The Effects of Training and Competition on Achievement Goals, Motivational Responses, and Performance in a Golf-Putting Task

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This study examined whether (a) training and competition influence achievement goals, effort, enjoyment, tension, and performance; (b) achievement goals mediate the effects of training and competition on effort, enjoyment, tension, and performance; and (c) the context influences the relationships between goals and effort, enjoyment, tension, and performance. Participants (32 males, 28 females; M age = 19.12 years) performed a golf-putting task in a training condition and a competition condition and completed measures of goal involvement, effort, enjoyment, and tension; putting performance was also measured. Both task and ego involvement varied across training and competition, and variation in ego involvement explained variation in effort and enjoyment between these conditions. Ego involvement positively predicted effort in training and performance in competition, and interacted positively with task involvement to predict effort and enjoyment in competition. Our findings suggest that the distinction between training and competition is a valuable one when examining individuals’ achievement motivation.

Keywords: effort, enjoyment, tension, sport

The sport domain can be subdivided into two core achievement contexts: training and competition. Training has a central place in athletes’ sporting life, as this is the context where they spend a vast amount of time to develop their sport skills (Baker, Côté, & Abernethy, 2003). In organized training, participants often practice alongside each other, and an important function of this context is to prepare athletes for competition. Competition is an integral part and defining feature of sport (Duda & Nicholls, 1992) and by nature involves social comparison. In its purest form, competition involves one person attempting to outperform another in a “zero-sum” situation; thus, one person either wins or loses (Stanne, Johnson, & Johnson, 1999; Tauer & Harackiewicz, 2004). Although training and competition
are important contexts in sport and could affect athletes’ motivational processes (Harwood, Hardy, & Swain, 2000), to date very few sport studies have considered this contextual distinction when examining achievement motivation (e.g., van de Pol & Kavussanu, 2011, 2012; Williams, 1998).

One way that training and competition may affect motivation is through the achievement goals athletes adopt in each context. According to achievement goal theory (e.g., Nicholls, 1989), individuals’ central motive for participating in achievement contexts is to develop or demonstrate competence. The criteria used to evaluate competence form the basis of two distinct goals, namely, task and ego involvement (Nicholls, 1989). When individuals are task involved, they evaluate competence using self-referenced criteria and feel successful when they learn something new, master a skill, or improve on a task. When they are ego involved, they evaluate competence using other-referenced criteria and feel successful when they establish normative superiority (Nicholls, 1989). These achievement goals may be differentially promoted in training and competition. In training, individuals have opportunities to develop and practice their skills, and this emphasis on self-referenced competence attainment should promote task involvement. In competition, the explicit social comparison and evaluation of objective success through normative standards should promote ego involvement. In competition, the explicit social comparison and evaluation of objective success through normative standards should promote ego involvement.

To date, only a few studies have examined whether achievement goals differ across training and competition. One study found that female softball players were more task involved before a training session than before a game but did not differ in ego involvement (Williams, 1998). In other research examining goal orientations (i.e., individuals’ proneness to be task or ego involved), task orientation was higher in training than in competition in tennis players (van de Pol & Kavussanu, 2011) but not in soccer players (van de Pol, Kavussanu, & Ring, 2012) or in athletes from a variety of sports (van de Pol & Kavussanu, 2012). However, in these studies, ego orientation was higher in competition than in training. Thus, ego orientation has been consistently found to be higher in competition than in training, while this difference has not been documented for ego involvement (Williams, 1998).

This discrepancy suggests that more research is needed to elucidate how individuals evaluate their success across training and competition as experienced at a situational level. Examining this issue is important as it could provide a better understanding of whether task or ego goal involvement is more likely to occur in certain contexts and why athletes may develop goal orientations that are specific to each context (e.g., van de Pol & Kavussanu, 2011). Finally, Williams (1998) examined only female softball players. As previous research indicates that typically females are lower in ego orientation than males (e.g., Marsh, 1994), they may be less sensitive to the normative cues in competition, which could weaken their ego goal in this context. Research is needed to examine both females’ and males’ goal involvement across training and competition.

Training and competition may also influence important achievement outcomes such as effort, enjoyment, tension, and performance. In previous research, athletes reported higher effort, enjoyment, and tension in competition than in training (van de Pol et al., 2012) and higher anxiety, which is an indicator of tension, in a softball game compared with a practice session (Williams, 1998). In addition, participants performed better in competition than in a practice trial in a rope-skipping task (Woodman, Akehurst, Hardy, & Beattie, 2010). This variation in outcomes
between contexts could be due to contextual differences in goals. For example, ego orientation has been positively linked to effort and enjoyment in competition (van de Pol & Kavussanu, 2011, 2012) as well as tension in sport (Biddle, Wang, Kavussanu, & Spray, 2003) and is higher in competition than in training (van de Pol & Kavussanu, 2011, 2012); thus, it could explain a potential increase in effort, enjoyment, and tension from training to competition. Similarly, task orientation has been negatively associated with tension (Biddle et al., 2003). Hence, a decrease in task involvement from training to competition may explain an increase in tension.

