

An Athletes' Approach to their Goals: The 3 x 2 Achievement Goal Framework

and its Association with Mindsets and Perceived Competence

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Abstract

Challenging situations are all around, but how do we find purpose and reason for engaging in these situations? The present study assumes that athletes' mindsets, or the extent to which they believe they can improve their qualities by training and hard work, are related to the standards they use to evaluate their performances. In the 3 x 2 achievement goal model (Elliot et al., 2011) this relationship is, to date, unknown in the sport setting. From the perspective of the 3 x 2 achievement goal model, this thesis examines the links between athletes' growth and fixed mindsets and their achievement goals, moderated by their perceived competence. Competitive athletes (105 tennis, padel, badminton, and squash players) completed an online questionnaire, distributed through on- and offline networks. As predicted, the results showed links between fixed mindset and other-based goals, and between growth mindset and task-approach goals. Unexpectedly, links were observed between fixed-mindset and task-based goals and self-avoidance goals, and perceived competence did not function as a moderator. Further research is needed to expand the knowledge about the role of mindsets in the 3 x 2 achievement goals.

Keywords: Mindset, Achievement Goals, Perceived Competence, Sports, 3 x 2 Model

Athletes Approach to (or Avoidance of) Their Goals: The 3 x 2 Achievement Goal Framework and its Associations with Mindsets and Perceived Competence

"The mindset of an athlete hungry for a challenge is a winning mindset. It is the mindset of success as opposed to a mindset driven by the fear of failing" (Karamovic, 2019, Introduction). Emma Karamovic, a professional basketball athlete, emphasizes the importance of how achievement situations should be approached in her blog. People differ greatly, not only in approach but also in which achievement situations they choose to engage in. Additionally, individuals differ in how they experience and interpret situations. This is because people have different reasons and purposes for engaging in competence-relevant behavior, which directs them towards or away from an achievement situation. These reasons and purposes come from having achievement goals (Elliot & Hulleman, 2017). Achievement goals in sports has been researched repeatedly using the dichotomous (Martin & Elliot, 2016), trichotomous (Elliot & Harackiewicz, 1996), and 2 x 2 achievement goal models (Elliot, 1999). Most recently, the 2 x 2 achievement goal model has been extended into the 3 x 2 achievement goal model in some domains, including sports (Elliot et al., 2011; Mascret et al., 2015, 2017). This extension facilitates a more nuanced view of achievement goals, which is suitable for research. However, extensive attention has not yet been paid to the new achievement goal model in the sports setting, specifically the relationship between mindsets and achievement goals. This relationship is essential, because the adoption of a different mindset increases the likelihood of an athlete endorsing a different achievement goal (Dweck, 1999; Elliott & Dweck, 1988). Thus, mindsets play a key role in the practical implications of the 3 x 2 achievement goal model, and therefore, the effect of mindsets in this model must be explored.

Relying on Dweck's (1986) approach to mindsets and the 3 x 2 achievement goal framework (Elliot et al., 2011), the current research aims to examine how athletes' mindsets

are related to their achievement goals. This leads to the research question: How is an athlete's mindset related to the 3 x 2 achievement goal framework? The second aim of this research is to examine the role of perceived competence in the relationship between athletes' mindsets and achievement goals. We will first discuss the 3 x 2 achievement goals framework, followed by how athletes' mindsets are associated with their achievement goals. Finally, we will discuss how perceived competence may change this relationship.

The 3 x 2 Achievement Goal Framework

Individuals have a basic need in life to feel competent (Ryan & Deci, 2017). But when do people feel competent? According to the achievement goal approach (Ames, 1992; Lüftenegger et al., 2016), an achievement goal is a cognitive representation of what lies in the future. An achievement goal produces the intentions of behavior and guides behavior towards a desired or away from an undesired outcome. This outcome is a competence-based possibility (Elliot et al., 2011) and gives individuals reason and purpose for engaging in competence-relevant behavior (Elliot & Hulleman, 2017; Lüftenegger et al., 2016; Moskowitz & Grant, 2009). Thus, an achievement goal defines the standard of competence in the evaluation of performance.

Originally, two goals were defined in the dichotomous achievement goals model (Dweck, 1986; Dweck & Leggett, 1988; Martin & Elliot, 2016): mastery goals, which are focused on the intrapersonal or absolute standards of competence, and performance goals, which are focused on the interpersonal or normative standards of competence. Thus, in performance goals, the purpose is to demonstrate competence, while in mastery goals, the aim is to develop competence and master tasks (Elliot et al., 2011; Senko et al., 2011). This definition shows that there are two aspects to mastery goals: tasks and development. Elliot et al. (2011) explained that these two aspects can be blended on occasion because mastering a new task and developing skills can produce the same result. Nevertheless, the two aspects

must oftentimes be viewed separately when the focus is solely on mastering a task without specifically aiming to improve one's skill and vice versa. Furthermore, improving one's skill is more cognitively demanding than mastering a task. When the focus is on mastering a task, one can simply try to meet the requirements of the task. However, when focused on developing an intrapersonal standard, one must define the desirable outcome in relation to the current level of competence. Thus, the intrapersonal standard requires an athlete to cognitively represent abstract information about one's current ability. The distinct differences between intrapersonal and absolute goals call for a model which splits up mastery goals.

