Psychological Characteristics and their Relation to Performance in Professional Golfers

Julien Bois, Philippe Sarrazin, Julien Southon, Julie Boiché

Running head: PSYCHOLOGICAL CHARACTERISTICS OF PROFESSIONAL GOLFERS

Psychological Characteristics and their Relation to Performance in Professional Golfers

Julien E. Bois

University of Pau and Pays de l'Adour, France

Philippe G. Sarrazin

University of Grenoble, France

Julien Southon

French Golf Federation

Julie C. S. Boiché

University of La Réunion, France

***The Sport Psychologist* (2009), *23*, 252-270.**

Corresponding authors:
Julien E. Bois, University of Pau and Pays de l'Adour, Laboratoire d'Analyse de la Performance Sportive, Département STAPS, Quartier Bastillac, 65000 TARBES France, Email : Julien.bois@univ-pau.fr
Or Philippe Sarrazin, Laboratoire Sport et Environnement Social, Université Joseph Fourier - UFRAPS, BP53, 38041 Grenoble cedex 9, France. E-mail: philippe.sarrazin@ujf-grenoble.fr

Acknowledgements:

We thank Noëlle Bru for help in the statistical analysis of the data.

Abstract

This study investigated the psychological characteristics of professional golfers and their relation to golf performance. The aims of the study were (a) to provide descriptive data on professional golfers, (b) to test possible differences between successful and unsuccessful players and (c) to estimate whether psychological characteristics could predict golf performance. The data were collected from 41 male professional golfers the day before an official competition. Results revealed that players who made the cut were characterized by higher scores on performance-approach goal, cognitive and somatic anxiety, relaxation strategies, attentional control, emotional control and lower score on performance-avoidance goal. Subsequently, a multiple regression analysis revealed that higher cognitive anxiety, more frequent use of relaxation strategies and emotional control strategies were associated with better player's ranking at the end of the competition.

Psychological Characteristics and their Relation to Performance in Professional Golfers

Golf is an activity that has consistently been studied by sports psychologists (e.g., Chamberlain & Hale, 2007; Cunningham & Ashley, 2002; Davidson & Templin, 1986; Gaudreau, Blondin, & Lapierre, 2002; Hudson & Walker, 2002; Nicholls, Holt, & Polman, 2005; Ramsey, Cumming, & Edwards, 2008). This popularity might come from the specificity of this sport: players spend a very short time at hitting the ball whereas moving across the course and waiting represent the majority of the duration of a game. The golfer must therefore develop emotional management skills (i.e., emotional control) and "adjust" his/her level of physiological and psychological activation. An efficient use of this time, which is mainly based on psychological competencies, is probably critical for golf performance. Therefore, golf clearly represents an ideal activity to be studied by sport psychologists.

In order to investigate the determinants of golf performance, a lot of studies have been conducted. Technical aspects interested some. For example, Davidson and Templin (1986) demonstrated the critical importance of acquired skills in golf performance. In a study of 119 professional golfers, they showed that driving and putting abilities as well as hitting green in regulation predicted 86 % of the variance of professional scoring average of the 1983 pro tour. Other researchers mainly focused on psychological factors related to golf performance. The studies can be classified into three categories depending on the variables examined: emotional factors, coping or performance strategies, and integrative studies. In the first part of the investigative rationale, we therefore present the golf-related studies. In the second part, we present studies examining psychological profiles of elite athletes in other activities.

Psychological Factors Related to Golf Performance

Among the three categories identified, the majority of the studies concerned the emotional aspects related to the performance, the most popular factor seeming to be state anxiety (e.g., Chamberlain & Hale, 2007; Cook et al., 1983; Cunningham & Ashley, 2002; Hardy, Woodman, & Carrington, 2004; Hassmén, Koivula, & Hansson, 1998; Hassmén, Raglin, & Lundqvist, 2004; Jones, Swain, & Hardy, 1993; Krane & Williams, 1987; Krane, Williams, & Feltz, 1992; McAuley, 1985; McKay, Selig, Carlson, & Morris, 1997). Results concerning this line of research are rather inconsistent. In a majority of studies, the relationships among the subscales of the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Vealey, Bump, & Smith, 1990) – namely cognitive anxiety, somatic anxiety and self-confidence – and golf performance were examined.

Cross-sectional and nomothetic research designs often revealed non-significant findings (e.g., Hassmén et al., 1998; McAuley, 1985; McKay et al., 1997). For example, McAuley (1985) used the CSAI-2 to examine the reciprocal effects between pre-competitive state anxiety and self-confidence on the one hand, and golf performance on the other hand, among collegiate golfers. The results showed that pre-competitive measures did not predict golf performance but that golf performance was a significant predictor of post-round cognitive state anxiety and self-confidence. Similar results were found with elite golfers (Hassmén et al., 1998; McKay et al., 1997). In a study of eight male golfers of the Swedish National Team, Hassmén et al. (1998) did not find a consistent relationship between pre-competitive mood states and performance. McKay et al. (1997) examined self-reported state anxiety measured by the CSAI-2 and physiological responses in 15 male professional golfers prior to, during and on completion of a tournament and practice round. If an increase in the anxiety variables and a lower self-confidence during competition compared to practice were observed, there was no significant correlation between psychophysiological variables and golf performance.

The results are a little bit more consistent in studies where experimental (e.g., Chamberlain & Hale, 2007; Hardy et al., 2004) and/or idiographic approaches (Hassmén et al., 2004) were used. For example, among a sample of eight male golfers of the Swedish National Team, Hassmén et al. (2004) showed that variability in somatic anxiety was significantly related to variability in golf performance. Using an experimental design and within-subjects comparisons with a sample of 12 experienced male golfers, Chamberlain and Hale (2007) brought partial support for the predictions of the Multidimensional Anxiety Hypotheses (MAH; Martens et al., 1990). More precisely, a negative linear relationship, a curvilinear relationship and a positive linear relationship were found respectively between cognitive anxiety, somatic anxiety and self-confidence on the one hand, and performance on the other hand. They also confirmed the impact of the directional aspect of competitive state anxiety - facilitative vs. debilitative - on performance.

