Master
Behavioural Economics

# The influence of self reported height on happiness of men in The Netherlands.

Taro Spruijt 552552

First supervisor: Dr. Martijn Hendriks
Co-reader: Dr. Julia Rose



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**Abstract**

Two very important factors in a man's life is his height and looks. Specifically, previous research has shown that height is a discriminatory factor in areas such as income, job prospects and dating prospects. Mainly, the halo effect is the underlying mechanism which drives human decisions when assessing others in all aspects. Where the halo effect describes that "everything that looks good is good", height similarly influences perceptions by the assumptions that someone who is tall is automatically also a good leader and more attractive. Due to this, taller men are more likely to end up in higher socioeconomic positions. In turn, higher socioeconomic positions lead to higher happiness. As such, this report reviews the relationship between height and happiness using a sample of men in The Netherlands.

This is done by using the "Longitudinal Internet studies for the Social Sciences" data set by Centerdata. Three analyses are done to test the height-happiness relationship for men in The Netherlands. Firstly, a main Ordinary Least Squares regression analysis is performed to test whether there is a relationship between height and happiness. It is also examined whether the shape of the relationship is linear, squared or logarithmic. Secondly, moderation analysis is conducted to test whether age, social media usage and political preference moderates the height-happiness relationship. Lastly, mediation analysis is carried out to assess potential mediating effects of income, self esteem and dating prospects on the height-happiness relationship.

It is found that there is a concave and squared relationship between height and happiness for men in The Netherlands. However, this result is only statistically significant at the 0.10 level. Additionally, the moderation analysis did not show a significant outcome for any moderating variable that is tested. The mediation analysis only found that the height-happiness relationship is mediated by an individual having a partner. If an $\alpha$-level of 0.10 is used, the findings in this report would support previous research observing a concave relationship between height and happiness in men. Although the results found in this report are dubiously significant, an interesting finding is still made. Nevertheless, one major limitation is that the full height-happiness relationship is more complicated than what was able to be estimated in this report. Future research should focus on using a more powerful model to estimate the height-happiness relationship and use a data set in a country where the average height is lower than the global average height.

# Contents

# 1 Introduction

## 1.1 Problem statement

Two important characteristics in your life are your looks and height. These two factors influence many aspects of life such as interpersonal relationships (Hitsch et al., 2010) (Stulp et al., 2013), work prospects (Kaul, 2011) (Judge & Cable, 2004) and general quality of life (Datta Gupta et al., 2015) (Habibov et al., 2019) (Salahodjaev & Ibragimova, 2018) (Denny, 2017) (Müller et al., 2022) (Magnusson et al., 2005). Namely, physical features such as height and looks affect how people view each other. Specifically, people subconsciously associate more attractive people with more positive traits. This bias is an example of the "halo effect" (Talamas et al., 2016) (Mitchem et al., 2014) (Eagly et al., 1991) (Weeden & Sabini, 2005) (Foo et al., 2017). Besides looks, the halo effect is subconsciously applied to all visual cues. Anything that looks good, is also assumed to be positive in other regards. One core component of the halo effect is the notion that anything that people find attractive positively influences their perceptions of the thing they are looking at.

When talking about physical attractiveness in humans, there are different beauty standards in men and women. Whereas women are expected to be more neotenous, men are expected to be more dominant. One desirable trait amongst men is being tall (Hitsch et al., 2010) (Stulp et al., 2013). In essence, being tall could be seen as a halo for men. For example, taller men (and women) are over represented in leadership roles such as CEO positions of companies. In an article from the Economic Times (Kaul, 2011) it is stated that 58% of the CEO's from companies in the Fortune 500 is 6 foot (183 centimetres) or taller, even though the average male height is only 5 foot 9 inches (177 centimetres) in the United States. Indeed, only ∼15% of the adult men in the United States is 6 foot or taller. Even more interesting is that 30% of the CEO's is over 6 foot 2 inches (188 centimetres) which is a vast over representation of the 3.9% of adult men in the United States who are 6 foot 2 or taller. The study by Salahodjaev and Ibragimova, 2018 found that life satisfaction decreased for men taller than 177 centimetres.

Interestingly, the study by Salahodjaev et al. and the over representation of men taller than 6 foot 2 in CEO positions of Fortune 500 companies seem to paint a different picture. While the study by Solahodjaev et al. shows that happiness of men drops off after a certain height, the data on Fortune 500 CEO's portray that taller men are selected for in the highest socioeconomic positions without dropping off. Additionally, the study by Denny found a concave relationship between men's height and life satisfaction while Magnusson et al. found a linear relationship between height and suicide rates in Sweden. However, the study by Stulp et al. and data by dating app Bumble both find a similar concave relationship between men's height and attractiveness to women.

However, the studies and data discussed which find a drop off in attractiveness or happiness after a certain height have a different turning point. Although, a relatively similar trend can often be seen showing the peak of happiness or attractiveness between average height and three to four inches above the average height. Besides, the tallest men are often found to be more happy or attractive than the smallest men. Currently, it is unknown whether peak happiness is at a fixed height or relative to the area a man lives in. Because previous research and data found different turning points, it can be suggested that the optimal height for men's happiness is relative to the average height a man lives in. As such, an interesting area to study height in is

The Netherlands. The Netherlands has the highest average height at around 6 foot or 182-184 centimetres ("Hoe lang zijn Nederlanders?", 2022) ("Average Height by Country 2023", 2023). Since previous research suggests that being very tall may not be beneficial for men's happiness, the relationship between height and happiness in men in The Netherlands could differ from previously studied countries.

## 1.2 Research question

Although it is difficult to determine the exact reason why taller men are selected for in higher socioeconomic positions, it is clear to see that height is a discriminatory factor regardless of whether people subconsciously or consciously take it into account. Based on this, it is to be expected that taller men should have a higher quality of life on average than smaller men. After all, happiness is an indicator of a high quality of life. Consequently, this report aims to tackle the question:

*How does the self reported height of men in the Netherlands affect their happiness?*

## 1.3 Literature review

Much research has already been done on the influence of physical attractiveness, height and many other factors on happiness and life outcomes. For example, it has been studied how a person's height has influence on their salary. Judge et al. (Judge & Cable, 2004) found that taller men had higher lifetime incomes in the United States and Great Britain on average. They also find a significant relation between height and measures of social esteem, leader emergence, and performance. Other papers have also looked at other life aspects than financial incomes finding that smaller men are also penalised (Hitsch et al., 2010) (Stulp et al., 2013) by women when dating.

Other research has also looked at the relationship between height and happiness/life satisfaction (Datta Gupta et al., 2015) (Habibov et al., 2019) (Salahodjaev & Ibragimova, 2018) (Denny, 2017) (Müller et al., 2022) (Magnusson et al., 2005). Also in this research, it was mostly found that taller people had higher self reported happiness on average. However, most research on the relation between height and happiness was done outside of the Netherlands. Datta Gupta et al., 2015 studied the relationship between height and psychological well-being and distress using a sample from Wisconsin. (Habibov et al., 2019), (Salahodjaev & Ibragimova, 2018), (Denny, 2017) and Müller et al., 2022 looked at the relationship between height and life satisfaction in former USSR countries, Russia, Europe and Switzerland respectively. Magnusson et al., 2005 looked at the relationship between male height and suicide rates in Sweden. Since The Netherlands is the tallest country in the world on average, research on the relationship between men's height and happiness could give insight on the effect of height on happiness in an area where many people are already approaching the genetic limit.

## 1.4 Research aim

As such, the aim of this report is to extend the existing literature on the relationship between men's height and happiness by analysing an area which has not yet been studied and is reaching the genetic average height limit. This way, the shape of the relationship between men's height and happiness can be determined. By extending the literature to The Netherlands, it can be

established whether the relationship between men's height and happiness is relative or that a fixed height is optimal. I intend to stimulate public opinion to better inform people on biases when making decisions and stimulate them to think about their health and the influence of height and physical attractiveness.

# 2 Theoretical framework

Many interesting findings have already been made on topics surrounding the scope of the project described in this report. In this section, some of the most important mediators, moderators and other important variables are explained and the relationships between them.

## 2.1 Main effects

Firstly, previous research has shown how height has impact on a man's life. Magnusson et al. (Magnusson et al., 2005) looked at the relation between a man's height and suicide rate in Sweden. They found that suicide rates decreased by 9% for every 5 centimetres in height gained. Other research was done on the relationship between height and life satisfaction on men in Russia (Salahodjaev & Ibragimova, 2018). Data was used from the RLMS. The RLMS is a series of national surveys to monitor the effects of Russian reforms on the health and economic welfare of households and individuals in the Russian Federation. The authors used a sample covering more than 90,000 observations. They found an inverted U-shaped association between height and life satisfaction. After controlling for potential antecedents of life satisfaction, the authors found life satisfaction decreased beyond 177 centimetres.

Another paper that looked at the relationship between height and happiness found similar results (Habibov et al., 2019). The authors of this paper looked at data from 27 countries. A data set called the Life in-Transition Survey (LITS) was used. The survey was conducted by the European Bank for Reconstruction and Development and the World Bank to estimate wellbeing in 27 post-communist transitional countries. In each of these countries, 1500 individuals were interviewed. The authors used Ordinary Least Squared regression models to estimate the height to life satisfaction relationship and ordered logistic regression models for robustness analysis. The authors found that height has a strong positive effect on life satisfaction. However the authors also state that "the inclusion of health and income substantially reduces the effect of height on life satisfaction to a factor of 0.0251 in our sample, suggesting that these variables play strong mediating roles in the height to life satisfaction relationship".

Next, a paper by Denny looked at the effects of height on well-being (Denny, 2017). Denny used the Survey of Ageing, Health and Retirement in Europe (SHARE) which collects "data from nationally representative samples of the non-institutional population aged 50 years and older" as stated by Denny. Denny used an ordered probit model to analyse the data. Like the paper by Salahodjaev et al., Denny found a concave relationship between height and life satisfaction. Also, Denny found that the relationship between height and life satisfaction changes when controlling for health and human capital. These results are in line with the results found by Habibov et al.. Denny concludes that being short is a penalty to well-being, but there is not necessarily a benefit to being tall.