The relationships between achievement goals and outcomes may also vary as a function of the context. Specifically, task-involved individuals may find opportunities to pursue their self-referenced goals in training (e.g., improving their skills) and competition (e.g., improving their personal performance); thus, task involvement may promote effort and enjoyment and reduce tension in both contexts. Ego-involved individuals may try harder and experience more enjoyment in competition than in training because competition typically provides opportunities for these individuals to demonstrate normative competence. Previous research has shown that ego orientation was positively related to effort in tennis players (van de Pol & Kavussanu, 2011) and enjoyment in athletes from a variety of sports (van de Pol & Kavussanu, 2012) only in competition. Ego orientation has also been linked negatively with tension in soccer players, but only in training (van de Pol et al., 2012). Thus, research on goal orientation provides some evidence to suggest that the relationships between goal involvement and effort, enjoyment, and tension may vary as a function of the context.

The context may also influence the relationship between achievement goals and performance. The relationship between task involvement and performance should be robust across the two contexts, as this goal should facilitate an intrinsic desire to perform well in both contexts (see Nicholls, 1989) whereas ego involvement should be unrelated to performance in training, as normative success is not formally rewarded in this context. However, this goal may facilitate performance in competition, as this context should evoke the desire to perform well in order to demonstrate normative competence. In previous research, both mastery (i.e., task) and performance-approach (i.e., ego) goals were associated with better performance in competition (Stoeber & Crombie, 2010). To date, no study has examined whether the relationships between goals and performance differ in training and competition.

Finally, when testing achievement goal theory, it is important to consider perceived competence, which is assumed to play a key role in ego involvement: Specifically, ego-involved individuals are hypothesized to show adaptive motivational patterns when their perceived competence is high, but maladaptive patterns, such as low effort, increased anxiety and impaired performance, when their perceived competence is low (Nicholls, 1989). However, previous research has revealed mixed findings with some studies supporting this moderating role of perceived competence for intrinsic motivation in physical education (e.g., Standage, Duda, & Ntoumanis, 2003), and others reporting no interaction between perceived competence and ego orientation in predicting enjoyment and anxiety (e.g., Hodge, Allen, & Smellie, 2008; Morris & Kavussanu, 2009). Nevertheless, we examined perceived competence to fully test Nicholls’s (1989) theory in both training and competition contexts.
The Present Study

The literature reviewed above indicates that there is value in making the distinction between training and competition when examining achievement motivation in sport; however, it also revealed some limitations. First, the studies that examined achievement motivation across the two contexts were cross-sectional (e.g., van de Pol & Kavussanu, 2011, 2012; Williams, 1998). This means that there was no control of extraneous variables within each context. Research is needed to examine achievement motivation in training and competition in standardized experimental conditions. Second, although variation in motivational outcomes across the two contexts has been found (e.g., van de Pol et al., 2012) we do not know whether changes in goals are associated with changes in outcomes, as one moves from one context to the other. Third, research has not examined the relationships between goals and outcomes across training and competition at a situational level. This should provide a better understanding of the situational characteristics of training and competition that influence achievement motivation across the two contexts. Finally, performance, which is a key outcome in sport, has been overlooked in studies that examined the training versus competition distinction.

In this study, we sought to address these issues by investigating achievement motivation across training and competition in an experimental setting, and had three purposes. The first purpose was to examine whether participants’ achievement goals, effort, enjoyment, tension, and performance differ between training and competition. We expected to find lower task involvement and higher ego involvement, effort, enjoyment, tension and performance in competition than in training (van de Pol et al., 2012; Williams, 1998). The second purpose was to determine whether changes in achievement goals from training to competition are associated with changes in effort, enjoyment, tension, and performance. We expected that a decrease in task involvement from training to competition would be associated with an increase in tension, and an increase in ego involvement would be associated with an increase in effort, enjoyment, tension, and performance (van de Pol & Kavussanu, 2011; van de Pol et al., 2012). To date, no study has experimentally examined these issues. Doing so could enhance our understanding of the situational determinants of goal adoption and the role of achievement goals in affecting variation in achievement outcomes across training and competition.

The third study purpose was to investigate whether the relationships between goal involvement and effort, enjoyment, tension, and performance differ between training and competition, that is, whether the context influences these relationships. This is important as it may provide a better understanding of the utility of achievement goals in leading to adaptive motivational responses and better performance in the two contexts, as the two goals may be differently associated with outcomes in the two contexts. We hypothesized that task involvement would positively predict effort, enjoyment, and performance and negatively predict tension in both contexts. However, we expected that ego involvement would be unrelated to effort, enjoyment, and performance in training, and positively predict effort and performance in competition. Due to inconsistent previous findings, we made no predictions for the relationship between ego involvement and enjoyment in competition, and tension in either context (see Biddle et al., 2003; Stoeber & Crombie, 2010; van de Pol & Kavussanu, 2011, 2012). Finally, we examined whether perceived competence
moderates the relationship between ego involvement and outcomes in each context but formed no hypotheses due to the mixed findings reported in previous research (e.g., Hodge et al., 2008; Morris & Kavussanu, 2009; Standage et al., 2003).

Method

Participants
Participants were 32 male and 28 female ($M_{\text{age}} = 19.12$ years, $SD = 0.92$ years) right-handed undergraduate students enrolled in a sport and exercise sciences degree at a British university. They received course credit for participation. Participants had no formal experience in playing golf or an official golf handicap. Their average experience in their main sport was 7.90 ($SD = 3.83$) years.