Finally, testing the "catastrophe model" of anxiety and performance (see Hardy, 1996), few works (e.g., Hardy et al., 2004) proposed that cognitive anxiety, physiological arousal and self-confidence affect performance in an interactive fashion. In their study, Hardy et al. (2004) investigated eight male golfers participating in a golf tournament who reported their cognitive anxiety, somatic anxiety, and self-confidence prior to their tee shot on each hole. The results showed a complex relationship between these three variables. In a low self-confidence condition, cognitive anxiety was positively related to performance when somatic anxiety was low but negatively related to performance when somatic anxiety was high. By contrast, under condition of high self-confidence, cognitive anxiety was more positively related to performance when somatic anxiety was high than when it was low. The conclusion of such research is that cognitive anxiety is not as detrimental for performance as hypothesized in MAH. It could have a beneficial effect upon performance when competitors

have low levels of physiological arousal and interpret their anxiety symptoms as being beneficial to performance.

Another line of research concerned the coping and performance strategies likely to moderate the effect of anxiety on performance and/or to reinforce self-confidence. Certain studies have investigated imagery direction and its subsequent effects on golf putting performance (Beilock, Afremow, Rabe, & Carr, 2001; Ramsey et al., 2008; Short et al., 2002; Wegner, Ansfield, & Pillof, 1998). They generally demonstrated improved performance following positive imagery such as seeing the path of the ball until the hole (Ramsey et al., 2008; Short et al., 2002), and impaired performance following negative imagery such as missing the putt (Short et al., 2002) or through suppressive imagery, such as do not image hitting the ball "pass the target" (Beilock et al., 2001; Wegner et al., 1998) or do not image an obstacle (a bunker) to avoid (Ramsey et al., 2008). In the same vein, one study (Smith & Holmes, 2004) examined the effect of various imagery modalities (i.e., self-modeling via video intervention, audio intervention, written-script intervention) on golf putting performance. It appeared that the video and audio groups performed significantly better than the written script and control groups.

Others studies were carried out especially to examine the role played by coping strategies (e.g., Gaudreau, Lapierre, & Blondin, 2001; Nicholls, Holt, & Polman, 2005; Nicholls, Holt, Polman, & James, 2005). Nicholls's studies were qualitative and implicated adolescent elite golfers. The existence of efficient (e.g., positive self-talk, breathing exercise, following a routine) and inefficient (e.g., negative thoughts, trying too hard, speeding up) coping strategies was emphasized. Gaudreau et al. (2001) demonstrated that the coping strategies used differ throughout the pre-competitive, competitive and post-competitive phases of a golf competition. However, this piece of research does not concern the possible effect of coping strategies on golf performance.

Finally, integrative studies used one or two of the above factors in a context of a golf performance (Beauchamp P., et al., 1996; Beauchamp M., et al., 2002; Catley & Duda, 1997; Cumming, Hall, Harwood, & Gammage, 2002; Gaudreau & Blondin, 2004a, 2004b; Gaudreau et al., 2002; Thill & Cury, 2000). Two studies can be distinguished because of their use of an experimental design (Beauchamp et al., 1996; Thill & Cury, 2000). Beauchamp et al. (1996) examined the effect of a 14-week golf-teaching program on the motivation, preparation, and putting performance of novice golfers. Three groups were compared: participants in the first group followed a cognitive behavioral program, those in the second group used a physical skill-training program and the third group was a control group. The results indicated that the cognitive-behavioral group presented higher levels of intrinsic motivation, a more consistent use of pre-putt routines and better putting performance as compared to the 2 other groups. Thill and Cury (2000) used a similar design with recreational golfers and found that a motivational context of one-on-one competition leads to anxiety and distraction, whereas a task-involving context excludes intrusive thoughts and is negatively related with self-handicapping. Using a correlational design with a sample of recreational golfers, Catley and Duda (1997) studied the psychological antecedents of flow and found that pre-round measure readiness variables (calm, positive focus, confident readiness and pessimism) as well as golf skill level were significantly related to the frequency and intensity of flow.

The rest of this set of studies has focused mainly on the role and the importance of coping strategies in golf performance and emotional reactions (Beauchamp et al., 2002; Gaudreau et al., 2002; Gaudreau & Blondin, 2004a, 2004b). Studies conducted by Gaudreau and his colleagues investigated the mediating role of coping strategies between (1) emotional reactions and performance (Gaudreau et al., 2002) and (2) pessimism/optimism and emotional reactions (Gaudreau & Blondin, 2004b). These studies conducted with male amateur golfers

confirm the great importance of coping strategies for emotional adjustment and performance in golf. For example, using a sample of regional male golfers, Gaudreau et al. (2002) investigated the mediating role of coping in the relationship between Performance Goal Discrepancy (PGD) and affect. Multivariate path analyses revealed that active coping and behavioral disengagement mediated the relationship between PGD and positive affect during competition, whereas only behavioral disengagement mediated the relation between PGD and negative affect, during the competition.

Psychological Profiles of Elite Athletes

As indicated above, only a few studies carried out in golf concerned "elite" participants and this statement is also true for other sports. Only a limited amount of articles report empirical data on psychological profiles of elite athletes. Most of them stress the importance of psychological skills (or performance strategies) used by high performers (Vealey, 2007). Early research in this domain aimed at discriminating successful and less successful athletes in gymnastics (Mahoney & Avener, 1977), racquetball (Meyers, Cooke, Cullen, & Liles, 1979) and wrestling (Gould, Weiss, & Weinberg, 1981; Highlen & Bennett, 1979). Overall, this set of studies revealed that the best athletes involved in these investigations (a) presented higher levels of self-confidence (Gould et al., 1981; Highlen & Bennett, 1979; Meyers et al., 1979), (b) were closer to achieving their maximum potential (Gould et al., 1981; Highlen & Bennett, 1979), (c) focused less their attention on negative thoughts before competition (Highlen & Bennett, 1979; Meyers et al., 1979) and (d) used more self-talk (Mahoney & Avener, 1977; Meyers et al., 1979).

More recent qualitative and quantitative researches confirmed and supplemented the elites' athletes profile showing that Olympic/ World championship competitors were characterized among others by: imagery skills (Orlick & Partington, 1988), pre-competition and competition game plans (Orlick & Partington, 1988), strong self-beliefs (Mallett &

Hanrahan, 2004; Marsh & Perry, 2005), high personal drive, with high ego and high task orientation as well as high intrinsic and extrinsic motivation (Mallett & Hanrahan, 2004), abilities to focus and to block distracters (Gould, Dieffenbach, & Moffett, 2002; Orlick & Partington, 1988), to set goals (Gould et al., 2002; Orlick & Partington, 1988) and to cope with and control anxiety (Gould et al., 2002). Results regarding anxiety are not congruent in that some studies reported lower levels for the best achievers (Gould et al., 2002; Highlen & Bennett, 1979; Meyers et al., 1979) whereas other found no differences (Gould et al., 1981).