Lastly, a study was done on the effect of height on self-reported health status and life satisfaction (Müller et al., 2022). The authors used data from a Swiss health survey from 2017 including

19435 respondents. Using General Additive Models and Multinomial Logistic Regression, the authors found that height was positively associated with self-declared aspects of health and life satisfaction. Similarly to the aim of this report, the authors stimulate the notion that height as a co-factor of health aspects should be considered in public health research. They state that nutrition and healthy growth can be influenced in children by public health programs, eliminating social inequalities, and strengthening healthy living conditions. While adult body height cannot be changed, proper nutrition and health should be stimulated in children to increase their future quality of life.

## 2.2 Mediators

Next, view the mediators. Mediators are variables which explain how two variables are related to each other (see Figure 1).

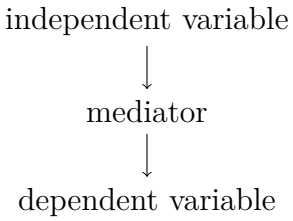


Figure 1: Mediation graph

### 2.2.1 Physical attractiveness

The first mediator relevant for the relationship between height and happiness, is physical attractiveness. Specifically, the relationship between height and happiness is not direct. Height first influences the mediator physical attractiveness. Physical attractiveness influences self esteem, dating prospects and income in turn. Research was done to study the relationship between men's height and their physical attractiveness to women (Pazhoohi et al., 2023). It was found that taller men were more attractive and masculine to women. However, height is often seen as less attractive after a certain point (Stulp et al., 2013).

There have been multiple studies done on the relationship between physical attractiveness and self esteem, dating prospects and income. Physical attractiveness influences the way an individual is perceived by others. A study looking at perceived social perceptions based on faces of people found patients to be perceived more positively after having had corrective jaw surgery (Sinko et al., 2018). Other studies have also looked at the effects of physical attractiveness on life aspects. It was found that more attractive individuals had better jobs and more prestigious careers (Sala et al., 2013) and better success in dating (Hitsch et al., 2010). Also, physical attractiveness was found to be the most important in a relationship during a speed dating experiment (Eastwick & Finkel, 2008) for both men and women. The relationship that is estimated in this report is shown in Figure 2.

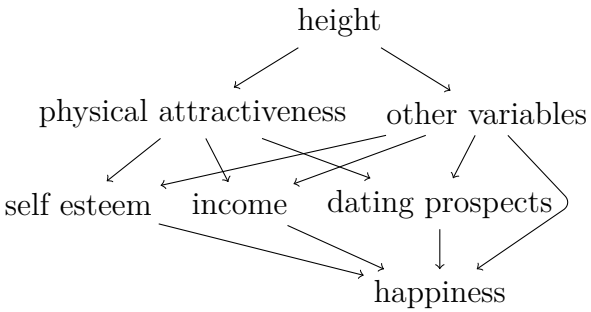


Figure 2: Relationship analysed in this report

However, note that height also influences other variables which are not included in this graph. For example, height not only influences social perceptions, but also health. Someone who is shorter can eat less than someone who is taller than and gain more body fat or muscle mass. This in turn influences social perceptions, self esteem and income. Besides, other variables which are influenced by height may directly influence happiness in line with the halo effect. Despite other mechanisms influencing the height-happiness relationship, this report mainly focuses on physical attractiveness and its consequences.

### 2.2.2 Dating prospects

Firstly, physical attractiveness affects dating prospects. As discussed in Section 1.1, looks are an example of the halo effect. That is, humans associate someone who is better looking with positive personality traits. In Section 2.2.1, it was discussed that height is a factor of attractiveness (Pazhoohi et al., 2023). Accordingly, height influences the mediator physical attractiveness. Consequently, physical attractiveness influences dating prospects (Hitsch et al., 2010). In turn, dating prospects affect happiness.

Much research has been done surrounding dating and topics surrounding happiness. A meta-analysis by (Holt-Lunstad et al., 2015) found that loneliness increased the risk of premature death by 26%, social isolation increased the risk of premature death by 29% and living alone increased the risk of premature death by 32%. In another meta analysis from 2010 the authors found a 50% increased likelihood of survival for participants with stronger social relationships (Holt-Lunstad et al., 2010). Another study found that poor mating performance has a moderate to strong effect on negative emotions and well-being. In addition, a study done on depression in 23 European countries found that marriage and cohabitation are a protective factor against the development of depression in both sexes (Van de Velde et al., 2010). Also, being single or widowed was a significantly larger risk factor for higher levels of depression in men than in women.

### 2.2.3 Income

As discussed in section 2.2.1, physical attractiveness affects income. It was then established that physical attractiveness influences self esteem, dating prospect and income through physical attractiveness. As such, height has an influence on self esteem, dating prospects and income through physical attractiveness. Next, income influences happiness. Di Tella et al. studied the relationship between status and income on happiness (Di Tella et al., 2010). The authors used individual panel data of 7812 individuals living in Germany from 1984 to 2000. They found that they can reject the hypothesis of no adaptation of happiness to income during the four years

following an income change.

Interestingly, they also found that individuals on the right of the political spectrum adapt to status but not to income and individuals on the left to income but not to status. Also, another study done in Great Britain found lottery winners to have better psychological health (Gardner & Oswald, 2007). In addition a cross sectional study by Azizi et al. found a significant relationship between income and happiness (Azizi et al., 2017). Lastly, a study by Judge et al. found that taller individuals have higher lifetime salaries on average (Judge & Cable, 2004).

Another study looked at the relationship of income and happiness by analysing medium sized lottery winners in Britain (Gardner & Oswald, 2007). They did this by analysing longitudinal data on a random sample of Britons who receive medium-sized lottery wins of between £1000 and £120,000. When comparing a control with no wins and a control group with small wins, the medium-sized lottery winners went on to have significantly better psychological health. Also, the average measured improvement in mental well being was 1.4 GHQ points two years after a lottery win. Lastly, a cross sectional study by Azizi et al. looked at the effect of individual factors, socioeconomic factors and social participation on individual happiness Azizi et al., 2017. They found a significant relationship between income ($p=0.001$, $r=0.264$) and happiness.

Another study also found that a person's height influences their salary. Judge et al. (Judge & Cable, 2004) studied the relation between height and salaries in the United States and Great Britain by analysing data from four longitudinal studies in these countries. Even after controlling for age, bodyweight and gender, Judge et al. found that someone who is 6 foot earns on average $166000 more in their lifetime than someone who is 5 foot 5 inches. Not only do they find this correlation between height and salary they also find a significant relation between height and measures of social esteem, leader emergence, and performance.

### 2.2.4 Self esteem

Not only does height affect dating prospects and income, but also self esteem. As stated in Section 2.2.3, physical attractiveness affects dating prospects and income. It was discussed that height influences physical attractiveness. Then, it was debated that physical attractiveness influences self esteem, dating prospects and income. Due to this effect of physical attractiveness on self esteem, dating prospects and income, height has an influence on self esteem, dating prospects and income through physical attractiveness.

Besides dating prospects and income, the graph discussed in section 2.2.1 shows a relation between self esteem and happiness. Namely, Baumeister et al. looked at this relationship in 2003 (Baumeister et al., 2003). They found that self esteem has a strong relation to happiness. One limitation though, was that the research was not able to establish causation. Another study also looked at the relationship between self esteem and happiness (Malik & Sadia, 2013). The authors looked at 120 university students and found a positive relationship between self esteem and happiness.

## 2.3 Moderators

Last, view the moderators of the height-happiness relationship. Moderators are variables that determine the strength or direction of a relationship (see Figure 3).

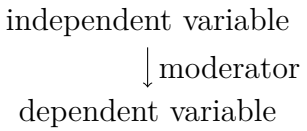


Figure 3: Moderation graph

One such moderator in the relationship between height and happiness could be social media usage. Namely, Vogel et al. looked at the impact of social media usage on self esteem and relative self evaluations (Vogel et al., 2014). The authors first performed a study by testing whether participants who used social media had poorer self esteem. In this study, they found that participants who used Facebook most often had poorer self esteem. The authors also performed a study evaluating the effect of temporary exposure to social media profiles on state self esteem and relative self-evaluations. They found that "participants" state self esteem and relative self-evaluations were lower when the target person's profile contained upward comparison information (e.g., a high activity social network, healthy habits) than when the target person's profile contained downward comparison information (e.g., a low activity social network, unhealthy habits)".

Moreover, Lin et al. looked at the relationship between social media usage and depression among US young-adults (Lin et al., 2016). They did this by surveying 1787 adults between the ages of 19 and 32. They found that individuals in the highest quartile had significantly increased odds of depression (AOR = 1.66, 95% CI = 1.14–2.42) than individuals in the lowest quartile of total time per day spent on SM after controlling for all covariates. Lin et al. also found that individuals in the highest quartile of social media visits per week (…) had significantly increased odds of depression (AOR = 2.74, 95% CI = 1.86–4.04; AOR = 3.05, 95% CI = 2.03–4.59, respectively).

As discussed in Section 2.2.1, height influences physical attractiveness which influences self esteem. The papers by Vogel et al. and Lin et al. find that social media usage influences self esteem. Lin et al. also found that self esteem of individuals was higher or lower depending on the profiles these individuals looked at. In essence, it could be possible that individuals compare themselves to others on social media which affects their self esteem. When individuals look at profiles they deem as "lower" than them or profiles that have a low activity social network it stimulates self esteem, according to Lin et al.. As such, when men see profiles of men who are taller than them, it may decrease their self esteem. Besides, TikTok's algorithm decides who to push based on physical features (Sam Biddle, 2020). This results in an over stimulation of upward comparison information.

Another moderator for the relationship between height and happiness could be age. Due to age, skin sags, men lose hair and physical attractiveness in general becomes less important. Moreover, an individual's ideological inclination and religion status could moderate the effect between height and happiness. The paper from Di Tella et al., 2010 showed that status and income have different effects on happiness for politically right and left leaning individuals. It may be that more right leaning/conservative individuals also live in communities with more conservative values where practices such as strict monogamy or arranged marriages are more important. For these, physical attractiveness may be less important than values of the community.

## 2.4 The Dutch context

Despite the research done in other countries on the relationship between height and happiness or life satisfaction, the results in The Netherlands could have some similarities and differences with results found in previous research. Firstly, two studies were discussed in Section 2.2.1. Both a study by Denny and Salahodjaev et al. found a concave relationship between height and life satisfaction. Also, Denny found that the relationship between height and life satisfaction changes when controlling for health and human capital. These results were in line with the results found by Habibov et al.. Denny concludes that being short is a penalty to well-being, but there is not necessarily a benefit to being tall.

