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The Effect of Upward Social Comparison on Student Athletes' Performance: The Role of Self- Approach Goals and Envy

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Abstract

Social Comparison Theory suggests that individuals compare themselves to others in order to evaluate their skills and abilities. Comparison is also a prominent phenomenon in sports, but its impact on performance is understudied. The current study investigates the effects of upward social comparison on the sport performance of student athletes ($M_{\text{age}} = 12$) at the Topsport Talent school in Groningen. It was hypothesized that student athletes who compare themselves upwards would be more likely to set self-approach goals and in turn would show higher levels of sport performance. It was further expected that student athletes who experience benign envy would be more likely to set self-approach goals as a result of comparing themselves upward, whereas student athletes who show malicious envy would be less likely to set self-approach goals as a result of upward social comparison. Data was collected through an online questionnaire using Qualtrics and analyzed using PROCESS macro for SPSS. No significant mediation effect of self-approach goals on the relationship between upward social comparison and sport performance was found. Contrary to expectations, benign envy negatively moderated the relationship between upward social comparison and self-approach goals. Malicious envy did not have a significant moderation effect, but was found to significantly mediate the relationship between upward social comparison and self-approach goals. These findings suggest that upward social comparison can motivate student athletes to adopt self-approach goals, but highlight the potential detrimental effect of malicious envy on goal-setting. Theoretical and practical implications are discussed, providing insights into the complex interplay between social comparison, envy, goal-setting, and sport performance.

Keywords: student athletes, upward social comparison, envy, self-approach goals, sport performance

The Effect of Upward Social Comparison on Student Athletes' Performance: The Role of Self-Approach Goals and Envy

The world of sports is highly competitive and comparing oneself to other athletes plays a significant role in an athlete's motivation and performance (Diel et al., 2021). The act of social comparison is a natural human tendency to evaluate ourselves in relation to others with regard to our abilities, skills and attributes (Festinger, 1954). Better understanding the impact and underlying mechanisms of social comparison in sports can help athletes, coaches, and sport psychologists to better manage the psychological factors that affect performance in sports.

Athletes can compare themselves to both superior and inferior others, and each type of comparison has its own set of benefits and drawbacks. While comparing oneself to an inferior other is likely to boost one's self-esteem, the comparison to a superior standard may lower one's self-esteem (Redersdorff & Martinot, 2003). Even though downward social comparison may make a person feel better about themselves in the short-term, it is not a long-term coping strategy. Upward social comparison, on the other hand, allows for self-improvement (Collins, 1996). Past research has found a positive relationship between upward social comparison among athletes and their sport performance (Diel et al., 2021). In other words, athletes who compare themselves to higher-performing athletes, tend to show higher levels of performance. The underlying mechanisms of this relationship are however still unclear.

The purpose of this research is to fill this gap by investigating the role of self-approach goals and envy in athletes' motivations to improve their performance as a result of upward social comparison. A moderated-mediation model is proposed in which self-approach goals mediate the relationship between athletes' upward social comparisons and their performance, and where envy moderates the relationship between upward social comparison and self-approach goals.

(Upward) Social Comparison in Sports

Social Comparison Theory by Leon Festinger (1954) suggests that individuals have a natural tendency to compare themselves to others in an attempt to evaluate their own abilities, opinions and social standing (i.e., their self-worth). Social comparison is a prominent phenomenon in sports, as it allows athletes to evaluate their skills and performance, track their development, and establish their standing in relation to others. Within the realm of social comparison, two distinct forms emerge: downward and upward social comparisons (Festinger, 1954). Downward social comparison occurs when athletes compare themselves to those who they perceive as worse off in terms of skills, achievements, or overall performance. Upward social comparison in sports, on the other hand, involves comparing oneself to individuals who are perceived as better off in terms of skills, achievements or performance level. Comparing oneself to a higher standard (i.e., negative discrepancy between oneself and a comparison standard) can trigger negative emotions such as shame, guilt, and a decline in self-esteem (Carver, 2004; Carver & Scheier, 1981, 1990; Redersdorff & Martinot, 2003). On the contrary, engaging in downward comparison (i.e., positive discrepancy between oneself and a comparison standard) is associated with positive emotions such as pride, happiness, and an increase in self-esteem, indicating a self-enhancement effect (Morse & Gergen, 1970; Redersdorff & Martinot, 2003; Wills, 1981).

Upward social comparison, despite its potential negative impacts, is however not without its merits. A recent longitudinal study by Diel et al. (2021) suggests that upward social comparison in athletes is related to higher performance, while downward social comparison is related to lower levels of performance. The researchers examined the long-term effects of social comparison on the motivation and performance of German athletes at the Sport University Cologne who were engaged in various sports, ranging from state division to national team level. The study spanned over one semester, during which freshmen participating in track-and-field and swimming courses reported their social comparisons after each weekly session. The researchers also collected running and swimming time data at the

beginning and end of the term. The study found that higher motivation and performance was observed in cases of upward social comparison. Conversely, extreme upward comparison was associated with a decline in motivation and increased disengagement (Diel et al., 2021). This suggests that athletes who compare themselves to other athletes that perform better than themselves, tend to be more motivated to self-improve and may therefore show higher performance levels. Building upon these findings, the present study aims to explore the impact of upward social comparison on the likelihood of setting self-approach goals, which are focused on self-improvement. Moreover, the study intends to investigate the role of envy in determining the strength of this relationship.

The Role of Benign versus Malicious Envy in Upward Social Comparison

Envy is considered a complex emotion that occurs when an individual “lacks another’s superior quality, achievement, or possession and either desires it or wishes that the other lacked it” (Parrott & Smith, 1993, p. 908). There is sound scientific evidence for the existence of two qualitatively different forms of envy that differ in their motivations and outcomes: benign envy and malicious envy (van de Ven et al., 2009; Lange & Crusius, 2014; Fam et al., 2020; Kwiatkowska et al., 2020; Dinić & Branković, 2022). Benign envy involves a desire to attain the same quality or possession the other person possesses, while malicious envy involves a desire to see the envied individual lose their quality or possession.

In order for envy to arise, there needs to be an upward social comparison – an individual needs to feel that someone else is better off (van de Ven, 2016). Upward social comparison creates a discrepancy between the self and the superior comparison target. The individual is motivated to minimize this discrepancy, and there are two potential ways of doing this. While benign envy is thought to motivate the individual to reduce the discrepancy via self-improvement (i.e., leveling oneself up to the superior target), malicious envy is thought to trigger that same motivation by harming or discrediting the superior standard (i.e., bringing superior target down to one’s level) (Crusius & Lange, 2014). Hence, individuals

who show benign envy (compared to malicious envy) seem to be more likely to be motivated to self-improve as a result of upward social comparison and are hence expected to be more likely to set self-approach goals (i.e., wanting to improve themselves).

The Role of Self-Approach Goals for Performance

Achievement goals play a crucial role in shaping performance outcomes (Elliot et al., 2006; Lochbaum & Gottardy, 2015; Stoeber & Crombie, 2010) and different forms of motivation in sport (Conroy et al., 2006; Moreno et al., 2010). Achievement Goal Theory (e.g., Dweck, 1986; Elliot & McGregor, 2001) is based on the idea that individuals are motivated to achieve competence in their pursuits and this motivation influences their goal orientation and subsequently their behavior. The achievement goal theory proposes two types of achievement goals: mastery goals and performance goals. While mastery goals are focused on attaining competence, performance goals are focused on demonstrating competence. In more recent models of achievement goals, additionally, a distinction is made between approach and avoidance goals (Elliot, 1997; 1999; Elliot & Harackiewicz, 1996). Approach goals focus on developing or demonstrating competence in a certain task, whereas avoidance goals focus on avoiding situations where one might feel or look incompetent (Elliot et al., 2017; Harackiewicz et al., 2002).

The 3 x 2 model of achievement goals (Elliot et al., 2011), which has been applied to the sport domain by Mascaret et al. (2015), extended this 2 x 2 achievement goal model by separating mastery-based goals into task-based (i.e., degree to which one has accomplished the task or not) and self-based (i.e., degree to which one is improving or not) components. Furthermore, performance-based goals were relabeled as other-based goals. The model includes six different constructs related to goal orientation: task-approach, self-approach, other-approach, task-avoidance, self-avoidance, and other-avoidance. The present study only focuses on self-approach goals, which are centered around the attainment of self-based competence (Elliot et al., 2021). Previous research has found that mastery-approach goals

positively predict sport performance (Li et al., 2011; van Yperen et al., 2014). Given that self-approach goals fall within the category of mastery-approach goals, it is expected that a similar relationship exists between self-approach goals and sport performance. In other words, athletes who actively set goals to improve themselves are expected to show higher levels of performance.