The Present Study

At this point several comments can be made: although the amount of studies concerning recreational or amateur golfers is significant, only few studies included a sample of professional golfers (e.g., Davidson & Templin, 1986; Hassmén et al., 1998, 2004; McKay et al., 1997). This is unfortunate because psychological training for peak performance interests high-level competitors. Hence research is needed on that population. Several sets of factors have been distinguished in the literature reviewed above: motivational factors, emotional factors and coping strategies. However, even the integrative studies fail to combine these three categories of factors to better understand psychological functioning and to predict golf performance.

Based on the literature reviewed above, this study has three purposes: (1) to provide descriptive data on a population poorly explored: professional golfers; (2) to study differences between players who competed for the whole tournament and players who were excluded after two days of competition; and (3) to investigate possible psychological predictors of golf performance. We conducted a study on 41 male professional golfers. Based on previous studies, several motivational variables (achievement goals, perceived competence), emotional reactions (pre-competitive state anxiety) and coping strategies (relaxation, imagery, emotional control, attentional control, negative thoughts and self-talk) were assessed the day before an

important competition. The relationships of these variables with two performance indicators (cut success, final ranking) were subsequently examined.

The following specific hypotheses were made. With regard to the motivational factors, we expected that the best golfers would present higher mastery-approach and performance-approach goal (e.g., Mallett & Hanrahan, 2004), higher perceived competence (e.g., Marsh & Perry, 2005) and would present higher use of coping strategies, in particular attentional control, self-talk and imagery (e.g., Gould et al., 2002; Mahoney & Avener, 1977). Eventually we anticipated that the best golfers would display lower somatic and cognitive anxiety and higher self-confidence.

Method

Participants

Forty-one male professional golfers (M_{age} = 28.8, ± 5.75) volunteered for this study. These players had been professionals for 3.68 years (± 3.42) and practiced 30.9 hours (± 14.1) a week.

Procedure

This study was part of a larger project in collaboration with the French Golf Federation. As the goal of the study was the examination of several psychological factors of golf performance and their consequences for professional golfers, we chose to focus on an important event: the Open of Bordeaux, which is the first stage of the French professional tour. This competition opened the season 2004 and lasted 4 days (i.e., 72 holes stroke play, 18 holes a day, cut after the second round). As it is the case for professional tournaments, the cut after two days of competition, which is a selection procedure, enabled the first 50 placed competitors to stay in the tournament, excluding the rest of them. In the present study we labeled “successful golfers” the players who made the cut and hence competed for the entire

competition whereas the adjective "unsuccessful" was used for players eliminated after two days of competition.

All the golfers were informed prior to the competition that they would be presented with a questionnaire on their attitudes during competition. Players were contacted the day prior the competition to fill out the questionnaire. They were informed that the questionnaire was not anonymous so that the data concerning their subsequent performance could be collected and that this information would only be accessible to the researchers of the study and treated consistently within the ethical guidelines of the university of the second author.

Measures

Achievement goals. A French version of the Achievement Goals Questionnaire for Sport (Conroy, Elliot, & Hofer, 2003), the "Approach and Avoidance Questionnaire in Sport and Physical Education" (QAE-EPS; Schiano-Lomoriello, Cury, & Da Fonseca, 2005) was used to assess situational achievement goals. Grounded on the 2×2 achievement goal framework (Elliot & McGregor, 2001), the scale consists of 12 items divided into 4 sub-scales: 3 items assessed mastery-approach goal (e.g., "It is important to me to perform as well as I possibly can"), mastery-avoidance goal (e.g., "I worry that I may not perform as well as I possibly can"), performance-approach goal (e.g., "It is important to me to do well compared to others"), performance-avoidance goal (e.g., "I just want to avoid performing worse than others"). Responses were indicated on a 7-point Likert-type scale ranging from (1) "not at all like me" to (7) "completely like me". Construct validity and reliability of this scale were supported in previous research using French (Schiano-Lomoriello et al., 2005) or English (Adie, Duda, & Ntoumanis, 2008; Conroy et al., 2003) samples.

Perceived competence. To assess perceived golfing ability, a questionnaire similar to the one developed by Nicholls and colleagues (Duda & Nicholls, 1992; Nicholls, Patashnick, & Nolen, 1985) was used. Due to the length of the questionnaire, only two items of the scale

were used in this study. ("When you are golfing and you compare yourself to most of the other golfers, you consider yourself..."; "I feel that my level in golf is…"). Responses were indicated on an 8-point scale ranging from (1) "very bad" to (8) "very good". This scale has already been used with French samples and has demonstrated good construct validity, internal consistency and predictive validity (Sarrazin, Roberts, Cury, Biddle, & Famose, 2002; Trouilloud, Sarrazin, Martinek, & Guillet, 2002). The correlation between the two items was high ($r = .68$, $p < .001$), and the answers of the participants to these two items were averaged.

Performance strategies. The French version carried out by Debois, Quillet, Sylvestre, and Calmels (2004) of the Test of Performance Strategies (Thomas, Murphy, & Hardy, 1999) was used. This 64-item questionnaire assesses 16 psychological skills and strategies used either in competition or during practice. In this study we retained only 6 dimensions of the competition setting[1]. This selection was made in line with previous studies, which also chose to focus on the most commonly cited psychological strategies (Fletcher & Hanton, 2001; Harwood et al., 2004). Three items per variable were used to assess relaxation (e.g., "I am able to relax if I get too nervous at competition"), imagery (e.g., "I visualize successful past performances"), emotional control (e.g., "In competition my emotions prevent me from playing my best", inversed form), attentional control (e.g., "In competition, I am able to control my negative thoughts"), negative thoughts (e.g., "In competition, I have negative thoughts") and self-talk (e.g., "I talk positively to myself to get the most out of competition") strategies. Responses were indicated on a 7-point Likert-type scale ranging from (1) "never" to (7) "always". This scale has been consistently used in the past and has demonstrated good psychometric properties (Debois et al., 2004; Fletcher & Hanton, 2001; Harwood et al., 2004). Thomas et al. (1999) reported Cronbach alpha coefficients ranging from .73 (attentional control) to .80 (self-talk) for the six dimensions used in the present study.