Based on the reasoning above, Elliot et al. (2011) created the 3 x 2 achievement goal framework. Here, mastery goals are split into two separate achievement goals: self-based and task-based. In the 3 x 2 achievement goal framework three achievement goals can be defined: task-based, self-based, and other-based goals. Self-based goals are evaluated intrapersonally and define competence relative to one's trajectory (Elliot et al., 2011; Mascret et al., 2015). Task-based goals are evaluated based on absolute standards and define competence relative to the requirements of the task. Lastly, other-based goals remain the same as performance goals. Here, competence is evaluated interpersonally, which means that other-based goals are defined as receiving favorable judgments of one's competence or avoiding negative judgment.

Indeed, one can strive to meet the standard they set by directing behavior towards a desirable or positive outcome (Elliot, 1999), or behavior can be directed away from an undesirable or negative outcome with the objective of avoiding not meeting the standard. With the definition dimension of competence, this adds a second dimension to how competence is differentiated: how competence is valenced (Elliot & McGregor, 2001). Accordingly, striving to meet the set standard is called an approach goal, while working to avoid not meeting the standard is an avoidance goal. Both ways have different effects on behavior (Elliot, 1999; Elliot & Church, 1997; Elliot & Harackiewicz, 1996). Thus, approach

goals are related to the regulation of effort and other positive and negative behaviors (Cury et al., 2002; Elliot, 1999), while avoidance goals activate self-protective behavior, which interferes with task engagement (Elliot & Harackiewicz, 1996), and other maladaptive outcomes (Elliot, 1999).

Combining the definition dimension with the valence dimension results in six different achievement goals. Elliot et al. (2011) encapsulated these achievement goals in the 3 x 2 achievement goal model, presented in Table 1. The achievement goals are defined as follows. A self-approach goal focuses on the attainment of self-based competence, and a selfavoidance goal concentrates on avoiding self-based incompetence. Meanwhile, a taskapproach goal emphasizes the attainment of task-based competence, and a task-avoidance goal focuses on avoiding task-based incompetence. Finally, an other-approach goal concentrates on the attainment of other-based competence, and an other-avoidance goal emphasizes avoiding other-based incompetence. Since the 3 x 2 achievement goal model is relatively new, little research has been done on it. However, in the existing research, which is mostly based on academical domains, there are relatively consistent findings concerning the fit of this model to the data. The 3 x 2 achievement goal model explains more variance than previous achievement goal models (Dweck, 1986; Elliot et al., 2011; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001; Lüftenegger et al., 2016; Mascret et al., 2015, 2017; Wu, 2012) and more accurately defines achievement goals (Wu, 2012). This suggests that the model's framework is more complete than other goal models.

Mindsets and achievement goals

The standards people use to evaluate their competence and decide which achievement goals to adopt are determined by their perceived source of competence. This is the mindset. Dweck et al. (1995a) described how people have implicit theories, or assumptions about themselves and the world around them. Implicit theories, or mindsets, give meaning to events and foster judgments and behavioral reactions. Thus, mindsets determine what individuals use as a standard to evaluate competence and have different consequences for the evaluation of competence. There are two attributes people can have: fixed or malleable. In the fixed attribute, also called entity theory or fixed mindset, traits are seen as innate and unchangeable (Burgoyne et al., 2020; Dweck et al., 1995a, 2017). In the malleable attribute, also called incremental theory or growth mindset, traits are perceived as changeable and able to be developed or learned. In this study, the terms fixed mindset and growth mindset will be used.

Moving beyond theory, Biddle et al. (2003) saw that individuals with fixed mindsets believe that athletic ability is static, while those with growth mindsets considered athletic ability to be a developmental trait, increased by effort. Furthermore, Butler (2000) found that high school pupils with fixed mindsets focused on initial performance while evaluating other pupils' competence, even if their performance increased over time. In contrast, pupils with a growth mindset appreciated the progress that other pupils made and reported increasing appraisals of competence. Similar effects were found in an organizational context by Heslin et al. (2005). These findings can be explained by the impact a mindset has, which is that it attracts certain achievement goals (Dweck et al., 2017). A mindset that is fixed resorts to the validation of competence to feel competent. It involves the belief that competence is static, and thus, a positive self-concept is outcome-dependent, rather than focused on the process of learning (Shaffer et al., 2015). Here, the only way to feel competent is by demonstrating their competence to others through other-based goals (Dweck, 1986).

In research, the link between a fixed mindset and other-approach or other-avoidance goals is consistently supported (Corrion et al., 2010; Cury et al., 2002; Gardner et al., 2017; Mascret et al., 2015; Stevenson & Lochbaum, 2008). Individuals with a fixed mindset are either focused on demonstrating competence or avoiding demonstrating incompetence; the latter would negatively affect their feeling of competence. Therefore, assignments must be within their abilities to ensure success which can be approached with other-approach goals. Additionally, they will try to outperform others using other-approach goals and with minimal effort, because effort is a sign of incompetence. Therefore, challenges tend to be avoided within the fixed mindset (Dweck & Leggett, 1988) and thus are individuals with this mindset expected to also use other-avoidance goals. This leads to Hypothesis 1:

- (a) A fixed mindset has a positive relationship with other-approach goals.
- (b) A fixed mindset has a positive relationship with other-avoidance goals.