Experimental Task and Equipment
The experimental task was a golf-putting task, which has been used in previous research (Cooke, Kavussanu, McIntyre, & Ring, 2010; Kavussanu, Morris, & Ring, 2009). The task was self-paced with the participant determining how long to prepare before each putt. The ball was collected after each putt by an experimenter. A standard length (90 cm) golf putter was used to putt regular-size golf balls (diameter = 4.27 cm) to a full-size hole (diameter = 10.8 cm; depth = 2.8 cm) from a distance of 2.4 m. The hole was located 1.5 m from the end and 0.7 m from the side of a 7 m long × 1.4 m wide flat green artificial putting mat.

Experimental Design and Conditions
We employed a within-subjects design with two levels: training and competition. As training typically prepares athletes for competition, the design reflected that reality; that is, participants took part first in training followed by competition. All participants were tested in pairs. Details of each condition are described below.

Training. The purpose of this condition was to create a training session, which would facilitate skill development, but just as in real training settings, where athletes often observe other athletes’ performance (e.g., during demonstrations and rest intervals), social comparison information was available. Participants were told that the purpose of the training was to learn and improve the skill of golf putting. Each participant performed six blocks of 10 putts alternating after every block with the other participant. Pilot testing revealed that performance became stable after approximately 40 putts, thus 60 putts were performed to prevent potential practice effects when comparing performance across contexts.

To facilitate skill development, the participant who was not putting completed a learning task that comprised two parts. The first part was to watch three golf learning tips on a computer screen (see Kavussanu et al., 2009). The tips included photographs of a golf professional demonstrating the putting technique and brief instructions about how to perform the skill. The first tip concerned “posture” (and preceded Block 1), the second tip was about “direction” (and preceded Block 3), and the third tip referred to “timing and distance” (and preceded Block 5). The tips were presented one at a time with the previous tip(s) still accessible. The second
part of the learning task was to watch the other participant putt before Blocks 2, 4, and 6. This part aimed to facilitate observational learning, which in combination with physical practice facilitates skill development compared with physical practice alone (Shea, Wright, Wulf, & Whitacre, 2000). The duration of the learning tips was standardized (tips in Blocks 1, 3, and 5 lasted 2, 2.5, and 3 min, respectively), and the observational learning task lasted until the other participant finished his or her block of 10 putts.

**Competition.** The purpose of this condition was to create a “zero-sum” competition. Participants were told that the purpose of competition was to compete against each other, and were informed that there would be only one winner. Each participant performed 10 putts alternating with the other participant after each putt. To control for order effects, participants switched their order of putting after the fifth putt. Then, they were informed that the winner of the competition was the participant who holed the most balls after 10 putts, or, in case of a draw, the one to hole the ball in a “sudden death,” where each participant made one putt at a time until there was a winner. To emphasize social comparison—which is a defining feature of competition (Stanne et al., 1999)—a scoreboard showing the number of putts holed was placed at a prominent position adjacent to the golf mat, one of the experimenters explicitly announced the interim scores during, and the winner after, the competition, and participants were informed that their individual performance would be displayed in a rank order with all the other participants on a notice board. Finally, the putting participant was watched by the waiting participant and the two experimenters.

**Manipulation Check**

The manipulation check comprised four items specifically developed for this study. Participants were asked to think about the training or competition in which they just participated and indicate its purpose. The items for training (learn a skill, improve a skill) and competition (outperform another, beat another) were chosen to reflect “skill development” and “zero-sum competition” respectively. Participants rated each item on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

**Measures**

**Goal Involvement.** Participants’ goal involvement was measured with the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998), which consists of two six-item subscales measuring task and ego orientation. The stem was adapted to measure goal involvement and was for each item: “In training/competition, I felt most successful when. . . .” Example items are as follows: “I worked hard” for task involvement and “I was the best” for ego involvement. Participants responded on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The POSQ has demonstrated very good internal consistency with Cronbach’s alpha coefficients of .90 for the task and .84 for the ego orientation subscale (Roberts et al., 1998). The mean for each subscale was computed and used in all analyses. This procedure was followed for all scales used in this study.

We measured goal involvement after the training and competition sessions for the following reasons. First, participants could consider the entire session and
indicate the degree to which they were task and ego involved throughout the session. As goal involvement is affected by both dispositional and situational factors, assessing these variables after the session to capture the overall degree of goal involvement during the session was deemed important. Second, the use of retroactive recall may help avoid potential effects that repeated assessments of goal states during task engagement could have on task and ego involvement (see Duda, 2001). Third, measuring achievement goals before the task, as other researchers have done (e.g., Williams, 1998), could have harmed internal validity via potential carryover/practice, interference, response-shift bias, and/or sensitization effects; for example, the latter could have occurred by administering a pretest measure of achievement goals, which could have oriented attention toward certain aspects of the treatment (see Lam & Bengo, 2003). Finally, this approach is consistent with many previous studies (e.g., Dewar & Kavussanu, 2011, 2012; Vansteenkiste, Matos, Lens, & Soenens, 2007).

Perceived Competence. We used the four-item Perceived Competence Scale (PCS; e.g., Williams, Freedman, & Deci, 1998) adapted for use in the two contexts to measure perceived competence. Participants were asked to indicate their feelings of competence regarding their performance in training and competition. Example items are as follows: “I felt able to meet the challenge of performing well” and “I was capable of performing well.” The items were rated on a scale ranging from 1 (not at all true) to 7 (very true). In past research, the PCS has shown high internal consistency with alpha coefficients above .80 (Williams et al., 1998).