The studies by Salahodjaev et al. and Denny finding inverted u shaped relationships between men's height and happiness means that happiness as a function of height increases up to a certain height, after which it decreases. These findings suggest that the relationship between height and happiness for men in The Netherlands might not be linear either. Instead, a similar relationship might hold as found in the study by Salahodjaev et al.. From the data in this paper, it seems that the most accepted height seems to be 6 foot (182.88 centimetres) in the United States. Also, the optimal height for life satisfaction was found to be 177 centimetres by Salahodjaev and Ibragimova, 2018 in Russia. Both in the United States and Russia the average male height is around 177 centimetres ("Average Height by Country 2023", 2023). This may suggest that the most optimal height for men's happiness is between the average male height and around three to four inches taller than average male height in a specific region.

Secondly, a possibility for a different result compared to previous research in the Dutch case is the difference in average height. The Netherlands has the tallest men on average ("Average Height by Country 2023", 2023) ("Hoe lang zijn Nederlanders?", 2022) with an average height of around 182-184 centimetres for men. As previous research has suggested, being taller may not influence happiness after reaching a certain height. Both in the paper by Salahodjaev et al. and Denny it was found that being short may be a penalty, but being tall may not necessarily be a benefit either to life satisfaction. As a result, it could be possible that happiness as a function of height may increase up to average male height and then decrease.

As discussed in Section 1.1, different studies found a similar concave relationship between height and happiness/attractiveness, but with different turning points. In these studies, happiness as a function of height usually increased up to three or four inches above average after which it decreases. Based on this, it can be expected that the relationship in The Netherlands might also be concave and decrease after average height or three to four inches above average height. However, some data and studies pointed to a linear relationship between height and socioeconomic status. Then, it could also be possible that the relationship might be S-shaped or perhaps even linear.

Thirdly, the study by Di Tella et al. (Di Tella et al., 2010) found the effect of status and income changes based on an individual's political preferences. Compared to the countries studied by Salahodjaev et al. and Denny, the relationship between height and happiness might be different in The Netherlands due to a different political climate. That is, status and income are mediators between height and happiness. This report only looks at income as a mediator. Lastly, the papers by Habibov et al. and Denny found that the inclusion of health reduces the effect of height on happiness. The average health of individuals in The Netherlands is likely to be different than individuals in former USSR countries. As a result, the relationship between height and

happiness could be different compared to the study of Habibov et al..

## 2.5 Hypotheses

Combining the mediators and moderators the following hypotheses can be set up:

1. On average, self reported happiness is higher for men who report to be taller than for men who report to be smaller in The Netherlands.
2. The relationship between height and happiness is concavely shaped.
3. The effect of height on happiness is mediated by income.
4. The effect of height on happiness is mediated by dating prospects.
5. The effect of height on happiness is mediated by self esteem.
6. The effect of height on happiness is stronger for men who are younger.
7. The effect of height on happiness is stronger for men who use more social media.
8. The effect of height on happiness is stronger for individuals who are more right leaning politically.

# 3 Method

The main relationship to be established in this report is the causal relationship between height and happiness in men in The Netherlands through their mediators. Also, it must be determined how moderators affect this relationship. To be able to analyse this relationship, a quantitative data set is used. Namely, a data set consisting of individuals in households in The Netherlands were asked relevant questions relating to their health, happiness and physical characteristics. When analysing the relationship between men's height and happiness, many other factors should be accounted for. For example, nutrition affects the height a person grows to, but also their facial and bodily attractiveness. In turn, these three factors can influence a person's potential income, which affects a person's happiness. As a result, much noise exists within the analysis of the relationship between men's height and happiness. As such, only the graph in Figure 2 is estimated in this report.

## 3.1 Data

### 3.1.1 Data set

In order to test the research question a ready to use data set was used. Data was used from the LISS (Longitudinal Internet studies for the Social Sciences) panel which is administered by Centerdata (Tilburg University, Netherlands). The LISS panel data were collected by Centerdata (Tilburg University, The Netherlands) through its MESS project funded by the Netherlands Organisation for Scientific Research. The LISS panel is a representative sample of Dutch individuals who participate in monthly Internet surveys. The panel is based on a true probability sample of households drawn from the population register. Households that could not otherwise participate are provided with a computer and Internet connection. A longitudinal survey is fielded in the panel every year, covering a large variety of domains including health, work,

education, income, housing, time use, political views, values and personality. More information about the LISS panel can be found at: www.lissdata.nl.

### 3.1.2 Data manipulation

To clean the data, the different survey data sets made by the LISS surveys are merged. The data sets which were the most recent at the time of writing (July 2023) and include all required variables for the analyses are used. The Health, Religion and Ethnicity, Social Integration and Leisure, Family and Household, Work and Schooling, Personality, Politics and Values and Economic Situation: Income are joined on respondent id. Following, female entries are deleted. Additionally, outliers of individuals with a height underneath 145 centimetres and above 220 centimetres are deleted. Also, all entries with unknown happiness levels are removed. For all regression models, NA values are omitted. For main effects model two, all entries with an unknown ethnicity are removed. For the moderation analysis, all entries with unknown political preference are removed. For the mediation analysis, all individuals with unknown income have their unknown income replaced by the median income.

## 3.2 Analyses and measures

As discussed in Section 2.4, the relationship between height and happiness is not likely to be linear. Instead, it can be expected that happiness as a function of height has an inverted u shape. It may also be possible for the relationship to be s-shaped or linear. In order to analyse the relationship between height and happiness in men, an Ordinary Least Squares (OLS) is used. To be able to estimate a non-linear relationship, height is squared within the regression. Three regression models are used at first. For all three models, height is estimated using a linear, squared and logarithmic variable. Adjusted R-squared is then compared for the fitted regression models. The model with the highest adjusted R-squared is picked to be used for the full moderation and mediation analysis. The graphs are plotted using stargazer (Hlavac, 2022) in Appendix B. Based on the adjusted R-squared, the squared model is picked. Firstly, a model is estimated using no control variables. The following equation is estimated:

$$Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \epsilon_i \qquad \text{(OLS model 1)}$$

In this model, $happiness_i$ is the happiness of individual i gathered from the LISS study at a certain point in time. The answer was obtained with the question: "on the whole, how happy do you feel you are?" from the LISS data survey. The numerical response ranged from 1 to 10, with 1 being totally unhappy, 10 totally happy and a specific value of -9 for the answer "I don't know". $\beta_0$ is a constant. $Height_i$ is the height of the individual obtained by asking the question: "how tall are you?" in the LISS survey. The numerical answer ranges from 0 to 300 and is in centimetres. $Height_i^2$ is added to estimate the non-linearity of the model. $\epsilon_i$ is the error term to account for other variables.

Secondly, an OLS regression model is estimated by adding exogenous variables to height to the OLS model 1 equation. These exogenous variables are variables which cannot be influenced by height. In this model, ethnicity and age are included. Age is a numeric, pre loaded variable in the LISS data and has an unlimited range. Ethnicity was derived from questions asked in the Religion and Ethnicity survey. The possible answers were categorical and were: a Dutch

background, a First generation foreign, Western background, a First generation foreign, non-western background, a Second generation foreign, Western background, a Second generation foreign, non-western background and unknown. The model then becomes:

$$Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Ethnicity_i + \epsilon_i \quad \text{(OLS model 2)}$$

Lastly, an OLS regression model is estimated by adding endogenous variables to the OLS model 2 equation. In this model, education level and the area the respondent lives in are added. The education level of an individual was assessed with the question: " what is the highest level of education that you have completed with diploma or certificate?". The answer is an integer with a range of 1-28. The different possible values for this variable are explained in Appendix A. The area an individual lives in was constructed based on their postal code. 1 is extremely urban and 5 is not urban. The equation for this model is:

$$\begin{aligned} Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \\ \beta_5 Ethnicity_i + \beta_6 Area_i + \beta_7 Education_i + \epsilon_i \end{aligned} \quad \text{(OLS model 3)}$$

### 3.2.1 Mediation analysis

For the mediation analysis, a main model is estimated using OLS model 2 and adding the individual mediators as control variables. In addition, the effect of the mediators on height and the effect of the mediators on happiness (see Figure 4) is tested. Namely, three main tests need to be performed in order to be able to test whether a variable mediates the height-happiness relationship. First, there must be a relationship between height and the mediator. Second, there must be a relationship between the mediator and happiness. Last, the relationship between height and happiness must significantly decrease after controlling for the mediator.

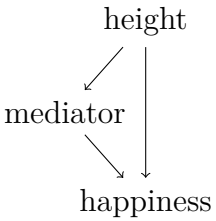


Figure 4: Relationship between height and the mediators

#### 3.2.1.1 Income

Firstly, a regression model is run for the income mediator. For the income variable, the question which asks "How much were your gross wages in total in 2021 [at your employer / at all of your employers]?" is used. The answer is an integer ranging from 1 to 1000000000. An answer of "I don't know" is coded as -9 and "Prefer not to say" as -8. Unknown and prefer not to say answers are replaced by the median income to train the model. The following equation is estimated:

$$Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Ethnicity_i + \beta_6 Income_i + \epsilon_i$$
(Income mediation)

A regression model is also run to test the effect of height on income. The equation for this model is as follows:

$$Income_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Ethnicity_i + \epsilon_i$$
(Height-Income)

Another regression model is run for the effect of income on happiness. The equation for this model is as follows:

$$Happiness_i = \beta_0 + \beta_1 Income_i + \beta_2 Age_i + \beta_3 Age_i^2 + \beta_4 Ethnicity_i + \epsilon_i \text{ (Income-Happiness)}$$

#### 3.2.1.2 Esteem

Secondly, a regression model is run for the self esteem mediator. In order to measure self esteem, the question "I feel that I'm a person of worth, at least on an equal plane with others" in the LISS data set is used. Answers range from 1 to 7 where 1 equals to "Totally disagree" and 7 "Totally agree". Then, the following equation is estimated:

$$Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Ethnicity_i + \beta_6 Esteem_i + \epsilon_i$$
(Esteem mediation)

Another regression model is run for the relationship between height and esteem using the following equation:

$$Esteem_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Ethnicity_i + \epsilon_i$$
(Height-Esteem)

Additionally, a regression model is run for the relationship between esteem and happiness using the following equation:

$$Happiness_i = \beta_0 + \beta_1 Esteem_i + \beta_2 Age_i + \beta_3 Age_i^2 + \beta_4 Ethnicity_i + \epsilon_i \text{ (Esteem-Happiness)}$$

#### 3.2.1.3 Dating prospects

Thirdly, the dating prospects mediator is tested. The question which asks "Do you currently have a partner?" from the LISS data set is used as the dating prospects variable. The answers is binary where 0 equals to the respondent not having a partner and 1 to the respondent having a partner. The following equation is estimated:

$$Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Ethnicity_i + \beta_6 Partner_i + \epsilon_i$$
(Dating prospects mediation)

Similarly to the other two mediators, a regression model is run to test the relationship between height and a man's dating prospects. However, the dating prospects variable is binary, so a probit model is estimated. The following equation is then used:

$$pr(Partner_i = 1) = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \beta_4 Age_i^2 + \beta_5 Ethnicity_i + \epsilon_i$$
(Height-Dating)

In addition, an OLS regression model is run for the relationship between dating prospects and happiness:

$$Happiness_i = \beta_0 + \beta_1 Partner_i + \beta_2 Age_i + \beta_3 Age_i^2 + \beta_4 Ethnicity_i + \epsilon_i \text{ (Dating-Happiness)}$$

#### 3.2.1.4 Overall

Finally, all models estimating the relationships between height and the mediators and the relationships between the mediators and happiness are also estimated with only linear terms. The linear models are then compared to the squared models. The results of the mediation analysis are discussed in Section 4.4.

