

Persistence in a Putting Task During Perceived Failure: Influence of State-attributions and Attributional Style

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Dans cette étude, on a examiné l'influence de l'état des attributions et le style attributionnel (AS) sur la persistance à court-terme d'un échec perçu à une tâche de putting. 101 élèves débutants en golf ont participé à cette recherche. Deux épreuves de 8 putts ont été interrompues chacune pendant trois minutes. Durant cette période, on a mesuré la persistance individuelle en comptant le nombre de fois que le sujet essayait de putter. L'analyse des résultats montre que le style attributionnel influence la persistance à court-terme contrairement à l'état des attributions. Les sujets ayant un AS "fort contrôle personnel" font montre de plus de persistance que ceux ayant un AS "faible contrôle personnel". Ces résultats confirment ceux obtenus lors de recherches antérieures sur les bénéfices motivationnels d'un style attributionnel "optimiste" dans des situations d'échec lors de la réalisation d'une tâche. Des attributions instables sont particulièrement bénéfiques aux sujets ayant un AS externe/incontrôlable. Ces derniers ont un niveau significativement plus élevé de persistance que les sujets ayant un AS externe/incontrôlable mais qui ont fait des attributions causales stables.

This study investigated the influence of state-attributions and attributional style (AS) on short-term persistence in a putting task during perceived failure. Participants were 101 novice golf students. Two trials of eight putts each were interrupted by a 3-minute free period during which individual persistence was measured by calculating the number of putts attempted in the free period. Analyses revealed that attributional style influenced short-term putting persistence but state-attributions did not. Participants with a "high personal control" AS showed greater persistence than those with a "low personal control" AS, which supports past research on the positive motivational benefits of a more "optimistic" attributional style in task failure situations. Moreover, unstable attributions were particularly protective for individuals with an external/uncontrollable AS, in that they promoted significantly higher levels of persistence than was shown by external/uncontrollable AS individuals who made stable causal attributions.

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INTRODUCTION

Causal attributions are defined as the explanations that a person makes about events in order to better control and predict future similar events (Heider, 1958; Weiner, 1979). Weiner's (1985, 1992) attributional theory of motivation and emotion stresses that causal attributions (a) are influenced by outcomes (e.g. victory or defeat in sport) and (b) have an effect on future behaviors, because they affect the choice, intensity, and persistence of behaviors. However, according to Weiner (1985), the influence of causal attributions rests more in the dimensions underlying the causes than in the causes themselves. There are four empirically substantiated causal attributional dimensions: (a) locus of causality, (b) personal controllability, (c) external controllability, and (d) stability. The "locus of causality" relates to whether the cause is perceived to reside within or is external to the (target) person (internal vs. external). "Personal controllability" is an attributional dimension in which causes for events are perceived to be either within or beyond the person's control (controllable vs. uncontrollable). "External controllability" is an attributional dimension in which causes for events are perceived to be either within or beyond anyone's (other than the person's) control (controllable vs. uncontrollable). "Stability" is a dimension that relates to the perceived temporal duration of the cause (stable vs. unstable) (Biddle & Hanrahan, 1998; McAuley, Duncan, & Russell, 1992; Weiner, 1992).

In sporting contexts, many studies have examined the influence of the outcome on the causal attributions emitted by the athletes (e.g. Hassmén, Koivula, & Hansson, 1998; Leith & Prapavessis, 1989; McAuley, 1985; McAuley & Gross, 1983). A noted finding has been that both the objective outcome (e.g. victory/success vs. defeat/failure) and the subjective outcome (i.e. the actor's perception of the outcome) influence the causal attributions emitted by the athletes at the end of their performances (Kimiecik, Allison, & Duda, 1986). In particular, winners, either in individual sports (table tennis; McAuley & Gross, 1983; gymnastics; McAuley, 1985; golf; Hassmén et al., 1998; wrestling; De Michele, Gansneder, & Solomon, 1998) or in team sports (softball; White, 1993; football; Robinson & Howe, 1987), attribute their victories more often to internal and stable factors than do losers (Biddle & Jamieson, 1988; Grove, Hanrahan, & McInman, 1991; Mark, Nutrie, Brooks, & Harris, 1984; McAuley & Gross, 1983). Moreover, both winners and losers make more controllable attributions about winners than about losers (Biddle & Jamieson, 1988; Grove et al., 1991; Mark et al., 1984; McAuley, 1985; McAuley & Gross, 1983).

Nevertheless, it is not possible to conclude from these findings that those athletes who explain their performance with internal, controllable, and stable attributions are more competitive or efficient athletes than those who explain their performance with external, uncontrollable, and unstable attributions.

