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Achievement Goals and Championship Performance: Predicting Absolute Performance and Qualification Success

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Abstract

Objectives: Research on athletes' achievement goals has suggested that the contrast between performance approach and performance avoidance goals (performance approach-avoidance contrast) is a significant predictor of sports performance. However, so far only two studies investigating triathletes found that performance approach-avoidance contrast predicted sports performance in competitions. The present study aims to replicate and expand on these findings with a diverse sample of track and field athletes.

Design: The study used a prospective correlational design controlling for athletes' previous performance (personal best).

Method: A sample of 161 track and field athletes competing at the 2008 Outdoor Athletic Championships of the British Universities Sports Association completed questionnaires indicating their personal best and their achievement goals before competing in the championships. Two measures of championship performance (absolute performance, qualification success) were obtained from the official records.

Results: Results showed that the performance approach-avoidance contrast in athletes' achievement goals predicted absolute performance and qualification success in the championships beyond what was predicted from athletes' personal best.

Conclusions: The findings corroborate previous findings that, when athletes pursue performance goals, the relative strength of athletes' motivational orientation (approach vs. avoidance) is critical for performance and competitive success.

Keywords: performance; mastery; achievement goals; motivation; approach; avoidance; competition; track and field athletics

Achievement Goals and Championship Performance: Predicting Absolute Performance and Qualification Success

Research on achievement goals has a long tradition in sport psychology, and the question of how achievement goals influence athletes' performance is of central interest for sport psychologists (Duda, 2005). Traditionally, achievement goal theory distinguished between only two goals (Ames & Archer, 1987; Dweck, 1986; Nicholls, 1984): mastery goals (also termed task goals or learning goals) and performance goals (also termed ego goals). At the end of the 1990s, however, a further distinction was introduced differentiating between approach and avoidance goals. This differentiation was first applied to performance goals (Elliot & Harackiewicz, 1996; Skaalvik, 1997) and later extended to mastery goals (Elliot & McGregor, 2001; Pintrich, 2000). As a result, achievement goal theory has now adopted a 2 × 2 framework that differentiates two dimensions: definition (performance vs. mastery) and valence (approach vs. avoidance) (Elliot & McGregor, 2001). With this, four achievement goals can be differentiated: performance approach, performance avoidance, mastery approach, and mastery avoidance goals. Performance approach goals represent the motivation to demonstrate normative competence (e.g., striving to do better than others), and performance avoidance goals represent the motivation to avoid demonstrating normative incompetence (e.g., striving to avoid doing worse than others). In contrast, mastery approach goals represent the motivation to achieve absolute or intrapersonal competence (e.g., striving to master a task), and mastery avoidance goals represent the motivation to avoid absolute or intrapersonal incompetence (e.g., striving to avoid doing worse than one has done previously) (Elliot & McGregor, 2001).

Sport psychology first saw the introduction of the 2 × 2 framework of achievement goals in 2003 when Conroy and colleagues published an instrument to measure the 2 × 2 achievement goals in athletes: the Achievement Goals Questionnaire for Sport (AGQ-S; Conroy, Elliot, & Hofer, 2003). Since then numerous studies have provided evidence of the usefulness of differentiating between approach and avoidance motivation when investigating how athletes'

performance and mastery goals are related to characteristics, processes, and outcomes that are of central interest to sport psychology such as fear of failure (Conroy, 2004; Conroy & Elliot, 2004), motivation and perceived competence (Morris & Kavussanu, 2008; Nien & Duda, 2008), and cognitive appraisals of competitive situations (Adie, Duda, & Ntoumanis, 2008).

Regarding sports performance, the comparison of performance approach goals and performance avoidance goals has been of particular interest. While both approach and avoidance performance goals have shown positive associations with fear of failure (Conroy, 2004; Conroy & Elliot, 2004), only performance approach goals have shown positive associations with perceived competence, extrinsic motivation, and challenge appraisals of competitive situations (Adie et al., 2008; Nien & Duda, 2008). In contrast, performance avoidance goals have shown positive associations with amotivation and negative associations with challenge appraisals in competitive situations (Adie et al., 2008; Nien & Duda, 2008). Consequently, athletes who pursue performance approach goals (rather than performance avoidance goals) should be more self-confident and more motivated in competitive situations, and thus should perform better in competitions compared to athletes who pursue performance avoidance goals (rather than performance approach goals).

Performance Approach and Avoidance Goals and Sport Performance

Whereas research in educational psychology has long gathered evidence that the differentiation between performance approach and performance avoidance goals is important when regarding how performance goals affect academic performance (see revised goal theory; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002), research in sport psychology only recently started to investigate how the two different performance goals affect sport performance. So far, only five studies have investigated how performance approach and performance avoidance goals affect sport performance: three studies investigating sport performance in training and practice (Chalabaev, Sarrazin, Stone, & Cury, 2008; Elliot, Cury, Fryer, & Huguet, 2006; Schantz & Conroy, 2009) and two studies investigating sport performance in competitions

(Stoeber, Uphill, & Hotham, 2009, Studies 1 and 2). Three of the five studies found significant effects of performance goals on performance (Elliot et al., 2006; Stoeber et al., 2009, Studies 1 and 2), whereas two did not (Chalabaev et al., 2008; Schantz & Conroy, 2009).

