Aiming for Success: The Role of Approach Goals in Performance Improvement in

Youth Tennis Players

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Abstract

Goal setting, especially setting approach goals, is an often-used strategy to enhance task performance. Previous research has shown that mastery approach (MAp) goals are beneficial for sports performance, while performance approach (PAp) goals seem to have mixed results. The current study investigated whether approach goals are related to improvement of tennis performance over time, through a prospective design. Enjoyment is proposed to be a potential mediator of the relationship between MAp goals and performance improvement, but not for the relationship between PAp goals and performance improvement. Talented youth tennis players ($N = 171$) filled in a questionnaire on achievement goal orientations and answered questions about enjoyment of their sport. The players' objective performance ratings of two tennis seasons were used to calculate their improvement in the sport over five years. The statistical analyses indicate that both PAp and MAp goals do not relate significantly to performance improvement over time. Enjoyment is also not significantly related to approach goals and performance, when controlling for age. It can be concluded that in this sample, approach goal orientations seem to be unrelated to performance improvement or enjoyment in talented young tennis players. Theoretical implications are discussed.

Keywords: achievement goal orientation, enjoyment, sports, mastery, prospective design

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Tennis is a well-loved sport in the Netherlands: in a country of 18 million people, over half a million players are registered at the KNLTB, the Royal Dutch Lawn Tennis Association (KNLTB, n.d.). The KNLTB takes a 'Five Steps to the Top' approach, in which they encourage a top sport climate, to develop talented youth players with the goal of becoming a professional in the sport (KNLTB, 2023). Besides physical, tactical, and technical skills that these players must develop, psychological skills are an important aspect of athletic performance (Moran & Toner, 2017). They give athletes a way to deal with the many demands that weigh on them during training, matches, and off the court. Among coaches of elite players in the Netherlands, the psychological aspect of tennis is considered to be the second most important, after physicality (Kramer, 2020). Thus, it is valuable to investigate which psychological aspects have the biggest impact on the road to the top. Specifically, goal setting has consistently found to be important in sport performance (e.g., Burton et al., 2010; Van Yperen, 2021; Jeong et al., 2021).

Achievement goals

One approach to conceptualize goal setting is through the 2x2 achievement goal framework. As proposed by Elliot and McGregor (2001), this framework consists of a definition of competence dimension and a valence dimension. These dimensions combine to form four different types of achievement goals, or reasons why one wants to perform well.

The first dimension, definition of competence, is based on how a person defines their own abilities. Here, one can distinguish between mastery goals and performance goals (Elliot & Church, 1997). *Mastery goals* are focused on mastering the task itself (e.g., having a good backhand technique). *Performance goals* are about demonstrating the competence on the task relative to others (e.g., outperforming your opponent). The second dimension focuses on

valence and is also split into two types of goals. *Approach goals* are positively stated and are about a desirable possibility (e.g., wanting to hit a perfect serve). *Avoidance goals* are negatively stated and are about avoiding something undesirable (e.g., not wanting to miss the serve) (Elliot & Church, 1997). These two dimensions make up the 2x2 achievement goal framework. It comprises four types of achievement goals. Someone holding *mastery approach (MAp) goals* aims for task competence, for example, to improve one's forehand technique. *Mastery avoidance (MAv) goals* focus on avoiding showing task incompetence, for example, to not get worse at volleying. A person holding *performance approach (PAp) goals* aims to show their competence relative to others, for example, winning a set against one's opponent. *Performance avoidance (PAv) goals* focus on avoiding showing one's incompetence relative to others, for example, to avoid losing a point against one's opponent (Morris & Kavussanu, 2008).

In this paper, the focus will specifically be on the two types of approach goals. This is because approach goals seem to correlate positively with performance, while avoidance goals correlate negatively with performance (Van Yperen, 2021). The current study investigates how youth players improve their performance, which is why performance and mastery approach goals are most relevant.

Approach goals and Performance

In the literature, approach goals seem to be positively related to performance in various domains (Hulleman et al., 2010; Baranik et al., 2010). This may be explained by approach goals having a focus on the possibility of success. This focus relates to positive emotions like hope, excitement and eagerness (Van Yperen et al., 2015). Furthermore, the possibility of something good happening leads to more feedback seeking and mental focus, which both seem to be related to better performance (Van Yperen, 2021).

The current research focuses on the change in performance after multiple years, which is crucial information for player development programs, since they need to predict which players can reach the top. Although most research is done cross-sectionally, only experimental and longitudinal studies can inform us about improvement over time. A meta-analysis on the existing experimental research on the 2x2 model indicates that approach goals likely have a causal role in the relationship (Van Yperen et al., 2015). This shows that targeting certain achievement goals through interventions could be beneficial for improving performance. However, this meta-analysis did contain studies in other contexts than sports. It appears that most people have different achievement goals when they are in different contexts (e.g., education, work, or sports) (Van Yperen et al., 2011). Thus, it is difficult to interpret the meta-analysis for sports purposes.

In sports specifically, there has been less research on the effects of goal orientations on performance. A meta-analysis conducted in sports showed similar outcomes as in other domains, namely that approach goals are beneficial for performance (Lochbaum & Gottardy, 2014). However, other studies show there might be a difference between PAp and MAp in how they relate to sport performance outcomes. In one study containing a large sample of adolescent athletes playing various sports, it was found that MAp goals were predictive of performance while PAp goals were not (Li, 2010). This was replicated in a sample of high-level adolescent handball players (Li et al., 2011). Regarding tennis specifically, it has too been found that MAp goals positively relate to performance, but PAp do not, in a sample of adolescents that were members of private tennis clubs (Puente-Diaz, 2012).