Proposed Moderated Mediation Model

To summarize, a model was proposed in which self-approach goals mediate the relationship between student athletes' upward social comparison and performance. Therefore, both the direct effect of upward social comparison on students' performance as well as the mediating role of self-approach goals in this relationship were examined. Additionally, a moderating role of envy on the relationship between upward social comparison and self-approach goals was predicted. More specifically, benign envy was predicted to strengthen the relationship between these two variables, while malicious envy was predicted to weaken it. Student athletes with high scores on benign envy are expected to be more likely to set self-approach goals (i.e., goal to improve themselves), while students with high scores on malicious envy are expected to be less likely to set self-approach goals as a result of comparing themselves upward. Student athletes that are more likely to set self-approach goals are in turn expected to report higher performance. Based on the presented literature and theory, the following hypotheses are formulated:

H1: There is a positive relationship between students' upward social comparison and their self-reported sport performance.

H2: Self-Approach goals mediate the relationship between students' upward social comparison and their self-reported sport performance.

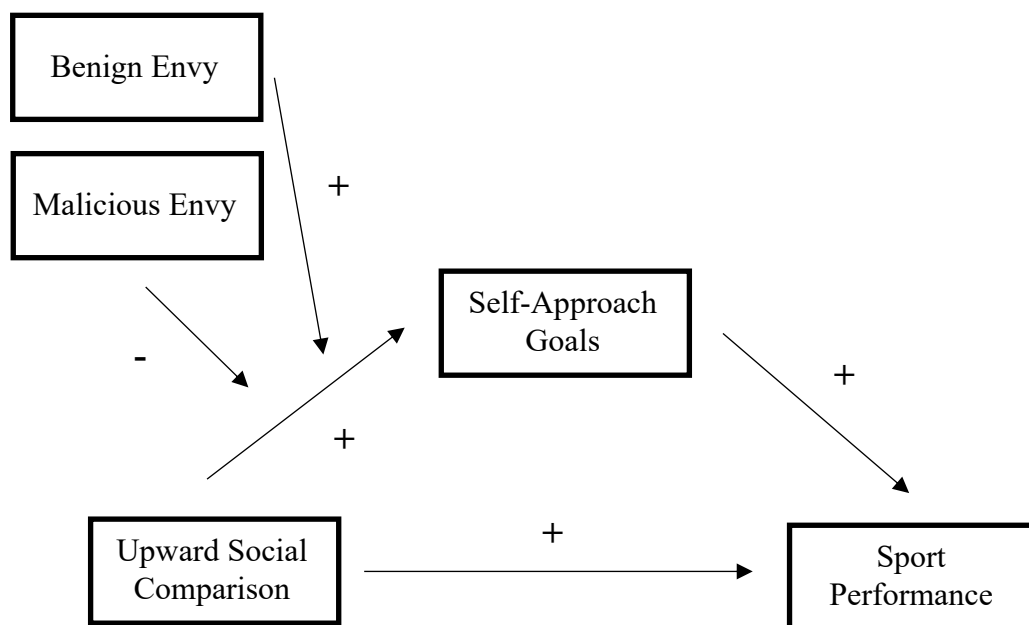
H3: Benign envy strengthens the relationship between upward social comparison and self-approach goals.

H4: Malicious envy weakens the relationship between upward social comparison and self-approach goals.

The present research gives insights into the psychological mechanisms behind the effects of upward social comparison in youth athletes and its effects on their performance. On top of that, it dives into the role of self-approach goals for improving young athletes' performance levels.

Figure 1.

Proposed dual moderated mediation model



Method

Participants

The study sample consisted of 117 regular students and student athletes (VMBO, HAVO, VWO) at the Topsport Talent school (TTS) in Groningen. The participants' ages ranged from 12 to 13. The University of Groningen has a collaboration with the TTS. Hence, a convenience sample was used.

Study Design and Procedure

A cross-sectional research design was used to test the proposed moderated mediation model. Information was gathered with means of an online survey via Qualtrics (Qualtrics, Provo, UT). The research was part of a longitudinal study for which the ethical committee of Psychology at the University of Groningen has given approval. Prior to the testing days, parents were informed of the study and were asked to give consent about whether their children are allowed to participate in the study or not. Only the data of those students who obtained parental consent was used. The survey took approximately 20 minutes to complete. Students could access the study through the learning platform of the school (Its Learning) on the day of the testing. To be able to link the data to future studies, all participants were assigned an identification number prior to their participation. This also ensured the anonymity and confidentiality of their data. After having filled in their participant number, participants were asked a number of questions about their demographics and performance in school, followed by questions about their sport and how they would rate their own sport performance. Thereafter, participants encountered questionnaires about goal orientations, envy and upward social comparison. The researchers were present throughout the collection of the data and students were allowed to ask questions throughout the entire duration of the study. All survey items were made mandatory to answer in order to avoid missing data. A dropout resulted in the exclusion of their data. After completion of the survey, participants were thanked for their participation and could take a treat.

Practice Session

The present study was part of a larger research project. Prior to conducting the presented study, a similar study with additional scales had been conducted within the same research sample. This ‘practice study’ helped increase the experience with the study methods and procedure and led to the following changes of the original study. Firstly, the study was divided into two parts and each part was administered on a different day. This division aimed to reduce the work load for students and consequently enhance their productivity and

motivation to complete the questionnaires. Additionally, a forced-answer option was added in Qualtrics in order to prevent students from simply skipping through the questions. In terms of the Instruments used, the Achievement Goals Scale (van Yperen, 2006) was replaced with the 3 x 2 Achievement Goal Questionnaire for Sport (Mascret et al., 2014).

Measurement Instruments

The survey included four instruments to measure the variables presented in the proposed model (see Appendix A). The entire questionnaire was administered in the Dutch language, for fluency of the paper the items are written in English.

Upward Social Comparison

A modification of the Upward Physical Appearance Comparison Scale (UPACT; O'Brien et al., 2009) was used in order to determine the extent to which participants compare themselves upward. The scale consists of 10 items (e.g., "I compare myself to those who are performing better than me than those who are not."), measured on a 5-point Likert scale ranging from *completely disagree* (1) to *completely agree* (5). The total score on the scale ranges from 0 to 50, with higher scores indicating greater levels of upward social comparison. The total score for each participant was obtained by summing their item scores. Cronbach's alpha for the original scale was .94, and the test-retest reliability was at $r = .79$. The scale has also been shown to be valid (O'Brien et al., 2009). Cronbach's alpha for the modified scale in this sample was .90.

Goal orientation

In order to measure the participants' goal orientation, the 3 x 2 Achievement Goal Questionnaire for Sport (3 x 2 AGQ-S; Mascret et al., 2014) was used. The scale measures six distinct goal orientations: task-approach goals (e.g., "In sport, my goal is to perform well."), self-approach goals (e.g., "In sport, my goal is to do better than what I usually do."), other-approach goals (e.g., "In sport, my goal is to do better than others."), task-avoidance goals (e.g., "In sport, my goal is to avoid performing badly."), self-avoidance goals (e.g., In sport,

my goal is to avoid doing worse than I usually do.”), and other-avoidance goals (e.g., In sport, my goal is to avoid doing worse than others.”). Each of these orientations was measured with 3 items, scored on a 7-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (7). The scale has been shown to have good validity (Mascret et al., 2014). The internal consistency reliability of the scale lies above .80 (Cronbach’s alpha) for each achievement goal: task-approach ($\alpha = .80$), task avoidance ($\alpha = .87$), self-approach ($\alpha = .86$), self-avoidance ($\alpha = .90$), other-approach ($\alpha = .92$), and other-avoidance ($\alpha = .93$). In a second study by Mascret et al. (2014) the internal consistency was found to be even higher. This paper solely focuses on self-approach goals. In the present sample, Cronbach’s alpha for self-approach goal items was .76. The total score on this subscale ranges from 0 to 21, with higher scores indicating greater levels of self-approach goals. The total score for each participant was calculated by summing their item scores.

Sport Performance

In order to determine the participants’ level of sport performance, participants were asked to rate their own performance in the current season in comparison to same-age athletes in their sport in the Netherlands. For this, the Sport Report Questionnaire was used, which was developed by the University of Groningen specifically for coaches, and later modified for athletes. Both versions assess the performance level of athletes in a universally applicable manner. For the present study the version for athletes was used. Participants had the option to move a vertical slider on a horizontal line, ranging from 0 (i.e., average performance level) to 100 (i.e., top-sport performance level), to the point where they see themselves (i.e., total score). The decision to begin the scale line at ‘average level’ is based on the understanding that athletes of a top sport talent school are considered to be above the average level. The Sport Report has been validated by comparing the scores with the position on a national ranking in speed skating ($r_s(41) = .663, p < .001$) (Hijlkema, 2016). Additionally, the Sport Report demonstrated interclass reliability ($r = 0.78, p > .05$) and intraclass reliability (ICC =

0.92, with a confidence interval of ICC = 0.81 – 0.97) (Hendriks, 2016). These results were however only shown for the Questionnaire for coaches, the validation of the Sport Report for athletes still needs to be done.