Regarding the two studies that found no significant effects, the first study (Chalabaev et al., 2008) investigated performance goals and training performance in female soccer players (N = 51) examining how players' goals influenced performance in a soccer dribbling task. Achievement goals were measured with the AGQ-S (Conroy et al., 2003). Neither performance approach nor performance avoidance goals showed significant correlations with performance. Moreover, the authors computed for each participant a difference score between the two goals (performance approach-avoidance contrast). However, this contrast too showed no significant correlation with performance. The second study (Schantz & Conroy, 2009) investigated performance goals and training performance in collegiate golfers (N = 25). Whereas performance approach and avoidance goals predicted changes in affect that golfers experienced over a round of golf, they did not predict performance.

Regarding the three studies that found significant effects, the first study (Elliot et al., 2006) investigated performance goals and training performance in physical education students (N = 101) examining how students' goals influenced their performance in a basketball dribbling task. The study employed an experimental design where students were randomly assigned to one of three goal conditions: a performance approach goal condition, a performance avoidance goal condition, or a mastery goal condition. Students were instructed to pursue the goal set in their respective goal condition when performing a basketball dribbling task. Results showed that, when contrasts between the groups were analyzed comparing the manipulated goal conditions, the contrast between the performance approach condition and the performance avoidance condition predicted students' dribbling performance: Students who pursued performance approach goals performed significantly better in the dribbling task than students who pursued performance avoidance goals.

The second and third study (Stoeber et al., 2009) investigated performance goals and competitive performance in triathletes (Study 1: $N = 112$; Study 2: $N = 321$) examining how performance approach and performance avoidance goals influenced triathletes' race performance. The first study investigated race performance over the half-Ironman distance (1.9 km swimming, 90 km cycling, 21 km running), and the second investigated race performance over the Olympic distance (1.5 km swimming, 40 km cycling, 10 km running). Both studies employed a prospective correlational design investigating naturally occurring individual differences in athletes' performance approach and performance avoidance goals for the race they had registered for. On the day before the race, athletes completed the AGQ-S (Conroy et al., 2003) to measure their 2 × 2 achievement goals for the next day's race. Moreover, athletes indicated their personal best and seasonal best which were used to control for differences in athletes' performance level. To contrast performance approach and performance avoidance goals, the difference between athletes' performance approach goals and performance avoidance goals was computed following previous studies (e.g., Chalabaev et al., 2008). When multiple regressions were conducted predicting race performance while controlling for athletes' performance level (seasonal best, personal best), results showed that the contrast between performance approach-goals and performance avoidance goals predicted athletes' race performance beyond their performance level.

The findings of Stoeber et al. (2009) indicate that athletes' approach-versus-avoidance orientation towards performance predicts athletes' performance in competitions. Athletes who are more oriented towards performing better than others (rather than towards not performing worse than others) are more likely to perform at levels beyond what can be expected from their personal best—and the greater this difference is, the better their competitive performance is. With this, the findings suggest that it was not so much the strength of the individual performance goals, but the difference in the strength of the goals (performance approach goals minus performance avoidance goals). This is similar to theoretical conceptualizations in

achievement motivation theory according to which it is not so much the strength of the individual achievement motives—hope for success (approach) and fear of failure (avoidance)—but the differences between the two motives (hope of success minus fear of failure) that is important. This difference, which Atkinson (1957) called "resultant motivation" and Heckhausen and Strang (1988) called "net hope," is critical in understanding people's achievement motivation and how the two motives influence people's effort and task performance.

Open Questions

Stoeber et al.'s (2009) findings indicate that the contrast between performance approach goals and performance avoidance goals predicts not only athletes' performance in training tasks (Elliot et al., 2006) but also athletes' performance in real-life competitions after controlling for athletes' previous performance level (personal best). However, a number of questions remain. First, performance level in triathlon is difficult to measure because triathlon races show considerable differences regarding distance (from the super sprint distance to the full "Ironman" distance), water type (swimming in a river, lake, or sea), terrain (running and cycling on a flat or hilly surface), and weather conditions (hot or cold, dry or rainy). Therefore, triathlon performance between different races cannot be directly compared and athletes' personal best can only be roughly estimated (e.g., by computing the average speed of athletes' personal best race; see Stoeber et al., 2009, for details). Second, triathlon is an endurance sport combining different disciplines in one race (swimming, cycling, running) and thus requires a unique combination of physical, mental, technical, and tactical skills to be successful in competitions. Thus it is unclear whether Stoeber et al.'s findings can be generalized to competitive performance in other sports. Consequently, it is important to replicate the findings in other sports.

The Present Research

The aim of the present research was to investigate whether the contrast between performance approach and performance avoidance goals would predict competitive performance in sports other than triathlon. To obtain a sufficiently large sample of athletes competing in

different sports, we investigated track and field athletes at a national championships meeting. From Stoeber et al.'s (2009) findings on competitive performance in triathlon, we expected that the contrast between performance approach goals and performance avoidance goals would predict athletes' championship performance beyond what could be expected from their personal best: The more athletes pursued performance approach goals relative to performance avoidance goals, the better we expected their championship performance to be.