How could this difference between PAp and MAp goals be explained? It appears that MAp goals, since they are focused on the task itself instead of on performance outcomes or comparison to others, lead to less worrying than PAp goals (Van Yperen, 2021). There also seems to be less fear of failure in mastery goals compared to performance goals (Elliot &

Church, 1997). Important to remember is that in sports, outperforming the opponent is not always possible. Especially in tennis, players constantly lose points, games, and sets; in every tournament there is only one person who does not lose a match (Puente-Diaz, 2012). Therefore, losing is often inevitable, which means that holding PAp goals has risks and the sense of self can be threatened. Nevertheless, PAp goals might be beneficial if athletes see the situation as an opportunity for personal growth instead of as a threat (Adie et al., 2008).

Approach Goals and Enjoyment

Enjoyment of the sport is important to consider when working with young athletes. It is helpful to understand which factors influence enjoyment since it is positively linked with performance (Barnicle & Burton, 2016) and negatively with dropout (Butcher et al., 2002; Crane & Temple, 2014). The existing literature suggests that mastery and performance approach goals might have different relationships to enjoyment.

Overall, it seems that specifically MAp goals positively relate to enjoyment. For example, high level youth ice hockey players with MAp goals had higher levels of enjoyment of their sport (Jaakkola et al., 2016). Gardner and colleagues (2018) found the same in children who participate in regular organized sports. Other researchers indicate similar outcomes (Wang et al., 2018; Morris & Kavussanu, 2009; Briki, 2020). In trying to explain why MAp goals are beneficial for enjoyment, Adie and colleagues (2008) proposed that MAp goals lead to challenge appraisals of situations, which would improve positive affect. Another explanation could be that athletes with MAp goals focus less on others, which leads to more focus on the task than with PAp goals. More focus on the task is then related to more enjoyment (Morris & Kavussanu, 2009). This might be through an element of mindfulness that is involved in MAp goals (Briki, 2020). The focus on the here and now and full immersion in the task would lead to more enjoyment and happiness.

However, there are also some opposing findings to the idea that only MAp goals relate to enjoyment. For example, Wang and colleagues (2007) found that, although MAp goals had the strongest positive relationship with enjoyment for children in PE lessons, PAp goals also had a moderate positive relationship. There was also no difference found between PAp and MAp goals in a golf putting task, as they both had a positive relationship with enjoyment (Kavussanu et al., 2009). Other research found a positive relationship between PAp goals and enjoyment when sport participants were autonomously motivated (Gaudreau & Braaten, 2016). Overall, it is thus unclear how exactly PAp goals relate to enjoyment in a sports setting. However, the existing literature does give a clear indication that MAp goals are positively related to enjoyment.

Enjoyment and Performance

The literature on enjoyment shows that it has a positive relationship with performance. For example, more enjoyment in class improves performance on math tests in school settings (Schukajlow & Rakoczy, 2016). Puca and Schmalt (1999) also found that enjoyment was positively related to performance on a reaction task. Enjoyment mediated the relationship between approach goals and performance, if participants expected to receive feedback on the task. The authors suggested that receiving this competence feedback leads to more intrinsic motivation, which makes participants enjoy the task more.

It seems that enjoyment affects sport performance as well. McCarthy (2011) argues that it can lead to reaching a flow state more often, which benefits sports performance. Furthermore, increased intrinsic sources of enjoyment after doing an intervention was significantly related to an increase in performance in a high-level college soccer team (Barnicle & Burton, 2016).

Specifically regarding tennis, enjoyment was found to be positively related to performance outcomes in young players (Puente-Diaz, 2012). Enjoyment also served here as a

mediator between MAp goals and performance, which is a similar finding to that of Puca and Schmalt (1999). Puente-Diaz (2012) suggested that MAp goals lead to more feelings of controllability and a high value of the task, which should lead to higher levels of enjoyment. Consequently, enjoyment leads to better performance. This is an interesting finding, since enjoyment itself is important in youth sports. If it would be possible to also influence performance through enjoyment by setting approach goals, it might be beneficial for coaches to try to stimulate approach goals in young players.

Important to note is that the research of Puente-Diaz (2012) had a cross-sectional design. The current project will add unique value to the literature through having a prospective design. Although it is still impossible to draw conclusions on causality, the performance difference after multiple years could provide information on how enjoyment relates to performance improvement. This would be valuable for coaches and scouts in youth sport, since the aim is to select players who will develop the furthest in the longer term. Furthermore, the study of Puente-Diaz (2012) used a subjective performance measure, by asking for the coaches' opinion. One can question the reliability and validity of this approach. For this reason, the current project uses an objective rating system. It enables us to follow performance level over time, which is changing based on if a player wins or loses a match and the distance from the opponents' rating (KNLTB, n.d). This more objective way of measuring performance eliminates biases that are common in field research, but it does not give a restricted, possibly ecologically invalid measure like experiments might have.

Aim of This Study

The research questions investigated in this paper are: "What are the relationships of performance and mastery approach goals with performance improvement in youth tennis? Secondly, is there a mediating role of enjoyment in these relationships?"

The first set of hypotheses regard the effect of approach goals on performance

improvement. Firstly, H1A states that PAp goals positively predict performance improvement. Secondly, H1B states that MAp goals positively predict performance improvement. This is because different findings (e.g., Van Yperen et al., 2015) show that approach goals in general are positively related to performance.

The second set of hypotheses are focused on the possible mediating role of enjoyment. Building on the findings of Puente-Diaz (2012), H2A states that MAp goals are positively related to enjoyment, which is positively related to performance improvement. The final hypothesis (H2B) is that the positive relationship between PAp goals and performance improvement is not mediated by enjoyment.