Effort, Enjoyment, and Tension. Three subscales of the Intrinsic Motivation Inventory (Ryan, 1982) were used to measure effort (5 items), enjoyment/interest (5 items) and tension/pressure (4 items). Participants were asked to think about their experiences during the training/competition, and to respond to each item. Example items used are “I did put a lot of effort into the training/competition,” “I enjoyed the training/competition very much,” and “I felt very tense during the training/competition.” Each item was rated on a Likert scale ranging from 1 (not at all true) to 7 (very true). These subscales have demonstrated satisfactory to very good reliability in previous research (effort, $\alpha = .84$; enjoyment, $\alpha = .78$, tension, $\alpha = .68$; McAuley, Duncan, & Tammen, 1989).

Performance. Mean radial error (in centimeters) and number of putts holed were used as measures of performance (e.g., Cooke et al., 2010) and were recorded with a camera-based scoring system (see Neumann & Thomas, 2008). For each block of trials, we computed the average distance of the 10 balls from the hole and recorded 0 for holed putts. Number of putts holed was measured because it allowed us to directly identify a winner in competition to increase the zero-sum element.

Participants were informed that their performance score would be a combination of the number of putts holed and the average distance from the hole. This was done to (a) encourage participants to take the same approach to putting in both conditions as when playing golf (i.e., focus on making the putt, but in case of a miss, leave the ball as close to the hole as possible), and (b) ensure that in competition participants do not give up when they realize they cannot win anymore based on number of putts holed. As mean radial error includes number of putts holed but not vice versa, this was used as the performance measure for all statistical analyses. The performance measure was computed after all sessions were completed.
because pilot testing showed that measuring radial error after each put interfered with the putting task. Participants did not receive feedback regarding their exact radial error but had a good indication of it as they could see how close to the hole the ball had come to rest.

**Procedure**

Participants were tested in single-sex pairs by two experimenters in a quiet room. Following informed consent, they completed a demographics questionnaire and were each given a golf club. Next, the putting task was explained, and participants were informed that their performance in both conditions would be recorded with a camera. Then, they completed the training condition followed by a questionnaire measuring goal involvement, effort, enjoyment, tension, perceived competence, and a manipulation check referring to this condition. Next, they completed the competition condition followed by a questionnaire measuring the same variables with reference to competition. At the end of the session, they were debriefed. Instructions to participants were read out by one of the experimenters using a standard script.

**Results**

**Preliminary Analyses**

All scales had good-to-very good internal consistency that ranged from \( \alpha = .72 \) to \( \alpha = .95 \). The correlations among the variables in each context are presented in Table 1; values of .10, .30, and .50 are considered small, medium, and large effect sizes, respectively (Cohen, 1992). On average, participants’ mean radial error (cm) was 50.91, 36.73, 31.86, 31.27, 28.54, 29.88 in the six training blocks and 28.98 in the single competition block. ANOVA revealed that performance improved significantly only from Block 1 to 2, \( F(1, 58) = 51.20, p < .001, \eta^2_p = .47 \); thus, it was stable before the end of training. Mean radial error of the last training block was used as measure of performance in training.

**Table 1  Zero-Order Correlations Among Variables in Training and Competition (\( N = 60 \))**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task involvement</td>
<td>.32*</td>
<td>.17</td>
<td>.27*</td>
<td>.03</td>
<td>−.18</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Ego involvement</td>
<td>.01</td>
<td>.57**</td>
<td>.40**</td>
<td>.15</td>
<td>−.51**</td>
<td>−.31*</td>
<td></td>
</tr>
<tr>
<td>Effort</td>
<td>.25</td>
<td>.32*</td>
<td>.71**</td>
<td>.25</td>
<td>−.49**</td>
<td>−.49**</td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>−.02</td>
<td>.14</td>
<td>.58**</td>
<td>.18</td>
<td>−.31*</td>
<td>−.35**</td>
<td></td>
</tr>
<tr>
<td>Tension</td>
<td>.14</td>
<td>.25</td>
<td>.41**</td>
<td>.32*</td>
<td>−.20</td>
<td>−.17</td>
<td></td>
</tr>
<tr>
<td>Performance (cm)</td>
<td>.06</td>
<td>−.33**</td>
<td>.06</td>
<td>.10</td>
<td>−.10</td>
<td>.38**</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>−.10</td>
<td>−.37**</td>
<td>−.28*</td>
<td>−.15</td>
<td>−.24</td>
<td>.46**</td>
<td></td>
</tr>
</tbody>
</table>

*Note. Correlations are presented below the diagonal for training and above the diagonal for competition; gender was coded as 0 for males and 1 for females; *\( p < .05 \); **\( p < .01 \).
Manipulation Checks

Separate 2 Condition (training, competition) × 2 Gender (male, female) ANOVAs confirmed main effects for context for each perceived purpose (Table 2, top). Partial eta-squared ($\eta_p^2$) was used as a measure of effect size, and values of .02, .13, and .26 indicate small, medium, and large effects, respectively (Cohen, 1992). Participants rated the items that reflected the purpose of training higher in training than competition and the items reflecting the purpose of competition higher in competition than training, confirming that participants perceived each condition as intended.