Method

Participants and Procedure

A sample of 192 athletes (122 male, 70 female) was recruited at the 2008 Outdoor Athletics Championships of the British Universities Sports Association (BUSA)[1] which took place in Bedford, UK, on the weekend of 3-5 May 2008. Of those, 29 athletes (17 male, 12 female) had missing data for the central variables of the present study, and 2 athletes (both male) were identified as multivariate outliers (see *Preliminary Analyses* below). Consequently, the final sample consisted of $N = 161$ athletes (103 male, 58 female).

Athletes were on average 20.7 years old ($SD = 2.3$; range = 18-36 years) and had been active in their discipline for $M = 5.8$ years ($SD = 3.5$ years; range = 0-15 years). If competing in more than one event, athletes were asked to answer the questions with regard to the event of their main discipline only. The sample consisted of athletes taking part in the following disciplines (percentage of athletes in parentheses): 800 m (14%); 100 m and 400 m (13% each); 1500 m (11%); long jump (6%); 200 m, 5000 m, 400 m hurdles, and high jump (5% each); 10000 m and discus (4% each); 100/110 m hurdles, triple jump, javelin, and hammer (3% each); and 2000/3000 m steeplechase (2%).[2]

Questionnaires were distributed to athletes before they competed in the competition. Overall, 417 questionnaires were distributed of which 192 (46%) were returned. Participants, who returned completed questionnaires, entered a raffle to win one of two cash prices of £100 (at the time approx. US $200). The study was approved by the relevant ethics committee, and all

procedures followed the British Psychological Society's code of conduct and ethical guidelines (British Psychological Society, 2005).

Measures

Personal best. To measure athletes' performance level, athletes indicated their personal best in the main discipline they were competing in at the championships. For this, participants ticked the box next to the discipline they were competing in (e.g., "100 m," "10000 m," or "long jump") and then filled in their personal best in the spaces provided for this discipline (e.g., "___sec ___msec," "___min ___sec," or "___m ___cm").

Achievement goals. To measure the 2 × 2 achievement goals, we used the Achievement Goals Questionnaire for Sport (AGQ-S; Conroy et al., 2003). The AGQ-S has been used in numerous studies and has shown good reliability and validity (e.g., Conroy et al., 2003; Conroy, Kaye, & Coatsworth, 2006; Kaye, Conroy, & Fifer, 2008). It comprises four scales with three items each to capture performance approach goals (e.g., "It is important to me to perform better than others"), performance avoidance goals (e.g., "I just want to avoid performing worse than others"), mastery approach goals (e.g., "It is important to me to perform as well as I possibly can"), and mastery avoidance goals (e.g., "I worry that I may not perform as well as I possibly can"). All items were presented with the instruction stressing that participants respond to the items with respect to the main discipline they were competing in at the weekend. To emphasize this point, the heading "This weekend, …" was printed in boldface above the items. Athletes responded to the items on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). With Cronbach's alphas between .73 (mastery approach) and .91 (mastery avoidance), all scores displayed satisfactory reliability (Nunnally & Bernstein, 1994).

Championship performance. For each athlete, championship performance data were obtained from the official records of the meeting regarding two aspects of performance: absolute performance and qualification success. Absolute performance captured athletes' performance in the first competition of the championships weekend measured in min/s/ms for all running

competitions (e.g., 100 m, 10000 m) and m/cm for all jumping and throwing competitions (e.g., long jump, javelin). If the competition included one or more "heats" (qualification rounds), absolute performance was taken from the first heat to make performances comparable for all athletes. Qualification success, in comparison, was a dichotomous variable (coded as 1 = yes, 0 = no) and was only available for athletes whose competition included one or more heats. Qualification success captured whether an athlete qualified for the next round—the next heat (if there were two rounds of qualifications) or the final (if there was only one round)—or not. If the competition included more than one heat, qualification success was taken from the first heat.

Preliminary Analyses

IAAF points. To make track and field performance comparable across different disciplines, performance measures have to be converted to the same metric (Donovan & Williams, 2003). Therefore we converted athletes' absolute performance to points from the scoring tables of the International Association of Athletics Federations (IAAF points) using the scoring tables for outdoor competitions (Spiriev, 2008). Conversion to IAAF points makes absolute performance in different disciplines directly comparable. (As an example, consider three male athletes in an outdoor competition: one running the 100m in 10.92 s, one running the 10000 m in 29 min 29 s, and one jumping 7.40 m in the long jump. If we convert the three performances to IAAF points, all three performances convert to 1000 IAAF points.) The same conversion was applied to athletes' personal best. With this, personal best and absolute performance in the championships were on the same metric (IAAF points) and directly comparable between different athletes from different disciplines.