Alternatively, when traits are perceived as malleable, one focuses on the acquisition of competence through learning the necessary skills and applying effort. Here, a positive self-concept is influenced by becoming better at something (i.e., process-dependent; Dweck et al., 2017), which corresponds with the intrapersonal self-based and task-based goals. In research, the relationship between mindsets and self-based and task-based goals has yet to be covered extensively. Mascret et al. (2015), who developed the 3 x 2 Achievement Goal Questionnaire for Sport, found that growth mindsets are positively related to both task-approach and self-approach goals. With the 2 x 2 achievement goal model, where task-based and self-based goals to the growth mindset (Burnette et al., 2013; Corrion et al., 2010; Gardner et al., 2017; Spray & Warburton, 2011; Stevenson & Lochbaum, 2008; Wang et al., 2009). This is comparable to the results of Mascret et al. (2015). Therefore, Hypothesis 2 states the following:

- (a) A growth mindset has a positive relationship with task-approach goals.
- (b) A growth mindset has a positive relationship with self-approach goals.

Task-avoidance and self-avoidance goals are more challenging to link to mindset. Mascret et al. (2015) did not find an association between task-avoidance and self-avoidance goals and either of the mindsets. For fixed mindsets, this makes sense because the task-based and self-based goals are not focused interpersonally. The missing link between growth mindset and task- and self-avoidance goals (Stevenson & Lochbaum, 2008; Warburton & Spray, 2009) could be explained by understanding that not completing a task or increasing one's competence is not necessarily considered failing. Not being able to reach the set standard could be seen as a moment of evaluation and learning from one's mistakes for later attempts. Diener and Dweck (1978) observed that children with growth mindsets who could not complete a problem-solving task did not consider this a failure. Furthermore, Dweck and Elliott (1983) found that people with a growth mindset tend to choose challenging tasks that allow them to learn, even at the risk of making mistakes. Overall, the source of selfassumptions can have major effects on the reason and purpose for immersing oneself in competence-relevant behavior. Accordingly, Hypothesis 3 states the following:

- (a) A growth mindset has a negative relationship with task-avoidance goals.
- (b) A growth mindset has a negative relationship with self-avoidance goals.

Perceived Competence

Another critical construct in goal pursuit and attainment is perceived competence, the extent to which people feel their need for competence is fulfilled (Deci & Ryan, 2000). Both Dweck (1986) and Dweck and Leggett (1988) theorized that perceived competence acts as a moderator in the relationship between mindset and achievement goals, and this was studied by Wang et al. (2009). This means that perceived competence is assumed to change the relationship between mindset and achievement goals. Specifically, when perceived

competence is high among athletes with a fixed mindset, they are likely to feel confident about meeting their other-based standard and are more likely to adopt an other-approach goal. When perceived competence is low, however, fixed-mindset athletes would not expect to meet their other-based standard, which could threaten their self-concept. To avoid showing their incompetence and suffering from threats to their self-concept, they would be more likely to select an other-avoidance goal. Hence, Hypothesis 4 states the following:

(a) Greater perceived competence strengthens the positive relationship between a fixed mindset and other-approach goals.

(b) Greater perceived competence weakens the positive relationship between a fixed mindset and other-avoidance goals.

Similarly, because athletes with a growth mindset consider skills to be malleable, they would seek to challenge themselves regardless of their level of perceived competence. Approaching challenges does not increase the risk of failing, but fosters learning, and therefore, the relationship between growth mindsets and self-approach and task-approach goals is not expected to change when perceived competence is added. In contrast, among athletes with a growth mindset, low perceived competence could cause concerns about not being able to learn from or finish a task. This means that the athlete would want to eliminate the possibility that their competence is too low to benefit from the challenge as a learning opportunity. Therefore, athletes with lower perceived competence probably direct their behavior more towards avoidance goals. Contrarily, athletes with high perceived competence would direct behavior away from avoidance goals, because the athletes believe their competence sufficient to learn from the challenge. Accordingly, Hypothesis 5 states the following:

- (a) Greater perceived competence weakens the negative relationship between a growth mindset and task-avoidance goals.
- (b) Greater perceived competence weakens the negative relationship between a growth mindset and self-avoidance goals.

Method

Recruitment and Respondents

The necessary amount of respondents to ensure adequate power was checked with $G^*Power 3.1$ (Faul et al., 2009). An a priori power calculation for a multiple regression test design, with medium effect size $f^2 = .15$, an alpha of .05, and the power set on .80 generated a minimal sample size of 68 respondents. Respondents were recruited for six weeks and in several ways. Flyers with a quick response code, which led to the questionnaire when scanned were distributed at training sessions and unofficial competitions of sports associations specializing in racket sports. Additionally, a link leading to the questionnaire was posted on various social media accounts of national and regional organizations specializing in racket sports. Lastly, several regional tennis and padel coaches and trainers spread the questionnaire through their network. There was no reward given to the respondents who agreed to complete the survey, but all respondents received feedback on sport motivation, mental resilience, mental health, and mindset. The respondents' scores on these constructs and an interpretation of the scores were presented to the respondents. The feedback was generated automatically at the end of the questionnaire and was based on the respondents' answers.