Thus, some research has focused on determining whether certain causal attributions are more favorable than others to the improvement and/or the increased use of various behavioral factors. In sport, it appears that the use of internal, controllable, and unstable attributions by individuals in failure situations results in an increase in the individuals' (a) expectancies of future success (Orbach, Singer, & Price, 1999), (b) persistence (Johnson & Biddle, 1989; Rudisill & Singer, 1988), and (c) actual performance (Orbach, Singer, & Murphey, 1997; Rudisill, 1989). Generally, the results of these studies support Weiner's model concerning the influence of causal attributions on achievement behavior, particularly in situations involving failure. Weiner (1985) specified that situations of failure engage attributional activities more than do situations of success, and that causal attributions about failure involve attempts by the individual to understand what occurred in order to better predict future events. Specifically, Weiner (1985, 1992) argued that failure situations are more likely than situations of success to engage the motivational mechanisms involved in attribution-emotion-behavior linkages.

A large number of empirical studies support Weiner's model. For example, in a study on motor skills, Johnson and Biddle (1989) demonstrated that the least persistent individuals were those who used attributions related to task difficulty and/or the lack of ability (external, uncontrollable, and stable). Conversely, those who used attributions related to a lack of effort (internal, controllable, and unstable) were most persistent. Further, in an experiment involving false failure feedback, Rudisill and Singer (1988) demonstrated that subjects who received feedback that involved controllable and unstable causes persisted more after failure in a stabilometer task than did subjects who received feedback that involved uncontrollable and stable causes or no attributional feedback.

Weiner's attributional theory (1985) deals primarily with "state-attributions", which are defined as the attributions individuals make about a specific situation at a specific point in time. Another attributional approach to understanding behavioral persistence, and motivational and emotional deficits in general, is the reformulation of learned helplessness theory (Abramson, Seligman, & Teasdale, 1978). Within this framework, the researchers proposed another "level" of analysis of causal attributions that they called "attributional style" (AS). AS is defined as a cognitive personality variable that reflects how people typically explain the causes of life events. AS is the tendency to make particular types of attributions across different situations and time (Peterson & Seligman, 1984). AS, conceptualised as a "cognitive trait" or "habit", is a key factor in examining the influence of causal attributions on behavior (Peterson, 1991; Peterson & Seligman, 1984). Indeed, and even if all the findings on attributional style are not in accordance (Bridges, 2001; Hale, 1993), AS has been shown to be a "risk factor" (Peterson & Seligman, 1984) for a number of consequences of helplessness, such as depression or

failure (Coyne & Gotlib, 1983; Sweeney, Anderson, & Bailey, 1986), loneliness or shyness (Anderson & Arnoult, 1985), as well as poor academic (Brewin & Shapiro, 1985), professional (Schulman, 1995), and school (Peterson & Barrett, 1987) performance.

In its original form, AS was defined as a general tendency to make consistent causal attributions across multiple contexts, as attested to by the questionnaire developed to measure it, the Attributional Style Questionnaire (ASQ; Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982; Seligman, Abramson, Semmel, & von Baeyer, 1979). However, although AS is still considered a cognitive trait concept, more recent research has shown that proper measurement of AS requires some domain-specificity, i.e. assessment using context-specific items (Cutrona, Russell, & Jones, 1985; Higgins, Zumbo, & Hay, 1999; Peterson, 2000; Peterson & Park, 1998). According to Peterson and Park (1998), there is no doubt that the same person can present a different AS depending on the explanatory context. For example, a person who often attributes his/her poor performance during sporting competitions to one kind of cause may repeatedly explain his/her bad scores in a school context with a completely different type of cause. In other words, the same individual may have different AS, one in relation to sporting contexts and the other in relation to school performance contexts.

AS effects have been studied extensively, and the majority of AS studies have focused on the relations between AS and behavioral, cognitive, and emotional variables in “pathological” populations (e.g. Brewin, Smith, Power, & Furnham, 1992; Fowler & Peterson, 1981). The interest in these populations comes from the origin of the AS construct within the reformulation of learned helplessness theory, in which the objective is to capture the behaviors of stressed and/or depressive individuals (Peterson & Seligman, 1984). By comparison, in sporting contexts, studies that examine the influence of AS on athletes’ behaviors are rare. For example, in one study, swimmers with an “optimistic” AS (i.e. attributing their failures to external, unstable, and specific causes and their successes to internal, stable, and global causes) had a smaller percentage of poor performances in one season than those with a “pessimistic” AS (i.e. attributing their failures to internal, stable, and global causes and their successes to external, unstable, and specific causes) (Seligman, Nolen-Hoeksema, Thornton, & Thornton, 1990). In other words, AS predicted the percentage of competitions in which expert swimmers had poor performance. Moreover, the performance of the most pessimistic swimmers (measured by a composite score for bad events) worsened more between two timed tests than did the performance of the optimistic swimmers (Seligman et al., 1990). In another sports study of AS, Martin-Krumm, Sarrazin, Peterson, and Famose (2003) examined the influence of AS (assessed in terms of optimism and pessimism using a global composite score) on individuals’ persistence in a basketball task involving perceived

failure. Persistence was assessed by calculating how much time each participant spent training himself during a 5-minute free-time period. However, the results did not reveal any effect of the “global” AS on persistence.