Data screening. Of the 192 athletes who returned questionnaires, 29 (15%) returned questionnaires with missing data or did not start so that no performance data were available. Consequently, complete data were available from 163 athletes. When investigating whether the achievement goals of athletes who provided complete data differed from those of athletes who did not provide complete data, the only significant difference was that athletes who provided

complete data had lower mastery avoidance goals (M = 4.80, SD = 1.53) than athletes who did not provide complete data (M = 5.41, SD = 0.92), $t(188) = 2.00$, $p < .05$.

Multivariate outliers. Because multivariate outliers can significantly distort the results of correlation and regression analyses, we inspected the data for multivariate outliers. Two male athletes showed a Mahalanobis distance greater than the critical value of $\chi^2(6) = 22.46$, $p < .001$ (see Tabachnick & Fidell, 2007) and were excluded from the analyses.

Gender. To examine whether the variance–covariance matrices differed between male and female participants, we computed a Box's M test. Because this test is highly sensitive, differences are tested against a $p < .001$ significance level (Tabachnick & Fidell, 2007). Box's M was nonsignificant with M = 46.21, $F(28, 27877) = 1.54$, $p = .033$. Consequently, data were collapsed across gender.

Contrast scores. To measure the contrast between performance approach and performance avoidance goals (in short: performance approach-avoidance contrast), we computed difference scores between performance approach and performance avoidance goals scores (performance approach-avoidance contrast = standardized performance approach goals – standardized performance avoidance goals) which is the standard procedure to investigate the contrast between performance approach and performance avoidance goals (see Chalabaev et al., 2008; Cury, Da Fonseca, Rufo, Peres, & Sarrazin, 2003; Cury, Elliot, Sarrazin, Da Fonseca, & Rufo, 2002; Stoeber et al., 2009). Note that computing difference scores is comparable to effect-coding the two performance goals, giving performance approach goals a weight of +1 and performance avoidance goals a weight of –1. Moreover, using standardized scores when computing difference scores gives both performance goals equal weight, as is reflected in the correlations of the resulting contrast scores with the performance goals (see Table 1, r[performance approach-avoidance contrast, performance approach goals] and r[performance approach-avoidance contrast, performance avoidance goals]). Finally we computed descriptive statistics for all variables (see Table 1).

Analytic Strategy

To investigate our hypotheses, we first computed bivariate correlations between personal best, achievement goals, and championship performance (absolute performance, qualification success). In addition, we computed partial correlations between the achievement goals and championship performance (absolute performance, qualification success) to investigate the relationships of the achievement goals with championship performance, once the influence of prior performance (personal best) was removed. Next, two regression analyses were computed: one predicting absolute performance in the championships, and one predicting qualification success in the championships. To predict absolute performance (which is a continuous variable: IAAF points), a hierarchical multiple regression was computed. To predict qualification success (which is a dichotomous variable: 1 = yes, 0 = no), a sequential logistic regression was computed (see Hair, Black, Babin, Anderson, & Tatham, 2006; Tabachnick & Fidell, 2007). Both regression analyses comprised two steps. In Step 1, we entered personal best as a predictor. In Step 2, we entered performance approach-avoidance contrast as a predictor to investigate if the performance approach-avoidance contrast explained additional variance in championship performance (absolute performance, qualification success) beyond the variance already explained by athletes' personal best. To provide for greater precision in the interpretation of the results (particularly regarding small changes in R^2), all regression coefficients are reported to three decimals.

Results

Correlations

Table 1 shows the bivariate correlations between all variables. Corroborating previous findings (Stoeber et al., 2009), athletes' personal best showed positive correlations with performance approach goals and mastery approach goals. Moreover, as was expected, personal best showed positive correlations with performance approach-avoidance contrast. Finally, performance approach goals and mastery approach goals showed a positive correlation with both

indicators of championship performance (absolute performance, qualification success), as did performance approach-avoidance contrast.

Regarding these correlations, it is important to note that personal best showed high positive correlations with both indicators of championship performance, particularly absolute performance (see Table 1). These high correlations indicate that championship performance of young track and field athletes is largely determined by athletes' previous best: athletes who have achieved high absolute performance in the past (personal best) are likely to achieve high absolute performance in competitions and—if they have to go through qualifications (heats)—to qualify for the next round. Consequently, the critical test for our hypotheses was whether performance approach-avoidance contrast predicted championship performance over and above athletes' personal best.

Table 2 shows the partial correlations of the four achievement goals and performance approach-avoidance contrast with championship performance, controlling for personal best. In line with the previous findings (Elliot et al., 2006; Stoeber et al., 2009), only the performance avoidance-approach contrast showed significant correlations with both indicators of championship performance (absolute performance and qualification success) once the influence of previous performance was controlled for. In addition, performance avoidance goals showed a significant negative correlation, but only with absolute performance.

Regression Analyses

Predicting absolute performance. Next, the hierarchical multiple regression predicting absolute performance in the championships was computed (see Table 3). In Step 1, personal best was entered predicting 78.1% of variance in absolute performance. In Step 2, performance approach-avoidance contrast was added making a significant contribution to the prediction of absolute performance and predicting a further 0.8% variance in absolute performance. Confirming our hypotheses, performance approach-avoidance contrast predicted absolute

performance in the championships beyond what was predicted from athletes' previous performance level (personal best).