Methods

Participants and procedure

The data used for this project was collected in part by Kramer (2020) in 2017. After deleting three players for missing performance data, the sample contains 171 young tennis players from the Netherlands between ages 8 and 19 ($M = 13.1$, $SD = 2.1$). At the time of measurement, 163 of the players (95.3%) were ranked in the national top 200 of their birth year. The group consists of 98 boys (57.3%) and 73 girls (42.7%). Most participants were part of training programs of the KNLTB, and the academies were asked if they were willing to participate in the data collection, after which players and both of their parents were contacted. They all had to give informed consent for the player to be included in the study, and they indicated that their data was allowed to be reused for future research projects. Taking part in the study was on a voluntary basis, as there was no incentive to participate. Ethical approval was given by the Faculty of Health and Social Studies at HAN University of Applied Sciences, EACO 62.03/17.

The questionnaires were taken by players before or after their training during the 2017-2018 season. The researcher gave instructions about the questionnaires and was

available for questions if the player did not understand. It was made clear that there were no right or wrong answers, and that the information given by players would not be shared with coaches or parents.

Materials

The 2x2 Achievement Goal Questionnaire was used to measure the player's dominant achievement goal orientation. The questionnaire is developed by Van Yperen (2006). It was administered in Dutch. It contains six forced-choice items where two goal orientations are mentioned, and the player must choose the one that suits them the best. One example of a question is: "In tennis, I find it most important to… A) Perform better than most others on my level, or B) Perform better than how I usually perform." Here, the player had to choose between a performance approach (PAp) orientation (answer A) and a mastery approach (MAp) orientation (answer B), and they got one point for the orientation that they chose. The full questionnaire can be found in Appendix A. All four of the goal orientations were compared to each other in the six different questions. In this study, we focused on the five questions that used at least one approach goal orientation, since these were relevant for this study's hypotheses. The maximum score per goal orientation is three points, which would mean it is the players' dominant goal orientation (Van Yperen, 2006).

Enjoyment of tennis was measured with a short questionnaire by Kramer (2020). Players answered four questions about how much they enjoyed tennis on a Likert scale (1 = not at all, 5 = very much). The total score of a player can range between five and twenty points. The internal consistency (Cronbach's alpha) of this scale is 0.634, which is acceptable. The full questionnaire can be found in Appendix B.

Improvement of performance in tennis was operationalized by the public KNLTB tennis ratings of the players. This is an objective calculation of performance in official matches. A rating of 0.000 is the highest achievable, while a rating of 9.000 is given to

beginners. The rating is subject to change after every match, based on if a player wins or loses. How much it changes depends on the difference with their opponent's rating. Since this study focuses on the improvement of tennis performance, we looked at the difference between the most recent rating of the player (at end of the 2022-2023 season) and their rating around the time of filling in the questionnaire (at end of 2017-2018 season). The prospective design gives an indication if a players' performance levels improved, stayed the same or decreased over this time span. Important to note is that a lower rating means a player is performing better, so finding a negative value when taking the difference between 2017/2018 and 2022/2023 would mean the player improved. For clarity purposes, in this paper the difference variable is transformed to state the performance improvement in positive terms. This means that from now on, a positive performance improvement value means that the player improved.

Data analysis

After deletion of three players with missing data, the final sample consists of 171 players. According to the recommendation of Khamis and Kepler (2010), the formula for minimum sample size for multiple linear regression is 20 plus 5 times the number of independent variables. This project investigates four independent variables, so the sample adheres to the recommendation.

Performance ratings are likely to be related to age, since the older a player is, the more tennis experience they likely will have. We assume that age is also related to performance improvement, since older players will probably improve less over five years than younger players will. To avoid these potential issues and to only focus on the effects that goal orientation and enjoyment have on performance, age will be controlled for in the analyses.

In the data analysis in IBM SPSS (Version 29.0.2.0), a check of the assumptions for multiple linear regression was conducted first. Then, descriptive statistics and correlations between variables were calculated. Following this, a multiple linear regression analysis was

performed to investigate the effect of the approach goal orientations on performance improvement, controlled for age. Finally, indirect effects were tested to investigate if enjoyment plays a mediating role in the relationship.

Results

In Table 1, the means and standard deviations are presented. Correlations and partial correlations controlled for age are presented in Table 2.

Table 1

Descriptive Statistics

Variable	n	M	SD
1. PAp	171	1.52	0.88
2. MAp	171	2.57	0.70
3. Enjoyment	171	18.40	1.60
4. Performance Improvement	171	1.58	1.58
5. Age	171	13.14	2.13

Table 2

Correlations and Partial Correlations

Variable	1	2	3	4	5	1[a]	2[a]	3[a]	4[a]
1. PAp	—					—			
2. MAp	-.315*	—				-.322*	—		
3. Enjoyment	.015	.105	—			.031	.144	—	
4. Δ Perf.	.047	-.099	.278*	—		.096	-.045	.120	—
5. Age	.046	.103	-.305*	-.620*	—	—	—	—	—

[a] Partial correlations, controlled for Age.

[b] Δ Perf. stands for performance improvement.

* $p < 0.05$

Important to note is that not all assumptions for multiple linear regression were adhered to (see Appendix C). The assumption of linearity is valid, as visible in the scatterplot of standardized residuals of the model. However, the scatterplot also shows that the assumption of homoscedasticity is not completely valid. In addition, when doing the Shapiro-Wilk test of normality, only age seemed to be a normally distributed variable. The rest of the variables were skewed in their Q-Q plots. Finally, the data was collected through a convenience sample, so there is no guarantee of fully independent observations. In trying to improve the adherence to the assumptions, log transformations were performed, but this did not make a notable difference. Despite these issues with homoscedasticity, normality and independent observations, a more complex statistical analysis or additional data collection is beyond the scope of this bachelor thesis. Additionally, a check for multicollinearity was performed. The Variance Inflation Factors (VIF) of performance approach (PAp) goals (VIF = 1.126) and mastery approach (MAp) goals (VIF = 1.158) were not of concern, so there is no issue of multicollinearity despite the forced-choice questionnaire. For age (VIF = 1.138) and enjoyment (VIF = 1.133), the VIFs are also not problematic.