In total, 281 respondents voluntarily followed the link to the questionnaire in the study's data collection period. The racket sports included are tennis, squash, padel, and badminton. Of the 128 respondents who finished the entire questionnaire, 22 respondents

(16.5%) were excluded for not meeting study criteria, either for not practicing one of the four sports considered (5.5%) or not participating in competitions (11.7%). Additionally, the interquartile range, which shows the scatter of the data, showed one outlier which was then removed. This resulted in a final sample of 105 (68 male, 37 female) athletes. Participants ranged from 14 to 71 years of age (M = 42.14, SD = 12.81). On average, respondents practiced their specific sport 4.21 hours per week (SD = 3.86); however, several respondents reported not having played their sport due to COVID-19-related constraints. Respondents mostly competed on the regional (37.1 %) and recreational (29.5 %) levels, followed by competing at the Dutch sub-top (25.7%) and top levels (5.7%), leaving the smallest percentage indicating anything other than these levels (1.9%).

Materials and Measures

The sports motivation questionnaire (Van Yperen, 2020), designed to measure different aspects of athletes' motivation, was used to measure the constructs. This questionnaire has a duration of approximately twenty minutes and consisted of 126 Likert scale questions divided into 28 categories. Additionally, the questionnaire covered several questions about demographics. The questionnaire included a consent form, and respondents were instructed to give their individual opinions. For this study, the following constructs were used: achievement goals, mindset, and perceived competence.

Achievement Goals

Achievement goals were assessed by items based on the 3 x 2 Achievement Goal Questionnaire for Sport (Mascret et al., 2015). Each achievement goal was measured with three items and followed a Likert response scale that ranged from 1 (*never*) to 7 (*always*). Internal consistency scores were computed for task-approach ($\alpha = .86$), task-avoidance ($\alpha = .89$), self-approach ($\alpha = .90$), self-avoidance ($\alpha = .89$), other-approach ($\alpha = .90$), and otheravoidance ($\alpha = .89$) goals. Sample items for approach scales are "My goal in my sport during competitions is: 'Making the right choices'" for a task-approach goal, "My goal in my sport during competitions is: 'Surpass myself'" for a self-approach goal, and "My goal in my sport during competitions is: 'Beating others'" for an other-approach goal. Sample items for avoidance scales are "My goal in my sport during competitions is: 'Making no mistakes in my task performance'' for a task-avoidance goal, "My goal in my sport during competitions is: 'Not doing worse than before''' for a self-avoidance goal, and "My goal in my sport during competitions is: 'Not losing''' for an other-avoidance goal.

Mindset

The independent variable mindset was measured with two items. Initially, growth mindset and fixed mindset were measured with two items each.¹ Due to low internal consistency for the growth mindset ($\alpha = .20$) and somewhat low internal consistency for the fixed mindset ($\alpha = .57$), the choice was made to use one item for each mindset. The content of the chosen items best matches the constructs' theoretical description. Therefore, these items are considered high in face validity. The fixed mindset item was "The highest level you can achieve in sports is determined mostly by predisposition and innate talent." The growth mindset item was "In sports, you can improve your qualities by training and hard work." Both items were followed by a Likert response scale ranging from 1 (*completely disagree*) to 7 (*completely agree*).

Perceived Competence

Perceived competence was measured with four items adapted from Van Yperen (2006), including "In my sport, I have the feeling that I have sufficient knowledge and skills to

¹ Fixed and growth mindsets can co-exist within the same domain or trait (Dweck et al., 1995b; Lüftenegger & Chen 2017) because they are two different factors rather than a single bipolar factor. Confirmatory factor analysis supports this claim (Tempelaar et al., 2015).

complete my tasks well" and "In general (technically, tactically, physically, mentally), I feel that I am good at my sport". The Likert response scale for these items ranged from 1 (*not at all*) to 7 (*to an extremely high degree*). Internal consistency was sufficiently high ($\alpha = .92$).

Data Diagnostics

All analyses were conducted using the software IBM SPSS 27 (IBM Corp., 2020). After data collection, the data set was scrutinized for missing values and outliers. Cases with missing values on descriptives, achievement goal items, and mindset items were removed from the analysis. Furthermore, two outliers for task-approach goals and one outlier for the growth mindset were found in a stem-and-leaf plot using an interquartile range rule of 1.5. However, based on Hoaglin and Iglewicz (2021), the 1.5 interquartile range rule is often inaccurate. They found a range rule of 2.2 to be more accurate. After applying an interquartile range rule of 2.2 and doing a visual inspection, the outliers for task-approach goals disappeared. The outlier for the growth mindset remained visible and was removed.

Results

Preliminary Analysis

After reviewing the data in normal quantile-quantile plots, it was concluded that the assumption of normality was met for the different analyses. The assumption of linearity and homoscedasticity were checked and concluded sufficient using scatterplots of standardized residuals. There was no concern of multicollinearity, as the variance inflation factors (VIFs) and tolerance scores, which identify multicollinearity, were below 10 and above .2 for all values, respectively. For growth mindset and perceived competence, VIF = 1.08 and Tolerance = .92. Furthermore, for fixed mindset and perceived competence, VIF = 1.00 and Tolerance = 1.00. The assumption of independent errors, which means that residuals should be uncorrelated, has been met by the data because Durbin-Watson values ranged from 1.64 to 1.99, see Appendix 1. Lastly, Cook's distance values were all under 1, which suggests that there was no influence from individual cases.