To better understand the results of the regression analysis, an inspection of the unstandardized regression weights (*B*s) of the final model is informative (see Table 3, Step 2). When personal best and performance approach-avoidance contrast were simultaneously considered as predictors of absolute performance, personal best showed an unstandardized regression weight of 0.864, meaning that a 1-unit difference in athletes' personal best predicted a 0.864-unit difference in their championship performance. Put differently, an athlete whose personal best was 1 IAAF point higher than that of another athlete achieved on average an absolute performance in the championships that was 0.864 IAAF points higher that of the other athlete. In comparison, performance approach-avoidance contrast showed an unstandardized regression weight of 16.462, meaning that a 1-unit difference in athletes' performance approach-avoidance contrast predicted a 16.462-unit difference in their championship performance. Put another way, an athlete whose performance approach-avoidance contrast was 1 unit higher than that of another athlete achieved on average an absolute performance that was 16.462 IAAF points higher than that of the other athlete.

A 1-unit difference in personal best corresponds to 1 IAAF point and thus can be understood by simply looking at the respective IAAF tables (Spiriev, 2008). But how should we understand a 1-unit difference in performance approach-avoidance contrast? Performance approach-avoidance contrast is the difference between standardized performance approach goal scores and standardized performance avoidance goal scores (see Preliminary Analyses). To give an example, a 1-unit difference in performance approach-avoidance contrast between two athletes would result if one athlete (Athlete A) had performance approach goals that were 1 standard deviation higher than his or her performance avoidance goals (difference = +1 *SD*) whereas the other athlete (Athlete B) had equally high performance approach and performance avoidance goals (difference = ±0 *SD*). With this the results of the regression analysis would

mean that we would expect, on average and after controlling for differences in personal best, Athlete A to achieve an absolute performance in the championships that was 16.462 IAAF points higher than the absolute performance of Athlete B.

Predicting qualification success. Next, the sequential logistic regression predicting qualification success was computed (see Table 4). In logistic regression, the first model (Step 1) is evaluated against a baseline model (see Hair et al., 2006; Tabachnick & Fidell, 2007). In general, baseline models predict that all cases have a value of zero for the dichotomous criterion variable. In the present case, the baseline model predicted that all athletes would not qualify (qualification success = 0). This baseline model correctly classified 88 of the 141 athletes (62.4%): 88 (100%) of the 88 athletes who did not qualify, and none (0%) of the 53 athletes who qualified. When personal best was entered in Step 1, this significantly increased the prediction of qualification success compared to the baseline model. Now 111 of the 141 athletes (78.7%) were correctly classified: 74 (84.1%) of the 88 athletes who did not qualify and 37 (69.8%) of the 53 athletes who qualified. In Step 2, performance approach-avoidance contrast was added making a further significant improvement of model fit and classification. When this contrast was included, 114 of the 141 athletes (80.9%) were classified correctly: 77 (87.5%) of the 88 athletes who did not qualify and 37 (69.8%) of the 53 athletes who qualified. Confirming our hypotheses, performance approach-avoidance contrast predicted qualification success in the championships beyond what was expected from athletes' previous performance level (personal best).

Again, an inspection of the final model (see Table 4, Step 2) is informative. However, in logistic regression, it is most informative to examine the odds ratios (not the unstandardized regression weights). It is often easier to understand odds ratios after transforming them to percentages. For this, one subtracts 1.0 from the odds ratio and then multiplies the result by 100 (see Hair et al., 2006; Tabachnick & Fidell, 2007). This gives the percentage by which the chances increase (if odds ratio > 1.0) or decrease (if odds ratio < 1.0) for achieving qualification success. Table 4 shows that, when personal best and performance approach-avoidance contrast

were predictors of qualification success (Step 2), personal best had an odds ratio of 1.018 meaning that a 1-unit difference for personal best (IAAF points) predicted a 1.8% higher chance to qualify. In other words, an athlete whose personal best was 1 IAAF point higher than the personal best of another athlete had on average a 1.8% higher chance to qualify in the first heat of the championships. In comparison, performance approach-avoidance contrast in Step 2 had an odds ratio of 1.960 meaning that an athlete whose performance approach-avoidance contrast was one unit higher than that of another athlete (cf., e.g., Athlete A and Athlete B in our example above) had, on average and controlling for differences in personal best, a 96.0% higher chance to qualify in the first heat of the championships.