Emotional reactions. The French version (Debois & Fleurance, 1998) of the "Competitive State Anxiety Inventory-2" (CSAI-2, Martens et al., 1990) was used. This 27-item scale is a self-report instrument designed to measure cognitive (9 items) and somatic (9 items) states of anxiety, as well as self-confidence (9 items). In this study 10 items were selected to assess the three dimensions: 3 items for cognitive state anxiety (e.g., "I am concerned about performing poorly"), 4 items for somatic state anxiety (e.g., ''I feel tense in my stomach'') and 3 items for state self-confidence (e.g., "I am confident about performing well"). This scale has been used with French samples and has demonstrated good construct validity, internal consistency and predictive validity (e.g., Filaire, Alix, Ferrand, & Verger, *in press*; Filaire, Alix, Rouveix, & Le Scanff, 2007).

Performance. The player's success/failure at the cut procedure served as the first performance indicator. His ranking at the end of the tournament was used as a second indication of his performance.

Data Analysis

Descriptive statistics were first performed. Analysis of variance was then used to investigate the differences between players who made the cut and players who did not. Since there is no necessary relationship between the results of univariate and multivariate tests of the same hypothesis (Finn, 1974) and since univariate F tests alone do not reflect the discriminating power that the variables may share, a discriminant analysis was also used as a means to see which variable(s) could discriminate the same two groups. Eventually, multiple regression analysis was used to predict players' ranking at the end of the tournament.

Result

Descriptive Statistics

Means, standard deviations and Cronbach alphas of all the variables assessed in this study are presented in Table 1. Alpha coefficients were in general satisfying, ranging from .59

to .95. Only mastery-approach goal presented a Cronbach coefficient of .32 and was therefore excluded from subsequent analysis. The correlation matrix between the studied variables is displayed in Table 2.

Cut Effect

To investigate possible differences between players who passed the cut selection and players who were excluded after two days of competition, we carried out a MANOVA on the variables of the study, with the cut passed or not as the independent variable. The main effect was significant: Wilks $\lambda = .45$, $F(13, 27) = 2.54$, $p < .05$. Follow-up univariate analyses revealed significant differences (see Table 1) for performance-approach goal [$F(1, 39) = 4.42$, $p = .04$, $\eta^2 = .10$], cognitive anxiety [$F(1, 39) = 5.57$, $p = .02$, $\eta^2 = .13$], somatic anxiety [$F(1, 39) = 6.90$, $p = .012$, $\eta^2 = .15$], emotional control [$F(1, 39) = 4.48$, $p = .04$, $\eta^2 = .10$], and attentional control [$F(1, 39) = 5.26$, $p = .03$, $\eta^2 = .12$]. According to Cohen's (1988) guidelines for interpreting an eta square value (η^2), .01 indicates a small effect, .09 indicates a medium effect and .25 indicates a large effect. Hence the effects reported in this analysis can be considered as medium.

Discriminant Analysis

In order to discriminate between players who made the cut and players who failed to, we used discriminant analysis (DA). Due to the high number of variables with regard to the number of subjects we used a similar procedure to the one used by Highlen and Bennett (1979). First, an overall DA using all 13 variables was conducted to obtain each subject's discriminant score. These scores were then correlated with each subjects' raw scores on each of the 13 variables. The choice of the variables to enter into the subsequent DA was determined by rank-order magnitude of these correlations. To meet the recommended 5:1 subject to variable ratio (Cooley & Lohnes, 1971), only the top 8 variables were considered. This resulted in the introduction of the following variables: somatic and cognitive anxiety,

attentional and emotional control, performance-approach goal, relaxation strategies, performance-avoidance goal and self-talk.

DA showed that the two groups could be distinguished significantly: Wilks $\lambda = .55$, $\chi^2(8) = 21.15$, $p < .01$. The discriminant function had an eigenvalue of .83 and a canonical correlation of .67. Overall, 80.5% of the total sample could be correctly classified, which is superior to a random assignment based on prior group membership probabilities (50%; Tabachnick & Fidell, 1996). Since in DA, loadings > |0.30| are considered to be substantial, the discriminant function represents six variables that substantially contribute to differentiating the two groups. Players who made the cut are characterized by higher performance-approach goal, somatic and cognitive anxiety, relaxation strategies and emotional control strategies. They also tended to have lower performance-avoidance goal (see Table 3).

Predicting Performance

Regression analysis was used to test whether variables that discriminated players who made from players who failed the cut could predict their ranking. The six variables that were significant in the DA were regressed on performance. The regression was significant[2]: $F(6, 34) = 8.28$, $p < .001$, $R^2 = .59$ (see Table 4). Cognitive anxiety ($\beta = -.57$, $p < .001$) and emotional control strategies ($\beta = -.44$, $p < .05$) significantly predicted performance, relaxation strategies ($\beta = -.28$, $p = .07$) had a marginal significant effect. The higher the scores on those variables, the better was the performance.

Discussion

The goal of this study was to provide information on an under-explored population: professional golfers. Players completed a questionnaire the day before the beginning of an official competition of the French professional tour. Performance indicators (i.e., cut

success/failure, ranking) were then collected at the end of the competition. These variables were subsequently used to see which types of psychological characteristics were related to performance. An examination of the cut result on the variables assessed was first conducted. Discriminant function analysis was then used to examine which variables contributed the most to differentiate players who made the cut from those who failed to. Lastly, a regression analysis was used to predict players' ranking.

Investigating the cut effect revealed significant differences between players who competed for the whole tournament and players excluded after two days of competition. Most successful players presented higher scores on performance-approach goal, cognitive and somatic anxiety, emotional control and attentional control. The results of the discriminant function analysis revealed that six variables significantly discriminated successful from unsuccessful players. Successful players were characterized by higher scores on performance-approach goal, cognitive and somatic anxiety, relaxation strategies and emotional control strategies and lower score on performance-avoidance goal. Lastly, regression analysis highlighted three predictors of performance among the six variables identified in the discriminant function analysis. The more athletes presented high levels of cognitive anxiety, frequent use of relaxation strategies and strategies of emotional control, the better their performance was. This regression accounted for 59% of the variance of players' ranking.