As expected, a strong correlation was found between age and improvement of performance (r = -.620, p < .001). Linear regression analysis showed that age predicts improvement of performance significantly ($F(1, 169)$ = 105.774, p < .001) with B = -.461 (p < .001). It explains 38.1% of the variance in performance improvement (R^2_{adj} = .381). The older the player, the less improvement they will have in their rating over the years. Therefore, the partial correlations, controlled for age, will be reported to show the effects of the rest of the variables. The regression analyses will include age as a control variable.

Concerning the first set of hypotheses, it is visible in Table 2 that there is no significant partial correlation between PAp goals and performance improvement (r = 0.96, p = .212). The regression slope showed that PAp goals did not predict improvement of tennis

performance ($B = .136$, $t = 1.252$, $p = .212$). This is not in line with H1A. For MAp goals, there is also no significant partial correlation with performance improvement ($r = -.045$, $p = .557$). Regression analysis with age as control variable showed that MAp goals did not predict improvement of tennis performance ($B = -.081$, $t = -.589$, $p = .557$). This does not align with H1B, which stated that MAp goals positively predict performance improvement. The first set of hypotheses about the relationship between goal orientation and performance improvement were thus not supported.

The second set of hypotheses concerned a possible mediating role of enjoyment. Although no main effect was found, indirect effects were still tested for, since it is possible to find a mediation effect in absence of a main effect (O'Rourke & MacKinnon, 2018). Firstly, the relationships between goal orientations and enjoyment were investigated. No relationship between MAp goals and enjoyment was found, with the partial correlation being $r = .144$ ($p = .061$). The regression slope of MAp goals when age was controlled for is not significant ($B = .314$, $t = 1.887$, $p = .061$), meaning that having a MAp goal orientation does not predict enjoyment of tennis significantly. This does not support the first part of H2A. For PAp goals, there was also no significant partial correlation with enjoyment ($r = 0.31$, $p = .691$). The regression slope of PAp goals is not significant when age is controlled for ($B = .053$, $t = .399$, $p = .691$). PAp goals thus also seem to be unrelated to enjoyment, which is as predicted in H2B.

Regarding the second part of the potential mediation, there is a significant positive correlation between enjoyment and performance improvement over the years ($r = .278$, $p < .001$). The more enjoyment at the time of measurement, the more performance improves over the years. However, when controlling for age, it becomes clear that the second part of H2A is also not supported ($r = .120$, $p = .120$). The regression analysis controlling for age shows that enjoyment did not significantly predict improvement of performance ($B = .098$, $t = 1.563$, $p = $

.120). This makes sense, since there is a significant negative relationship between age and enjoyment ($r = -.305$, $p < .001$). It appears that age when filling out the questionnaire significantly predicts the level of enjoyment of tennis at that moment ($F(1, 169) = 17.287$, $p < .001$) with $B = -.228$ ($p < .001$). It explains 8.7% of the variance in enjoyment ($R^2_{adj} = 0.087$). This shows that younger players had higher levels of enjoyment of the sport.

The second set of hypotheses were thus not fully supported. Contrary to predictions of H2A, there is no mediating role of enjoyment in the relationship between MAp goals and performance improvement. In line with hypothesis H2B, there is no significant relationship between PAp goal orientation and enjoyment of the sport.

Discussion

The aim of this study was to examine if approach goals relate to improvement of performance in young tennis players, and if enjoyment plays a mediating role in this. The first hypotheses stated that performance approach (H1A) and mastery approach (H1B) goals positively predict performance improvement. Both PAp goals and MAp goals do not seem to be significantly related to performance improvement. These findings are inconsistent with the existing literature, which did find a positive impact of approach goals most of the time (e.g., Van Yperen et al., 2015; Baranik et al., 2010). A potential reason for the non-significant findings is that the current sample consists of children. The meta-analysis of Van Yperen (2015), in which a clear relationship with performance was found, included adults. In children, mental processes might be less influential on performance than physical ones. The maturation differences between children can be large (Kramer, 2020), which might result in potential psychological effects to be invisible.

The second hypothesis concerned enjoyment as a potential mediating variable. Firstly, H2A stated that MAp goals are positively related to enjoyment. This is not supported by the current data, which is inconsistent with results of previous studies (e.g., Jaakkola et al., 2016;

Wang et al., 2018; Briki, 2020). The second part of H2A was that enjoyment positively relates to performance improvement. A significant relationship was found, but when controlling for age, the relationship disappeared. Age was thus found to be a confounding factor, related to both enjoyment and performance improvement. Therefore, the second part of H2A is also not supported. This is not in line with the research of Puente-Diaz (2012), which found enjoyment to be mediating the positive relationship between MAp goals and performance. One potential reason why these results are unlike previous literature is the prospective design. Puente-Diaz (2012), among most other studies in this field of work, used a cross-sectional design, while the current research only looks at change of performance over multiple years. Possibly, the inconsistent results could be explained by MAp goals and enjoyment only being useful for immediate performance, and that they might not predict performance improvement over a longer period.

H2B stated that enjoyment is not related to PAp goals. The current data shows support for this hypothesis. This is consistent with some of the existing literature (e.g., Jaakkola et al., 2016; Briki, 2020). However, other research has suggested that PAp goals do have a positive relationship to enjoyment (e.g., Wang et al., 2007; Gaudreau & Braaten, 2016). The current project adds to this ongoing debate through suggesting there is no relationship between enjoyment and approach goals.

