size of the effect in comparison with baseline.

Results

Upon receiving the intervention the participants experienced an immediate performance and flow effect with two overlapping data points on his performance scores and one overlapping data point on his flow scores. Specifically, the participant improved his performance from a mean of 75.5 ($SD = 1.7$) during the baseline to a mean of 71.1 ($SD = 3.0$) during the intervention phase (See Figure 1).

His Flow data also improved from a mean flow score of 115.5 ($SD = 4.7$) during the baseline to a mean of 133.7.6 ($SD = 12.1$) during the intervention phase (See Figure 2).

The results suggest that the hypnosis intervention consistently improved golf performance and the intensity of the participant's experience of flow during real competitions.

Practical Assessment Data

After finishing each tournament, the participant responded to the practical assessment questionnaire. This helped the researcher examine the internal experience of the player during tournament golf.

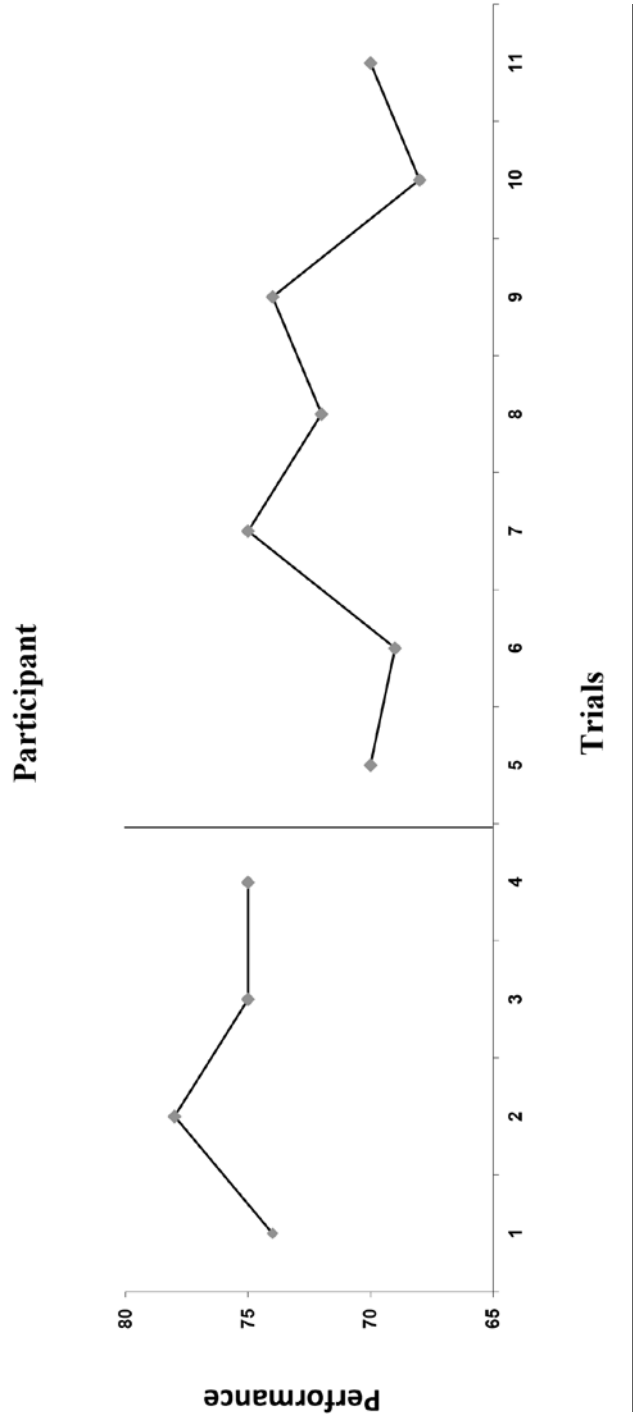


Figure 1 — Performance scores (stroke average) for the participant on each trial.