Effects of Context on Goals and Outcomes

The first study purpose was to examine whether achievement goals and outcomes differ between training and competition. To this end, we conducted 2 Condition (training, competition) × 2 Gender (male, female) repeated measures MANOVA with goals and outcomes as dependent variables. Significant effects were followed with univariate ANOVAs and results are presented in Table 2. We found a multivariate effect for condition, $F(6, 53) = 18.69, p < .001, \eta_p^2 = .68$. Follow-up ANOVAs showed that participants reported significantly lower task involvement and higher ego involvement, effort, enjoyment, and tension in competition than in training; there was no difference in performance between contexts. A significant gender multivariate effect also emerged, $F(6, 53) = 4.24, p = .001, \eta_p^2 = .32$. Follow-up ANOVAs indicated that males reported higher ego involvement, $M$ difference = 0.70, $SE = 0.23$, $F(1, 58) = 9.06, p < .01, \eta_p^2 = .14$; effort, $M$ difference = 0.75, $SE = 0.20$, $F(1, 58) = 13.66, p < .001, \eta_p^2 = .19$; and enjoyment, $M$ difference = 0.40, $SE = 0.17$, $F(1, 58) = 5.39, p < .05, \eta_p^2 = .09$; and performed better, $M$ difference = 16.70, $SE = 4.23$, $F(1, 58) = 15.57, p < .001, \eta_p^2 = .21$, than females. There was no condition by gender interaction.

Mediation Analysis

The second study purpose was to determine whether achievement goals mediate the effects of context on effort, enjoyment, tension, and performance. This purpose was examined using the analysis recommended by Judd, Kenny, and McClelland (2001) for examining mediation in within-subject designs. We also investigated moderation because this is an integral part of this analysis, and we controlled for gender as this variable was correlated with ego involvement (see Table 1). Prerequisites for mediation are that both the mediator and the outcome differ across the two contexts, that these differences are in the same direction, and that the mediator is related to the outcomes. These conditions were met for ego involvement, effort, and enjoyment, but not for task involvement, tension and performance (see Tables 1 and 2). Thus, regression analyses were conducted to predict the difference in effort, enjoyment, and tension between training and competition from (a) the difference in goal involvement between the two contexts and (b) the mean-centered sum of goal involvement in the two contexts. If the context difference in goal involvement predicts the difference in an outcome, mediation is inferred. When the intercept remains significantly different from zero, partial mediation is indicated. If the mean-centered sum predicts the difference in an outcome, there is evidence for moderation (Judd et al., 2001).
Table 2  Manipulation Checks, Achievement Goals, and Outcomes as a Function of Context (N = 60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Training</th>
<th>Competition</th>
<th>( F(1, 58) )</th>
<th>( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manipulation Checks</strong></td>
<td>Range</td>
<td>( M )</td>
<td>SE</td>
<td>Range</td>
</tr>
<tr>
<td>Learn a skill</td>
<td>1.00–5.00</td>
<td>3.82</td>
<td>0.10</td>
<td>1.00–5.00</td>
</tr>
<tr>
<td>Improve a skill</td>
<td>3.00–5.00</td>
<td>4.21</td>
<td>0.06</td>
<td>1.00–5.00</td>
</tr>
<tr>
<td>Outperform another</td>
<td>1.00–5.00</td>
<td>2.65</td>
<td>0.13</td>
<td>2.00–5.00</td>
</tr>
<tr>
<td>Beat another</td>
<td>1.00–5.00</td>
<td>2.27</td>
<td>0.13</td>
<td>1.00–5.00</td>
</tr>
<tr>
<td><strong>Achievement Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task involvement</td>
<td>2.50–5.00</td>
<td>3.95</td>
<td>0.07</td>
<td>1.17–5.00</td>
</tr>
<tr>
<td>Ego involvement</td>
<td>1.00–4.83</td>
<td>3.02</td>
<td>0.12</td>
<td>1.00–5.00</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effort</td>
<td>2.80–7.00</td>
<td>4.88</td>
<td>0.11</td>
<td>2.00–7.00</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>2.60–7.00</td>
<td>4.81</td>
<td>0.12</td>
<td>3.80–7.00</td>
</tr>
<tr>
<td>Tension</td>
<td>1.00–6.00</td>
<td>3.41</td>
<td>0.16</td>
<td>1.25–6.75</td>
</tr>
<tr>
<td>Performance (cm)</td>
<td>0.00–64.10</td>
<td>30.45</td>
<td>2.18</td>
<td>0.00–82.40</td>
</tr>
</tbody>
</table>

*Note. * \( p \leq .001 \).
To protect against Type I error without increasing the risk of Type II error, in all regression analyses, we examined regression coefficients only when the F-test for the overall model was significant (Cohen, Cohen, West, & Aiken, 2003). This was significant for effort, \(F(3, 56) = 4.89, p < .01\), and enjoyment, \(F(3, 56) = 3.96, p = .01\). The increase in ego involvement from training to competition predicted the increase in both effort, \(b = 0.28, SE = 0.12, t = 2.31, p < .05\), and enjoyment, \(b = 0.40, SE = 0.15, t = 2.74, p < .01\). The intercept remained significantly different from zero for effort, \(b = 0.49, SE = 0.15, t = 3.18, p < .01\), and enjoyment, \(b = 0.56, SE = 0.18, t = 3.05, p < .01\). Thus, ego involvement partially mediated the effects of the context on both outcomes. The mean-centered sum of ego involvement did not predict the difference in effort and enjoyment, thus there was no evidence for moderation.