### 3.2.2 Moderation analysis

In order to do moderation analysis and test hypothesis 7, 8 and 9 interaction effects are added to OLS model 2. Then, four interaction models are estimated using the three moderators discussed in Section 2.5. This is done by creating a binary variable for all the moderators. In this variable, a value of 1 corresponds to an individual being above the mean of the total population and a value of 0 corresponds to an individual being below the mean of the total population. Firstly, an interaction model is created for the age variable. The estimated regression model has the following equation:

$$\begin{aligned} Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 Age_i + \\ \beta_4 Age_i \times Height_i + \beta_5 Age_i \times Height_i^2 + \beta_6 \times ethnicity + \epsilon_i \end{aligned} \quad \text{(Age Moderation)}$$

Secondly, an interaction model is created for the social media usage (SMU) variable. The question from the LISS data which asks: "average number of hours per week spent on: reading and viewing social media (e.g. Facebook, Instagram, Twitter, Youtube, LinkedIn, Pinterest, TikTok, etc.)?" is used for the social media usage variable. The answer is an integer ranging from 0 to 168. The estimated regression has the following equation:

$$\begin{aligned} Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 SMU_i + \\ \beta_4 SMU_i \times Height_i + \beta_5 SMU_i \times Height_i^2 + \beta_6 \times ethnicity + \epsilon_i \end{aligned} \quad \text{(SMU Moderation)}$$

Thirdly, an interaction model is created for the political preference (Polpref/PV) variable. The question from the LISS data which asks: "Where would you place yourself on the scale below, where 0 means left and 10 means right?" is used. The answer ranges from 0-10 where 0 is left and 10 is right. An answer of -9 equals to is given a respondent answers "I don't know". The equation for this regression model is as follows:

$$\begin{aligned} Happiness_i = \beta_0 + \beta_1 Height_i + \beta_2 Height_i^2 + \beta_3 PV_i + \\ \beta_4 PV_i \times Height_i + \beta_5 PV_i \times Height_i^2 + \beta_6 \times ethnicity + \epsilon_i \end{aligned} \quad \text{(PV Moderation)}$$

Lastly, an interaction model is created using all three moderators. The equation that is estimated for this model is as follows:

$$\begin{aligned} Happiness_i = \beta_0 + \beta_1 \times Height_i + \beta_2 \times Height_i^2 + \beta_3 \times ethnicity + \\ \beta_4 \times Age_i + \beta_5 \times Age_i * Height_i + \beta_6 \times Age_i * Height_i^2 + \\ \beta_7 \times SMU_i + \beta_8 \times SMU_i * Height_i + \beta_9 \times SMU_i * Height_i^2 + \\ \beta_{10} PV_i + \beta_{11} \times PV_i * Height_i + \beta_{12} \times PV_i * Height_i^2 + \end{aligned} \quad \text{(Full Moderation)}$$

The results are discussed in Section 4.3 and plotted in Appendix C.

### 3.3 Rationale

The LISS data set is picked due to its relative large sample size, country of origin and vast amount of variables included. To perform the moderation and mediation analysis for the height-happiness relationship, both a large data set is needed and all relevant variables must be present. Another data set such as the data set by the Central Bureau of Statistics (CBS) in The Netherlands was available for use, but despite a larger sample size some relevant variables such as social media usage are not included. For the regression analyses, NA and unknown values were omitted. Only for the income variable the median income was inserted into all entries with an unknown/NA income.

There are multiple reasons why these entries can contain NA or unknown values. Centerdata states that it could be possible that an individual either did not finish the survey or that they did not participate in a specific survey at all. While it may be possible to replace NA or unknown values for a variable with the mean or use NA as a level of the variable to increase the learning ability of the regression model, these entries were removed due to the unknown nature of the missing data. The reason why entries with unknown income have their income replaced by the median income is due to a change observed in the data and results when the income variable is used. The height-happiness relationship changes when omitting all entries with an unknown or NA income. In order to have the ability to use the same data set for all analyses, the median income is used. It is suspected that the removal of entries with an unknown/NA income introduces (non-)response bias.

## 4 Results

### 4.1 Descriptive statistics

In Table 1 the descriptive statistics of the data set is plotted. In this data set, female entries, entries with unknown happiness and height outlier entries are removed. This is the base data that is used and adjusted in the main, moderation and mediation analysis. The distribution between height and happiness is plotted in Figure 8. Education and urban are used as categorical variables.

Table 1: Descriptive statistics of the data after female, unknown happiness and height outlier entries are removed

| Statistic | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| Age | 2,391 | 56.544 | 17.782 | 16 | 96 |
| Urban | 2,384 | 2.743 | 1.326 | 1 | 5 |
| Height | 5,094 | 173.917 | 9.663 | 147 | 206 |
| Education | 4,779 | 16.441 | 6.768 | 1 | 28 |
| Happiness | 5,094 | 7.411 | 1.402 | 0 | 10 |
| Self Esteem | 5,081 | 5.799 | 1.245 | 1 | 7 |

## 4.2 Main effects

The descriptive statistics of the data used for the main effects analysis are plotted in Table 2. The mean height in this sample is 180.72 centimetres, despite the average height of 182-184 centimetres found in previous research ("Average Height by Country 2023", 2023) ("Hoe lang zijn Nederlanders?", 2022). Note that the data in Table 2 is the same as the data in Table 1, except entries with unknown ethnicity are removed. The OLS regression results for the main analyses are the same when using data from both Table 2 and Table 1.

Table 2: Descriptive statistics for the data used in the main analysis

| Statistic | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| Age | 2,330 | 57.109 | 17.394 | 16 | 96 |
| Urban | 2,323 | 2.748 | 1.325 | 1 | 5 |
| Height | 2,330 | 180.721 | 7.515 | 153 | 206 |
| Education | 2,198 | 16.718 | 6.832 | 1 | 28 |
| Happiness | 2,330 | 7.442 | 1.406 | 0 | 10 |
| Self esteem | 2,327 | 5.890 | 1.164 | 1 | 7 |

The results of the main model are plotted in Table 3 and Figure 5. A Dutch background is the reference category for ethnicity in Table 3. At a height of 184 centimetres, an increase of 1 centimetre in height increases happiness by $0.23 \times 1 + 2 \times$ -0.0006167 $\times$ 184 = 0.0031 points, ceteris paribus. This result is statistically significant at the 0.10 level, but not at the 0.05 level. The effect reaches its maximum at $\frac{\beta_1}{2\times\beta_2} = \frac{0.23}{2\times-0.0006167} = 186.48$ centimetres. Hypothesis 1 in Section 2.5 asked whether self reported happiness is higher for men who report to be taller than for men who report to be smaller in The Netherlands on average. Hypothesis 2 asked whether The relationship between height and happiness is concavely shaped.

The squared term of height has a p-value of 0.08 and the linear term for height has a p-value of 0.07. Using an $\alpha$-level of 0.10 the null hypotheses could be rejected that the distribution is not concave and that taller men have the same happiness level as smaller men. However, these null hypotheses cannot be rejected at an $\alpha$-level of 0.05. As such, these results must be viewed carefully when making conclusions.

Table 3: Main effects analysis results for squared model 2

| | *Dependent variable:* |
|---|---|
| | Happiness |
| Height | 0.230* |
| | (0.126) |
| Height$^2$ | −0.001* |
| | (0.0003) |
| Age | −0.011 |
| | (0.010) |
| Age$^2$ | 0.0002** |
| | (0.0001) |
| First generation western | −0.231 |
| | (0.166) |
| First generation non-western | −0.530*** |
| | (0.138) |
| Second generation western | −0.187 |
| | (0.129) |
| Second generation non-western | −0.239 |
| | (0.156) |
| Constant | −13.802 |
| | (11.355) |
| Observations | 2,330 |
| $R^2$ | 0.024 |
| Adjusted $R^2$ | 0.021 |
| Residual Std. Error | 1.391 (df = 2321) |
| F Statistic | 7.132*** (df = 8; 2321) |
| *Note:* | *p<0.1; **p<0.05; ***p<0.01 |