Ancillary Analyses

To complement the analyses, a series of regression analyses was conducted to examine whether other combinations of achievement goals predicted performance when entered in Step 2 of the regression analyses. In particular, we examined four combinations: (a) performance approach and performance avoidance goals entered separately (i.e., not as a contrast), (b) mastery approach-avoidance contrast (i.e., the difference between standardized mastery approach and mastery avoidance goals), (c) mastery approach and mastery avoidance goals entered separately (i.e., not as a contrast), and (d) all 2 × 2 achievement goals. Only the first combination yielded significant results, corroborating the findings from the analyses that used the performance approach-avoidance contrast. Entering performance approach and performance avoidance goals separately in Step 2 of the regression analysis predicting absolute performance, made an overall significant contribution to explain performance ($\Delta R^2 = .009$, $p < .05$). However, when the regression coefficient of the individual goals were inspected, only performance avoidance goals showed a significant coefficient ($B = –19.375$, $SE\ B = 7.517$, $\beta = –.117$, $p < .05$), but not performance approach goals ($B = 12.288$, $SE\ B = 8.100$, $\beta = .074$, $p = .131$). Entering the two goals separately in Step 2 of the regression analysis predicting qualification success made an overall significant contribution (–2 log-likelihood change = 6.025, $p < .05$) correctly classifying

81.6% of the athletes. Moreover, both goals showed a significant regression coefficient: performance approach goals ($B = 0.737$, $SE\ B = 0.350$, odds ratio = 2.089, $p < .05$) and performance avoidance goals ($B = –0.638$, $SE\ B = 0.306$, odds ratio = 0.528, $p < .05$).

Finally, we examined whether the effects of performance approach-avoidance contrast shown in Tables 3 and 4 were moderated by discipline, that is, whether the effects were different for athletes competing in different track and field disciplines (see Participants section). For this, we first dummy-coded the disciplines and then computed moderated regression analyses (Aiken & West, 1991) including the disciplines and the interactions of disciplines and performance approach-avoidance contrast as predictors. None of the interactions was significant. This suggests that the effects of performance approach-avoidance contrast shown in Tables 3 and 4 are generalizable across different track and field disciplines.

Discussion

The present study examined whether competitive athletes' achievement goals predicted championship performance beyond what could be predicted from their personal best. From previous findings on achievement goals and performance in sports (Elliot et al., 2006; Stoeber et al., 2009), it was expected that athletes' performance approach-avoidance contrast (i.e., the contrast between athletes' performance approach goals and their performance avoidance goals) would predict championship performance. To investigate a large sample of athletes in different disciplines, the study investigated track and field athletes competing in the 2008 Outdoor Athletics Championships of the British Universities Sports Association (BUSA). Confirming our hypotheses, performance approach-avoidance contrast predicted championship performance beyond what was predicted from athletes' personal best. Athletes who showed a more positive performance approach-avoidance contrast showed a higher absolute performance and higher qualification success in the championships than athletes who showed a less positive performance approach-avoidance contrast.

The present findings have important implications for theory and research on achievement goals in sport and beyond. First, they provide further evidence in support of revised goal theory (Elliot & Harackiewicz, 1996; Harackiewicz et al., 2002) stressing the importance of differentiating between performance approach and performance avoidance goals when investigating how achievement goals are related to performance. Second, they provide further evidence that this differentiation is important not only for educational psychology and research on academic performance (Harackiewicz et al., 2002), but also for sport psychology and research on sport performance. Third, regarding sport performance, the present findings corroborate previous findings that it is the contrast between performance approach goals and performance avoidance goals (or, in short, performance approach-avoidance contrast) that plays a critical role when predicting athletes' performance in training (Elliot et al., 2006) and in competitions (Stoeber et al., 2009). Further, by replicating Stoeber et al.'s (2009) findings in a large sample of track and field athletes, the present findings show that this effect is not restricted to triathlon, but also applies to track and field athletics and appears to generalize across different disciplines. With this, the findings indicate that, across different sports and events, higher competitive performance can be achieved when athletes' performance goals are oriented towards trying to perform better than others (approach) to a higher degree than towards trying to not perform worse than others (avoidance). And the higher their "net approach orientation" (i.e., the difference between approach and avoidance) in pursuing performance goals in competitions, the higher competitive performance can be expected.

The distinction between approach and avoidance is a fundamental distinction in the history of achievement motivation research (Elliot, 2005). But why do performance approach and performance avoidance goals have such different consequences for competitive performance? Performance avoidance goals have been shown to undermine intrinsic motivation relative to performance approach goals (Cury et al., 2002). Moreover, the two goals are associated with different appraisals. According to Elliot and Harckiewicz (1996), people perceive

achievement settings as a challenge when approach-oriented in pursuing performance goals, whereas they perceive these settings as a threat when avoidance-oriented in pursuing performance goals (see also Chalabaev, Major, Cury, & Sarrazin, 2009). Challenge and threat appraisals may have significant effects on people's affective, cognitive, and behavioral reactions to achievements situations (Lazarus & Folkman, 19894). When perceiving an achievement setting as a threat, people feel that they are lacking the resources (e.g., knowledge, skills, experience, physical fitness) that are necessary to successfully deal with the situation. They think they are not competent and consequently feel anxious which has negative effects on task involvement and concentration and impedes performance. By contrast, when perceiving achievement settings as a challenge, people feel that they have the necessary resources to successfully deal with the situation. They think they are competent and consequently feel self-confident, which has positive effects on task involvement, concentration, and competitive performance (e.g., Craft, Magyar, Becker, & Feltz, 2003; Elliot & Harackiewicz, 1996).