Envy

The Dispositional Benign and Malicious Envy Scale (BeMaS; Lange & Crusius, 2015) was used in order to determine the extent to which students experience benign or malicious envy. Given that all study participants were Dutch, the Dutch translation by Niels van de Ven (2017) was used. The scale consists of 10 items (e.g., “I wish that superior people lose their advantage.”; “I strive to reach other people’s superior achievements.”), scored along a 6-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (6). All participants could score low/high on both malicious and benign envy. The total score of both the benign and malicious envy subscale ranges from 0 to 30, with higher scores indicating greater levels of benign/malicious envy. To obtain the total score for each participant, the item scores of each scale were summed. The scale was found to be a valid and reliable measure (Fam et al., 2020; Kwiatkowska et al., 2020). In a study including residents from the United States, Germany, Russia and Poland, all values of the McDonald’s omega were higher than .85 for both subscales (Kwiatkowska et al., 2020). In the current sample, McDonald’s omega was .67 for the items related to benign envy and .82 for those related to malicious envy. McDonalds Omega is the preferred option to assess reliability when dealing with scales that include skewed test items (Trizano-Hermosilla & Alvarado, 2016 as cited in Kwiatkowska et al., 2020), which is especially the case for items measuring malicious envy.

Data Analysis

The data analysis was performed using PROCESS macro in SPSS (version 27) which uses a bootstrapping approach (i.e., a form of resampling) to model testing (Hayes, 2013). Two separate moderated mediation models were examined, which included upward social comparison as the independent variable, benign or malicious envy as a moderator, self-

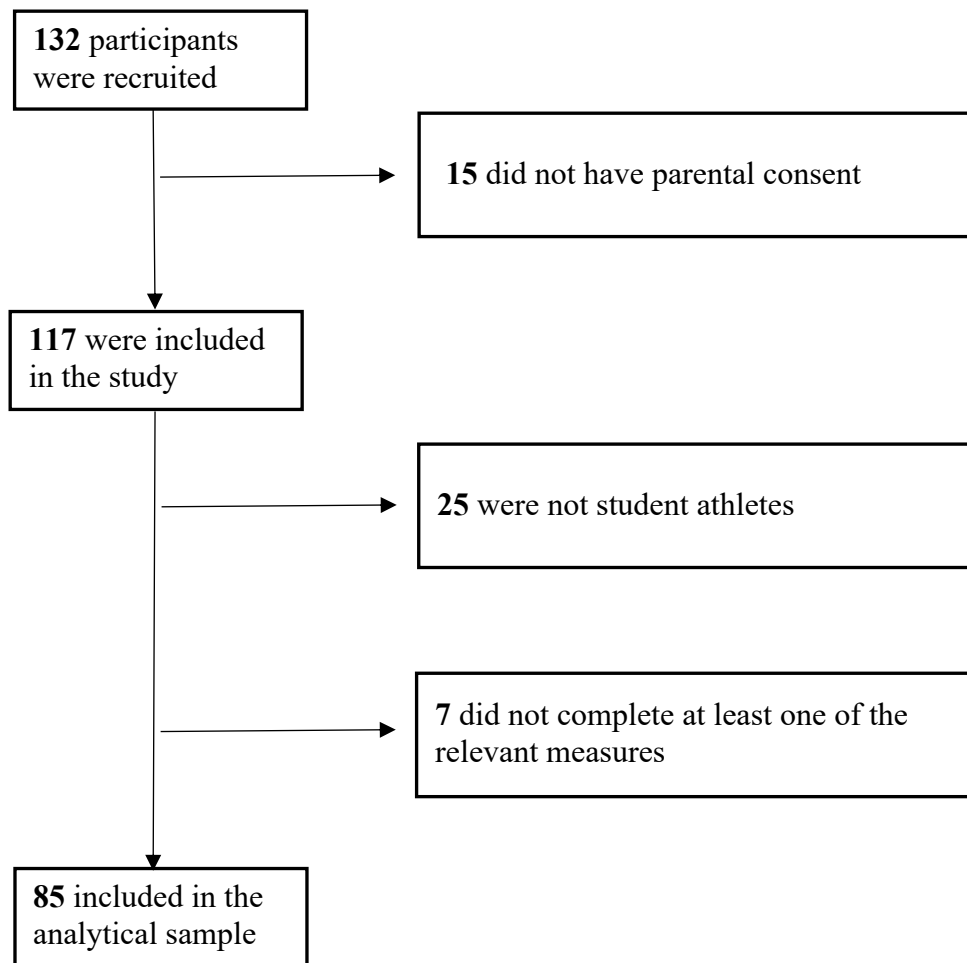
approach goals as a mediator, and sport performance as the outcome variable. In order to investigate whether there is a significant mediation effect, a mediation analysis was conducted using model 4. Then, two separate moderated mediation analyses were conducted using model 7 in order to examine the presence of a significant moderation effect of benign/malicious envy. This analysis also included looking at the effect of upward social comparison on self-approach goals at low, average and high levels of the moderator (i.e., benign or malicious envy). For each analysis, 5000 bootstrap re-samples were used. The significance of results was determined by 95% bias corrected confidence intervals. When the bootstrapped confidence interval did not include zero, it indicated that the parameter was statistically significant.

Data Preparation

In total, 132 students were recruited to participate in the study. However, a number of participants had to be excluded from the sample because they did not (yet) have parental consent. The study sample consisted of both student athletes as well as regular students. To test the proposed model only student athletes were of interest, which is why the regular students were removed. Of the 92 student athletes, 7 did not complete at least one of the relevant measures, which is why they had to be excluded as well. The analytical sample consisted of 85 participants (Figure 2).

Figure 2.

Participant Flowchart



Ethical Considerations

The study was part of a longitudinal study – PSY-1920-S-0448 Talent development at school and in sports – for which the ethical committee of Psychology of the Rijksuniversiteit Groningen has granted approval. Given that all participants were below the age of 18, their legal guardians were informed about the study in time and asked for their consent with regards to their children’s participation and data usage. Every student that was present at the day of testing was asked to take part in the study, however only the data of those who had parental consent was used. If a student without parental consent did not want to participate in the study, they were allowed to keep themselves busy otherwise. All students were assigned

an identification number, which ensured the anonymity of their data. Therefore, personal information cannot be traced back to the individuals.

Results

All assumptions of linear regression were met, except for one – the absence of strong multicollinearity (see Appendix B).

Descriptive Analysis

Pearson’s correlations, means and standard deviations were calculated for all variables (Table 1). As expected, self-approach goals were significantly positively correlated to both upward social comparison and performance. Upward social comparison was not significantly correlated with students’ level of performance, which is in disagreement with the proposed model. Benign envy was significantly positively correlated with performance, no significant correlation was found between malicious envy and performance. Further, benign envy was significantly positively correlated with self-approach goals, while malicious envy was not significantly related to self-approach goals. Lastly, upward social comparison was significantly positively correlated with both benign and malicious envy.

Table 1

Pearson correlations, means and standard deviations of the measured variables.

| | 1 | 2 | 3 | 4 | 5 | M | SD |
|------------------------|--------|--------|-------|-------|---|-------|-------|
| 1. Upward comparison | - | | | | | 36.38 | 9.01 |
| 2. Benign envy | .604** | - | | | | 22.65 | 4.35 |
| 3. Malicious envy | .537** | .300** | - | | | 12.79 | 5.88 |
| 4. Self-approach goals | .234* | .362** | -.098 | - | | 19.83 | 1.63 |
| 5. Performance | .160 | .241** | .103 | .222* | - | 71.43 | 20.13 |

Note. The unstandardized Pearson correlation coefficients are reported for each variable.

** indicates $p < .01$

* Indicates $p < .05$

Mediation Analysis

First, a mediation analysis was conducted in order to test the first and second hypothesis that self-approach goals mediate the positive relationship between students' upward social comparison and their self-reported performance. An overall non-significant model was found ($F(2, 82) = 2.099, p = .129$), providing no evidence to support the hypotheses. The extent of upward social comparison yielded a significant effect on self-approach goals ($B = 0.041, SE = 0.019, t = 2.191, p = 0.031, 95\% CI = [0.004; 0.079]$). However, there were no significant effects for the extent of upward social comparison on athletes' performance ($B = 0.249, SE = 0.246, t = 1.010, p = 0.315, 95\% CI = [-0.241; 0.739]$) and for self-approach goals on athletes' performance ($B = 2.414, SE = 1.585, t = 1.523, p = 0.132, 95\% CI = [-0.739; 5.567]$).