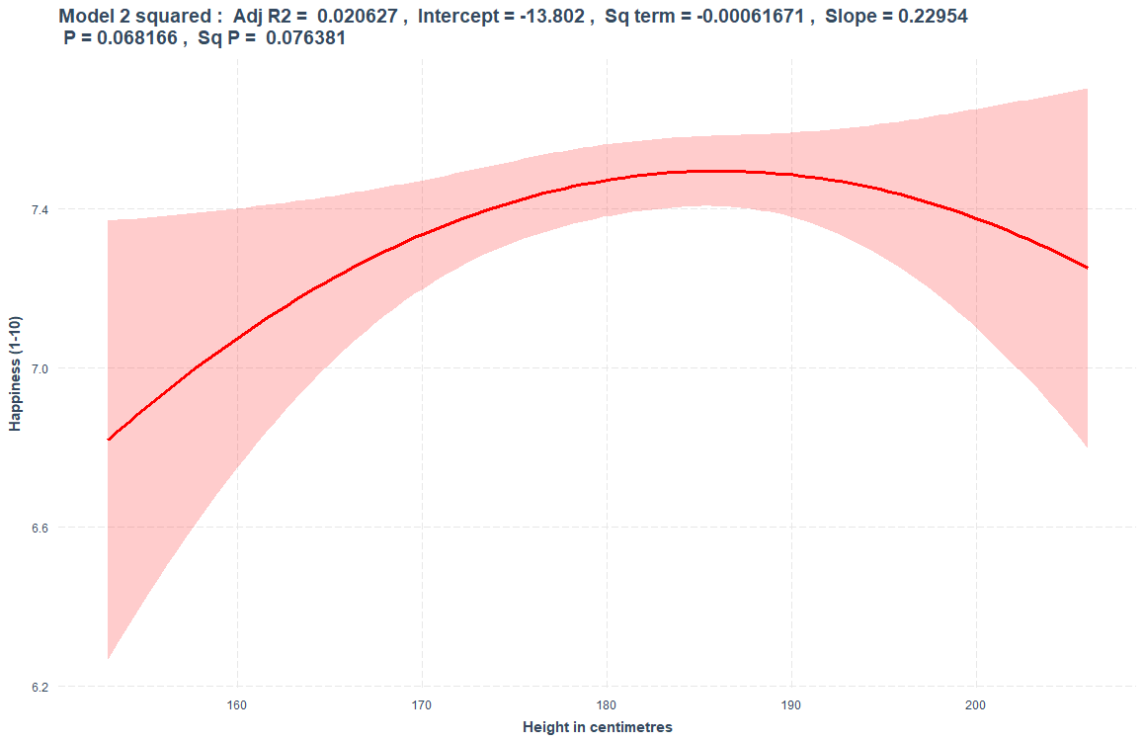


Figure 5: Squared OLS model 2

## 4.3 Moderation analysis

In Table 4 the descriptive statistics are plotted for the moderation data set.

Table 4: Descriptive statistics for the data used in the moderation analysis

| Statistic | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| SMU | 4,200 | 3.527 | 5.637 | 0.000 | 70.000 |
| PV | 4,315 | 5.182 | 2.144 | 0 | 10 |
| Age | 2,143 | 57.238 | 17.555 | 16 | 96 |
| Urban | 2,139 | 2.758 | 1.320 | 1 | 5 |
| Height | 4,315 | 174.315 | 9.658 | 147 | 206 |
| Education | 4,086 | 16.773 | 6.687 | 1 | 28 |
| Happiness | 4,315 | 7.437 | 1.365 | 0 | 10 |
| Self esteem | 4,309 | 5.838 | 1.222 | 1 | 7 |

The results of the moderation analysis are plotted in Table 5. The graphs are plotted in Appendix C. The reference category for the ethnicity variable is a Dutch background. One model is run for each moderator besides a model which contains all moderators. Hypotheses 6, 7 and 8 in Section 2.5 state that the effect of height on happiness is stronger for men who are younger (6), use more social media (7) and are more right leaning politically (8). Table 5 only shows statistically significant results for individuals with a first generation non-western ethnicity, in all models at an $\alpha$-level of 0.01. As a result, the null hypotheses of hypotheses 6, 7 and 8 cannot be rejected at any $\alpha$-level lower than or equal to 0.10. That is, it cannot be rejected that the effect of height on happiness is not stronger for younger men, men who use more social media and

are more right leaning politically. Also, in none of these models the squared term for height is statistically significant at any level, besides model C.

Based on the figures in Appendix C, it seems that men above the mean age are happier with regards to height in Figure 18, but the squared slope seems quite similar for men underneath and above the mean age. Similarly, it can be seen that men who use less social media than the mean are more happy in Figure 19, but the squared slope seems quite similar for both men who are underneath and above the mean. However, the slope for men who use less social media than the mean is more flat than the slope for men who use more social media than the mean. Also, a similar trend can be seen in Figure 20 for model C. Men who are more right leaning politically than the mean are a little happier with regards to height, but the squared slope is relatively similar to that of the group of men who are more left than the mean. The slope for more right-leaning individuals is almost completely flat compared to a concave shape found for more left-leaning men.

Lastly, the age model in the full model shows a similar squared slope and similar height-happiness relationship for men who are both above and beneath the mean age (see Figure 21). The slope for men underneath the mean age is more flat than the slope for men above the mean age. The political preference model shows a convex shape for men who are more right leaning than the mean, but a concave shape for men who are more left leaning than the mean (see Figure 22). The social media usage graph in the full model shows a relative flat, but concave slope for men who use less social media than the mean, but a more concavely sloped line for men who use more social media than the mean (see Figure 23). Note however, that none of these observations are statistically significant.

Table 5: Moderation analysis results for all four moderation models

| | *Dependent variable:* | | | |
|---|---|---|---|---|
| | Happiness | | | |
| | Moderation model A | Moderation model B | Moderation model C | Moderation model D |
| Height | 0.219 | 0.081 | 0.344* | 0.174 |
| | (0.214) | (0.162) | (0.180) | (0.274) |
| Height$^2$ | −0.001 | −0.0002 | −0.001* | −0.0005 |
| | (0.001) | (0.0004) | (0.0005) | (0.001) |
| Age | −0.664 | | | −8.627 |
| | (25.738) | | | (26.507) |
| Age*Height | 0.017 | | | 0.105 |
| | (0.284) | | | (0.293) |
| Age*Height$^2$ | −0.0001 | | | −0.0003 |
| | (0.001) | | | (0.001) |
| SMU | | −28.594 | | −43.274 |
| | | (26.711) | | (27.129) |
| SMU*Height | | 0.314 | | 0.477 |
| | | (0.295) | | (0.300) |
| SMU*Height$^2$ | | −0.001 | | −0.001 |
| | | (0.001) | | (0.001) |
| PV | | | 29.501 | 35.315 |
| | | | (24.254) | (24.545) |
| PV*Height | | | −0.322 | −0.388 |
| | | | (0.268) | (0.272) |
| PV*Height$^2$ | | | 0.001 | 0.001 |
| | | | (0.001) | (0.001) |
| First generation western | −0.170 | −0.128 | −0.185 | −0.115 |
| | (0.165) | (0.169) | (0.165) | (0.168) |
| First generation non-western | −0.502*** | −0.475*** | −0.532*** | −0.385** |
| | (0.150) | (0.152) | (0.150) | (0.153) |
| Second generation western | −0.122 | −0.139 | −0.123 | −0.096 |
| | (0.130) | (0.132) | (0.130) | (0.131) |
| Second generation non-western | −0.065 | −0.189 | −0.176 | −0.056 |
| | (0.173) | (0.174) | (0.170) | (0.177) |
| Constant | −13.166 | 0.054 | −23.752 | −9.220 |
| | (19.523) | (14.646) | (16.285) | (24.912) |
| Observations | 2,093 | 2,042 | 2,093 | 2,042 |
| $R^2$ | 0.017 | 0.012 | 0.015 | 0.024 |
| Adjusted $R^2$ | 0.013 | 0.008 | 0.011 | 0.017 |
| Residual Std. Error | 1.348 (df = 2083) | 1.350 (df = 2032) | 1.350 (df = 2083) | 1.344 (df = 2026) |
| F Statistic | 4.060*** (df = 9; 2083) | 2.829*** (df = 9; 2032) | 3.549*** (df = 9; 2083) | 3.327*** (df = 15; 2026) |

*Note:* *p<0.1; **p<0.05; ***p<0.01

## 4.4 Mediation analysis

The descriptive statistics for the data used in the mediation analysis are shown in Table 6. Note that the same sample is used as in Section 4.2 for the regression models due to the omitting of NA values in the regression analysis.

Table 6: Descriptive statistics for the data used in the mediation analysis

| Statistic | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| Age | 2,391 | 56.544 | 17.782 | 16 | 96 |
| Urban | 2,384 | 2.743 | 1.326 | 1 | 5 |
| Height | 5,094 | 173.917 | 9.663 | 147 | 206 |
| Education | 4,779 | 16.441 | 6.768 | 1 | 28 |
| Happiness | 5,094 | 7.411 | 1.402 | 0 | 10 |
| Esteem | 5,081 | 5.799 | 1.245 | 1 | 7 |
| Income | 5,094 | 25,242.880 | 19,732.670 | 1 | 466,654 |

## 4.5 Income

First, the income mediator is analysed. This is done by first testing whether height has a relationship with income. Then it is tested whether income has a relationship with happiness. Afterwards, a full model is viewed where both height and income are tested with regards to happiness. These results are then compared to the results of OLS model 2.

### 4.5.1 Height on income

Firstly, two regression models are run to test the Height-Income equation. One model is predicted using linear and squared height and age terms. Another model is predicted using only linear terms. The results are plotted in Table 7. From this table, it is visible that the linear height term is statistically significant and correlated with income in the model using only linear terms at the 0.01 level. On the other hand, neither the linear nor squared height term has a statistically significant relationship with income in the squared model at any $\alpha$-level. As such, the null-hypothesis that there is no relationship between height and income can only be rejected using the model with exclusively linear terms. To be able to make a conclusion using this data, more information is needed with regards to the relationship between height and income.

Table 7: Table for the regression model testing the effect of height on income

| | *Dependent variable:* | |
|---|---|---|
| | Income | |
| | Linear | Squared |
| Height | $205.801^{***}$ | 628.359 |
| | (67.345) | (1,977.370) |
| Height$^2$ | | $-1.509$ |
| | | (5.468) |
| Age | $-180.003^{***}$ | $2,091.527^{***}$ |
| | (29.065) | (152.805) |
| Age$^2$ | | $-21.575^{***}$ |
| | | (1.427) |
| First generation western | 969.381 | $-366.877$ |
| | (2,724.890) | (2,603.775) |
| First generation non-western | $-4,060.980^{*}$ | $-7,441.078^{***}$ |
| | (2,246.849) | (2,166.173) |
| Second generation western | $-2,358.141$ | $-2,594.344$ |
| | (2,131.906) | (2,034.703) |
| Second generation non-western | $-9,558.494^{***}$ | $-7,381.175^{***}$ |
| | (2,556.587) | (2,444.840) |
| Constant | 2,358.414 | $-77,323.910$ |
| | (12,787.870) | (178,500.800) |
| Observations | 2,330 | 2,330 |
| $R^2$ | 0.031 | 0.118 |
| Adjusted $R^2$ | 0.029 | 0.115 |
| Residual Std. Error | 22,911.600 (df = 2323) | 21,864.630 (df = 2321) |
| F Statistic | $12.418^{***}$ (df = 6; 2323) | $38.951^{***}$ (df = 8; 2321) |
| *Note:* | | $^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01 |

### 4.5.2 Income on happiness

Next, the effect of income on happiness is tested using the Income-Happiness equation. One model is predicted using squared height and age terms, while another model is estimated using only linear terms. The results of the regression models are plotted in Table 8. In both the model using exclusively linear terms and the model using squared terms, income has a statistically significant relationship with happiness at the 0.01 level. For an increase of €10,000 euro's in income, happiness increases by $10^5 \times 1 \times 10^{-5} = 1$, ceteris paribus. As a result, the null-hypothesis that there is no linear relationship between income and happiness can be rejected at the 0.01 level using both a squared and linear model.