However, some points are worth noting. Whereas the present study replicates and expands on the three previous studies that found performance approach-avoidance contrast to predict sport performance (Elliot et al., 2006; Stoeber et al., 2009, Studies 1 and 2), the present study's effects of performance approach-avoidance contrast on championship performance (absolute performance, qualification success), while significant, were small compared to the effects of athletes' performance level (personal best). Athletes' personal best explained most of the variance in athletes' championship performance regarding both absolute performance (times, distances, heights) and qualification success. With this, the present findings differ markedly from Stoeber et al.'s (2009) findings in which performance approach avoidance contrast had considerably larger effects on triathletes' race performance. Regarding the differences in effect size, however, it is important to note that triathlon races show great variations in distance, terrain, and weather conditions. Consequently, triathletes' performance level (personal best) can only be roughly estimated by calculating average speeds for swimming, cycling, and running in

the race the triathletes consider their personal best (see Stoeber et al., 2009, for details). Therefore, it is conceivable that personal best was a weaker predictor of competitive performance regarding triathlon race performance (and left considerably more variance in race performance for achievement goals to explain) in Stoeber et al.'s study than in the present study in which personal best was a strong predictor regarding athletics championship performance (and left little variance in competitive performance for achievement goals to explain).

Moreover, the present study cannot explain why two other previous studies (Chalabaev et al., 2008; Schantz & Conroy, 2009) did not find that performance approach and performance avoidance goals had significant effects on performance. However, one possibility is that the studies, both of which investigated relatively small samples (N = 51 and N = 25, respectively), may have lacked the necessary statistical power to detect smaller effects (cf. Cohen, 1992; Maxwell, 2004).[3] As the present study shows, the effects of performance approach and performance avoidance goals and their contrast may be relatively small when athletes' performance level (e.g., personal best) is taken into account. Thus future studies investigating how achievement goals influence sports performance may be advised to work with sample sizes that are large enough to provide sufficient statistical power to detect smaller effects.

Whereas the present study investigated a sufficiently large sample, the study had other limitations. First, our data screening procedures showed that the athletes we excluded from the analyses (i.e., athletes who either did not complete all questionnaires or did not start at their competition) had higher mastery avoidance goals than those athletes on whom the present findings are based (athletes who both completed the questionnaire and started at their competition). Consequently, the present findings may be restricted to athletes with lower levels of mastery avoidance goals. The present findings may also not generalize to competitive performance in team sports. A study on achievement goals in competitive soccer players found that players' performance goals had negative effects on team cohesion such that players who strongly endorsed performance goals experienced less companionship and more conflict than

players who did not endorse performance goals so strongly (Ommundsen, Roberts, Lemyre, & Miller, 2005). Conflict and lack of companionship may severely impair a team's competitive performance. Consequently, future studies need to show that performance goals, and particularly performance approach-avoidance contrast, also predict performance of athletes competing in team sports.

Second, Elliot and Murayama (2008) recently identified a number of potential problems with the measurement of achievement goals in educational settings when using the Achievement Goals Questionnaire (AGQ; Elliot and McGregor, 2001). Because the items of the AGS-S (Conroy et al., 2003), which was used in present study to measure achievement goals, were adapted from the AGQ, they may show the same potential problems as the ACQ items such as (a) suggesting a value rather than a goal per se (e.g., "It is important to me to perform better than others"), (b) measuring affective content rather than goals (e.g., "Sometimes I am afraid that I may not perform as well as I like"), and (c) focusing on extreme groups that may not be relevant for all athletes (e.g., "It is important for me to avoid being one of the worst performers"). A revision of the AGQ that avoids these problems is available (see Elliot & Murayama, 2008), but a revision of the AGQ-S is still in preparation (David E. Conroy, personal communication, 21 November 2009) and thus was unavailable for use in the present study. Once the revised version is available, it may be important to examine if the present findings can be reproduced with a revised AGQ-S's improved measurement of the 2 × 2 achievement goals in sports.

Finally, the present study did not include measures of perceived competence, competence valuation, or practice time. Perceived competence has been shown to predict achievement goals in educational settings (Cury, Elliot, Da Fonseca, & Moller, 2006) and to moderate the relationships of achievement goals in sports (Wang, Liu, Lochbaum, & Stevenson, 2009). Furthermore, Elliot and colleagues (2006) found, when contrasting performance approach and performance avoidance goals, that the performance approach-avoidance contrast predicted differences in students' competence valuation (how much students cared about how they did on

the course) and practice time (how time they spent practicing the dribbling task before their dribbling performance was tested): Students who were told to pursue performance approach goals valued competence more highly and practiced the task for longer when contrasted to students who were told to pursue approach avoidance goals. Moreover, the positive effect that the performance approach-avoidance contrast had on basketball dribbling performance was fully mediated by competence valuation and practice time. Consequently, future studies on achievement goals and competitive performance should include measures of perceived competence, competence valuation, and practice time to examine what role these variables may play in the achievement goals–performance relationship.