Descriptives

In Table 2, the means, SDs, and intercorrelations of the relevant variables are presented. Additionally, a paired samples t-test was conducted to compare fixed and growth mindsets. There was a significant difference between the fixed (M = 4.40, SD = 1.49) and growth mindsets (M = 6.33, SD = .68); t(104) = -11.43, p < .001. A repeated-measures analysis of variance (ANOVA) revealed a main effect of both definition (F(2,208) = 3.790, p = .02) and valence (F(1,104) = 43.270, p < .001). For the definition by valence interaction effect, Mauchly's test indicated a violation of the assumption of sphericity ($\chi^2(2) = 6.3, p = .04$). Therefore, the Greenhouse-Geisser corrected results are reported. The interaction was not significant (F(1.88, 196.31) = 2.403, p = .10). Furthermore, the analysis revealed that selfbased goals (M = 4.48, SD = .13) and other-based goals (M = 4.79, SD = .13) significantly differ from each other (*p* = .02) and that approach (M = 4.98, SD = .10) and avoidance goals (M = 4.36, SD = .13) differ as well (*p* < .001).

In line with Hypothesis 1, the fixed mindset correlated positively with other-approach and other-avoidance goals (see Table 2). Furthermore, as expected in Hypothesis 2, the growth mindset correlated positively with task-approach goals and perceived competence. The correlation between perceived competence and task-avoidance goals is significant, aligning with Hypothesis 5. However, unexpectedly, the fixed mindset also correlated positively with task-approach goals, task-avoidance goals, and self-avoidance goals. Finally, perceived competence correlated positively with other-approach goals and task-approach goals.

In addition, *t*-tests were conducted to assess for possible sex-based differences. As shown in Table 3, men scored higher than women on other-approach goals and perceived competence. Therefore, sex was added as a covariate in analyses involving other-approach

goals and perceived competence. Furthermore, one-way ANOVA with achievement goals as the dependent variable and mindset as the independent variable revealed no differences in means between different levels of professionality in sports. Finally, a one-way ANOVA was conducted to detect differences in means between the four examined sports. The one-way ANOVA with achievement goals as the dependent variable and mindset as the independent variable revealed that there were differences regarding task-approach goals, F(3, 101) = 3.07and p = .03. Tukey's test showed that the mean value of padel (M = 5.31, SD = .91) was significantly different from squash (M = 4.50, SD = 1.45; p = .04). To correct for these differences, analyses involving task-approach goals will be included for the sport by adding this as a covariate.

Hypothesis Testing

To test the hypotheses, separate regression analyses were conducted with mindset, perceived competence, and their interaction as predictor variables; achievement goal as the dependent variable; and sex and sport as covariates. In line with Table 2, the first regression analysis with an other-approach goal as a dependent variable revealed main effects of the fixed mindset ($\beta = .26$, F(2,102) = 9.12, p = .006). These findings provide support for Hypothesis 1a, a positive association between fixed mindsets and other-approach goals. The regression where perceived competence was added as a moderator also revealed main effects of the fixed mindset ($\beta = .25$, F(4,100) = 5.87, p = .01) and perceived competence ($\beta = .21$, F(4,100) = 5.87, p = .03). However, the interaction between the fixed mindset and perceived competence was not significant ($\beta = .018$, p = .85). These findings provide support for Hypothesis 4a, indicating that perceived competence does not act as a moderator in the relationship between a fixed mindset and other-approach goal.

Furthermore, in line with Table 2, the regression analysis with an other-avoidance goal as a dependent variable revealed main effects of the fixed mindset ($\beta = .20$, F(1,103) = 4.39, p

= .04). These findings provide support for Hypothesis 1b, a positive association between fixed mindsets and other-avoidance goals. The regression where perceived competence was added as a moderator did not reveal main effects of the fixed mindset ($\beta = .17, p = .11$) or perceived competence ($\beta = -.29, p = .78$). The interaction between the fixed mindset and perceived competence was also not significant ($\beta = .11, p = .27$). These findings provide no support for Hypothesis 4b, indicating that perceived competence does not act as a moderator in the relationship between a fixed mindset and other-avoidance goal.

The regression analysis with self-approach goals as a dependent variable revealed no main effects of the growth mindset ($\beta = .13$, p = .17), which aligns with Table 2. These findings provide no support for Hypothesis 2b, indicating that the growth mindset is not positively related to self-approach goals. The regression analysis with perceived competence as a moderator did not reveal main effects of the growth mindset ($\beta = .10$, p = .33) or perceived competence ($\beta = .13$, p = .26). Furthermore, the interaction between the growth mindset and perceived competence was not significant ($\beta = .03$, p = .80), indicating that perceived competence does not function as a moderator in the relationship between a growth mindset and self-approach goal.

In line with Table 2, the regression analysis with a task-approach goal as a dependent variable revealed main effects of the growth mindset ($\beta = .20$, F(1,100) = 3.46, p = .04). These findings provide support for Hypothesis 2a, indicating that the growth mindset is positively related to task-approach goals. The regression analysis with perceived competence as a moderator did not reveal main effects of the growth mindset ($\beta = .10$, p = .28) but did show main effects of perceived competence ($\beta = .37$, F(7,97) = 4.82, p < .001). The interaction between the growth mindset and perceived competence was not significant ($\beta = .10$, p = .30), which indicates that perceived competence does not moderate the relationship between a growth mindset and task-approach goal.