Table 8: Table for the regression model testing the effect of income on happiness

| | *Dependent variable:* | |
|---|---|---|
| | Happiness | |
| | Linear | Squared |
| Age | 0.008*** | −0.025** |
| | (0.002) | (0.010) |
| $Age^2$ | | 0.0003*** |
| | | (0.0001) |
| First generation western | −0.274* | −0.261 |
| | (0.164) | (0.164) |
| First generation non-western | −0.588*** | −0.544*** |
| | (0.133) | (0.133) |
| Second generation western | −0.184 | −0.182 |
| | (0.128) | (0.128) |
| Second generation non-western | −0.189 | −0.213 |
| | (0.154) | (0.154) |
| Income | 0.00001*** | 0.00001*** |
| | (0.00000) | (0.00000) |
| Constant | 6.863*** | 7.584*** |
| | (0.115) | (0.246) |
| Observations | 2,330 | 2,330 |
| $R^2$ | 0.030 | 0.035 |
| Adjusted $R^2$ | 0.028 | 0.032 |
| Residual Std. Error | 1.386 (df = 2323) | 1.383 (df = 2322) |
| F Statistic | 11.986*** (df = 6; 2323) | 11.895*** (df = 7; 2322) |
| *Note:* | | *p<0.1; **p<0.05; ***p<0.01 |

### 4.5.3 Full income mediation

In Section 4.5.1 a relationship is found between height and income, but only when using a regression model with exclusively linear terms. In Section 4.5.2, a relationship is found between income and happiness in both a regression model using squared terms and a model using exclusively linear terms. Importantly, it is now tested whether adding income as a control variable to the height-happiness equation (OLS model 2) significantly decreases the effect of height on happiness. A regression model is run for the Income mediation equation. The results are plotted in Table 9 and the graphs are plotted in Appendix D.1. Comparing these results to the results found in Table 3, it is clear to see that the effect of both the linear and squared height terms barely change in the model including income.

Before controlling for income, the linear and squared height terms are 0.230 and -0.001 respectively, which is only statistically significant at the 0.10 level. After controlling for income, the linear and squared height terms are 0.225 and -0.001 respectively, which is only statistically significant at the 0.10 level. As a result, the null-hypothesis that the height-happiness relationship is mediated by income cannot be rejected. Hypothesis 3 in Section 2.5 states that the effect of height on happiness is mediated by income. While a relationship is found between height, income and happiness, the hypothesis that the height-happiness relationship is mediated by income can only be rejected with the data used in this analysis.

Table 9: Table for the regression model testing the effect using OLS model 2 and adding the income mediator

| | *Dependent variable:* |
|---|---|
| | Happiness |
| | Full model |
| Height | 0.225* |
| | (0.125) |
| Height$^2$ | −0.001* |
| | (0.0003) |
| Age | −0.027*** |
| | (0.010) |
| Age$^2$ | 0.0003*** |
| | (0.0001) |
| First generation western | −0.228 |
| | (0.165) |
| First generation non-western | −0.476*** |
| | (0.137) |
| Second generation western | −0.168 |
| | (0.129) |
| Second generation non-western | −0.185 |
| | (0.155) |
| Income | 0.00001*** |
| | (0.00000) |
| Constant | −13.238 |
| | (11.284) |
| Observations | 2,330 |
| $R^2$ | 0.037 |
| Adjusted $R^2$ | 0.033 |
| Residual Std. Error | 1.382 (df = 2320) |
| F Statistic | 9.847*** (df = 9; 2320) |
| *Note:* | *p<0.1; **p<0.05; ***p<0.01 |

## 4.6 Esteem

The second mediating variable that is tested is the esteem variable. First, it is tested whether height has a relationship with esteem. Second, it is tested whether esteem has a relationship with happiness. Afterwards, a full model is viewed where both height and esteem are tested with regards to happiness. These results are then compared to the results of OLS model 2.

### 4.6.1 Height on esteem

The first analysis done for the esteem variable is done by viewing the relationship between height and esteem. The Height-Esteem equation is modelled using both linear and squared height and age terms. The results are plotted in Table 10. Similarly to the results found in Table 7, height only has a statistically significant relationship with esteem in the model which exclusively uses linear terms. At the 0.05 level, height has a positive relationship with esteem. For every centimetre gained in height, a man's esteem increases by 0.008 points, ceteris paribus.

Table 10: Table for the regression model testing the effect of height on esteem

| | *Dependent variable:* | |
|---|---|---|
| | Esteem | |
| | Linear | Squared |
| Height | 0.008** | 0.050 |
| | (0.003) | (0.104) |
| Height$^2$ | | −0.0001 |
| | | (0.0003) |
| Age | 0.007*** | 0.025*** |
| | (0.001) | (0.008) |
| Age$^2$ | | −0.0002** |
| | | (0.0001) |
| First generation western | −0.128 | −0.137 |
| | (0.137) | (0.137) |
| First generation non-western | −0.176 | −0.200* |
| | (0.113) | (0.114) |
| Second generation western | 0.070 | 0.067 |
| | (0.107) | (0.107) |
| Second generation non-western | −0.257** | −0.238* |
| | (0.129) | (0.129) |
| Constant | 4.018*** | −0.064 |
| | (0.645) | (9.426) |
| Observations | 2,327 | 2,327 |
| $R^2$ | 0.017 | 0.019 |
| Adjusted $R^2$ | 0.014 | 0.016 |
| Residual Std. Error | 1.155 (df = 2320) | 1.154 (df = 2318) |
| F Statistic | 6.688*** (df = 6; 2320) | 5.735*** (df = 8; 2318) |
| *Note:* | | *p<0.1; **p<0.05; ***p<0.01 |

### 4.6.2 Esteem on happiness

The second estimation done to test esteem as a mediating variable in the height-happiness relationship is for equation Esteem-Happiness. Both a model using only linear terms and a model using squared terms for height and age are run. The results are plotted in Table 11. In both the squared and linear model, esteem has a positive relationship with happiness. This relationship is statistically significant at the 0.05 level in both models. An increase of esteem by 1 increases happiness by 0.42, ceteris paribus.

Table 11: Table for the regression model testing the effect of esteem on happiness

| | *Dependent variable:* | |
|---|---|---|
| | Happiness | |
| | Linear | Squared |
| Age | 0.004*** | −0.020** |
| | (0.002) | (0.009) |
| $Age^2$ | | 0.0002*** |
| | | (0.0001) |
| First generation western | −0.206 | −0.195 |
| | (0.155) | (0.154) |
| First generation non-western | −0.522*** | −0.494*** |
| | (0.125) | (0.125) |
| Second generation western | −0.221* | −0.223* |
| | (0.121) | (0.121) |
| Second generation non-western | −0.130 | −0.157 |
| | (0.145) | (0.145) |
| Esteem | 0.422*** | 0.425*** |
| | (0.023) | (0.023) |
| Constant | 4.761*** | 5.320*** |
| | (0.163) | (0.260) |
| Observations | 2,327 | 2,327 |
| $R^2$ | 0.140 | 0.143 |
| Adjusted $R^2$ | 0.138 | 0.141 |
| Residual Std. Error | 1.305 (df = 2320) | 1.303 (df = 2319) |
| F Statistic | 63.157*** (df = 6; 2320) | 55.379*** (df = 7; 2319) |
| *Note:* | | *p<0.1; **p<0.05; ***p<0.01 |

### 4.6.3 Full esteem mediation

The results in Section 4.6.1 find a positive relationship between the linear height model and esteem, which is significant at the 0.05 level. The results in Section 4.6.2 find a statistically significant relationship between esteem and happiness at the 0.01 level in both a squared and linear model. It is now tested whether the model for the Esteem mediation equation decreases the height-happiness relationship significantly compared to OLS model 2. The results for the esteem mediation model are plotted in Table 12. The graphs are plotted in Appendix D.2. While the height-happiness relationship decreases slightly, the squared height term is the same in both models and the linear height term changes from 0.230 in OLS model 2 to 0.206 in Esteem mediation.

In both models, the linear and squared height terms are significant at the 0.10 level. The null-hypothesis states that the height-happiness relationship is mediated by esteem. Due to the results found, this hypothesis cannot be rejected. Hypothesis 4 in Section 2.5 states that the effect of height on happiness is mediated by esteem. While a relationship is found between height, esteem and happiness, the hypothesis that the height-happiness relationship is mediated by esteem can only be rejected with the data used in this analysis. That is, the height-happiness relationship does not significantly weaken after controlling for the esteem variable.

Table 12: Table for the regression model testing the effect using OLS model 2 and adding the esteem mediator

| | *Dependent variable:* |
|---|---|
| | Happiness |
| | Full model |
| Height | 0.206* |
| | (0.118) |
| Height$^2$ | −0.001* |
| | (0.0003) |
| Age | −0.022** |
| | (0.009) |
| Age$^2$ | 0.0003*** |
| | (0.0001) |
| First generation western | −0.173 |
| | (0.155) |
| First generation non-western | −0.446*** |
| | (0.129) |
| Second generation western | −0.215* |
| | (0.121) |
| Second generation non-western | −0.139 |
| | (0.146) |
| Esteem | 0.424*** |
| | (0.023) |
| Constant | −13.579 |
| | (10.640) |
| Observations | 2,327 |
| $R^2$ | 0.145 |
| Adjusted $R^2$ | 0.141 |
| Residual Std. Error | 1.303 (df = 2317) |
| F Statistic | 43.529*** (df = 9; 2317) |
| *Note:* | *p<0.1; **p<0.05; ***p<0.01 |

## 4.7 Dating prospects

The last mediating variable tested in the height-happiness relationship is the dating prospects mediator. First, the relationship between height and dating prospects is analysed. Second, it is tested whether dating prospects has a relationship with happiness. Afterwards, a full model is viewed where both height and dating prospects are tested with regards to happiness. These results are then compared to the results of OLS model 2.