Despite these limitations, the present findings have important implications for theory and research on achievement goals and performance in sport. They confirm that athletes' performance approach and performance avoidance goals play a critical role in athletes' competitive performance and significantly contribute to athletes' competitive success or failure. Moreover, the findings have practical implications for competitive athletes, coaches, and sport psychologists providing psychological services to coaches and athletes, because the findings indicate that athletes should adopt a positive, approach-oriented mindset in their performance goals before an upcoming competition. Athletes who focus on beating their competitors, rather than focusing on not being beaten, are more likely to achieve that "extra bit" of performance that makes all the difference. And this extra bit should not be underestimated because in athletics, it is the small differences (milliseconds and centimeters) that determine who wins the gold.

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Footnotes

[1]Now called British Universities & Colleges Sport (BUCS).

[2]The 100 m hurdles and 2000 m steeplechase were for female athletes only, with the corresponding 110 m hurdles and 3000 m steeplechase for male athletes only. Note that percentages may not sum to 100% because of rounding errors.

[3]Note, however, that Schantz and Conroy's (2008) study employed a multilevel design measuring golfers' goals and performance repeatedly over the course of a 18-hole round of golf. Consequently, standard power calculations may not apply (Snijders, 2005). In addition, Schantz and Conroy did not investigate the effects of the *contrast* between performance approach and performance avoidance goals, only the effects of the individual goals.

Table 1

Descriptive Statistics and Bivariate Correlations

Variable	*M*	*SD*	Correlation						
			1	2	3	4	5	6	7
1. Personal best	804.82	164.32							
Achievement goals									
2. Mastery approach	5.77	0.98	.32***						
3. Mastery avoidance	4.81	1.53	.02	.28***					
4. Performance approach	4.43	1.40	.38***	.39***	.29***				
5. Performance avoidance	3.88	1.49	.08	.06	.55***	.57***			
6. Performance approach-avoidance contrast	0.00	0.93	.32***	.35***	–.28***	.46***	–.46***		
Championship performance									
7. Absolute performance	709.48	166.28	.88***	.31***	–.02	.34***	.00	.37***	
8. Qualification success[a]	0.38	—	.60***	.23**	–.06	.35**	–.02	.38***	.65***

Note. $N = 161$. Personal best and absolute performance = IAAF points (Spiriev, 2008). Qualification success = dichotomous variable (1 = yes, 0 = no). Achievement goals were measured on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Performance approach-avoidance contrast = z(performance approach) – z(performance avoidance).

[a] $n = 141$. The mean of 0.38 indicates that 38% of the sample achieved qualification success.

*$p < .05$, **$p < .01$, ***$p < .001$, two-tailed.

Table 2

Achievement Goals and Championship Performance: Partial Correlations Controlling for Personal Best

Achievement goals	Absolute performance	Qualification success
Mastery approach	.05	.07
Mastery avoidance	–.08	–.08
Performance approach	.00	.14
Performance avoidance	–.16*	–.09
Performance approach-avoidance contrast	.19*	.24**

Note. N = 161 (absolute performance), n = 141 (qualification success). Personal best and absolute performance = IAAF points (Spiriev, 2008). Qualification success = dichotomous variable (1 = yes, 0 = no). Performance approach-avoidance contrast = z(performance approach) – z(performance avoidance).

*p < .05, **p < .01, two-tailed.

Table 3

Summary of Multiple Regression Predicting Championship Performance: Absolute Performance

Criterion: Absolute performance	*B*	*SE B*	β	R^2	ΔR^2
Step 1				.781***	.781***
Personal best	0.894	0.038	.880***		
Step 2				.789***	.008*
Personal best	0.864	0.039	.854***		
Performance approach-avoidance contrast	16.462	6.918	.092*		

Note. $N = 161$. Personal best and absolute performance = IAAF points (Spiriev, 2008). Significance levels for *B* are the same as those for β.

*$p < .05$, ***$p < .001$, two-tailed.

Table 4

Summary of Logistic Regression Predicting Championship Performance: Qualification Success

Criterion: Qualification success	*B*	*SE B*	Odds ratio	R^2_N	–2 LL	Change	% correctly classified[a]
Step 1				.558	112.382***	74.306***	78.7
Personal best	0.019	0.003	1.019***				
Step 2				.591	106.460***	5.922*	80.9
Personal best	0.018	0.003	1.018***				
Performance approach-avoidance contrast	0.673	0.288	1.960*				

Note. $N = 141$. Personal best = IAAF points (Spiriev, 2008). Qualification success = dichotomous variable (1 = yes, 0 = no). Significance levels for *B* are the same as those for odds ratio. R^2_N = Nagelkerke R^2 ("pseudo R^2"). –2 LL = –2 log-likelihood. Change = $\chi^2(1)$ value of difference comparing fit (–2 LL) of prediction model in Step 1 with fit of baseline model (Step 1) and fit of prediction model in Step 2 with fit of prediction model in Step 1 (see Hair et al., 2006, Chap. 5, and Tabachnick & Fidell, 2007, Chap. 10, for details).

[a]Baseline model: 62.4% correctly classified.

*$p < .05$, ***$p < .001$, two-tailed.