With regard to motivational characteristics, the finding that the best performing players have higher performance-approach goal is consistent with our hypothesis, as well as with the achievement goal literature which posits that high level athletes present high scores on the performance-approach goal (e.g., Mallett & Hanrahan, 2004; Pensgaard & Roberts, 2000). Hence, trying to demonstrate his/her competence to others seems to constitute a powerful source of motivation for elite athletes. The results also show that the players excluded after two days of competition tended to have higher performance-avoidance goal.

An excessive focus on avoiding the demonstration of normative incompetence seems to be inimical for performance, a result conform to achievement goal literature (e.g., Elliot & McGregor, 2001) and a past study (Elliot, Cury, Fryer, & Huguet, 2006).

Conversely, the results concerning perceived competence are rather unexpected. This variable neither varied in relation to the cut success/failure nor discriminated those two groups. This is surprising because perceived competence is likely to affect the type of goal pursued by athletes, with high perceived competence related to performance-approach goal whereas low levels of perceived competence are more associated with avoidance performance goal (Cury & Da Fonséca, 2001). It might be that our sample was quite homogenous since all the participants were professionals, and the instrument used was not appropriated to this population. Specific tools for elite athletes such as the one used by Marsh and Perry (2005) should be used in future studies. Moreover, Mallet and Hanrahan (2004) also stressed the mediator role of perceived competence in the motivational process, in understanding the type of motivation that energizes elite athletes. In our study, performance-approach and performance-avoidance goals significantly appeared although perceived competence did not. Hence it might be that performance goals vary in this study depending on other processes or variables.

Our results regarding anxiety do not support our hypothesis and are inconsistent with the golf literature since those studies generally failed to find a link between pre-competitive anxiety and performance (Hassmen et al., 2004; McAuley, 1985; McKay et al., 1997). They are also rather inconsistent with studies on elite athletes' characteristics that either found no specific differences regarding anxiety between successful and less successful athletes (Gould et al., 1981) or indicated lower levels of anxiety for the best athletes (Highlen & Bennett, 1979; Meyers et al., 1979). In the present study, players who made the cut were cognitively and somatically more anxious before the beginning of the competition. This result contradicts

the MAH that propose an increase in cognitive anxiety is always deleterious for performance (e.g., Martens et al., 1990). They nevertheless support findings by Jokela and Hanin (1999; Individual Zone of Optimal Functioning hypothesis), by Hardy (1996; Hardy et al., 2004; Catastrophe Theory) and by Hanton and Jones (1999), who found that increases in cognitive anxiety did not necessarily lead to impaired performance. They are also in agreement with qualitative studies showing that among elite swimmers higher levels of anxiety could be related to higher performance if they interpreted the intensity of their anxiety symptoms as facilitative (e.g., Hanton & Jones, 1999). One has to note that the mean scores of cognitive and somatic anxiety were not very high in our study, since the maximum value approximated 4 with a scale ranging from 1 to 7 (see Table 1). The intensity of the most performing players is therefore only "moderate". Perhaps very good golfers do not want to feel too relaxed prior to performance and want to feel moderately worried, and interpret these symptoms as facilitative. Future studies should consider this eventuality by assessing both intensity and direction of anxiety.

The results regarding self-confidence do not support our hypothesis and are not consistent with the existing literature (e.g., Gould et al., 1981; Highlen & Bennett, 1979; Meyers et al., 1979). Nevertheless, the correlation (r = -.27, p = .09) between self-confidence and performance (i.e., players' ranking) is consistent with the literature although it does not reach significance. The size of our somewhat limited sample may explain why the correlation does not reach significance. Moreover, it might be that self-confidence does not discriminate successful and unsuccessful players because it is correlated with more proximal variables of performance (e.g., relaxation, emotional control, see Table 2) that are more powerful in this function.

Players who completed the cut selection also reported higher use of certain performance strategies. In particular, the best achievers in this competition used more

relaxation strategies, attentional control and emotional control which is consistent with our hypothesis. This result is of great interest and seems to indicate that even elite golfers are discriminated by the use of those strategies that could reflect better competencies to manage emotions and anxiety. Consistent results were found by Hanton and Jones (1999) with elite swimmers. Using in-depth interviews these authors demonstrated that elite swimmers used relaxation strategies (either physical or mental) as well as other forms of mental skills (i.e., internal focusing, thought and feeling control) that could be related to emotional control and relaxation strategies. Although the terms are labeled differently, Gould et al. (2002) in their study of Olympic champions also reported an ability to cope and control anxiety. The notion of "handling with distractors" proposed by Orlick and Partington (1988) also supports the competence of emotional and attentional control. In summary, although the terms are often different, previous studies on elite athletes support the findings of this study in relation to relaxation, attentional control and emotional control strategies.

Imagery, self-talk, and negative thoughts neither were found to discriminate successful and unsuccessful players nor predicted performance. For negative thoughts this may be due to the selection procedure in the discriminant analysis because its correlation with performance (see Table 2) is consistent with our prediction and indicates that less presence of negative thoughts is associated with better performance. This is in line with previous studies (Gould et al., 2002; Nicholls et al., 2005, Nicholls, Holt, & Polman, 2005). For imagery strategies and self-talk, the results do not support previous findings (e.g., Mahoney & Avener, 1977; Meyers et al., 1979). As proposed above, this might be due to shared variance with other strategies more correlated with performance: once the effects of these strategies are controlled, the influence of imagery and self-talk cannot explain more variance. However, the relatively high score of the players (respectively 5.14 and 5.25 for imagery and self-talk on a scale ranging

from 1 to 7) indicate a rather frequent use of these strategies consistently with other studies on elite athletes (e.g., Orlick & Partington, 1988).

Due to the design of the study, some limitations have to be mentioned. The goal of the study was to focus on a population that is difficult to explore: professional golf players. Although we managed to access this under-explored population, the sample size is somewhat limited, from a statistical point of view, and therefore the results must be interpreted cautiously. Secondly, we used a cross-sectional design that did not enable us to shed light on the consequences of goal performance. A field study using a longitudinal design should be used in the future. Another limitation concerns the absence of a variable in this study: mastery-approach goal. Although it was assessed, the low internal consistency observed resulted in its exclusion from subsequent analysis. This was unfortunate because some studies (Mallett & Hanrahan, 2004) propose that elite athletes are motivated both by performance-approach and mastery-approach goals, a result we were unable to replicate. Similarly, it was decided not to use all the dimensions assessed by the Test of Performance Strategies, to keep the length of the questionnaire reasonable. Hence, dimensions such as goal setting, automaticity or practice strategies were not assessed. Lastly, some dimensions presented low internal consistencies and therefore some results have to be interpreted cautiously.