Moderation Analyses

Two separate moderation analyses were conducted in order to examine the moderating influence of both malicious and benign envy on the relationship between student athletes' upward social comparison and their likelihood to set self-approach goals.

The second hypothesis stated that benign envy strengthens the relationship between upward social comparison and self-approach goals. A significant moderation effect was found ($B = -0.009, SE = 0.004, t = -2.312, p = 0.023, 95\% CI = [-0.017, -0.001]$), which caused a significant R^2 change in self-approach goals (R^2 change = 0.052, $F(1, 81) = 5.344, p = 0.023$). This means that benign envy significantly moderated the relationship between upward social comparison and self-approach goals. However, the effect of upward social comparison on self-approach goals was not significant at low (-1SD; $B = 0.048, SE = 0.029, t = 1.623, p = 0.108, 95\% CI = [-0.011, 0.106]$), moderate (Mean; $B = 0.007, SE = 0.019, t = 0.372, p = 0.711, 95\% CI = [-0.031, 0.045]$), or high (+1SD; $B = -0.034, SE = 0.022, t = -1.549, p = 0.125, 95\% CI = [-0.077, 0.010]$) levels of benign envy. Moreover, as indicated by the beta

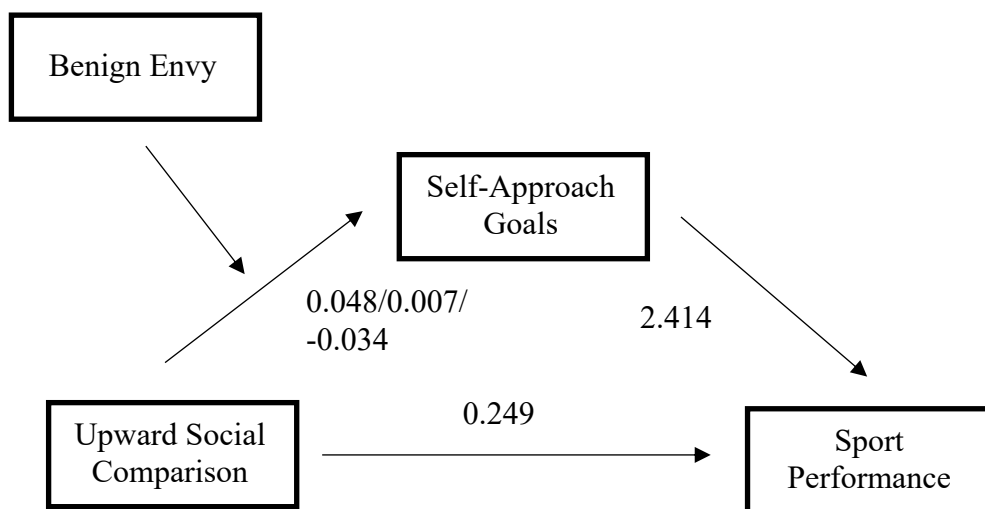
coefficient, benign envy negatively influenced the relationship between upward social comparison and self-approach goals. This is the opposite of what was hypothesized.

The third hypothesis proposed that malicious envy would weaken the relationship between upward social comparison and self-approach goals. However, no significant moderation effect was found ($B = 0.002$, $SE = 0.003$, $t = 0.478$, $p = 0.634$, $95\% CI = [-0.005, 0.008]$). This means that malicious envy did not significantly moderate the relationship between upward social comparison and self-approach goals and the interaction effect did not lead to a significant R^2 change in self-approach goals ($R^2 \text{ change} = 0.003$, $F(1, 81) = 0.228$, $p = 0.634$). Hence, there was no support for the third hypothesis.

Figure 4 and 5 portray the separated moderated mediation models with the values for the effects on each pathway, as stated in the analysis above.

Figure 3.

Moderated mediation model with benign envy as the moderator.

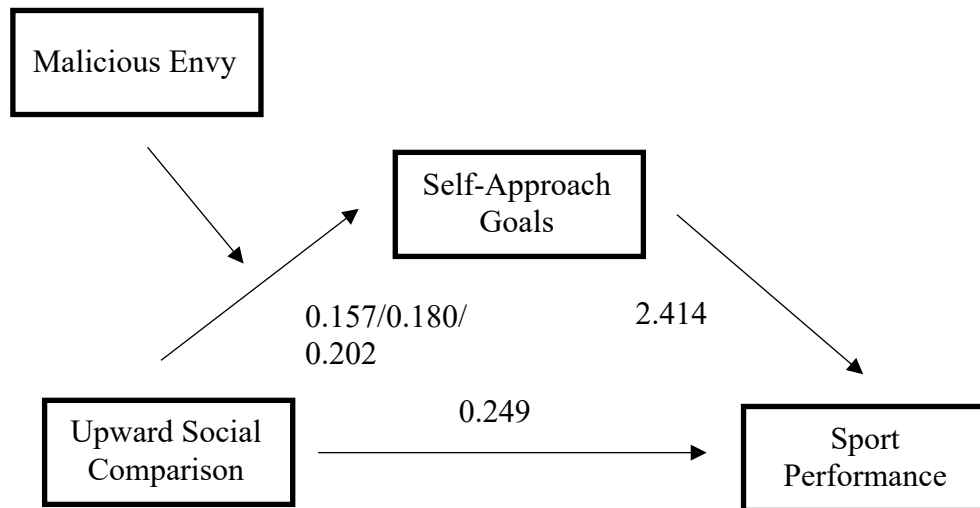


Note. Conditional indirect effects of upward social comparison on sport performance via self-approach goals, at low (-1SD), average (Mean), and high (+1SD) levels of benign envy.

* Indicates $p < 0.05$

Figure 4.

Moderated mediation model with malicious envy as the moderator.



Note. Conditional indirect effects of upward social comparison on sport performance via self-approach goals, at low (-1SD), average (Mean), and high (+1SD) levels of malicious envy.

* Indicates $p < 0.05$

Exploratory Analysis

As part of an exploratory analysis, it was investigated whether benign and malicious envy play a mediating role in the relationship between upward social comparison and self-approach goals. Using PROCESS macro model 4 (Hayes, 2013), a significant mediation model with malicious envy as the mediator was found ($F(1, 83) = 24.670, p < 0.001$). Significant effects were found for upward social comparison on self-approach goals ($B = 0.071, SE = 0.021, t = 3.447, p = 0.001, 95\% CI = [0.030, 0.112]$), for upward social comparison on malicious envy ($B = 0.354, SE = 0.071, t = 4.967, p = 0.000, 95\% CI = [0.212, 0.496]$), and for malicious envy on self-approach goals ($B = -0.084, SE = 0.030, t = -2.758, p = 0.007, 95\% CI = [-0.145, -0.023]$). Hence, there is evidence that malicious envy mediates the relationship between upward social comparison and self-approach goals. More specifically, student athletes that compare themselves upwards are more likely to experience malicious envy, which in turn makes them less likely to set self-approach goals. Using the

same analysis, a mediation model with benign envy as the mediator was tested. Significant effects were found for upward social comparison on benign envy ($B = 0.294$, $SE = 0.034$, $t = 8.543$, $p = 0.000$, $95\% CI = [0.225, 0.362]$) and for benign envy on self-approach goals ($B = 0.126$, $SE = 0.045$, $t = 2.781$, $p = 0.007$, $95\% CI = [0.036, 0.216]$). The indirect effect of upward social comparison on self-approach goals via benign envy was also significant ($B = 0.037$, $SE = 0.015$, $95\% CI = [0.011, 0.070]$). However, no direct effect of upward social comparison on self-approach goals was found ($B = 0.004$, $SE = 0.020$, $t = 0.206$, $p = 0.837$, $95\% CI = [-0.036, 0.044]$). Hence, there was no support for a mediation model with benign envy.

Post-Hoc Power Analysis

A power analysis conducted using G*Power ($f^2 = 0.02$, $\alpha = 0.05$, Power = 0.8) determined that a sample size of 385 participants is required to ensure the study's ability to detect the hypothesized effects accurately.

Discussion

In a sample of 85 student athletes at the Topsport talent school in Groningen, it was predicted that self-approach goals would mediate the relationship between upward social comparison and sport performance. It was further predicted that benign envy would strengthen and malicious envy would weaken the relationship between upward social comparison and self-approach goals. The present study yielded no evidence in support of the proposed moderated mediation model. In the following, findings pertaining to each pathway and their corresponding theoretical implications will be discussed.