### 4.7.1 Height on dating prospects

Firstly, the Height-Dating equation is estimated. A probit model is used to predict dating prospects as a function of height, because the dating prospects variable is binary (0 = respondent has no partner, 1 = respondent has a partner). The results are plotted in Table 4.7.1. The reference category of the dating prospects is that the respondent does have a partner. In the linear model height has a negative relationship with the probability of not having a partner, which is significant at the 0.01 level. The model must have a positive relationship with the probability of having a partner as a consequence. On the contrary, neither the linear nor squared height term has a statistically significant relationship at any level with dating prospects in the squared model.

Table 13: Table for the probit model testing the effect of height on dating prospects

| | *Dependent variable:* | |
|---|---|---|
| | Dating prospects | |
| | Linear | Squared |
| Height | −0.015*** | −0.080 |
| | (0.004) | (0.130) |
| Height$^2$ | | 0.0002 |
| | | (0.0004) |
| Age | −0.013*** | −0.100*** |
| | (0.002) | (0.010) |
| Age$^2$ | | 0.001*** |
| | | (0.0001) |
| First generation western | −0.022 | 0.030 |
| | (0.168) | (0.170) |
| First generation non-western | 0.244* | 0.389*** |
| | (0.132) | (0.135) |
| Second generation western | 0.155 | 0.181 |
| | (0.129) | (0.130) |
| Second generation non-western | 0.395*** | 0.357** |
| | (0.151) | (0.156) |
| Constant | 2.585*** | 10.031 |
| | (0.803) | (11.702) |
| Observations | 2,251 | 2,251 |
| Log Likelihood | -1,170.794 | -1,128.322 |
| Akaike Inf. Crit. | 2,355.587 | 2,274.643 |
| *Note:* | *p<0.1; **p<0.05; ***p<0.01 | |

### 4.7.2 Dating prospects on happiness

Next, the Dating-Happiness equation is estimated. A model using exclusively linear terms and a model using squared height and age terms is tested. The results are plotted in Table 14. In both the linear and squared model having no partner has a negative relationship with happiness. In the linear model, a man with a partner has a 0.72 higher happiness score on average compared to a man without a partner. In the squared model a man with a partner has a 0.79 higher happiness score on average compared to a man without a partner. The results of both of these models is statistically significant at the 0.01 level.

Table 14: Table for the regression model testing the effect of dating prospects on happiness

| | *Dependent variable:* | |
|---|---|---|
| | Happiness | |
| | Linear | Squared |
| Age | 0.004** | −0.037*** |
| | (0.002) | (0.010) |
| Age$^2$ | | 0.0004*** |
| | | (0.0001) |
| First generation western | −0.263 | −0.246 |
| | (0.161) | (0.161) |
| First generation non-western | −0.556*** | −0.503*** |
| | (0.134) | (0.134) |
| Second generation western | −0.167 | −0.164 |
| | (0.129) | (0.128) |
| Second generation non-western | −0.179 | −0.216 |
| | (0.160) | (0.160) |
| Dating | −0.720*** | −0.788*** |
| | (0.069) | (0.071) |
| Constant | 7.406*** | 8.414*** |
| | (0.108) | (0.261) |
| Observations | 2,251 | 2,251 |
| $R^2$ | 0.066 | 0.073 |
| Adjusted $R^2$ | 0.063 | 0.070 |
| Residual Std. Error | 1.361 (df = 2244) | 1.356 (df = 2243) |
| F Statistic | 26.367*** (df = 6; 2244) | 25.340*** (df = 7; 2243) |
| *Note:* | | *p<0.1; **p<0.05; ***p<0.01 |

### 4.7.3 Full dating prospects mediation

The results in Section 4.7.1 show a positive relationship between height and dating prospects when using a probit model with exclusively linear independent variables. The results in Section 4.7.2 find a positive relationship between a man having a partner and happiness. To test whether the dating prospects variable has a mediating effect, the last analysis is done by testing the Dating prospects mediation equation. The results are plotted in Table 15. While the dating prospects variable stays statistically significant, the height and height$^2$ are not statistically significant in this model. The linear height term is 0.230 in the main analysis, but 0.199 when adding the dating prospects variable to the model. The linear and squared height terms also change from statistically significant at the 0.10 level to not statistically significant in the full model.

These results suggest mediation. In order to analyse the dating prospects mediator further, view the graphs of OLS model 2 and the Dating prospects mediation model. The graph for the model without the dating prospects mediator is plotted in Figure 5. The graph for the model with the dating prospects mediator is plotted in Figure 6. Comparing the two graphs, it seems like the squared slope and general happiness levels are almost identical. Based on the results in Table 15, the null-hypothesis that the height-happiness relationship is not mediated by dating prospects can be rejected at the 0.10 level, but not the 0.05 level.

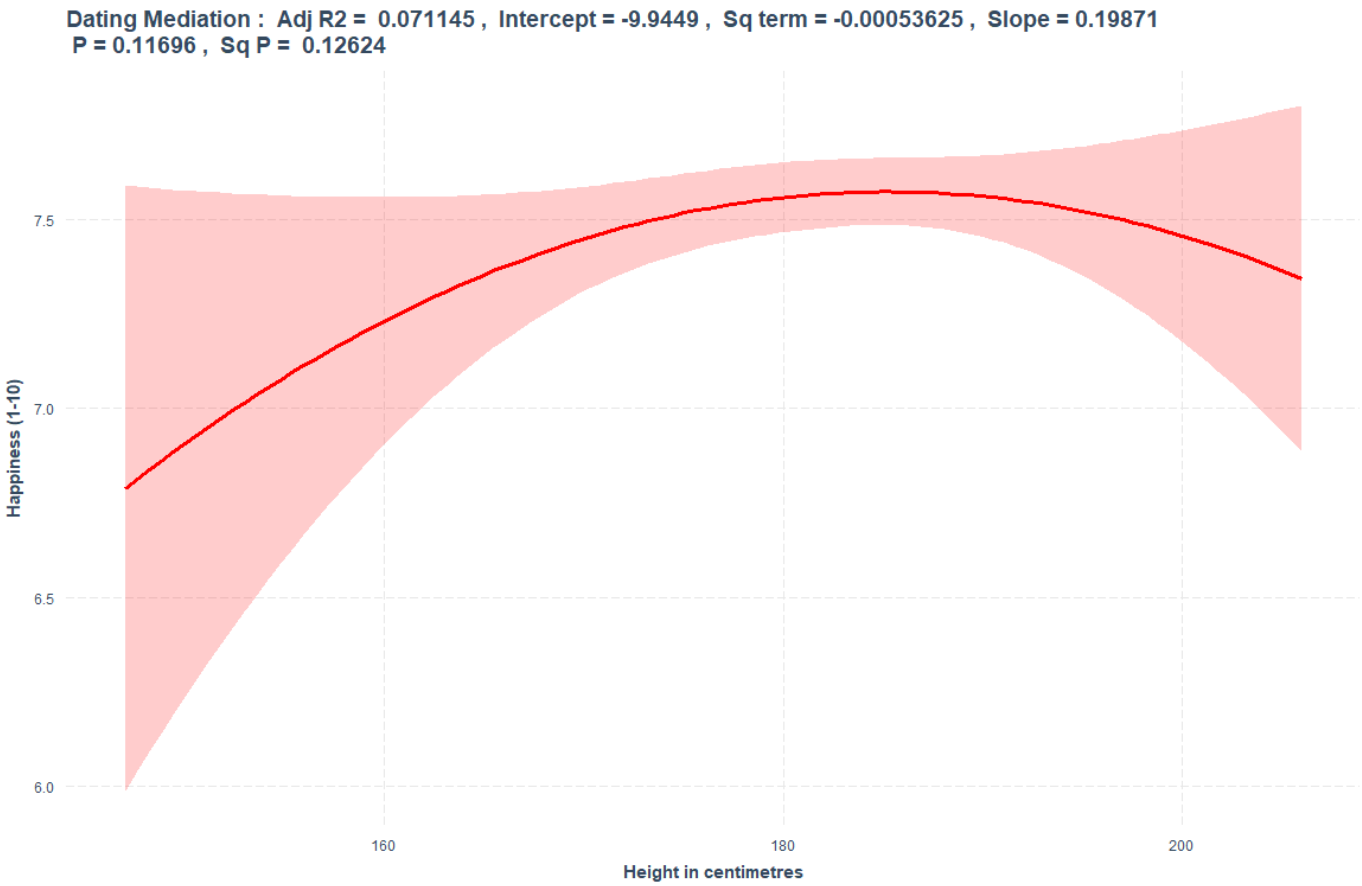


Figure 6: Mediation model for the dating prospects mediator

Table 15: Table for the regression model testing the effect using OLS model 2 and adding the dating mediator

| | *Dependent variable:* |
|---|---|
| | Happiness |
| | Full model |
| Height | 0.199 |
| | (0.127) |
| $Height^2$ | −0.001 |
| | (0.0004) |
| Age | −0.039*** |
| | (0.010) |
| $Age^2$ | 0.0004*** |
| | (0.0001) |
| First generation western | −0.218 |
| | (0.162) |
| First generation non-western | −0.446*** |
| | (0.138) |
| Second generation western | −0.154 |
| | (0.129) |
| Second generation non-western | −0.193 |
| | (0.160) |
| Dating | −0.782*** |
| | (0.071) |
| Constant | −9.945 |
| | (11.435) |
| Observations | 2,251 |
| $R^2$ | 0.075 |
| Adjusted $R^2$ | 0.071 |
| Residual Std. Error | 1.356 (df = 2241) |
| F Statistic | 20.148*** (df = 9; 2241) |
| *Note:* | *p<0.1; **p<0.05; ***p<0.01 |

# 5 Conclusion

## 5.1 Summary

This report looked at the relationship between height and happiness using a sample of men in The Netherlands. In conclusion, the analysis in Section 4.2 found a concave relationship between height and happiness, which is significant at the 0.10 level, but not the 0.05 level. The optimum was found to be around 186 centimetres. Next, Section 4.3 found no moderating effects of age, social media usage and political preference on the height-happiness relationship. Lastly, Section 4.4 found no mediating effect for a man's income and self esteem. However, a positive relationship was found by height on income and esteem. Also, a positive relationship was found by income and esteem on happiness. A small mediating effect was found for a man's dating prospects.