The central aim of the present study was to measure the respective influence of state-attributions and AS on persistence in a sporting context. In the clinical domain in which the AS concept appeared, there are behavioral anomalies associated with learned helplessness, which led researchers to consider the causal dimensions of “stability” and “globality” (Abramson et al., 1978). However, the choice of attributional dimensions to be evaluated depends on the key variables in the study in which the style is measured. That is, in any particular AS study, “the researcher must specify attributional dimensions of explanatory style in relationship to some purpose” (Peterson, 1991, p. 2). Thus, adding or withdrawing certain dimensions in the assessment of AS should improve rather than worsen the AS under study. Given the central aim of the present study, it was necessary to measure AS using three causal dimensions that were expected to influence persistence: “locus of causality”, “controllability”, and “stability”. Moreover, since the controllability dimension is so fundamental to understanding motivational deficits (Abramson et al., 1978; Weiner, 1985, 1992), it was particularly important to assess this causal dimension when measuring AS in the present study (Anderson, 2002; Anderson & Deuser 1991; Deuser & Anderson, 1995).

Lastly, many studies have measured people’s AS using a variety of positive and negative events. However, AS for positive events is often independent of AS for negative events (Hanrahan, Grove, & Hattie, 1989; Peterson, 1991; Sweeney et al., 1986). Because the focus of the present study was to examine behavioral persistence in a sporting context, AS specific only to negative events was measured as it is only under conditions of failure that motivational problems are likely to be experienced (Weiner, 1992). This strategy of evaluation is in agreement with recent advances in improving the predictive capacity of measurements of concepts such as AS, by increasing the specificity of the predictor with respect to the studied field and the focus of the research (Higgins et al., 1999; Peterson, 1991; Sweeney et al., 1986).

In summary, the purpose of the present study was to measure the respective influence of state-attributions and AS on a form of motivated behavior: short-term persistence after failure. An individual may explain in a recurring way his or her experiences of failure in one context (e.g. always using internal, controllable causes for poor academic performance), but may attribute a specific failure in a specific situation to a completely different type of cause (e.g. an external, uncontrollable cause for poor basketball performance). Thus, this study examines whether these two attributional “levels” (AS; state-attributions) independently influence short-term persistence after failure. Our failure method, measure of persistence, and expected findings were based on past evidence in the AS sports literature (Martin-Krumm et al.,

2003) and in the state-attributions literature (Johnson & Biddle, 1989; Rudisill & Singer, 1988). It was expected that at both attributional levels (AS and state-attributions), individuals who attribute their failures to internal, controllable, and temporary (unstable) causes would be more persistent than those who use external, uncontrollable, and stable causes to explain their failures.

METHOD

Participants

One hundred and ten students, 58 men ($M = 21.3$ years, $SD = 1.08$) and 52 women ($M = 21.1$ years, $SD = 1.10$), all registered in the 1st year in the University of Sport Sciences of Rennes 2, agreed to take part in the study.

Materials

Attributional Style. The Questionnaire d'Evaluation du Style Attributionnel en Sport (QESAS; Le Foll, 2004),¹ an adapted French version of the Sport Attributional Style Scale (SASS; Hanrahan et al., 1989), was used in the present study. The QESAS is a self-report measure of AS, comprising six hypothetical negative (i.e. failure) events that allow an individual to subjectively interpret the event and its possible cause. Participants are instructed to write the single most likely cause for each event, and then rate this cause along three 7-point scales representing the locus (L), personal control (PC), and stability (S) causal dimensions. Higher scores represent more internal, personally controllable, and stable attributions, whereas lower scores represent more external, personally uncontrollable, and unstable attributions. A fourth 7-point scale item for each event assesses the degree to which participants view the event as negative, with higher scores indicating

¹ The QESAS (Le Foll, 2004) was developed with a sample of 352 subjects (232 males, $M = 21.5$ years, $SD = 1.09$, and 120 females, $M = 21.4$ years, $SD = 1.06$), by respecting stages 1, 2, 3, and 5 of trans-cultural validation defined by Vallerand (1989). The QESAS includes hypothetical negative events, rather than negative and positive events, as past research on AS has demonstrated that one's style for explaining negative events is a better predictor of motivational deficits than is one's style for explaining positive events (e.g. Peterson & Seligman, 1984; Sweeney et al., 1986). In the QESAS, six negative events are used to define each participant's AS, which is higher than the number of events retained in the short version of the (English) SASS proposed by Hanrahan and Grove (1990). Finally, the original SASS contains five attributional dimensions, two of which (globality and intentionality) were not integrated into the QESAS. Thus, we advise caution regarding the use of the QESAS until the validity of the instrument has been further established. Forthcoming research will have to attest that this instrument is formulated in conformity with the theory on which it is based.

that the event is viewed more negatively and lower scores indicating that the event is viewed less negatively. The latter scale item is used only to check the degree to which participants perceive each hypothetical event as negative and is not used in scoring.