Although no support was found for most hypotheses, there is one noteworthy exploratory finding. As mentioned earlier, enjoyment was significantly related to a player's age. This means that younger players experienced more enjoyment of tennis compared to older participants. This is also found by Scanlan and Lewthwaite (1986) in research on young wrestlers. An explanation could be that the younger players are still in their sampling years of sports, which are mostly focused on deliberate play and having fun (Strachan et al., 2009). In these years, it is also possible for the children that do not enjoy it to quit tennis, without

having sunken costs like invested time or money. In the specializing years, from age 13 on, athletes take the sport more seriously and less focus lays on having fun (Strachan et al., 2009), which could possibly lead to less enjoyment. Future investigations could take a sample in a smaller age range to account for these factors.

Strengths and limitations

Overall, the current project adds to the existing literature in multiple ways. An important aspect is its prospective design. By being able to track performance at two moments in time, it was possible to measure players' improvement over five years. The goal of the KNLTB and other sport associations is to select the players that have the largest chances of playing the sport professionally and developing them most optimally. Through a prospective research design, it is possible to see if certain psychological aspects actually make a difference in the long run. Armed with this information, coaches and other staff can make better informed selections and create training programs that improve the psychological aspects needed for tennis. We are unaware of projects on the 2x2 achievement goal model that have done something similar. The current design thus shows that approach goals might not be as relevant for the future as once thought.

A second way this research adds to the literature is through the sample. The participants were a talented group of young tennis players, from which 95% were in the Dutch top 200 of their birth year. It is useful to have talented, young players in the sample, considering that adolescence is a crucial developmental period in a tennis player's career (Kolman, 2023), and they likely have the highest chances of improvement over a set number of years. The findings are important for selective talent development programs: it appears that holding approach goals might not significantly benefit these young, talented athletes in the long run.

A third strength of this research is how performance improvement is operationalized. Other research papers have had trouble operationalizing performance in an ecologically valid, reliable and unbiased way. Examples of operationalization in earlier projects are letting players do basic motor tasks related to the sport (Kavussanu et al., 2009), using coaches' subjective opinions (Puente-Diaz, 2012; Li et al., 2011), or on perceived performance from players themselves (Jaakkola et al., 2016; Li, 2010). The objective rating system is also more valid than using only match statistics and win-loss ratios, since these statistics do not take the level of opponents into account. Through having an objective way of measuring performance over time, it is possible to draw better conclusions about the impact of goal orientations on performance improvement.

Despite this project having certain strengths, there are some limitations. Firstly, the prospective design does not allow claims about causality. It would have been an interesting addition to let the athletes retake the questionnaires in 2023 and thus have a longitudinal design. In this way, one could have seen how mental processes develop at the same time as how performance changed, and if the goal orientations are stable over multiple years.

Additionally, the achievement goal orientations and enjoyment levels were measured through self-report. Response bias has been found in self-report measures for high level athletes before (e.g., Williams & Krane, 1989). Specifically regarding goal orientations, mastery goals were found to be a more socially desirable answer compared to performance goals (Grossbard et al., 2007). It is unknown if issues like socially desirable responding were at play in this sample. However, in an attempt to prevent this, it was made clear to the participants that the responses would not be shared with coaches or other people.

There are also a few limitations about the 2x2 Achievement Goal questionnaire. For example, we were unable to calculate the internal reliability, because the questions were set up as forced choice items. A benefit of the forced choice items is that they measure one

dominant achievement goal (Van Yperen, 2006). However, if a player chooses one orientation, they therefore do not choose the other, which automatically leads to a relationship between the two options. Since this paper only investigated two of the four goal orientations, there were no problems with multicollinearity. However, for future research using all four orientations, issues may occur since the data scores are all inherently related to each other. It might be advisable to choose another measure depending on the goals of the study.

One issue in the literature of achievement goal orientations is that they get operationalized in various ways. Hulleman and colleagues (2010) wrote that PAp goals can be measured in normative ways (i.e., wanting to perform better than others) and self-presentational ways (i.e., wanting to show others you are good at the task, to not look foolish). They found that research using normative items often finds a more positive relationship between PAp goals and performance. The questionnaire used in this paper by Van Yperen (2006) has approach goals operationalized normatively. Similarly, Van Yperen (2006) mentioned that MAp goals can be operationalized as task-referenced (i.e., wanting to do well in the task), but that he operationalized it as self-referenced in the questionnaire (i.e., wanting to perform better than your usual self). The different ways to measure the constructs make interpretation and comparison of study results challenging. It could be one explanation for the mixed outcomes of approach goals on performance.

There are also some limitations to the enjoyment scale created by Kramer (2020). The questionnaire consists of merely four items, which might not be enough to convey an accurate picture. Although there is strong face validity, the questionnaire has not been validated in any other way. Therefore, any interpretations should be made with caution.

Lastly, there were some difficulties with the statistical analysis. Multiple linear regression assumes independent observations, homoscedasticity and normality of the variables, but these were not fully adhered to. This did not improve after performing logistic

transformations. Multiple linear regression might not be the most suitable option for these data, but the use of more complicated statistical analyses lay outside the scope of this bachelor thesis. Another important point is that the 2x2 Questionnaire results in data on an ordinal scale, but it is treated as continuous in the analysis. It can be argued that this practice is justified since the items contain between three and six categories (Robitzsch, 2020). However, all things considered, it is important to interpret the results with caution.

Implications and future research

Through this research, no evidence is found for the idea that approach goals benefit performance improvement in high level youth sports. The usefulness of PAp goals was already questioned by some researchers (e.g., Elliot & Church, 1997), but MAp goals seemed to have a positive relation with performance (e.g., Van Yperen et al., 2015). The current investigation adds to the theoretical knowledge base by showing that the relationships are less clear than previously thought, especially regarding long term performance change. In practice, it might not be useful to include approach goals in talent selection and training programs. More research is needed to replicate these findings to draw firm conclusions on practical implications.