Additionally, in line with Table 2, the regression analysis with a task-avoidance goal as a dependent variable revealed no main effects of the growth mindset ($\beta = .09$, p = .34). These findings provide no support for Hypothesis 3a, indicating that the growth mindset is not related to task-avoidance goals. The regression analysis with perceived competence as a moderator did not reveal main effects of the growth mindset ($\beta = .02$, p = .84) or perceived competence ($\beta = .21$, p = .054). Additionally, the interaction between the growth mindset and perceived competence was not significant ($\beta = .05$, p = .61). These findings provide no support for Hypothesis 5a, indicating that perceived competence does not moderate the relationship between a growth mindset and task-avoidance goal.

In line with Table 2, the regression analysis with self-avoidance goals as a dependent variable revealed no main effects of growth mindset ($\beta = .10, p = .30$). These findings provide no support for Hypothesis 3b, indicating that the growth mindset is not related to self-avoidance goals. The regression analysis with perceived competence as a moderator did not reveal main effects of the growth mindset ($\beta = .12, p = .25$) or perceived competence ($\beta = .04, p = .71$). Furthermore, the interaction between the growth mindset and perceived competence was not significant ($\beta = .16, p = .12$). These findings provide no support for Hypothesis 5b. Perceived competence does not moderate the relationship between a growth mindset and self-avoidance goal.

Additionally, in line with Table 2, regression analysis revealed main effects of fixed mindset in the prediction of a task-avoidance goal ($\beta = .23$, F(1,103) = 5.96, p = .02) and a self-avoidance goal ($\beta = .33$, F(1,103) = 12.44, p < .001). These findings indicate that fixed mindsets have a positive relationship with task-avoidance and self-avoidance goals.

Finally, regression analysis with other-approach goals as a dependent variable and perceived competence as a moderator revealed no main effects of growth mindset ($\beta = .10, p = .28$) or perceived competence ($\beta = .15, p = .15$). However, the interaction between the

growth mindset and perceived competence was significant ($\beta = .21$, F(4,100) = 5.30, p = .03). Tests of simple slopes' association between other-approach goals and growth mindset, with gender as a covariate revealed no significant result for those low in perceived competence (β = -.10, p = .44). The test of simple slopes did reveal a significant result for those high in perceived competence ($\beta = .31$, F(4,100) = 5.30, p = .02). This indicates, as visualized in Figure 1, that the positive relationship between growth mindset and other-approach goals strengthens significantly only with high competence. Additionally, regression analysis with other-avoidance goals as a dependent variable revealed no main effects of growth mindset (β = .10, p = .70) or perceived competence ($\beta = -.09$, p = .42). However, the interaction between the growth mindset and perceived competence was significant ($\beta = .27$, F(4,100) = 2.13, p =.006). Tests of simple slopes' association between other-avoidance goals and growth mindset, with gender as covariate revealed no significant result for those low in perceived competence $(\beta = -.23, p = .10)$. The test of simple slopes did reveal a significant result for those high in perceived competence ($\beta = .31$, F(4,100) = 2.13, p = .03). This indicates, as visualized in Figure 2, that the positive relationship between growth mindset and other-avoidance goals strengthens significantly only with high competence.

Discussion

The present research seeks to expand the knowledge of the 3 x 2 achievement goal model (Elliot et al., 2011) in the sport setting. It researches how an athlete's mindset is related to their achievement goals and what moderating role perceived competence plays in this relationship. The results show that athletes who adopt a fixed mindset, focus, among other things, on demonstrating their competence to others and avoiding demonstrating their incompetence. They do this through other-approach and other-avoidance goals. Additionally, but unexpectedly, athletes with a fixed mindset tend to avoid demonstrating their incompetence through not being able to complete tasks. As stated, tasks give immediate and clear feedback about an individual's success in completing or failing to do the task (Elliot et

al., 2011). This feedback can be used to evaluate the development of competence, which is the focus point in the growth mindset, and demonstrate competence. Instead of learning from the task and applying this extended knowledge to a new situation, individuals in the fixed mindset solely use the task-based goal to protect their feelings of competence. As said, they focus on the outcome instead of the process and, thus, use a task-avoidance goal to circumvent a demonstration of incompetence.

Finally, athletes with a fixed mindset also avoid performing worse than they did before. While it was originally thought that a self-avoidance goal would only be used by athletes with a growth mindset, the results show otherwise. Arguably, athletes with a fixed mindset adopt this goal to avoid not reaching their previous standards, instead of adopting this goal to avoid no development of competence. Individuals with a fixed mindset have been shown to experience feelings of worthlessness after failure because it threatens their self-worth (Burhans & Dweck, 1995; Robins & Pals, 2002). Thus, when individuals with a fixed mindset perform worse than before, they will not interpret this as a temporary and situation-dependent standard of their competence, but a new permanent standard. After all, in their minds, they must work with what abilities they already have, with no chance of developing their abilities to a higher level. Therefore, a bad performance can cause feelings of worthlessness. Unexpectedly, the likeliness of athletes with a fixed mindset adopting certain achievement goals does not change when the extent to which people feel their need for competence is fulfilled changes. This means that athletes' feelings of being competent does not impact the goal selection of fixed mindset athletes.