In conclusion, this study has demonstrated that among professional golfers, the best achievers can be discriminated from lower achievers on the basis of their psychological characteristics. Our results indicate that most successful athletes were more cognitively and somatically anxious, used more frequently relaxation strategies, attentional control and emotional control and pursued more performance-approach goal and less performance-avoidance goal. It was also found that 59% of the variance of players' ranking could be explained by some of these psychological factors. It appears that anxiety could be beneficial for performance to the extent that players possess the competencies to manage the affects

1 related to this anxiety. In terms of application, this result contributes to the identification of
2 the most efficient mental skills.

Footnotes

1. The attentional control dimension actually comes from the practice part of the TOPS. It was decided to include this variable since certain specificities of golf, and especially the length of the game, clearly demands a rigorous management of attention, in practice but also during competition. This is why this concept was added and adapted to the initial dimensions of the questionnaire coming from the competition context.

2. As suggested by Craft et al. (2003) we added somatic anxiety to our regression analysis as a quadratic term in order to test the non-linear hypothesis proposed by the multidimensional anxiety theory. The somatic anxiety quadratic term influence was not significant and did not modify the remaining results which were therefore presented without this variable. To test for the robustness of the results obtained in this analysis, we re-run the regression after dropping out the insignificant predictors. The regression was significant F (3, 37) =16.46, p < .001, R^2= .57 as were the effects of the predictors: cognitive anxiety (β = -.60, p <.001), relaxation strategies (β = -.31, p <.05) and emotional control strategies (β = -.52, p <.001).

References

Adie, J. W., Duda, J. L., & Ntoumanis, N. (2008). Achievement goals, competition appraisals, and the psychological and emotional welfare of sport participants. *Journal of Sport and Exercise Psychology, 30*, 302-322.

Beauchamp, M. R., Bray, S. R., & Albinson, J. G. (2002). Pre-competition imagery, self-efficacy and performance in collegiate golfers. *Journal of Sports Sciences, 20*, 697-705.

Beauchamp, P. H., Halliwell, W. R., Fournier, J. F., & Koestner, R. (1996). Effects of cognitive-behavioral psychological skills training on the motivation, preparation, and putting performance of novice golfers. *Sport Psychologist, 10*, 157-170.

Beilock, S. L., Afremow, J. A., Rabe, A. L., & Carr, T. H. (2001). "Don't miss!" The debilitating effects of suppressive imagery on golf putting performance. *Journal of Sport and Exercise Psychology, 23*, 200-221.

Catley, D., & Duda, J. L. (1997). Psychological antecedents of the frequency and intensity of flow in golfers. *International Journal of Sport Psychology, 28*, 309-322.

Chamberlain, S. T., & Hale, B. D. (2007). Competitive state anxiety and self-confidence: Intensity and direction as relative predictors of performance on a golf putting task. *Anxiety, Stress and Coping: An International Journal, 20*, 197-207.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.

Conroy, D. E., Elliot, A. J., & Hofer, S. M. (2003). A 2 x 2 Achievement Goals Questionnaire for Sport: Evidence for factorial invariance, temporal stability, and external validity. *Journal of Sport & Exercise Psychology, 25*, 456-476.

Cook, D., Gansneder, B., Rotella, R., Malone, C., Bunker, L., & Owens, D. (1983). Relationship among competition state anxiety, ability, and golf performance. *Journal of Sport Psychology, 5*, 460-465.

Cooley, W. W., & Lohnes, P. R. (1971). *Multivariate data analysis*. New York, NY: Wiley.

Craft, L. L., Magyar, T., Becker, B. J., & Feltz, D. L. (2003). The relationship between the Competitive State Anxiety Inventory-2 and sport performance: A meta-analysis. *Journal of Sport & Exercise Psychology, 25*, 44-65.

Cumming, J., Hall, C., Harwood, C., & Gammage, K. (2002). Motivational orientations and imagery use: A goal profiling analysis. *Journal of Sports Sciences, 20*, 127-136.

Cunningham, G. B., & Ashley, F. B. (2002). Debilitative and facilitative perceptions of trait anxiety among students in a college golf class. *Perceptual and Motor Skills, 94*, 739-742.

Cury, F., & Da Fonséca, D. (2001). Approche / évitement et théorie des buts d'accomplissement : Données empiriques et avancées conceptuelles [Approach / avoidance and achievement aoal aheory : Empirical data and conceptual advances]. In F. Cury & P. Sarrazin (Eds.), *Théories de la motivation et pratiques sportives: État des recherches*. [Theories of Motivation in Sport and Exercise : The State of Research] Paris: Presse Universitaire de France.

Davidson, J. D., & Templin, T. J. (1986). Determinants of success among professional golfers. *Research Quarterly for Exercise and Sport, 57*, 60-67.

Debois, N., & Fleurance, P. (1998). *Validation du CSAI-2 sous forme rétrospective: questions sur la méthode.* [Retrospective validation of the CSAI-2: Questioning methodology] Paper presented at the Annual Meeting of the French Society of Sport Psychology, University of Poitiers.

Debois, N., Quillet, J., Sylvestre, A., & Calmels, C. (2004). *Contribution à la validation en langue française d'un outil de mesure des stratégies mentales : le "test des stratégies de performance".* [Contribution to the Validation of a French Tool Assessing Mental Strategies: the "Performance Strategy Test"] Paper presented at the Annual Meeting of the French Society of Sport Psychology, University Joseph Fourier: Grenoble.

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290-299.

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80*, 501-519.

Elliot, A.J., Cury, F., Fryer, J.W., & Huguet, P. (2006). Achievement goals, self-handicapping, and performance attainment: A mediational analysis. *Journal of Sport & Exercise Psychology, 28*, 344-361.

Filaire, E., Alix, D., Ferrand, C., & Verger, M. (in press). Psychophysiological stress in tennis players during the first single match of a tournament. *Psychoneuroendocrinology*.