Regarding future research possibilities, longitudinal designs would be especially beneficial. Having measures of goal orientation at the same times as performance measures would give a clearer picture of the temporal pathways, for example, to see whether goal orientations also change together with performance over the years. Another option for achieving this is through an experimental design, in which one can try to coach a certain achievement goal at tennis training, and then see how these players' performance ratings develop over time. Experimental designs were investigated in the meta-analysis by Van Yperen and colleagues (2015), but most of these studies did not follow the participants over

time. Doing so would take a lot of time and resources, but it would provide valuable information.

A related suggestion for future research is to explore whether achievement goal orientations are stable, or if they change easily depending on the context. At training, a player might hold MAp goals, but before an important game, PAp goals might be more valuable. For example, Van de Pol and colleagues (2012) found more performance orientations in matches than in trainings in a football sample, while they found equal mastery orientations. However, they did not consider the approach/avoidance dimension or measures of performance. Vansteenkiste and colleagues (2014) measured within-person fluctuations of the 2x2 goal orientations at different volleyball matches. They found that the dominant orientation can even differ between matches. In the current paper, performance ratings are taken only from matches. However, the goal orientation questionnaire was focused on tennis in general (both training and matches) and it was taken by players at a training session. This mismatch in context of measurement might impact outcomes. Future research could focus on measuring goal orientations in training separately to matches while using objective performance indicators over time.

This project also investigated the role of enjoyment in high level youth tennis. Although dropout was not considered in the current research, it is known that enjoyment plays a large role in preventing it (Butcher et al., 2002; Crane & Temple, 2014). As the goal is to select and develop the most talented players, we must encourage as many children as possible to keep playing tennis. High levels of enjoyment were found in this research, especially in younger players. If approach goals do not predict enjoyment, which mental aspects of sports do, and how can we encourage them? And how can we keep the enjoyment of players high as they grow older? Future research could shed light on these questions.

Conclusion

Overall, the aim of this project was to investigate the predictive value of the two types of approach goals on improvement of tennis performance. Although it was expected that PAp and MAp goals were positively related to performance improvement, this was not shown by the results. Enjoyment was not significantly related to any variables after controlling for age. The prospective design with objective performance ratings is innovative, but not completely without its limitations. Future research should focus on finding out if approach goals truly do not have performance development benefits in the long term, or if approach goals can still provide a positive impact for young tennis players.

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Appendix A

2x2 Achievement Goal Questionnaire and Instructions

De volgende lijst bestaat uit zes vragen. Je krijgt bij elke vraag twee stellingen voorgelegd waaruit je er één moet kiezen. Kies per vraag of optie A of optie B meer op jou slaat. Denk niet te lang na en ga af op je eerste indruk. Omcirkel of onderstreep de letter van jouw keuze en ga dan door met de volgende vraag. Omcirkel PER VRAAG de letter "A" òf "B".

In mijn tennis vind ik het *meest* belangrijk om ....

1 A ... het *beter* te doen dan de meeste anderen van mijn niveau.	òf **B**	... het *niet slechter* te doen dan de meeste anderen van mijn niveau.

2 A ... het *beter* te doen dan waar ik normaal gesproken toe in staat ben.	òf **B**	... het *niet slechter* te doen dan waar ik normaal gesproken toe in staat ben.

3 A ... het *beter* te doen dan de meeste anderen van mijn niveau.	òf **B**	... het *beter* te doen dan waar ik normaal gesproken toe in staat ben.

4 A ... het *niet slechter* te doen dan waar ik normaal gesproken toe in staat ben.	òf **B**	... het *niet slechter* te doen dan de meeste anderen van mijn niveau.

5 A ... het *niet slechter* te doen dan de meeste anderen van mijn niveau.	òf **B**	... het *beter* te doen dan waar ik normaal gesproken toe in staat ben.

6 A ... het *niet slechter* te doen dan waar ik normaal gesproken toe in staat ben.	òf **B**	... het *beter* te doen dan de meeste anderen van mijn niveau.

Appendix B

Enjoyment questionnaire and Instructions

Hieronder vind je een aantal vragen over het plezier dat je kan ervaren binnen tennis. Er zijn verschillende stellingen weergegeven. Geef aan in hoeverre elke stelling bij jou past.

Kies het meest toepasselijke antwoord voor elke stelling.

Vind je het leuk om te trainen?

Helemaal niet een beetje   best wel   behoorlijk   heel erg

Vind je het leuk om wedstrijden te spelen?

Helemaal niet een beetje   best wel   behoorlijk   heel erg

Heb je plezier tijdens trainingsoefeningen?

Helemaal niet een beetje   best wel   behoorlijk   heel erg

Houd je ervan bezig te zijn met tennis?