Theoretical Implications

First, the relationship between the predictor and outcome variable is considered. Upward social comparison in student athletes was not significantly correlated with their sport performance and no direct effect was found. Thus, in the current sample, the extent of upward social comparison in student athletes does not seem to play a role in how well they perform.

This is not in agreement with past research findings that suggest a positive relationship between upward social comparison and sport performance (Diel et al., 2021). The difference in findings may be due to methodological shortcomings and differences in samples. In the study by Diel et al. (2021) performance was measured in a very specific and objective manner – participants had to indicate how fast they currently swim 200m or run 100m –, whereas in the current study, the performance measure was very broad and based on the perception of the athletes, which is subject to biases. On top of that, while the sample in the study by Diel et al. (2021) only included swimmers and runners, the current study included students that exercised various different sport types – including individual and group sports. It could therefore be that the finding by Diel et al. (2021) does not generalize to the sample used in this study, or that there is a relationship between those two variables, but it could not be detected due to the measurement that was being used.

Secondly, a significant correlation was found between upward social comparison and self-approach goals. Upward social comparison had a significant positive effect on self-approach goals, suggesting that student athletes that tend to compare themselves to higher-performing athletes are more likely to set self-approach goals. This is in line with the research by Diel et al. (2021), which demonstrated that athletes that compare themselves to better performing athletes are more motivated to self-improve. Therefore, the present study supports the notion that upward social comparison can serve as a catalyst for self-approach goals in the context of student athletes. This highlights the importance of considering social comparison processes in understanding athlete motivation and goal-setting.

Setting self-approach goals did not have a significant effect on the sport performance of student athletes. It was theorized that setting self-approach goals – which are focused on improving one's performance – would be associated with higher performance levels. Previous research, including a study by Li et al. (2011) and a meta-analysis by van Yperen et al. (2014), has shown a positive link between mastery-approach goals and sport performance.

The results of the present study, however, suggest that simply setting the goal to improve will not automatically result in higher performance levels. The discrepancy in results may, again, be due to variations in how sport performance was measured. Unlike the non-self-report measures found in the meta-analysis by van Yperen et al. (2014), the current study relied on self-reported performance assessments. It could however also be that setting self-approach goals might improve future performance. A longitudinal study could help investigating this possibility.

Next, findings regarding the two proposed moderators benign and malicious envy are discussed. Benign envy significantly negatively moderated the relationship between upward social comparison and self-approach goals. Contrary to the proposed model and prior research, experiencing benign envy did not result in a higher likelihood to set self-approach goals as a result of upward social comparison. This finding challenges the conventional understanding and theoretical assumptions that benign envy would enhance the motivation for self-improvement (Crusius & Lange, 2014). It suggests that, in the context of upward social comparison among student athletes, benign envy might have a counterproductive effect on their goal orientation. Further exploration is needed to understand the underlying mechanisms and potential explanations for this unexpected finding. It may be that benign envy, despite being less malicious in nature, still generates negative emotions or a sense of inadequacy, which could undermine the adoption of self-approach goals. Future research is needed to investigate this assumption. Unlike benign envy, malicious envy did not moderate the relationship between upward social comparison and self-approach goals. This implies that the presence of malicious envy does not influence or alter the strength of the relationship between these variables. In other words, student athletes experiencing malicious envy do not exhibit any significant changes in their likelihood to set self-approach goals as a result of engaging in upward social comparison.

An exploratory analysis however showed that malicious envy served as a mediator between upward social comparison and self-approach goals, suggesting that student athletes that compare themselves to better performing athletes are more likely to experience malicious envy and in turn are less likely to set self-approach goals. This finding suggests that malicious envy may have a detrimental impact on goal orientation among student athletes. The experience of malicious envy undermines their ability to adopt goals directed at improving themselves. The direct negative effect of malicious envy on self-approach goals is in line with what theory suggests (Crusius & Lange, 2014). Student athletes that experience malicious envy are less likely to set self-approach goals. No significant mediation effect of benign envy was found. However, benign envy had a significant direct impact on self-approach goals. This effect was positive, which suggests that the presence of benign envy positively influences student athletes' inclination to set self-approach goals. This is in line with existing theory and research on the effects of benign envy: When individuals compare themselves to people who are better off, it creates a discrepancy between them and the superior comparison target and they are motivated to reduce this discrepancy by improving themselves (Crusius & Lange, 2014). In relation to the other finding that showed benign envy negatively moderates the relationship between upward social comparison and self-approach goals, these results present an intriguing contrast. While benign envy was found to have a negative moderating effect, indicating a weakening of the relationship between upward social comparison and self-approach goals, it simultaneously displayed a positive direct effect on self-approach goals in the exploratory analysis. This discrepancy indicates that the role of benign envy in the relationship between upward social comparison and self-approach goals is complex and multifaceted, and further investigation is needed in order to get a better understanding of the dual nature of benign envy.

Limitations and Future Directions

There are some limitations that need to be addressed when considering the results, which simultaneously provide opportunities for future research directions.

To begin with, the findings of this study are derived from a cross-sectional design. Cross-sectional studies provide a snapshot of data collected at a specific point in time, which makes it impossible to draw definitive causal connections between the variables outlined in the model (West, 2011). Future research could consider incorporating an experimental design to establish causality in the relationship between upward social comparison, self-approach goals, both types of envy and sport performance. By randomly assigning participants to an experimental group and a control group, the study can manipulate upward social comparison through exposure to successful athletes. Within the experimental group, benign or malicious envy can be induced to examine its impact on self-approach goals. Self-approach goals can be measured and compared between the experimental and control group. By analyzing the data, researchers can gain insights into the causal effects of upward social comparison, malicious and benign envy and their interaction on self-approach goals. Moreover, future research endeavors could consider employing longitudinal designs to establish temporal precedence and explore potential changes in the variables of interest over time. This would allow for a more in-depth understanding of the temporal dynamics between these variables.

Another limitation of this study is the use of a self-report measure to assess the sport performance of the student athletes. Participants were asked to rate their own performance in comparison to same-age athletes in their sport in the Netherlands using the Sport Report Questionnaire for athletes. While self-report measures provide valuable insights into individuals' subjective perceptions, they also introduce potential biases and limitations. A study conducted at the same school using the same performance measure found that student athletes rated their performance level significantly higher than their coaches (Duinhoven, 2018). Based on this finding, it may be possible that student athletes in the current study overestimated their performance. Additionally, the scale has not been validated yet. Objective

performance assessments or observer ratings could offer more robust and objective measures of sport performance. The instrument used to measure upward social comparison in student athletes was also not optimal. It was a modified version of the UPACT scale (O'Brien et al., 2009), originally designed to measure tendencies related to upward physical appearance comparison. While the modified questionnaire demonstrated satisfactory reliability, its validity as a measure of upward social comparison in student athletes remains uncertain. To address this limitation, future research could focus on the development of an upward social comparison scale tailored specifically to the context of sports.

The small sample size is another important limitation that should be considered when interpreting the findings of this study. With only 85 participants the study's sample size is rather small, which increases the risk of type 2 errors (Columb & Atkinson, 2016). A power analysis indicated that a larger sample of 385 participants would have been required to achieve a desired statistical power of 0.80. Consequently, the study's ability to detect true effects may have been compromised. Nonetheless, the findings provide initial insights into the relationship between upward social comparison, self-approach goals, envy and sport performance in student athletes. Future research endeavors with larger sample sizes are recommended to validate and strengthen the observed trends, enhance statistical power, and improve the external validity of the findings.

Finally, due to convenience, the research sample was restricted to student athletes at the Topsport Talent school in Groningen. Thus, the findings and conclusions drawn from this study may not be representative of the broader population of student athletes or athletes in general. To mitigate this limitation, future research could aim to include a more diverse sample of student athletes from various talent schools or different sport settings. This would enhance the external validity of the findings.

Conclusion and Practical Implications

The aim of this study was to contribute to a deeper understanding of the psychological mechanisms underlying the impact of upward social comparison on youth athletes with regard to their performance. It was hypothesized that student athletes that compare themselves upwards would be more likely to set self-approach goals and in turn would show higher levels of sport performance. Moreover, it was proposed that student athletes that experience benign envy would be more likely to set self-approach goals as a result of comparing themselves upward, whereas student athletes that show malicious envy would be less likely to set self-approach goals as a result of upward social comparison. Even though none of the hypotheses were found to be significant, this study still provides important practical implications, which should be especially interesting to sports organizations and coaches. For once, the findings of this study support the idea that upward social comparison can act as a catalyst, triggering the adoption of self-approach goals among student athletes. The positive relation between benign envy and performance further suggests that fostering a supportive and collaborative atmosphere within sport settings can be beneficial. The exploratory analysis highlights the detrimental effect of malicious envy on goal-setting, potentially hindering student athletes to set goals focused on improving themselves. Understanding these dynamics can inform interventions and strategies to foster a more positive and supportive environment, promoting healthier social comparisons and encouraging the adoption of self-approach goals among student athletes.