In an examination of the factorial validity of the QESAS, three factors (accounting for approximately 45% of the total variance) were reliably produced representing the locus, personal control, and stability causal dimensions, and reliability coefficients (coefficient alpha) were .66, .73, and .79 for the L, PC, and S scales, respectively (Le Foll, 2004). These reliabilities compare well to those reported for the English SASS; for example, Hanrahan et al. (1989) reported coefficient alpha reliabilities of .58, .67, and .74 for the SASS Locus, Personal Control, and Stability scales of the SASS, respectively.

In total, the QESAS generates 18 scores: three items (i.e. locus, personal control, stability) for each of the six hypothetical negative events. The locus, personal control, and stability items are separately summed (or averaged) across the negative events to create three negative event scores, one for each dimension. Moreover, based on previous research, it was expected that the locus and personal control dimensions may be correlated (Higgins & Morrison, 1998; McAuley et al., 1992). For example, causes that are external also are personally uncontrollable. Similarly, causes that are personally controllable are, by definition, also internal causes. Thus, where the locus and personal control causal dimensions are highly correlated, a composite score comprising the average of the two dimensions is possible.

State-attributions. The Echelle de Mesure des Attributions Causales (EMAC; Fontayne, Martin-Krumm, Buton, & Heuzé, 2003) was used in this study to evaluate state-attributions. The EMAC is the validated French version of the Causal Dimension Scale 2 (CDS 2; McAuley et al., 1992). For some particular event or task outcome, the EMAC asks the participant to write down what he or she thinks is a likely cause of his or her performance. After writing down a cause, a participant then rates the cause on 12 rating scales designed to measure four dimensions of causal attributions, locus (L, three items), personal control (PC, three items), stability (S, three items), and external control (EC, three items) on 9-point Likert-type scales, from 1 (*External, Unstable, or Uncontrollable*) to 9 (*Internal, Stable, or Controllable*) (McAuley et al., 1992).² Fontayne et al. (2003) reported reliability coefficients (coefficient alpha) of .83, .79, and .79 for the EMAC Locus, Personal Control, and Stability scales, respectively. As with the SASS and the QESAS, where the locus and personal control causal dimensions are highly

² In order to compare our results with those obtained in earlier studies that examined attributional style, we were not interested in the dimension of external controllability. Interested readers may request further information on this dimension from the first author.

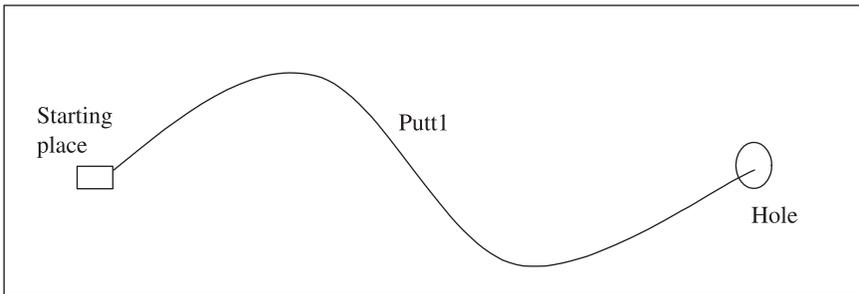


FIGURE 1. The putting task. Note that there are two successive slopes making a "hole out" (a hole made in one putt) on each putt nearly impossible.

correlated, a composite score comprising the average of the two dimensions is possible.

Lastly, on the EMAC, perception of success or failure is assessed on a binary rating scale that asks participants how they consider their performance: "*rather like a success*" vs. "*rather like a failure*".

Procedure

Six weeks after having completed the QESAS, student participants were requested to volunteer to take part individually in a golf putting task in a laboratory. All of the student participants were naive (i.e. had no experience with golf putting). Each participant was informed that the objective of the study was to examine how well novice participants would perform in a putting task. In the first trial, each participant had eight putts and was instructed to try to "hole out" (a hole made in one putt) on as many as possible of the eight. Participants were informed that the aim of the golf putting task was to obtain the best performance they could (maximal score was 8). The putting distance was approximately 4 meters with two successive slopes (see Figure 1). The distance and slopes were selected to ensure that the participants would fail to sink most of their putts even if the ball often passed close to the hole. After this first trial of eight putts, participants completed the EMAC. Notably, in completing the last item on the EMAC, all participants in the present study perceived their performance in the putting task to be "*rather like a failure*".

After completing the EMAC, participants were then informed that a 3-minute free period would follow, at the end of which a second trial of eight putts would take place under the same conditions as the preceding trial. Before and after the free-time period, the instruction to "try to achieve the best-performance you can" was repeated to the participants. During the free-time period, the experimenter stepped into an adjoining room. In the

present study, the mean number of putts that were “hole out” was 0.2 successful attempts on eight, which explains why all subjects perceived their performance as a failure.