Helemaal niet een beetje   best wel   behoorlijk   heel erg

Appendix C

Assumption checks
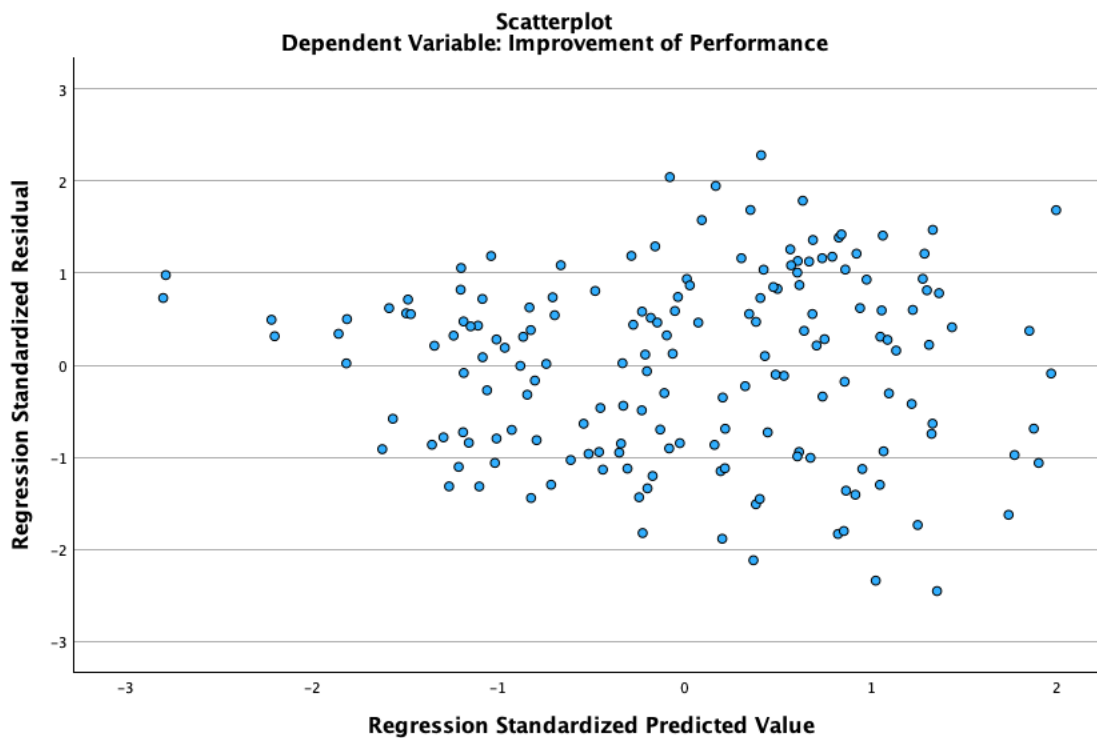
Figure 1. Test of Linearity and Homoscedacity

Scatterplot
Dependent Variable: Improvement of Performance

Figure 2. Q-Q Plot of Improvement of Performance

Normal Q–Q Plot of Performance Improvement
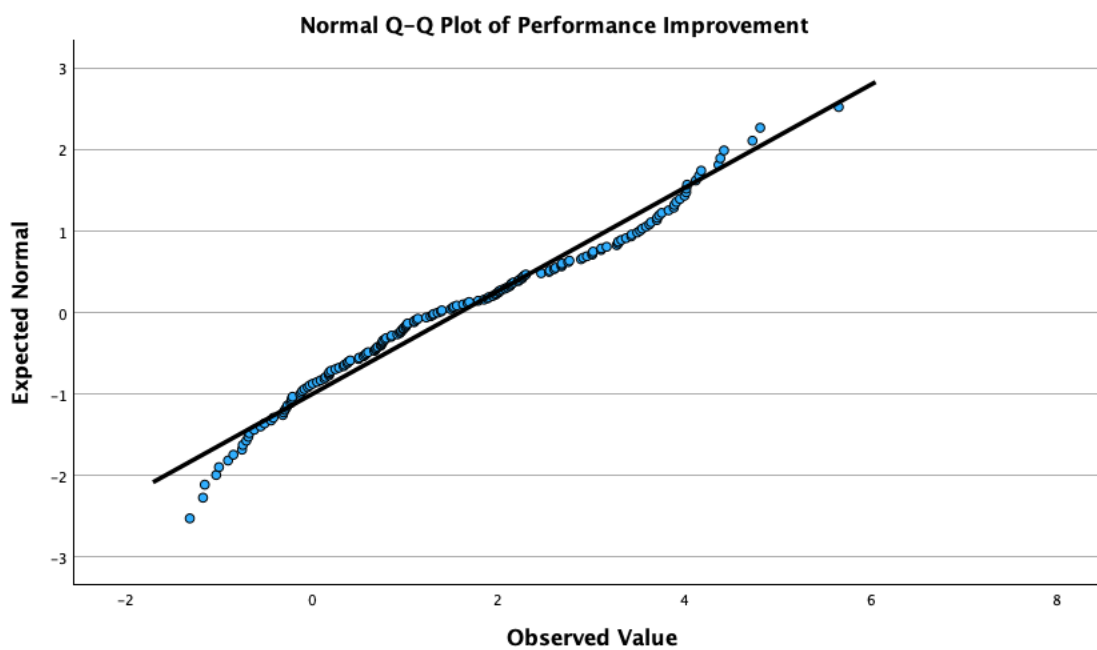
Figure 3. Q-Q Plot of Age