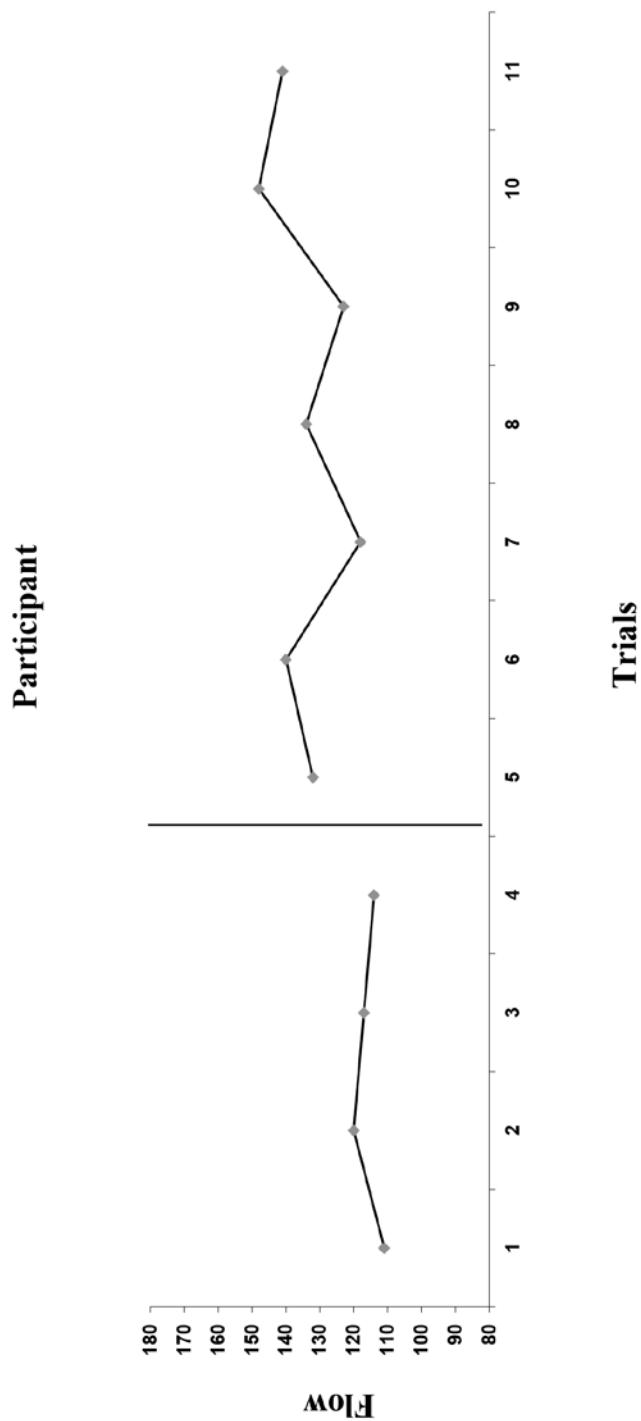


Figure 2 — Flow scores for the participant on each trial.

The participant indicated that the intervention made him feel more relaxed on the golf course and he reported having experienced images that relaxed him: "I feel much calmer out there". The images he experienced were those of the lakes around his home: "my mind keeps wondering back to images of the lakes around my home in Zurich. I really like this picture in my head". He felt the images slowed his swing down and stopped him thinking about the consequences of his shots: "the image of the lake slows my swing down and stops me thinking about what will happen if I miss the fairway or green... I have been using this image in my pre-shot routine". The participant also felt that after the intervention golf had become more enjoyable on the tour: "the most enjoyable golf I play is with my sister....I feel like I can get into that mind-set more often". Another important change for the participant was after the intervention he felt he had more control over his temper. Anger and frustration had plagued this golfer on numerous occasions during tournament play and he now felt more in control of these negative emotions: "I'm always losing control during tournaments.... I get angry so often when I hit poor shots...the hypnosis thing really works for me, it calms me down and makes me think about other things...good pictures just come into my mind automatically, the pictures stop me from getting upset". In addition, this golfer reported he had felt more optimistic on the course and was capable of winning: "I just feel I can make something good happen from most positions I find myself ... I think I could win out here, I have not felt like that before".