**Context Effects on Relationships Between Goals and Outcomes**

The third study purpose was to examine whether the context influences the relationships between goal involvement and effort, enjoyment, tension, and performance and was investigated using hierarchical regression analyses. Before entering the variables in the regression model, task and ego goals were centered, and then multiplied to form interaction terms (Aiken & West, 1991). Next, we entered gender in the first step to control for its effects, goals in the second step to examine main effects, and the cross-product of task and ego goals in the third step to investigate interaction effects. We also examined whether perceived competence moderated the relationships between achievement goals and outcomes within each context following the procedure described above, but adding perceived competence in the second step and all possible two- and three-way interactions with goals in the third and fourth steps, respectively.

Significant interaction effects were explored further by (a) plotting two simple regression lines corresponding to the regression of the outcome variable on the predictor at low (1 SD below the mean) and high (1 SD above the mean) values of the moderator and (b) testing whether the slopes of the simple regression lines were significantly different from zero (Aiken & West, 1991). As the two goals were correlated in competition (see Table 1), we used the squared semipartial correlation coefficient \((sr^2)\) as an effect size of the unique contribution of each goal to the total variance \((R^2)\) of each outcome. Values of .01, .09, and .25 for \(sr^2\) indicate small, medium, and large effect sizes, respectively (Cohen et al., 2003). Finally, we tested whether identified relationships were significantly different between the two conditions by comparing the respective unstandardized regression coefficients with a z-test (e.g., Paternoster, Brame, Mazerolle, & Piquero, 1998); \(z\)-values greater than \(\pm 1.96\) are considered significant at the .05 probability level. Results of these analyses are presented in Table 3 and are described below.

**Effort.** In training, effort was positively predicted only by ego involvement. The overall model for this step was significant, \(F(3, 56) = 4.24, p < .01\). In competition, there was a main effect for ego involvement, and an interaction between ego \((X)\) and task \((Z)\) involvement in predicting effort \((\hat{Y} = .43X + .13Z + .21XZ + 5.58)\). The overall model for this third step was significant, \(F(4, 55) = 12.24, p < .001\). Probing this interaction (Figure 1) showed that as ego involvement increased, effort also increased,
but the increase was larger when task involvement was high, $b = 0.61$, $SE = 0.14$, $t = 4.34$, $p < .001$, than when it was low, $b = 0.26$, $SE = 0.13$, $t = 2.01$, $p = .05$. The z-test showed that the regression coefficients of the main effect of ego involvement ($z = 1.11$, $p > .05$) and the interaction effect between ego and task involvement ($z = 0.73$, $p > .05$) on effort were not significantly different between conditions.

**Enjoyment.** There were no main effects for goals on enjoyment in either context. However, in competition, ego involvement ($X$) interacted with task involvement ($Z$) in predicting enjoyment ($Ŷ = .18X + .26Z + .18XZ + 5.63$). The overall model for this step was significant, $F(4, 55) = 6.09$, $p < .001$. As Figure 2 shows, when task involvement was high, as ego involvement increased enjoyment also increased, $b = 0.33$, $SE = 0.11$, $t = 3.03$, $p < .01$. When task involvement was low, ego involvement was not associated with enjoyment. The regression coefficients of this interaction effect were not significantly different between conditions, $z = 0.71$, $p > .05$.

**Tension.** No significant effects were found for goals on tension in either context.
Performance. In training, neither goal predicted performance. In competition, only ego involvement predicted performance negatively, indicating that this goal was associated with lower mean radial error, and thus better putting performance. The overall model for this second step was significant, $F(3, 56) = 8.51, p < .001$.

Figure 1 — Simple regression lines for effort in competition on ego involvement at high and low task involvement.

Figure 2 — Simple regression lines for enjoyment/interest in competition on ego involvement at high and low task involvement.
The regression coefficients of the effect of ego involvement on performance were not significantly different between conditions, $z = -1.28, p > .05$.

As a supplementary analysis, we also examined whether achievement goals predicted winning/losing in competition. Hierarchical regression analysis controlling for gender showed that both ego involvement, $b = 0.27, SE = 0.05, \beta = .60, sr^2 = .29, p < .001$, and task involvement, $b = 0.13, SE = 0.06, \beta = .21, sr^2 = .04, p = .05$, predicted winning. The overall model for this second step was significant, $F(3, 56) = 15.35, p < .001$. There was no interaction effect between task and ego involvement on winning/losing.

**Moderation by Perceived Competence.** Perceived competence did not moderate the relationships between task and ego goals and any of the outcomes in either context.

**Discussion**

Training and competition are the two core subcontexts of sport. Previous cross-sectional research indicates that achievement goals can vary across these two contexts and may be differentially associated with motivational outcomes within each context (e.g., van de Pol & Kavussanu, 2011, 2012). The present study aimed to extend this work by investigating achievement goals and motivation in a golf-putting task in training and competition in an experimental setting.