Filaire, E., Alix, D., Rouveix, M., & Le Scanff, C. (2007). Motivation, stress, anxiety, and cortisol responses in elite paragliders. *Perceptual and Motor Skills, 104*, 1271-1281.

Finn, J. D. (1974). *A general model for multivariate analysis*. Toronto: Holt, Rinehart, & Winston.

Fletcher, D., & Hanton, S. (2001). The relationship between psychological skills usage and competitive anxiety responses. *Psychology of Sport and Exercise, 2*, 89-101.

Gaudreau, P., & Blondin, J.-P. (2004a). Different athletes cope differently during a sport competition: A cluster analysis of coping. *Personality and Individual Differences, 36*, 1865-1877.

Gaudreau, P., & Blondin, J.-P. (2004b). Differential associations of dispositional optimism and pessimism with coping, goal attainment, and emotional adjustment during sport competition. *International Journal of Stress Management, 11*, 245-269.

Gaudreau, P., Blondin, J. P., & Lapierre, A. M. (2002). Athletes' coping during a competition: Relationship of coping strategies with positive affect, negative affect, and performance-goal discrepancy. *Psychology of Sport and Exercise, 3*, 125-150.

Gaudreau, P., Lapierre, A. M., & Blondin, J. P. (2001). Coping at three phases of a competition: Comparison between pre-competitive, competitive, and post-competitive utilization of the same strategy. *International Journal of Sport Psychology, 32*, 369-385.

Gould, D., Dieffenbach, K., & Moffett, A. (2002). Psychological characteristics and their development in Olympic champions. *Journal of Applied Sport Psychology, 14*, 172-204.

Gould, D., Weiss, M. R., & Weinberg, R. S. (1981). Psychological characteristics of successful and nonsuccessful big ten wrestlers. *Journal of Sport Psychology, 3*, 69-81.

Hanton, S., & Jones, G. (1999). The acquisition and development of cognitive skills and strategies: I. Making the butterflies fly in formation. *The Sport Psychologist, 13*, 1-21.

Hardy, L. (1996). A test of catastrophe models of anxiety and sports performance against multidimensional anxiety theory models using the method of dynamic differences. *Anxiety, Stress and Coping: An International Journal, 9*, 69-86.

Hardy, L., Woodman, T., & Carrington, S. (2004). Is self-confidence a bias factor in higher-order catastrophe models? An exploratory analysis. *Journal of Sport and Exercise Psychology, 26*, 359-368.

Harwood, C., Cumming, J., & Fletcher, D. (2004). Motivational profiles and psychological skills use within elite youth sport. *Journal of Applied Sport Psychology, 16*, 318-332.

Hassmén, P., Koivula, N., & Hansson, T. (1998). Precompetitive mood states and performance of elite male golfers: Do trait characteristics make a difference? *Perceptual and Motor Skills, 86*, 1443-1457.

Hassmen, P., Raglin, J. S., & Lundqvist, C. (2004). Intra-individual variability in state anxiety and self-confidence in elite golfers. *Journal of Sport Behavior, 27*, 277-290.

Highlen, P. S., & Bennett, B. B. (1979). Psychological characteristics of successful and nonsuccessful elite wrestlers: An exploratory study. *Journal of Sport Psychology, 1*, 123-137.

Hudson, J., & Walker, N. C. (2002). Metamotivational state reversals during matchplay golf: An idiographic approach. *The Sport Psychologist, 16*, 200-217.

Jones, G., Swain, A., & Hardy, L. (1993). Intensity and direction dimensions of competitive state anxiety and relationships with performance. *Journal of Sport Sciences, 11*, 525-532.

Krane, V., & Williams, J. (1987). Performance and somatic anxiety, cognitive anxiety, and confidence changes prior to competition. *Journal of Sport Behavior, 10*, 47-56.

Krane, V., Williams, J., & Feltz, D. (1992). Path analysis examining relationships among cognitive anxiety, somatic anxiety, state confidence, performance expectations, and golf performance. *Journal of Sport Behavior, 15*, 279-295.

Mahoney, M. J., & Avener, M. (1977). Psychology of the elite athlete: An exploratory study. *Cognitive Therapy & Research, 1*, 135-141.

Mallett, C. J., & Hanrahan, S. J. (2004). Elite athletes: Why does the 'fire' burn so brightly? *Psychology of Sport and Exercise, 5*, 183-200.

Marsh, H. W., & Perry, C. (2005). Self-concept contributes to winning gold medals: Causal ordering of self-concept and elite swimming performance. *Journal of Sport and Exercise Psychology, 27*, 71-91.

Martens, R., Burton, D., Vealey, R. S., Bump, L., & Smith, D. (1990). The development of the Competitive State Anxiety Inventory-2 (CSAI-2). In R. Martens, R. S. Vealey & D. Burton (Eds.), *Competitive anxiety in sport* (pp. 117-190). Champaign, IL: Human Kinetics.

McAuley, E. (1985). State anxiety: Antecedent or result of sport performance. *Journal of Sport Behavior, 8*, 71-77.

McKay, J. M., Selig, S. E., Carlson, J. S., & Morris, T. (1997). Psychophysiological stress in elite golfers during practice and competition. *Australian Journal of Science and Medicine in Sport, 29*, 55-61.

Meyers, A. W., Cooke, C. J., Cullen, J., & Liles, L. (1979). Psychological aspects of athletic competitors: A replication across sports. *Cognitive Therapy and Research, 3*, 361-366.

Nicholls, A. R., Holt, N. L., & Polman, R. C. J. (2005). A phenomenological analysis of coping effectiveness in golf. *Sport Psychologist, 19*, 111-130.

Nicholls, A. R., Holt, N. L., Polman, R. C. J., & James, D. W. D. (2005). Stress and coping among international adolescent golfers. *Journal of Applied Sport Psychology, 17*, 333-340.

Nicholls, J. G., Patashnick, M., & Nolen, S. B. (1985). Adolescents' theories of education. *Journal of Educational Psychology, 77*, 683-692.

Orlick, T., & Partington, J. (1988). Mental links to excellence. *The sport psychologist, 2*, 105-130.

Pensgaard, A. M., & Roberts, G. C. (2000). The relationship between motivational climate, perceived ability and sources of distress among elite athletes. *Journal of Sport Sciences, 18*, 191-200.

Ramsey, R., Cumming, J., & Edwards, M. G. (2008). Exploring a modified conceptualization of imagery direction and golf putting performance. *International Journal of Sport and Exercise Psychology, 6*, 207-223.