In order to be able to observe, *a posteriori*, the activity of subjects (i.e. persistence) during the free-time period, a video camera filmed each participant’s entire session in the laboratory. This technique has been used in other studies (e.g. Martin-Krumm et al., 2003; Orbach et al., 1997; Orbach et al., 1999; Rudisill, 1988). The participants were informed in advance of the presence and purpose of the video camera and could refuse to be filmed. None used this option.

Short-term Persistence. According to Bandura (1986), persistence is endurance, or the refusal to give up, especially when faced with opposition. In other words, persistence is the tendency to continue in a given direction in spite of difficulties. Generally, this measure of persistence has been assessed either (a) by scoring the time spent by individuals in practicing during a free-time period between two equal perceived failure situations (e.g. Andrews & Debus, 1978; Martin-Krumm et al., 2003; Medway & Venino, 1982; Orbach et al., 1997; Rudisill & Singer, 1988), or (b) by scoring the number of times a participant engaged in a task during a given free-time period after perceived failure (e.g. Gernigon & Fleurance, 1998; Johnson & Biddle, 1988—see Försterling (1985) for an overview of the cognitive attributional investigations). In this study, and based on past attributional research, we chose to assess short-term persistence, *a posteriori* and for each subject, by scoring (and adding) the number of times each subject achieved a “hole out”, under the same conditions as the task experienced (i.e. an even distance, even starting place) during a given free-time period of 3 minutes—which is a similar length of time as that used by Rudisill (1988, 1989) and Rudisill and Singer (1988). Similarly, as in the method used by these last authors, in the testing room, several sports magazines were left on the table where the participants completed the EMAC. The experimenter mentioned to each participant that s/he could do whatever s/he wanted during this period: read the magazines, not practice, or practice their putting.

RESULTS

Participants’ putting persistence was examined using regression analysis and univariate analysis of variance (ANOVA). Significant univariate effects were followed up with *t*-tests when necessary. Measures of effect size (eta-squared (η^2)) for univariate analyses, and population point biserial correlation (ρ_{pb}) coefficients for *t*-tests were also examined for all significant effects. According to Kirk (1996), η^2 values of .010, .059, and .138, and ρ_{pb} values of .10, .24, and .37 correspond to small, medium, and large effect sizes,

TABLE 1
 Mean Causal Dimension Scores and Coefficient Alpha Reliabilities for
 Attributional Style (QESAS) and State-Attribution (EMAC) Scales

<i>Measure</i>		<i>Locus</i>	<i>Personal control</i>	<i>Stability</i>
QESAS	<i>M</i>	4.64	4.32	3.30
	<i>SD</i>	0.79	0.77	1.19
	<i>N</i>	110	110	110
	α	.79	.77	.82
EMAC	<i>M</i>	5.56	6.03	4.57
	<i>SD</i>	2.04	2.01	2.05
	<i>N</i>	110	110	110
	α	.82	.86	.87

Note: QESAS causal dimensions were measured on 7-point Likert scales. EMAC causal dimensions were measured on 9-point Likert scales. Coefficient alpha reliabilities for the QESAS were calculated based on a subset ($n = 110$) of the sample ($N = 177$) reported in Le Foll (2004). There were no significant mean differences on the QESAS dimensions between those who did and those who did not take part in the putting task.

respectively. The probability of Type I error was maintained at .05 for all analyses.

A MANOVA was used to examine the effect of participant gender on the attributional dimensions (locus, personal control, stability) for state-attributions and AS, as well as on persistence. There were no main effects due to gender, Wilks's $\lambda = .90$, $R(7, 102) = 1.55$, $p = .16$. Consequently, subsequent analyses do not distinguish the male and female participants.

Table 1 shows the means, standard deviations, and coefficient alpha reliabilities for the causal dimension scales on the QESAS and the EMAC. The reliabilities of the QESAS scales and the EMAC scales in the present study were comparable with those found in previous studies (e.g. Fontayne et al., 2003; Hanrahan et al., 1989; Le Foll, 2004; McAuley et al., 1992; Weiss, Bredemeier, & Shewchuk, 1985).

As shown in Table 2, for both the QESAS and the EMAC, there was a significant positive correlation between Locus and Personal Control, and a significant negative correlation between Personal Control and Stability, which is consistent with past research on the (English) Sport Attributional Style Scale (SASS; Hanrahan et al., 1989). Scores on the QESAS and the EMAC scales were not correlated.