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Appendix A

Scales

Table A1

3 x 2 Achievement Goal Questionnaire for Sport (3 x 2 AGQ-S; Mascret et al., 2014): Self-Approach goal items

| # | Item wording |
|---|---|
| 1 | Mijn doel in mijn sport is om het beter te doen dan waar ik normaal gesproken toe in staat ben. |
| 2 | Mijn doel in mijn sport is om betere resultaten te behalen dan in het verleden. |
| 3 | Mijn doel in mijn sport is om effectiever (beter) te zijn dan in het verleden. |

Figure A1

Sport Report Questionnaire for athletes (University of Groningen)

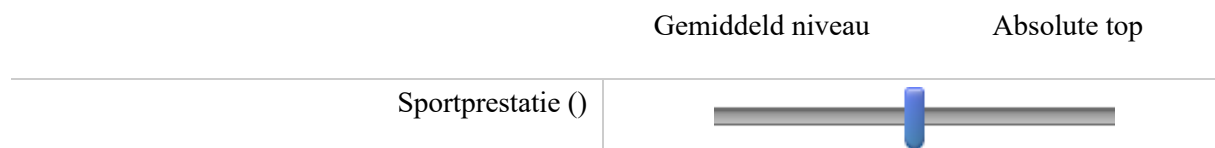


Table A2

Modification of the Upward Physical Appearance Comparison Scale (UPACT; O'Brien et al., 2009)

| # | Item wording |
|----|--|
| 1 | Ik vergelijk mezelf eerder met medesporters die beter presteren dan ikzelf, dan medesporters die slechter presteren dan ikzelf. |
| 2 | Ik heb de neiging om mijn eigen prestaties te vergelijken met de prestaties van professionele sporters. |
| 3 | Ik merk da tik erover nadenk of mijn eigen prestaties goed te vergelijken zijn met die van professionele sporters. |
| 4 | Wanneer ik sportevenementen/competities van professionele sporters en sportclubs bezoek, vraag ik me af of ik net zo goed presteer als de professionele sporters die ik daar goed zie presteren. |
| 5 | Ik heb de neiging om mezelf te vergelijken met sporters die beter presteren dan ikzelf. |
| 6 | Wanneer ik een sporter zie die heel goed presteert, vraag ik me af hoe mijn prestaties kunnen evenaren/matchen met die van hen. |
| 7 | Wanneer ik goed presterende sporters zie, vraag ik mezelf af hoe mijn prestaties overeenkomen met die van hen. |
| 8 | Tijdens mijn sportevenement/-training, vergelijk ik mijn prestaties met de prestaties van mijn goed presterende teamgenoten/medesporters. |
| 9 | Ik merk da tik mijn eigen prestaties vergelijk met sporters die beter presteren dan ik. |
| 10 | Ik vergelijk mijn eigen prestaties met die van sporters die betere prestaties laten zien dan ik. |

Table A3

Dispositional Benign and Malicious Envy Scale (BeMaS; Lange & Crusius, 2015);

Translated by Niels van de Ven (2017)

| # | Variable | Item wording |
|----|------------|--|
| 1 | Benign1 | Wanneer ik anderen benijd, focus ik op hoe ik even succesvol kan worden in de toekomst. |
| 2 | Malicious1 | Ik wens dat mensen die superieur aan mij zijn, hun voorsprong verliezen. |
| 3 | Benign2 | Als ik opmerk dat een andere persoon beter is dan ik, probeer ik mijzelf te verbeteren. |
| 4 | Benign3 | Anderen benijden motiveert me om mijn doelen te behalen. |
| 5 | Malicious2 | Wanneer andere mensen iets hebben dat ik graag wil, zou ik het hen graag afnemen. |
| 6 | Malicious3 | Ik heb vijandige gevoelens tegen mensen op wie ik afgunstig ben. |
| 7 | Benign4 | Ik streef ernaar de superieure prestaties van anderen te bereiken. |
| 8 | Malicious4 | Afgunstige gevoelens zorgen ervoor dat ik de ander niet mag. |
| 9 | Benign5 | Als iemand superieure kwaliteiten, prestaties of bezittingen heeft, probeer ik deze ook te verkrijgen. |
| 10 | Malicious5 | De prestaties van anderen lokken bij mij afgunst uit. |

Appendix B

Assumptions Check

Figure B1

Partial regression plot of the relationship between upward social comparison and sport performance

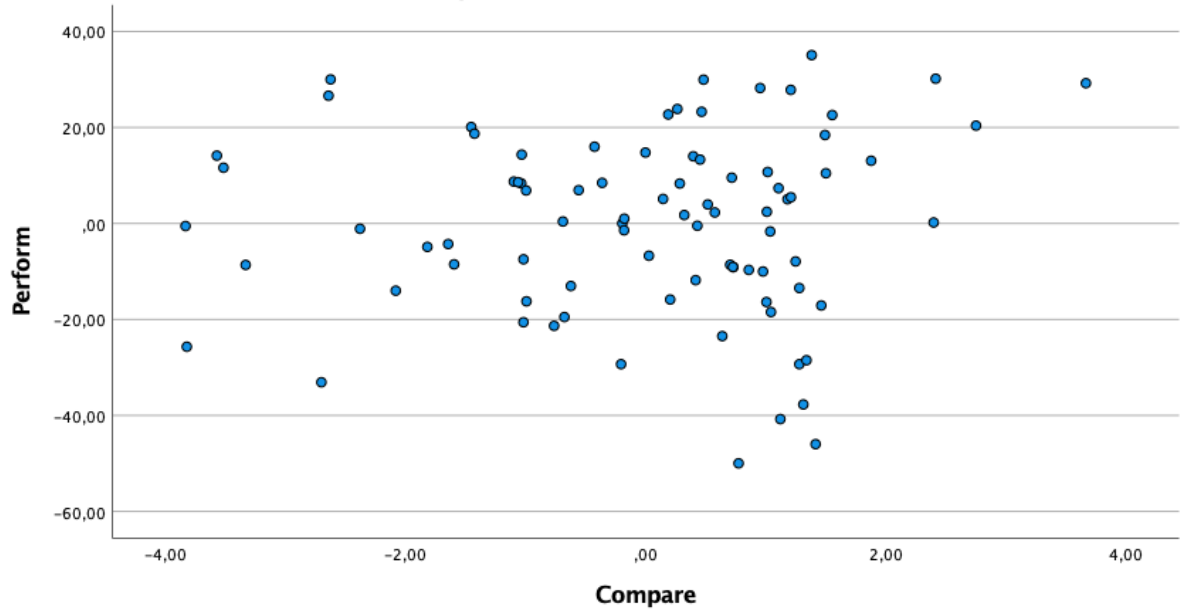


Figure B2

Partial regression plot of the relationship between benign envy and sport performance

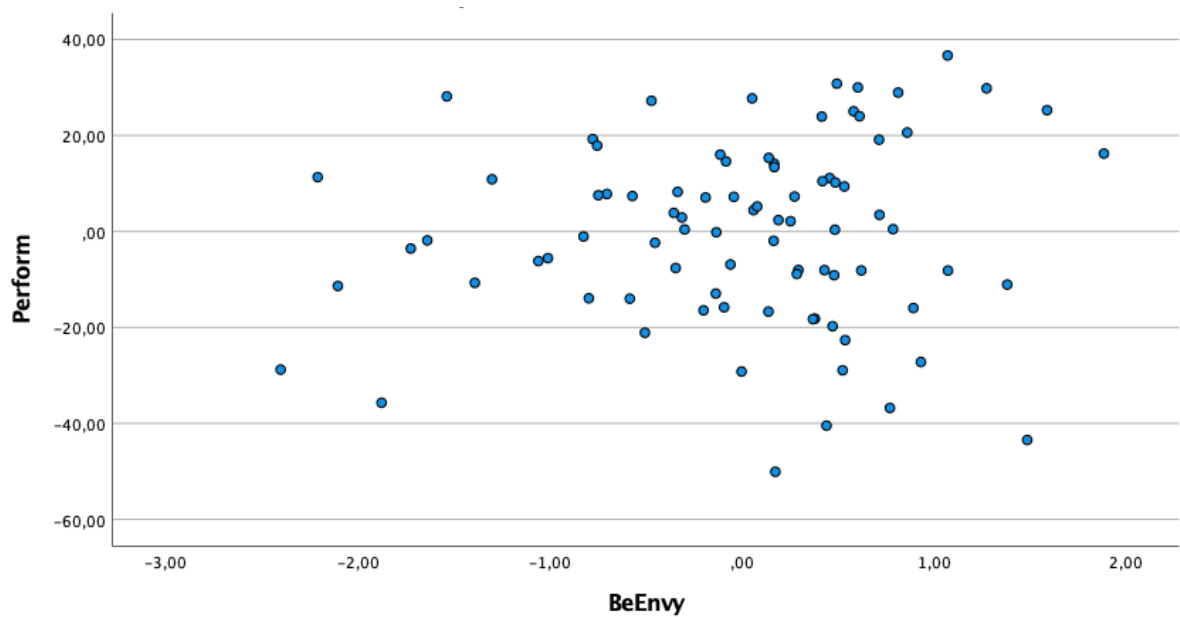


Figure B3

*Partial regression plot of the relationship between Int_1 (upward social comparison*benign envy)*