Sarrazin, P., Roberts, G., Cury, F., Biddle, S., & Famose, J. P. (2002). Exerted effort and performance in climbing among boys: The influence of achievement goals, perceived ability, and task difficulty. *Research Quarterly for Exercise and Sport, 73*, 425-436.

Schiano-Lomoriello, S., Cury, F., & Da Fonseca, D. (2005). Development and validation of the Approach and Avoidance Questionaire for Sport and Physical Education setting (AAQSPE). *Revue Europeenne de Psychologie Appliquee/European Review of Applied Psychology, 55*, 85-98.

Short, S. E., Bruggeman, J. M., Engel, S. G., Marback, T. L., Wang, L. J., Willadsen, A., et al. (2002). The effect of imagery function and imagery direction on self-efficacy and performance on a golf-putting task. *Sport Psychologist, 16*, 48-67.

Smith, D., & Holmes, P. (2004). The effect of imagery modality on golf putting performance. *Journal of Sport and Exercise Psychology, 26*, 385-395.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using Multivariate Statistics*. HarperCollins Publishers.

Thill, E. E., & Cury, F. (2000). Learning to play golf under different goal conditions: Their effects on irrelevant thoughts and on subsequent control strategies. *European Journal of Social Psychology, 30*, 101-122.

Thomas, P. R., Murphy, S. M., & Hardy, L. (1999). Test of performance strategies: Development and preliminary validation of a comprehensive measure of athletes' psychological skills. *Journal of Sports Sciences, 17*, 697-711.

Trouilloud, D. O., Sarrazin, P. G., Martinek, T. J., & Guillet, E. (2002). The influence of teacher expectations on student achievement in physical education classes: Pygmalion revisited. *European Journal of Social Psychology, 32*, 591-607.

Vealey, R. S. (2007). Mental skills training in sport. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of Sport Psychology, Third Edition* (pp. 287-309). Hoboken, NJ: John Wiley & Sons.

Wegner, D. M., Ansfield, M., & Pilloff, D. (1998). The putt and the pendulum: Ironic effects of the mental control of action. *Psychological Science, 9*, 196-199.

1 Table 1: Means, Standard deviation and Cronbach Coefficient of the variables.
2

Variables	Mean (SD)		Range	α
	Cut succeeded (N = 17)	Cut failed (N = 24)		
Perceived competence	5.38 (0.45)	5.35 (0.71)	1-8	r = .68
Mastery-approach goal	5.51 (0.66)	5.60 (0.93)	1-7	.32
Mastery-avoidance goal	2.33 (1.74)	2.46 (1.43)	1-7	.91
Performance-avoidance goal	2.59 (1.51)	3.58 (1.99)	1-7	.82
Performance-approach goal	6.06 (1.43)	5.03 (1.62)	1-7	.88
Cognitive anxiety	3.71 (1.03)	2.83 (1.25)	1-7	.63
Somatic anxiety	4.06 (1.64)	2.81 (1.39)	1-7	.95
Self-confidence	4.94 (0.77)	4.76 (0.81)	1-7	.67
Relaxation strategies	5.14 (1.01)	4.54 (1.00)	1-7	.60
Imagery strategies	5.31 (1.13)	5.01 (0.89)	1-7	.59
Emotional control	4.73 (1.14)	3.96 (1.14)	1-7	.74
Attentional control	4.92 (1.17)	4.14 (1.00)	1-7	.74
Negative thoughts	3.2 (1.14)	3.64 (1.46)	1-7	.76
Self-talk	5.57 (0.95)	5.03 (1.34)	1-7	.80
Age	28.82 (3.70)	28.80 (6.93)	21-50	-
Performance	26.76 (17.74)	100.88 (28.34)	1-143	-

3

Table 2: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Perceived competence	-													
Mastery-av goal	.12	-												
Performance-av goal	.08	-.03	-											
Performance-ap goal	.10	-.28	.18	-										
Cognitive anxiety	-.15	.17	-.05	.05	-									
Somatic anxiety	-.15	.14	-.42**	.04	.52***	-								
Self-confidence	.24	-.05	-.10	.47**	-.04	.00	-							
Relaxation strategies	.37*	-.17	-.29	.14	-.36*	.00	.51***	-						
Imagery strategies	.27	-.45**	-.15	.40**	-.14	.12	.31*	.44**	-					
Emotional control	.22	-.43**	-.09	.50***	-.35*	-.18	.43**	.61***	.48**	-				
Attentional control	.40**	-.42**	-.30	.26	-.24	-.01	.28	.66***	.58***	.75***	-			
Negative thoughts	-.35*	.49**	-.04	-.43*	.37*	.29	-.47**	-.59***	-.56***	-.67***	-.61***	-		
Self-talk	.10	-.18	-.45**	.24	.15	.45	.27	.25	.42**	.06	.16	-.22	-	
Age	.02	-.10	-.10	-.13	.06	.03	-.02	.22	.14	-.08	.22	-.12	-.15	-
Performance	-.16	.17	.27	-.38*	-.31*	-.26	-.27	-.41**	-.25	-.50***	-.54***	.31*	-.23	-.03

Note: significant correlation are marked: * $p < .05$, ** $p < .01$, *** $p < .001$. Mastery-av goal: mastery-avoidance goal, Performance-av goal: performance-avoidance goal, Performance-ap goal: performance-approach goal

Table 3 : Standardized canonical coefficient of discriminant analysis between players who made and players who failed the cut.

	Standardized canonical coefficient
Performance-avoidance goal	.29
Performance-approach goal	-.36
Cognitive anxiety	-.81
Somatic anxiety	-.33
Relaxation strategies	-.43
Emotional control	-.41
Attentional control	-.12
Self-talk	.23
Eigenvalue	.83

Note : Wilks $\lambda = .55$, $\chi^2 (8) = 21.15$, $p < .01$.

Table 4: Multiple regression of player's ranking

	β	B	*p*
Performance-avoidance goal	.16	3.73	.25
Performance-approach goal	-.13	-3.47	.38
Cognitive anxiety	-.57	-20.36	.00
Somatic anxiety	.03	.83	.84
Relaxation strategies	-.28	-12.03	.07
Emotional control	-.44	-16.28	.02

Note: F (6, 34) = 8.28, $p < .001$, $R^2 = .59$.