Participants reported higher task and lower ego involvement in training than in competition, consistent with research in goal orientations in tennis players (van de Pol & Kavussanu, 2011). However, the findings only partly support Williams (1998), who found that softball players reported higher task involvement before a practice session than before a game but did not differ in ego involvement. The discrepancy between our findings and those of Williams may be due to when goals were measured. Specifically, we measured achievement goals after training and competition, whereas Williams (1998) measured them before a practice and game (i.e., “I will be most successful if. . . .”). Pre- and postassessment of goals may differ because performance and outcome are experienced between these assessments (Harwood et al., 2000), which may affect reports of goal involvement.

Overall, the present findings contribute to greater understanding of contextual achievement motivation. Specifically, the findings confirm Nicholls’s (1989) predictions: tasks without salient extrinsic incentives and evaluative cues—like our training—promote task involvement, whereas evaluative, interpersonally competitive conditions—like our competition—promote ego involvement (Nicholls, 1989). Thus, this study revealed that training and competition can influence people’s criteria of success; these insights can help explain why dispositional goals may have some context specificity (see van de Pol & Kavussanu, 2011, 2012).

Participants reported higher effort, enjoyment, and tension in competition than in training, supporting our hypotheses and previous research (van de Pol et al., 2012; Williams, 1998). In competition, both participants had a reasonable chance of winning: The average difference in putts holed between the two opponents was 1.43 in the last training block, with a possible range of 1 to 10, indicating that pairs were very well matched in terms of golf-putting ability when they entered the competition. The rules for winning were clearly defined, and participants were
able to monitor each other’s performance. These conditions may have led to higher enjoyment and effort (Stanne et al., 1999). In addition, the importance placed on winning in competition, and the perceived uncertainty of achieving this, may explain the higher tension in this context compared to training.

Our finding that competition promoted both enjoyment and tension is in line with previous research (e.g., Cooke, Kavussanu, McIntyre, & Ring, 2011). However, previous findings also indicate that competition can both undermine (e.g., when perceived as controlling; Deci, Betley, Kahle, Abrams, & Porac, 1981) and promote (e.g., when perceived as challenging; Senko & Harackiewicz, 2005; Tauer & Harackiewicz, 2004) intrinsic motivation. Hence, our participants may have perceived the competition as challenging, which, in turn, may have positively affected their task interest/enjoyment. In addition, our participants perceived only moderate \((M = 4.12, \text{range: } 1–7)\) tension/pressure in competition. Hence, it is possible that when perceived performance pressure is not too high it may not harm task enjoyment. Future research may verify these explanations by examining the influence of potential mediators/moderators, such as perceived challenge and control, and create conditions with varying levels of performance pressure.

Performance did not differ between the two contexts, which was surprising as the higher level of reported effort and enjoyment in competition could have led to better performance in this context (e.g., Cooke et al., 2011). Perhaps these potential performance enhancers have been balanced out by other factors, such as physical tension. Indeed, Cooke et al. (2010) found that increased muscle tension partially mediated a decline in golf-putting performance, whereas cognitive anxiety did not mediate this performance reduction. Thus, even though in this study increased mental tension was unrelated to performance, perhaps physical (e.g., muscle) tension also increased from training to competition and may have impaired performance on this fine motor skill (see Hardy & Hutchinson, 2007). Future research should verify these explanations.

Investigating whether contextual variation in goals was associated with contextual variation in outcomes showed that the increase in participants’ ego involvement from training to competition partially mediated the increase in effort and enjoyment. This implies that one of the reasons that athletes try harder and feel more enjoyment when taking part in competition than in training is that their ego involvement increases in that context. In previous research, ego involvement has been linked to effort in competition (van de Pol & Kavussanu, 2011). The current study shows that ego involvement could facilitate effort and enjoyment as athletes move from training to competition. However, it is important to note that mediation was partial; thus, other unmeasured variables could also explain the higher effort and enjoyment reported in competition compared to training.

We also examined whether the context influenced the relationships between achievement goals and outcomes. In training, ego involvement positively predicted effort. Although normative success was not rewarded in this condition, participants observed each other’s performance; thus, social comparison information was available. Hence, ego involvement may have promoted effort in training because highly ego-involved participants may have wanted to demonstrate normative competence in this context (Lochbaum & Roberts, 1993). Another explanation is that these participants put effort in training because of the awareness that this could help them succeed in competition (Wilson, Hardy, & Harwood, 2006).
Contrary to our hypotheses and previous research (Biddle et al., 2003; van de Pol & Kavussanu, 2011, 2012), task involvement did not predict effort and enjoyment in training. Perhaps the experimental task was relatively easy and led participants to plateau their performance at an early stage in training. Thus learning the putting task may not have been interesting and challenging enough for task-involved participants. It would be interesting to replicate these findings with the same putting task but with a smaller number of training putts, or by incorporating an incremental level of difficulty, for example by varying the distance from the hole. This may provide task-involved individuals with a more challenging opportunity for skill improvement through effort and it could increase their enjoyment.

In competition, the two goals interacted, such that high levels of both goals led to the highest levels of effort and enjoyment. In fact, under conditions of low task involvement, ego involvement was not associated with enjoyment and had a weaker relationship with effort. These findings suggest that in competition, ego involvement could be beneficial for effort and enjoyment as long as task involvement is maintained at a high level. The results also highlight the importance of task involvement for both effort and enjoyment in competition. That is, the positive effects of ego involvement on these variables in this context depend on one’s level of task involvement. If one derives feelings of success from improvement, effort, and task mastery, then using also normative criteria to evaluate one’s competence during competition could lead to the highest levels of effort and enjoyment in this context.