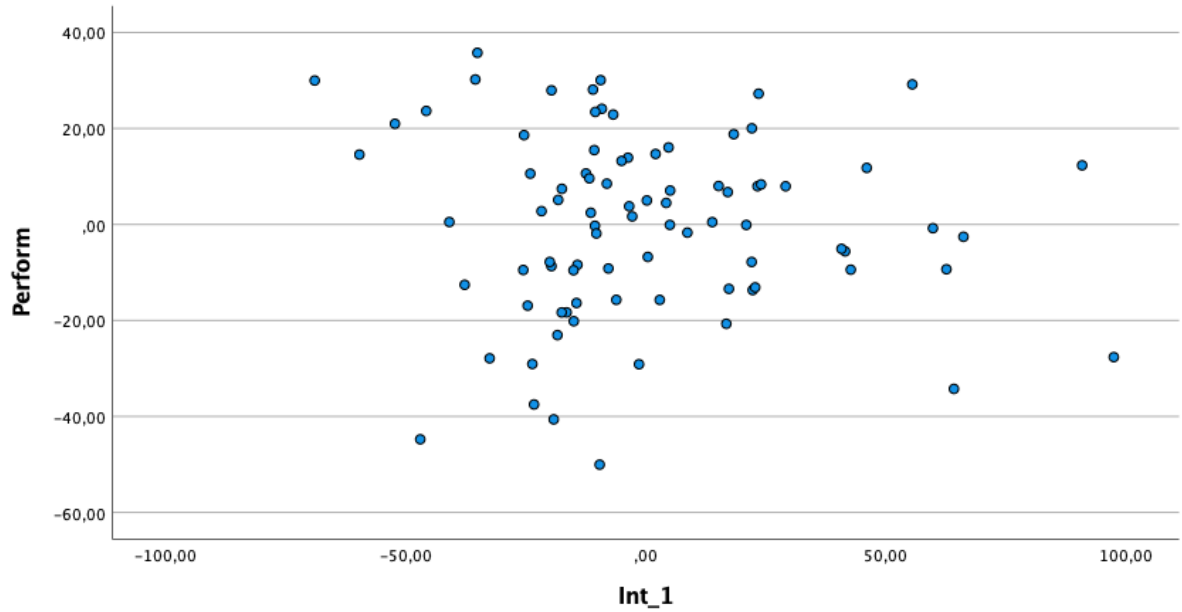


Figure B4

Partial regression plot of the relationship between malicious envy and sport performance

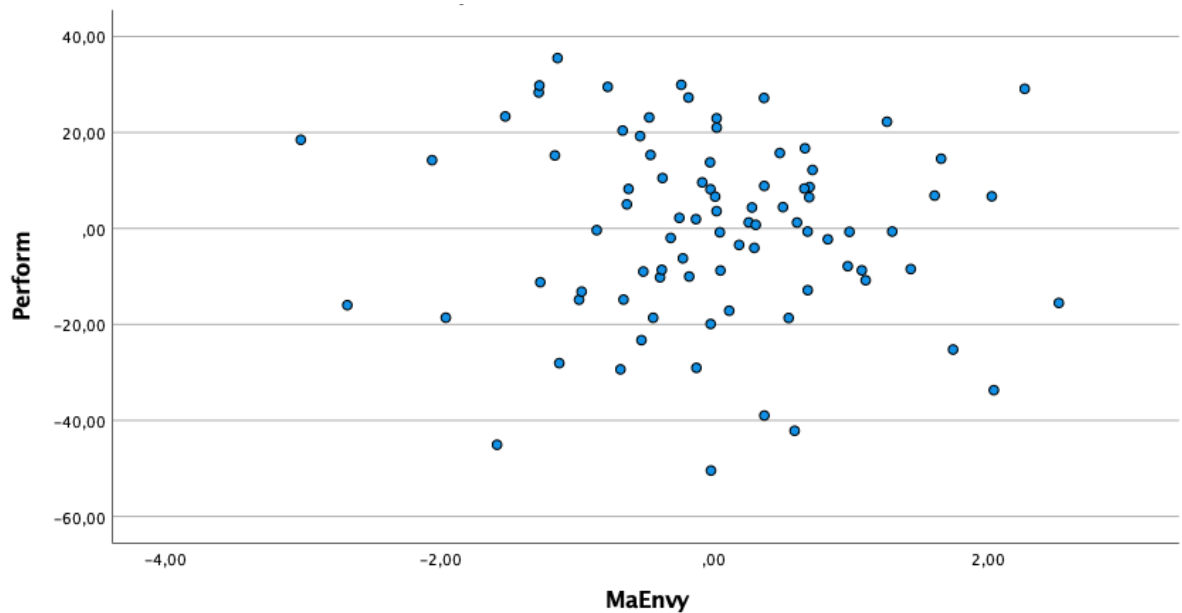


Figure B5

*Partial regression plot of the relationship between Int_2 (upward social comparison*malicious envy) and sport performance*

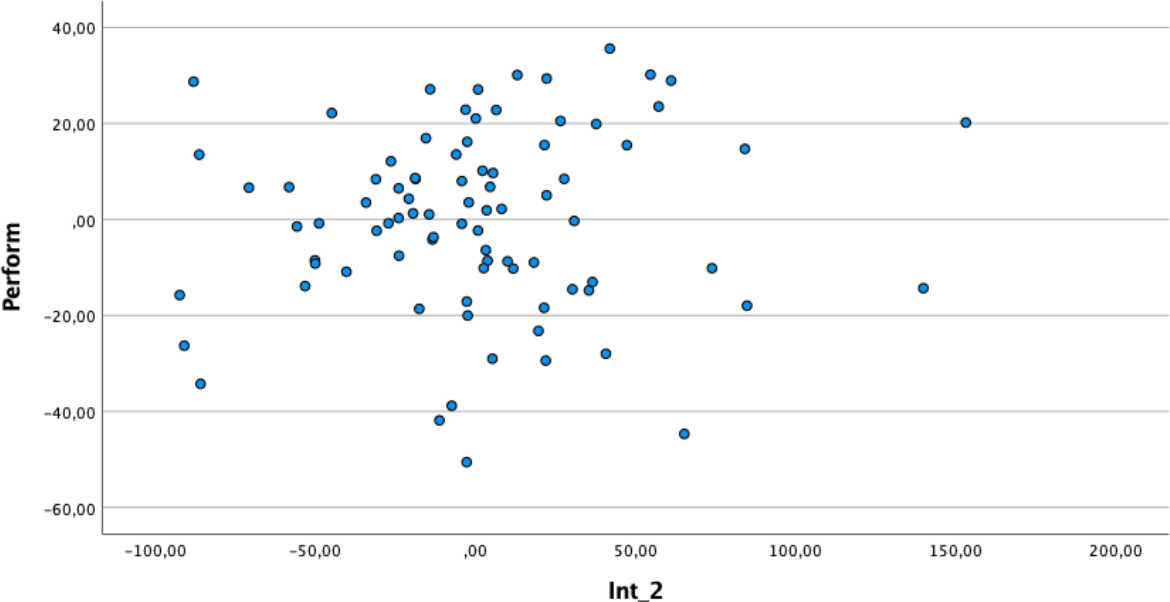


Figure B6

Partial regression plot of the relationship between self-approach goals and sport performance