In growth mindsets, where athletes perceive their competence as malleable, they tended to define their competence relative to the requirements of a task and evaluate their competence based on fulfilling the absolute standards of a task. Growth mindset athletes do not avoid evaluation of incompetence through a task-based goal. While it was expected and found that growth mindset athletes would turn away from a goal that focuses on avoiding task-based incompetence, it was unanticipated that there was no link found with task-avoidance goals. Additionally, growth mindset athletes did not try to avert a portrayal of incompetence relative to their intrapersonal trajectory. This could be interpreted with Dweck's (1986) theory that athletes with a growth mindset seek challenges to develop their abilities. This would explain why they seek to evaluate their competence through tasks but do not avoid demonstrations of incompetence, as every situation is seen as an opportunity for learning. Thus, it is irrelevant what the outcome of the task is (Diener & Dweck, 1978; Dweck & Elliott, 1983). This explains why there is no observed relationship between growth mindset athletes and avoidance goals.

Although athletes with a growth mindset define their competence by the requirements of a task, they do not evaluate their competence intrapersonally. Thus, athletes with a growth mindset do not adopt self-approach goals that define competence through the development of abilities in their own trajectory. This is possibly due to the heightened cognitive demands of adopting a self-based goal versus a task-based goal (Elliot et al., 2011). Arguably, athletes could prefer a task-based goal because formulating a self-based goal is much more complex and abstract. Additionally, Elliot et al. (2011) argue that the abstract nature of a self-based goal can cause uncertainties about self-worth to intrude and influence the evaluation of the goal. Task-based goals, which are more absolute and concrete, could therefore be selected instead of self-based goals. While these are potential explanations, the absence of the associations between the growth mindset and self-approach, task-avoidance, and selfavoidance goals could be due to only measuring the growth mindset with one item instead of two. Possibly, this one item was, although holistically evaluated, not fully suited to measure growth mindsets. Like fixed mindsets and interpersonal goals, athletes are not more likely to adopt an intrapersonal achievement goal when their view of their present level of ability changes. This result, like the one for fixed mindsets, could fail to appear because no meaningful differences could be found between the means of the achievement goals in this sample. This could have prevented any existing relationships from coming forward. Remarkably, it was found that athletes with high anticipation of their present level of ability were more likely to define their competence by receiving favorable judgment when their belief that traits are changeable becomes higher. Simultaneously, athletes with high anticipation of their competence by avoiding unfavorable judgment when their belief that traits are changeable becomes higher. This result could be due to the absence of interaction between the valence and definition dimension of achievement goals.

Another possibility for this result could be the effect of another variable that was not included in the model. For example, Burnette et al. (2013) proposed that threats to one's ability, public image, and control, ego threat, is related to achievement goal literature. It has been discussed that not meeting one's standard of competence can threaten one's self-concept, but it might be of importance if the standard used as an evaluation of competence has the capability of threatening the self-concept. For instance, an individual could have high levels of perceived competence, but because the situation has important implications for future success expectations, they could focus on avoiding any unfavorable judgment of their competence. Additional work is needed to define potential contributing factors.

Thus, different levels of perceived competence do not change the anticipated relationships. Additionally, the relationships in which perceived competence did appear as a moderator were not interrelated without the role of perceived competence. Furthermore, perceived competence is linked to task-approach, task-avoidance, and other-approach goals. This could be an indication that perceived competence acts as a dependent variable instead of a moderator. Perceived competence could be a predictor of achievement goals in the way that athletes' anticipated capabilities determine their expectations of success or failure, which in turn, regulates how they define competence (Elliot & Church, 1997). Elliot (1999) proposed the theory that high perceived competence is linked with the adoption of approach goals, while low perceived competence is linked with the adoption of avoidance goals. In research, there are indications that perceived competence could be a predictor of achievement goals (Dinger et al., 2013; Elliot & Church, 1997; Warburton & Spray, 2009), although the results are inconsistent. In future research, the role of perceived competence should be examined more closely. Experimental research could determine whether perceived competence is a predictor of achievement goals or has another role in achievement goal literature.

Strengths and Limitations

The findings of this study should be interpreted in light of some limitations. Firstly, the reported issues with the reliability of the mindset scales resulted in the inclusion of only one item for each mindset. Although the included items were considered the best representation of the different mindset factors, this could have consequences for the validity and general reliability of the mindset measurements in this sample. Additionally, the finding that there was no meaningful interaction between the two dimensions of achievement goals means the results must be interpreted with caution. Furthermore, the extension of the 3 x 2 achievement goal questionnaire to the sports domain did not cause any psychometric problems for Mascret et al. (2015); however, the questionnaire has not yet been used extensively in achievement goal literature, which could yield different results.

Moreover, because this study worked with a survey, rather than an experimental design, no claims can be made about the causality of the relationships. Various relationships have been found between the variables, but these links only tell us that there is an association between mindsets and achievement goals. To study whether mindset really is a predictor of achievement goals or if the direction of the relationship is different, an experimental design is necessary. Furthermore, the role of perceived competence in relation to achievement goals also needs to be studied in an experimental environment.

Lastly, it is important to note that the situation around COVID-19 influenced the respondents' personal situations. The data collection for this study was done only a few weeks after the government allowed people to practice sports inside sports centers again. This affected padel, squash, and badminton, as they are sports that are mostly played inside. Furthermore, competitions had also just been allowed to resume, but only within sports associations. This could have influenced people's answers, because they only just began practicing their sport again and may not yet have reached the level of skill or involvement they had before COVID-19.