Our hypothesis was that the two attributional "levels" (AS; state-attributions) would each influence short-term persistence after failure; specifically, that individuals who attribute their failures to internal, controllable, and unstable causes would be more persistent than those who use external, uncontrollable,

TABLE 2
Bravais-Pearson Correlations between Causal Dimensions of Attributional Style (QESAS), State-Attributions (EMAC), and Putting Persistence

	QESAS			EMAC			Persistence
	L_Q	PC_Q	S_Q	L_E	PC_E	S_E	
L_Q	1.00						
PC_Q	.22*	1.00					
S_Q	-.02	-.30**	1.00				
L_E	.12	.002	.10	1.00			
PC_E	.10	.04	.16	.30**	1.00		
S_E	.07	-.05	.09	-.11	-.22*	1.00	
Persistence	.18*	.24**	-.07	.01	-.002	.13	1.00

Notes: $N = 110$. * $p < .05$; ** $p < .01$. "L" = Locus of Causality, "PC" = Personal Control, "S" = Stability. QESAS refers to the Questionnaire d'Evaluation du Style Attributionnel en Sport (Le Foll, 2004), an adapted French version of SASS. EMAC refers to the Echelle de Mesure des Attributions Causales (Fontayne et al., 2003).

and stable causes to explain their failures. The bottom row of Table 1 shows correlations of the six predictor variables with putting persistence. As can be seen from the table, two of the three attributional style dimensions predicted persistence (Locus; $r = .18$; Personal Control; $r = .24$) but none of the state-attribution dimensions did. When the six predictors were entered in a stepwise multiple regression analysis the model was not significant; $R^2 = .09$, $F(6, 109) = 1.83$, *ns*. However, since scores on the QESAS and the EMAC were not correlated, the three QESAS predictors and the three EMAC predictors were examined in separate regression analyses.

When the QESAS predictors and interactions were entered in a hierarchical regression analysis, the main effects model was significant; $R^2 = .10$, $F(3, 109) = 3.74$, $p = .01$, but only Personal Control was a significant predictor of persistence: Personal Control ($\beta = .23$; $t = 2.37$, $p < .05$), Locus ($\beta = .12$; $t = 1.31$, *ns*), and Stability ($\beta = .13$; $t = 1.45$, *ns*). When the EMAC predictors were entered in a hierarchical regression analysis none of the models were significant.

Further analyses explored whether different attributional styles were linked with differing levels of putting persistence. Specifically, we conducted a 2 (Locus Group: internal-external) \times 2 (Personal Control Group: controllable-uncontrollable) \times 2 (Stability Group: stable-unstable) analysis of variance with persistence as the dependent variable to determine if individuals who attributed their failures to internal, controllable, and unstable causes were more persistent than those who used external, uncontrollable, and stable causes to explain their failures. Locus, Personal Control, and Stability

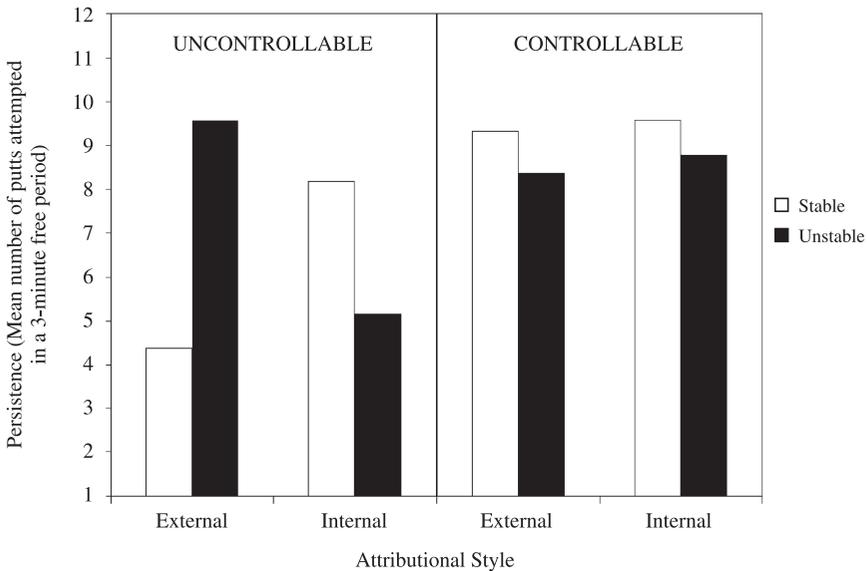


FIGURE 2. Mean number of putting attempts in a 3-minute free period by participants with different attributional styles measured by the Questionnaire d'Evaluation du Style Attributionnel en Sport (QESAS; Le Foll, 2004).

groups were created using a median split on each dimension. For example, an individual scoring below the median on the Locus, the Personal Control, and the Stability dimensions was classified as having an external/uncontrollable/unstable attributional style. An individual scoring above the median on the Locus, the Personal Control, and the Stability dimensions was classified as having an internal/controllable/stable AS. Examples of the types of causal attributions made by individuals with different sports attributional styles are shown in the Appendix.

The analysis revealed a significant group main effect for Personal Control, $F(1, 102) = 9.63$, $\eta^2 = .086$, $p = .003$, indicating that participants with a "high personal control" AS persisted more, $M = 9.01$, than those with a "low personal control" AS, $M = 6.82$. There were also significant Locus \times Stability, $F(1, 102) = 8.03$, $\eta^2 = .073$, $p = .006$, and Locus \times Personal Control \times Stability, $F(1, 102) = 8.76$, $\eta^2 = .079$, $p = .004$, interactions. Observed power (computed using alpha of .05) for the three significant effects was .866, .802, and .834, respectively, which exceed the criterion (.80) for adequate power established by Cohen (1992).