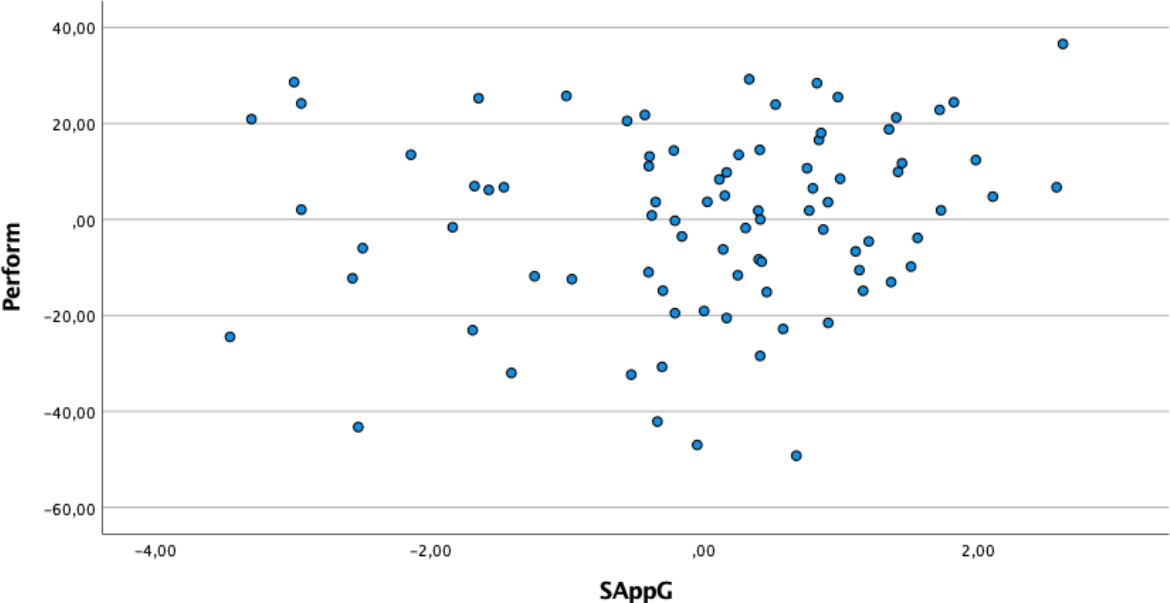


Figure B7

Histogram – Distribution of residuals

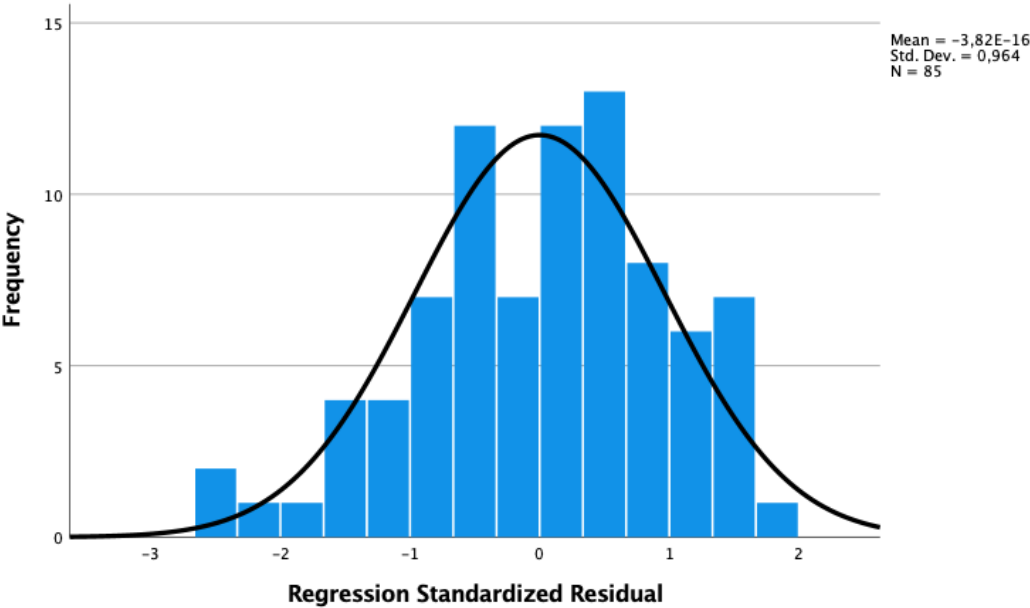


Figure B8

Normal P-P Plot of regression standardized residuals

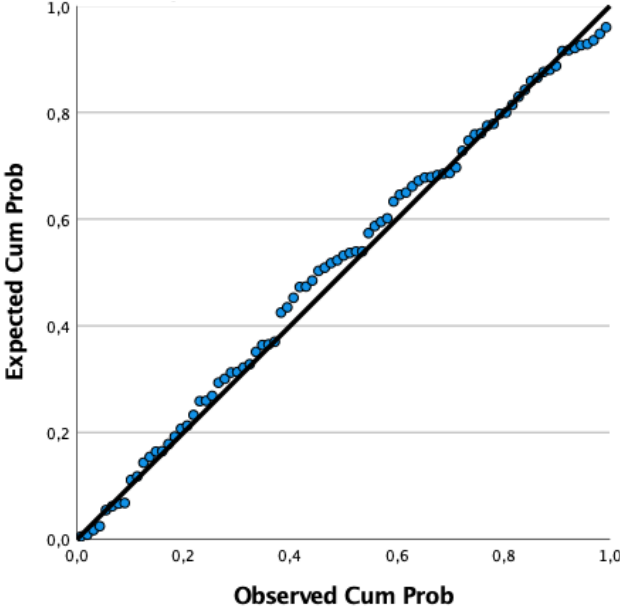


Figure B9

Homoscedasticity of the residuals – Scatterplot

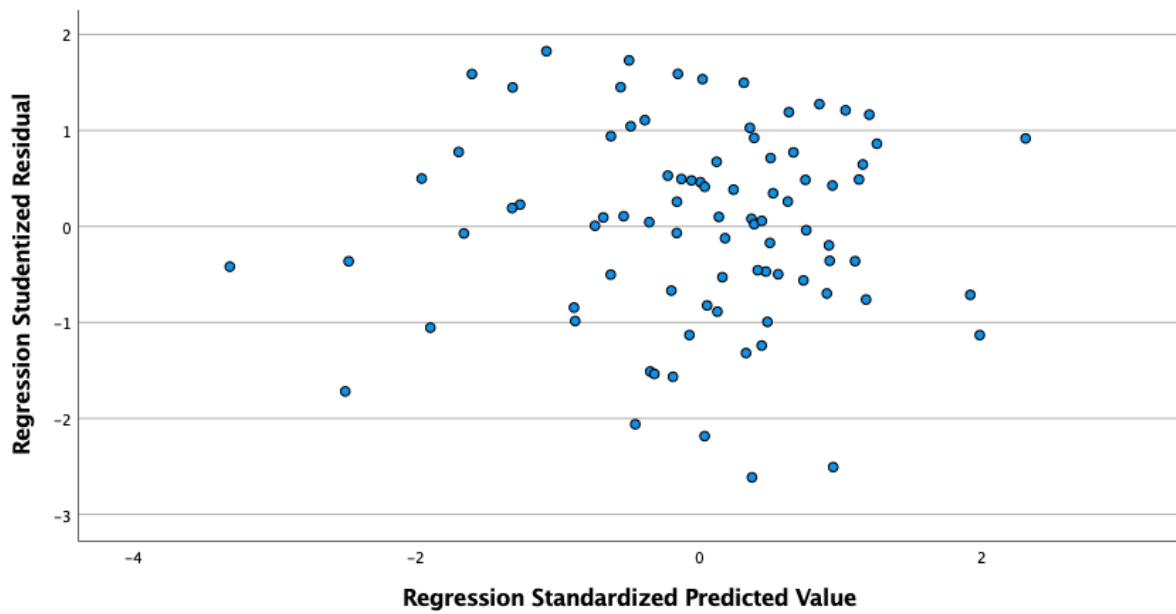


Table B1

Uncorrelatedness of the residuals – Durbin Watson statistic

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|------|----------|-------------------|----------------------------|---------------|
| 1 | .302 | .091 | .021 | 19.55181 | 1.973 |

Table B2*Multicollinearity statistic*

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|-------------------------|---------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | -5.174 | 46.909 | | -.110 | .912 | | |
| | Compare | .644 | 1.389 | .296 | .463 | .644 | .029 | 35.086 |
| | BeEnvy | 2.315 | 2.471 | .518 | .937 | .352 | .038 | 26.213 |
| | MaEnvy | -1.51 | 2.066 | -.350 | -.557 | .579 | .030 | 33.782 |
| | Int_1 | -.045 | .068 | -.755 | -.665 | .508 | .009 | 110.491 |
| | Int_2 | .034 | .048 | .550 | .710 | .480 | .019 | 51.513 |
| | SAppG | 1.861 | 1.555 | .151 | 1.197 | .235 | .736 | 1.359 |