Finally, it should be noted the social validation questionnaire revealed that the participant was satisfied with the results of the intervention and recognized that the intervention had improved his performance and prize money. Indeed, just three weeks after the introduction of the intervention the participant had a third place finish.

Discussion

The present study demonstrated that hypnosis interventions might have a positive effect on the performance and flow experiences of elite golfers. The results are consistent with previous research that showed Pates and Maynard (2000) intervention strategy improved the performance and intensity of flow states in elite athletic populations (see Lindsay et al., 2005). Although the intervention procedure is the same as Pates and Maynard (2000) this is the first time Hypnosis data has been captured on a golfer during actual Tour events. The findings are clearly relevant to sport psychology practitioners because they suggest hypnotic training may increase personal control over emotions associated with flow states and the performances of elite athletes. This discovery supports the work of Unestahl (1983, 1986) who explicitly indicated that in elite athlete's high levels of performance and positive emotions could be initiated through hypnosis techniques. In addition, the results support the work of Cohn (1991) and Pates and his colleagues who indicated that improved performances can be achieved with techniques designed to facilitate the flow experience (Pates et al., 2002; Pates & Maynard, 2000; Pates et al., 2001).

The qualitative data also revealed some other interesting findings. First, the data show that hypnosis may help athletes regulate their emotions. More specifically this golfer was able to suppress negative emotions such as anger, and elevate positive emotions such as confidence, optimism, enjoyment and fun. Second, it appeared hypnosis might elevate emotions associated with mental relaxation resulting in

feelings of calm and third, the intervention appeared to augment positive thinking about winning and change the player's belief.

Taken together, these findings are consistent with the outcomes of a number of clinical experiments (e.g., Crawford, Clarke & Kitner-Triolo, 1996; Damaser, Shor, & Orne, 1963; Wadden & Anderton, 1982; Kirsch, 1994) wherein hypnosis helped patients positively control emotions, thoughts, feelings and perceptions.

The results also appear to support a hypothesis that hypnosis is a dynamic cerebral process that activates a number of cognitive mechanisms important for athletic performance. Unfortunately, the mechanism by which hypnotic interventions increase performance and the experience of flow is not known. However, it is possible that hypnosis facilitates a shift from an analytical to a holistic style of thinking, which gives access to processes that are important for athletic performance (Crawford & Gruzelić, 1992).

A clear strength to this study is its ecological validity; rarely have elite golfers using a hypnosis intervention strategies been studied during professional golf tournaments. Another important aspect of the current study was that the single-subject design enabled the experimenter to be more confident that the change in flow and performance scores were produced by the intervention and not some other uncontrollable variable. Indeed, the demonstration of a performance and flow effect when the intervention was introduced, gave a very clear demonstration that the intervention had some degree of external validity (Kazdin, 1992).

The possibility remains, of course, that the positive results are an artifact of both participant and experimenter bias. Indeed, neither were blind to the outcome and so experimenter expectations or the demand characteristics of the experiment may have influenced the results (Kazdin, 1992). There may also have been either a Hawthorne or Rosenthal effect (Rosenthal & Rosnow, 2008). Scrutiny of performer in a single-subject experimental design might heighten these effects. However, Drew (1976) observed, these effects tend to decline as the participant become acclimatized to being studied, so the extended length of the single-subject study could aid in controlling this effect.

The results of the study indicate that a hypnosis intervention may be an effective way of preparing professional golfers for significant competitions. Based on these findings the researcher has a number of suggestions for the sport psychology community. First, attitudes and opinions about hypnosis need to be changed within the applied sports psychology community. Second, graduate programs in sports psychology may consider providing core foundational coursework in hypnosis. Third, scientific and professional societies may consider training for individuals in the use of hypnosis in sport.

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