The three-way interaction is displayed in Figure 2. Post-hoc decomposition of the interaction by t -tests indicated that participants with an external/uncontrollable/stable (EUS) attributional style showed significantly lower

TABLE 3
Significance and Effect Size (ρ_{pb}) of Mean Differences in Putting Persistence for all Attributional Style Groups

	<i>EUS</i>	<i>EUU</i>	<i>IUS</i>	<i>IUU</i>	<i>ECS</i>	<i>ECU</i>	<i>ICS</i>	<i>ICU</i>
<i>EUS</i>	–							
<i>EUU</i>	** (.69)	–						
<i>IUS</i>	* (.53)	<i>ns</i>	–					
<i>IUU</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	–				
<i>ECS</i>	* (.67)	<i>ns</i>	<i>ns</i>	<i>ns</i>	–			
<i>ECU</i>	* (.56)	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	–		
<i>ICS</i>	** (.67)	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	–	
<i>ICU</i>	** (.55)	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	–
Mean	4.38	9.56	8.19	5.17	9.33	8.36	9.58	8.78
SD	4.09	3.16	2.88	3.90	2.06	3.41	3.50	3.26

Notes: All *t*-tests were two-tailed and were corrected for multiple comparisons using the Bonferroni correction. * $p < .05$; ** $p < .01$. “*ns*” = not significant. Population point biserial (ρ_{pb}) effect sizes are subscripted in parentheses. SD refers to the standard deviation. *N*s were 21, 9, 16, 6, 9, 14, 12, and 23 for each of the attributional style groups in the order listed above. Attributional Styles are abbreviated to “*EUS*” = External/Uncontrollable/Stable, “*EUU*” = External/Uncontrollable/Unstable, “*IUS*” = Internal/Uncontrollable/Stable, “*IUU*” = Internal/Uncontrollable/Unstable, “*ECS*” = External/Controllable/Stable, “*ECU*” = External/Controllable/Unstable, “*ICS*” = Internal/Controllable/Stable, “*ICU*” = Internal/Controllable/Unstable.

putting persistence than participants with any other attributional style except one. The magnitude of these effects, $\rho_{pb} = .53$ to $.69$, was substantial. As shown in Table 3, the participants with an *EUS* attributional style had a lower level of putting persistence than all but the internal/uncontrollable/unstable (*IUU*) attributional style group. The data provided clear support for our hypothesis that individuals who attributed their failures to internal, controllable, and unstable causes would be more persistent than those whose style was to explain their failures with external, uncontrollable, and stable causes.

DISCUSSION

The purpose of this study was to investigate the influence of state-attributions and AS on short-term persistence during perceived failure in a golf putting task. The findings of the present study demonstrated that sports AS influenced individuals’ short-term persistence, but state-attributions did not. Overall, individuals with a “high personal control” AS showed greater persistence than those with a “low personal control” AS, which supports past research on the positive motivational benefits of a more “optimistic” AS in

task failure situations (e.g. Anderson & Arnoult, 1985; Schulman, 1995; Seligman et al., 1990). An “optimistic” AS, as Anderson (1983a) demonstrated, is characterised by individuals who attribute their failures to internal and controllable causes (i.e. who regard their failures as due to a lack of effort, concentration, or training). Such individuals also perceive that an increase in one of these factors (e.g. training harder) will lead to subsequent improvements in their performance. Future research might examine whether improvement and not only persistence are linked to more optimistic sports attributional styles.

Furthermore, in the present study, unstable attributions were particularly protective for individuals with an external/uncontrollable AS, in that they promoted significantly higher levels of persistence than was shown by external/uncontrollable AS individuals who used stable causal attributions. More precisely, individuals with an external/uncontrollable/*stable* AS persisted less than those with any other sports attributional style examined but one. This finding confirms past research that showed the importance of the stability dimension in athletes’ causal attributions about failure (Leith & Prapavessis, 1989). Future research that examines the repeatability of this finding might also examine whether it is present in other sports contexts as well as non-sports settings (e.g. school/academic contexts).

The present results indicated that an external/uncontrollable/*stable* AS, but not external/uncontrollable/*stable* state-attributions, was particularly dysfunctional to short-term persistence. Why would AS predict short-term persistence, but not state-attributions? One possible explanation for the link between AS and persistence may be that the present study used a *novel* situation of failure for individuals. All participants were novices to the task and the majority previously had never touched a golf club. This lack of golf experience would not enable them to compare their putting failure with any similar preceding task failure. Thus, missing information, these individuals likely behaved as they behave in general vis-a-vis a situation of failure; i.e. according to their AS.