While the current study is subject to these limitations, the sample of the current research was quite diverse. Although there were more men than women in the sample, the age of the respondents had a wide range, from 12 to 71. The respondents practiced their sport from 1 to 28 hours per week and varied in their levels of professionality from recreational play to the Dutch top level. This contributes to the generalizability of this study to a larger population.

Finally, this study is, to current knowledge, the second to assess the relationship between mindset and goals in the physical domain using the 3 x 2 achievement goal model. Furthermore, it is the first study to include perceived competence in the model. Both are necessary steps towards a broader base of knowledge of the model and its utility in relation to other influential factors in achievement goal literature.

Conclusion

Over the course of forty years, achievement goals have been researched and their models have been expanded, leading to the 3 x 2 achievement goal framework. While promising, the extent of this framework's utility in research on mindsets in the sports domain

has not yet been covered. With this study, athletes' mindsets that are linked with achievement goals in previous research have been expanded to the 3 x 2 achievement goal model. This thesis affirms the idea that athletes who consider their abilities and traits as innate are more likely to evaluate their competence by interpersonal comparison. Meanwhile, athletes who perceive their capabilities as flexible tend to evaluate their competence based on the absolute standards of a task. Furthermore, this research provides potential future courses of action regarding the role of perceived competence in achievement goal literature. Thus, it is hoped that research will expand its examination of the 3 x 2 achievement goal model in the sport setting in the near future, to enable a wider understanding of achievement goals and its possibilities for athletes.

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Tables and Figures

Table 1

The 3 x 2 achievement goal model

Valence	Definition		
	Self-based	Task-based	Other-based
	(intrapersonal)	(absolute)	(interpersonal)
Approach	Self-approach	Task-approach	Other-approach
(positive)	goal	goal	goal
Avoidance	Self-avoidance	Task-avoidance	Other-
(negative)	goal	goal	avoidance goal

Note. Retrieved from "A 3 x 2 Achievement Goal Model" by A.J. Elliot et al., 2011, Journal

of Educational Psychology, 103(3), 632-648. 2011 by American Psychological Association.

Table 2

Variable	М	SD	2	3	4	5	6	7	8	9	10	11
1. Fixed	4.40	1.49	16	.20*	.14	.25*	.23*	.33*	.20*	01	.03	11
mindset												
2. Growth	6.33	.68	_	.21*	.13	.18	.09	.10	.03	.28**	13	08
mindset												
3. Task-	4.98	1.17		_	.32**	.45**	.69**	.40**	.32**	.37**	08	.05
approach goal												
4. Self-	4.75	1.43			_	.51**	.30**	.41**	.44**	.15	05	08
approach goal												
5. Other-	5.21	1.33				_	.43**	.35**	.54**	.29**	29**	12
approach goal												
6. Task-	4.48	1.44					_	.47**	.47**	.26**	19	01
avoidance goal												
7. Self-	4.22	1.67						_	.53**	00	.05	14
avoidance goal												
8. Other-	4.37	1.63							_	00	07	01
avoidance goal												
9. Perceived	4.66	.93								—	36**	20*
competence												

Descriptives: means, standard deviations, and intercorrelations

3	5
-	-

Variable	М	SD	2	3	4	5	6	7	8	9	10	11
10. Sex	1.35	.48									_	.03
11. Sport	38.55	21.21										_

Note: n = 105

* *p* < .05.

^{**} *p* < .01.

Table 3

Gender differences

Variable	M _{men}	SD _{men}	Mwomen	SD _{women}	t	df	р
1. Fixed mindset	4.37	1.60	4.46	1.28	30	103	.765
2. Growth mindset	6.40	.65	6.22	.71	1.32	103	.191
3. Task-approach goal	5.05	1.28	4.86	.93	.85	94.65	.400
4. Self-approach goal	4.80	1.41	4.66	1.49	.48	103	.632
5. Other-approach goal	5.50	1.24	4.68	1.34	3.12	103	.002*
6. Task-avoidance goal	4.68	1.48	4.12	1.30	1.95	103	.054
7. Self-avoidance goal	4.16	1.77	4.33	1.47	52	103	.606
8. Other-avoidance	4.45	1.70	4.22	1.49	.69	103	.492
goal							
9. Perceived	4.90	.83	4.22	.93	3.88	103	<.001*
competence							

* *p* < .05.

Figure 1

Moderator effect of perceived competence on the relationship between growth mindset and other-approach goals



Figure 2

Moderator effect of perceived competence on the relationship between growth mindset and other-avoidance goals



Appendix A

Table of independent error assumption: Durbin-Watson value

	bin-Watson
Fixed mindset * Task-approach goals1.9°	7
Growth mindset * Task-approach goals 1.99	9
Fixed mindset * Self-approach goals 1.79)
Growth mindset * Self-approach goals 1.80)
Fixed mindset * Other-approach goals 1.64	4
Growth mindset * Other-approach goals 1.67	7
Fixed mindset * Task-avoidance goals 1.74	4
Growth mindset * Task-avoidance goals 1.72	2
Fixed mindset * Self-avoidance goals 1.79)
Growth mindset * Self-avoidance goals 1.82	2
Fixed mindset * Other-avoidance goals 1.9	1
Growth mindset * Other-avoidance goals 1.83	5

Note. All combinations of achievement goal and mindset include perceived competence as moderator.