In both contexts, task and ego goals were unrelated to tension, a finding consistent with previous research that found that both goals were unrelated to anxiety (van de Pol & Kavussanu, 2012). In view of these findings, researchers may wish to examine the goals-tension relationship across the two contexts by considering the approach-avoidance dimension in mastery (i.e., task) and performance (i.e., ego) goals (e.g., Elliot & McGregor, 2001). Specifically, mastery-avoidance goals (i.e., striving to avoid absolute and/or intrapersonal incompetence) could be induced in training when individuals are worried of not attaining the required skills, while performance-avoidance goals (i.e., striving to avoid normative incompetence) could be induced in competition when individuals are worried of performing worse than others.

In competition, ego involvement predicted performance, supporting research that found performance-approach (i.e., ego) goals were positively related to sport performance (Stoeber & Crombie, 2010). In light of the change in goal involvement from training to competition and that only ego involvement predicted performance in competition, this may suggest that participants effectively varied their goal levels from training to competition. That only ego involvement predicted performance may indicate that when a task has been mastered—as occurred in training—a motivational focus on an ego goal in competition may benefit performance. Normative success in competition was clearly defined, providing ego-involved athletes with a clear performance standard to pursue, which may have facilitated their performance (cf. Senko & Harackiewicz, 2005).

Task involvement was unrelated to performance in both contexts. This finding is consistent with previous experimental work, which found that a task goal was unrelated to performance in a computer-simulated running task (Tenenbaum, Hall, Calcagnini, Lange, Freeman, & Lloyd, 2001). Tenenbaum et al. (2001) argued that instant benefits of a task goal on performance may be difficult to detect because
it may take more time before a focus on improvement and mastery translates into actual performance effects; this argument may also explain our findings. It is worth noting that task involvement in competition was a predictor of winning in this condition, and this effect was in addition to the effect of ego involvement on winning. This finding suggests that both achievement goals could enhance performance in competition.

Finally, perceived competence did not moderate the relationship between ego involvement and any of the outcomes in either context, a finding consistent with previous sport studies (e.g., Hodge et al., 2008; Morris & Kavussanu, 2009). This result may have occurred because, on average, our participants reported moderate-to-high perceived competence in both conditions (training: $M = 5.06$, $SD = 0.97$; competition: $M = 4.84$, $SD = 1.15$). Ego involvement is assumed to be detrimental (e.g., to motivation and performance) in individuals with low perceived competence (Nicholls, 1989); thus, it was not surprising that perceived competence did not moderate the link between ego involvement and outcomes in this study. Future research may examine this issue with participants who have more varied levels of perceived competence. It may be that such participants are more easily found in physical education (e.g., Standage et al., 2003) than in sport (e.g., Hodge et al., 2008).

**Limitations of the Study and Directions for Future Research**

Although our experiment revealed some interesting findings, these findings need to be interpreted in light of some limitations. First, we created a strong contrast between “skill development” training and “zero-sum” competition conditions, as these aspects are typical and distinctive features of training and competition, respectively. However, in reality, training and competition may vary in the extent to which they are distinct. For example, some training sessions may incorporate competitive drills, making this context less distinct from competition. Thus, our experimental condition only partly reflected actual training. Second, our task was derived from an individual sport; thus, our results can be generalized only to similar sports. Future studies could integrate cooperative elements in an experimental training and competition set up to resemble team sports.

Third, we measured achievement goals after training and competition for the reasons explained in a previous section. In the future, researchers could measure participants’ achievement goals before, during, and after each condition to determine whether goals measured at different time points similarly predict outcomes. Such a design could allow examination of whether potential fluctuations in goals affect motivational outcomes in each context. Fourth, although we found several different relationships between the two contexts (i.e., significant in one context but not in the other), these relationships were not significantly different between contexts. This may have been due to the relatively small sample size (Paternoster et al., 1998). Future studies could attempt to replicate the current findings using a larger sample size. Fifth, the present findings are specific to the laboratory setting; therefore, research is needed to test whether they hold up in the actual sport field. Finally, achievement goals and perceived motivational climate (i.e., the perceived situational goal structure operating in an achievement context; Ames, 1992) may interact with each other in predicting outcomes. Although such interactions were not revealed in a previous study, which examined this issue in the training and
competition contexts (van de Pol et al., 2012), future research could investigate whether athletes’ achievement goals and perceptions of the climate interact in predicting outcomes in a specific training or competition session.

Conclusion

Our findings indicate that individuals’ goal involvement may differ in training and competition, and this, in turn, may partly explain why important motivational outcomes, such as effort and enjoyment, may vary across the two contexts. Different relationships emerged between goals and outcomes within each context, suggesting that the context influences these relationships and the optimal goal to pursue may depend on the context. Thus, there is value in distinguishing between training and competition contexts when examining individuals’ achievement motivation.

Note

1. Research conducted in the education domain also indicates the value of examining contextual variation in achievement goals. For example, Muis and Edwards (2009) have shown that students’ achievement goals may vary across different contexts: Students reported higher performance (i.e., ego) goals and lower mastery (i.e., task) goals in an exam compared with a classroom assignment.

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