Normal Q–Q Plot of Age
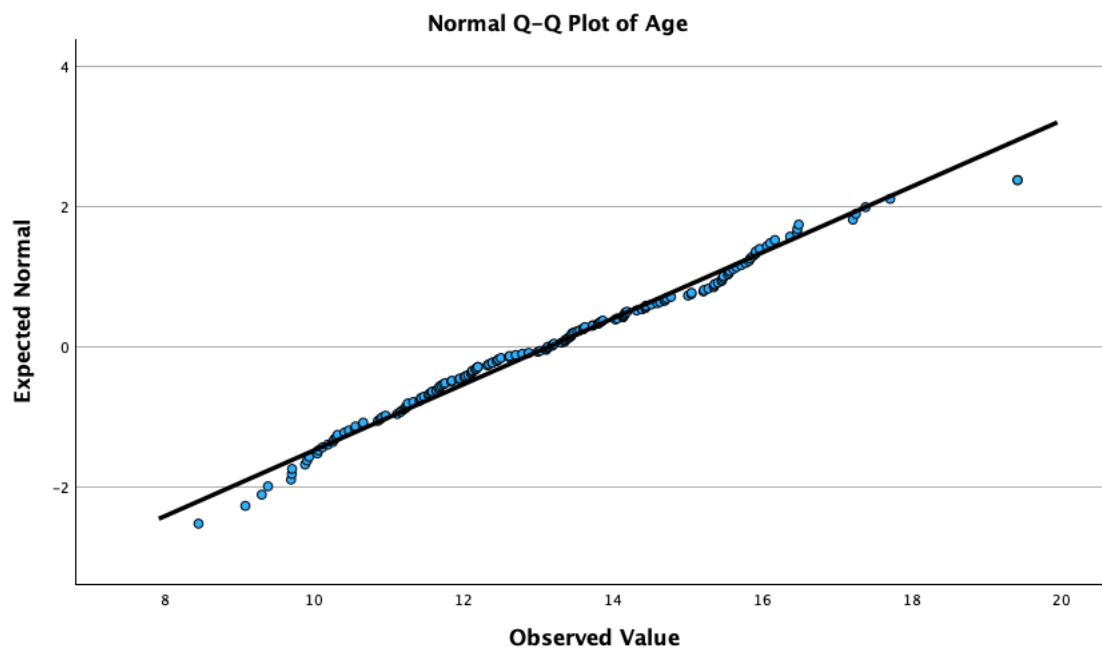
Figure 4. Q-Q Plot of Performance Approach Goals (PAp)
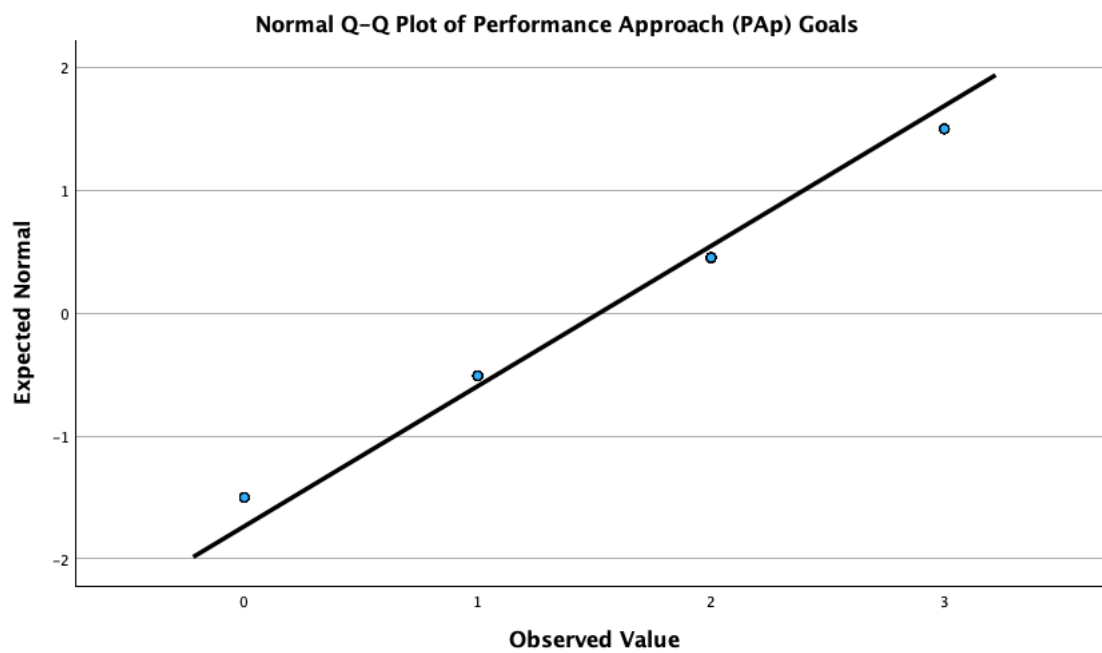
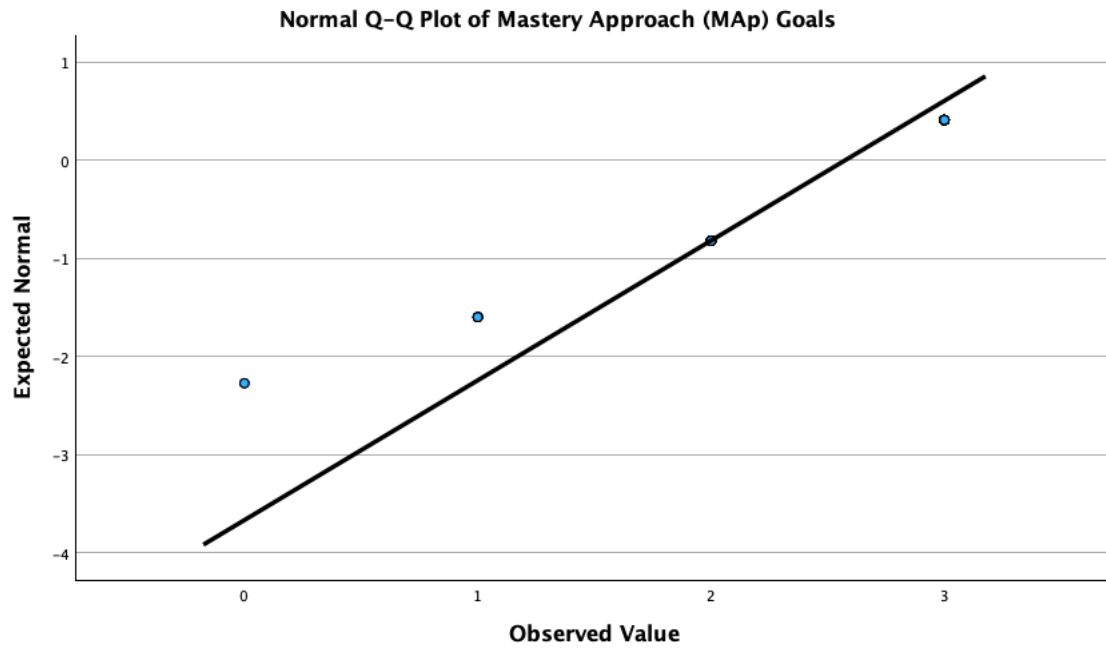**Normal Q–Q Plot of Performance Approach (PAp) Goals**

Figure 5. Q-Q Plot of Mastery Approach Goals

Figure 6. Q-Q Plot of Enjoyment