In addition, the golf putting task used in the present study was “neutral” or ambiguous about the cause for poor performance (failure). That is, for some tasks, the cause of failure (or success) is quite obvious and thus the type of cause a person uses to explain an outcome may be strongly determined by the task itself (e.g. Anderson, 1983b; Anderson & Arnoult, 1985; Higgins et al., 1999; Weiner, 1992). For example, a defeat in volleyball against a team classified as two or three divisions above one’s own team likely would be attributed to the level of the opposing team and not to one’s own incompetence or that of one’s team. However, when situational explanations are not an obvious part of the task’s “structure” (Anderson, 1983b), then AS should influence the way in which the individual will respond to failure (or success) (Peterson & Seligman, 1984). In the present study, it

seems likely that the causal ambiguity vis-a-vis the putting failure favored the salience of AS rather than state-attribution effects. Thus, future research might examine whether, in the same individuals, state-attributions influence individual persistence for familiar tasks (i.e. tasks within an individual's sport specialty) whereas AS influences persistence for novel tasks.

The lack of any state-attribution effects on persistence in the present study is puzzling. However, two possible methodological reasons may underlie the discrepancy between our results and preceding studies. First, investigations of Weiner's attributional theory in sports contexts typically are not structured to measure the *direct* influence of state-attributions on motivated behaviors. Studies that demonstrated links between causal attributions and task persistence all used attributional training techniques, and measured individuals' causal attributions only to check whether the feedback delivered at the time of attributional training was successful (Orback, Singer, & Price, 1999; Rudisill, 1989; Rudisill & Singer, 1988). In these studies, the attributional feedback influenced the causal attributions made by the subjects, as well as their task persistence. Thus, the authors suggested that it would be possible to modify an individual's task persistence by influencing his/her state-attributions via attributional feedback training. The present study used no attributional feedback, nor an attributional training manipulation, and the present findings suggest that state-attributions are linked to task persistence only in the presence of attributional training manipulations (e.g. false causal feedback about failure). Future studies will have to confirm our results and also evaluate the influence of attributional feedback compared to state-attributions (made in the presence and absence of an attributional feedback manipulation) on short-term persistence.

Second, Weiner's (1985, 1992) attributional theory states that there are no direct links between causal attributions and behavior, but that there are variables that mediate between attributions and behavior. Indeed, in a number of studies, expectancies of success (Bond, Biddle, & Ntouamis, 2001; Gernigon, Fleurance, & Reine, 2000; Weiner, 1985) and emotions (Biddle, 1988; Biddle & Hill, 1992; Caprara, Pastorelli, & Weiner, 1997; McFarland & Ross, 1982; Russell & McAuley, 1986; Weiner, 1985) have been shown to mediate between state-attributions and behavior. For example, attributing a failure to unstable causes engages an expectancy of success which, in turn, positively influences behavior (e.g. Bond et al., 2001). Similarly, other authors have shown that attributing failure to controllable causes generates emotions like culpability or anger, and that these emotions are linked with increased persistence after a failure (Weiner, 1985, 1992). The results of the present study show no direct links between state-attributions and short-term persistence, and thus indirectly confirm Weiner's theory. However, additional studies that include possible mediating variables (i.e. relevant emotions) are necessary in order to test the validity of this possibility

and to confirm our results in other sports contexts as well as non-sports settings.

In summary, in the present study, AS influenced short-term putting persistence, but state-attributions did not. Individuals with a more “optimistic” AS about sports failures showed greater persistence in a specific golf failure situation than did those with a more “pessimistic” AS. In addition, the stability dimension was particularly important in protecting those with more “pessimistic” AS. That is, golf novices who habitually explained their sports failures with external/uncontrollable/stable causes were less persistent than novices with any other AS examined. However, novices’ state-attributions about putting failure were unrelated to persistence. The main implication of our findings is that one’s AS may be particularly dysfunctional for behavioral persistence under failure, and thus for the likelihood of future improvements in performance. Moreover, for novices, continued involvement in a sport may be precluded by a dysfunctional AS.

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APPENDIX

Examples of Causal Attributions Made by Individuals with Different Sports Attributional Styles

ExternallUncontrollable/Unstable Style. Explains the negative outcome in terms of external circumstances beyond one's own control, but relatively temporary (e.g. "The playing field was in bad condition today"). Such causes can include factors to do with *another* person(s) (e.g. "The coach thought he taught me those plays but he was mistaken", "The entire team played badly, but the coach blamed me today").

ExternallUncontrollable/Stable Style. Explains the negative outcome in terms of external circumstances beyond one's own control, but relatively *permanent* (e.g. "That playing field is always in bad condition", "I have no luck"). Such causes can include factors to do with *another* person(s) (e.g. "We lose the match every time we get this referee").

InternallControllable/Unstable Style. Explains the negative outcome in terms of internal factors (features of oneself), but relatively temporary features (e.g. "I did not train for a whole week", "I missed the last two practices").

InternallControllable/Stable Style. Explains the negative outcome in terms of internal factors (features of oneself), but relatively *permanent* features (e.g. "I have no stamina, but I am very agile", "I push myself too hard most of the time, instead of getting the right amount of rest in between workouts").