## 5.2 Theoretical implications

While current research already looked at the relationship between height and happiness in men in other countries, this was not yet done in The Netherlands. Compared to other countries, the average height of men is the highest globally ("Average Height by Country 2023", 2023) ("Hoe lang zijn Nederlanders?", 2022) at around 182-184 centimetres. In a study done using a sample of men in the Russian Federation, the authors found a concave relationship between height and happiness which peaked at 177 centimetres (Salahodjaev & Ibragimova, 2018). This study supported the findings of another study which looked at the relationship between height and happiness in a sample of men in multiple European countries (Denny, 2017). Denny also found a concave relationship between height and happiness. The important question this report looked at was whether a similar relationship holds in the tallest country.

On the one hand, the findings in this report support the findings by Denny et al. and Salahodjaev et al. A concave relationship was found between height and happiness, with the optimum height being around 6 centimetres higher than the mean of the sample. However, this result is only statistically significant at the 0.10 level, but not at the 0.05 level or below. Because of this, it is difficult to make a statement on the question whether height and happiness are related in men in The Netherlands. Besides, the graph in Figure 5 shows that the difference between the lowest predicted happiness level and optimum predicted happiness level was only 6% on average. The lowest happiness level was predicted to be around 6.80 and the optimum happiness level a little above 7.40 on average. Because Denny et al. and Salahodjaev et al. found a concave height-happiness relationship, it would also make sense for the data in this report to result in a concave relationship. These findings may make one more inclined to suggest that using an $\alpha$-level of 0.10 is acceptable due to the result in this report finding a p-value of 0.08 for the squared height-term in the regression analysis.

Another interesting finding is that neither income nor self esteem mediates the height-happiness relationship. On the contrary, the dating prospects variable was found to slightly mediate the relationship between height and happiness. Based on previous research it may have been possible that the effect of height on happiness in men is not direct. Instead, the impact of height on happiness goes through other variables. For example, a strong bias humans have is the halo effect (Talamas et al., 2016) (Mitchem et al., 2014) (Eagly et al., 1991) (Weeden & Sabini, 2005) (Foo et al., 2017). Due to the halo effect humans automatically associate positive traits

with something they perceive to be positive. In turn, this affects self esteem (Malik & Sadia, 2013), income (Judge & Cable, 2004) and dating prospects (Hitsch et al., 2010). These variables then influence happiness (Baumeister et al., 2003) (Di Tella et al., 2010) (Van de Velde et al., 2010). Nevertheless, these findings on the relationship between height, esteem and income were also found.

That is, the results in this report found a positive relationship between height and esteem. A positive relationship was also found between height and income. A positive relationship between esteem, income and happiness was also found. Only a decrease in the relationship between height and happiness was not found after controlling for these two potential mediators. These findings may suggest that other variables related to esteem and income do mediate the relationship between height and happiness. Undoubtedly, the full relationship between height and happiness is more complicated than discussed in Section 2.2.1. Especially variables such as health are important in this relationship.

One more interesting finding in this report is that neither age, social media usage nor political preference moderate the height-happiness relationship. Previous research found that social media usage negatively relates to self esteem and positively to depression (Vogel et al., 2014) (Lin et al., 2016). Lastly, the mean height in the sample used in this report was found to be 180.72 centimetres. The mean is even around 174 centimetres when only female, unknown happiness and height outlier entries are removed. The average height according to the Central Bureau of Statistics (CBS) in The Netherlands is 181.7 for men born in 1960 ("Hoe lang zijn Nederlanders?", 2022). The mean age was also found to be around 57 in this sample. The average age according to the CBS is 42 ("Hoe ziet de leeftijdsopbouw van de Nederlandse bevolking eruit?", 2022).

## 5.3 Practical implications

Besides finding several different results than other studies, the findings in this report may also have practical implications. Primarily, the question arises whether the results found in these report would be applicable to other regions too. The relationship between height and happiness might differ in other countries where the average height is different. Although, the results by Denny et al. and Salahodjaev et al. also find a similar height-happiness relationship as the results found in this report. It does appear that a concave relationship between height and happiness with the optimum height being between average height and 9 centimetres above average height is universal. Notwithstanding, the height-happiness relationship should be tested for men in a country with smaller men on average such as India.

A second implication is the economic significance of the finding that there is a relationship between height and happiness in men in The Netherlands. As discussed in Section 5.2, the difference between the predicted optimum height and worst height had a difference of 6% in happiness levels. The happiness levels of the predicted optimum and minimum height were 6.8 and 7.4. While this difference is not close to zero, it shows that the relationship between height and happiness is not very strong. As Denny found in his paper, controlling for health decreases the height-happiness relationship significantly. Even though health was not included in the analyses in this report, health may be one of the most important variables leading to happiness. There is also a relationship between height and health, because both height and health depend heavily on nutrition (Price, 2010).

In essence, the relationship between height and happiness is very difficult to estimate. There are many variables that need to be accounted for. Though, it is evident from previous research that height influences life outcomes such as income, career, dating prospects and general quality of life. Some research even suggests that height discrimination is at least as severe as racial or gender discrimination (Kimhi, 2018). The main underlying mechanism for this phenomenon is the halo effect. It is important for this discrimination to be recognised by both the public and governments. Governments should focus on making the field of medicine enabling people to reach their genetic potential with regards to looks, height and health.

## 5.4 Limitations

This project also had multiple limitations. One major complication is the difficult relationship between height and happiness. As discussed in Section 5.3, the relationship between height and happiness is not direct. Rather, the relationship is mediated by other variables. In this report, some of the most important mediators were analysed. However, many other variables were not able to be captured. For example, nutrition influences both height and health in turn affecting happiness. Besides, the relationship is very noisy making inference surrounding this relationship much more difficult. Because of this, data analysis is also very difficult. A simple ordinary least squares regression model might not be able to capture the full relationship. As such, the results found in this report are a simplified version of the true height-happiness relationship.

Another limitation may be the data set chosen. While the data set contains a large amount of variables, many data entries had NA or unknown values. For example, due to a large number of entries with unknown income, it was decided that the median income was imputed into unknown entries. This was done because removing all entries with unknown income introduced (non-)response bias. In addition, all other analyses were done by omitting all NA and unknown entries. This may introduce (non-)selection bias. For example, the mean height in the main analysis data set was 180.72 centimetres, but the mean height in the entire moderation analysis data set was 174.315 centimetres. However, a similar data set was used as in the main and mediation analysis due to omitting NA values in the regression.

## 5.5 Further research

The results in this report found a statistically significant concave relationship between height and happiness in men in The Netherlands at the 0.1 level, but not the 0.05 level. No significant relationships were established for any mediating and moderating variables besides the dating prospects mediator. Although no significant result was found at the 0.05 level for the height-happiness relationship, useful findings were still made. This result should stimulate others to replicate and further investigate the relationship between height and happiness in men in countries where the average height is in the top 10 globally. Besides, public engagement must be stimulated on this topic. Two suggestions are key for future research.

Firstly, future research should try to establish the full relationship between height and happiness. One possibility could be the graph seen in Figure 7. Then, a more powerful machine learning model could be used to estimate the relationship. Future research could try using a multi-layer neural network to estimate the height-happiness relationship. Secondly, future research should use a different data set. Preferably, future research should use a data set containing at least 2500 full entries in order to be able to do all analyses. The most important factor of this future

study should be avoiding selection bias.

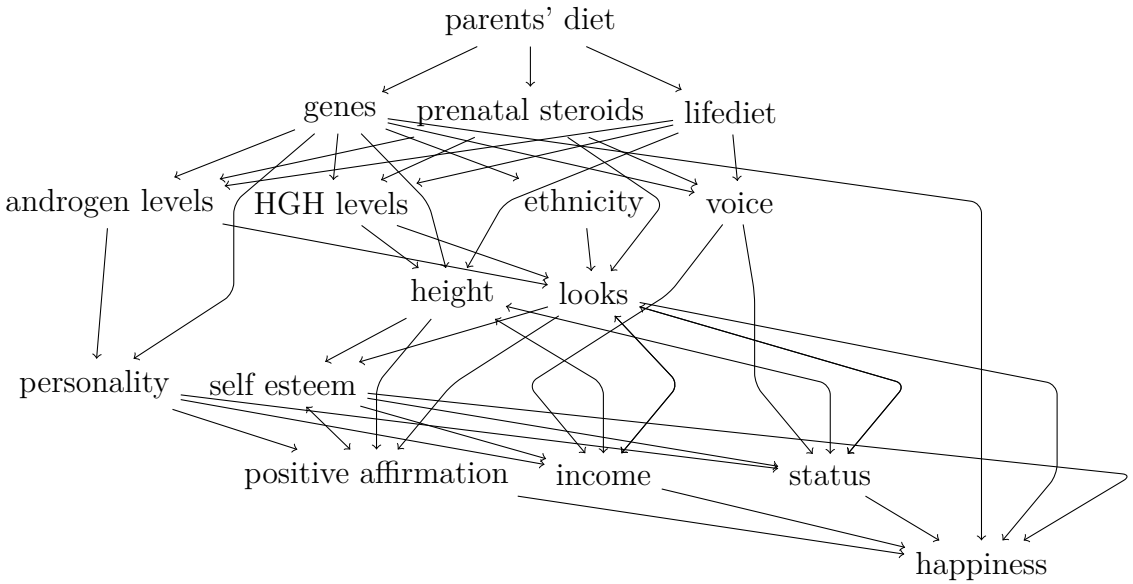


Figure 7: Potential full relationship between height and happiness

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# A Data variables

All possible values for the education variable.

1. did not complete any education
2. did not complete primary school
3. primary school
4. lower and continued special education
5. vglo (continued lower education)
6. lbo (lower professional education)
7. lower technical school, household school
8. mulo, ulo, mavo (lower/intermediate secondary education; US: junior high school)
9. vmbo vocational training program (preparatory intermediate vocational school)
10. vmbo theoretical or combined program (preparatory intermediate vocational school)
11. mms (intermediate girls' school)
12. hbs (former pre-university education, US: senior high school)
13. havo (higher general secondary education; US: junior high school)
14. vwo (pre-university education, US: senior high school)
15. gymnasium, atheneum, lyceum (types of pre-university education programs)
16. kmbo (short intermediate professional education), vhbo (preparatory higher professional education)
17. mbo professional training program (intermediate professional education) (BOL)
18. mbo professional training program (intermediate professional education) (BBL)
19. mbo-plus to access hbo, short hbo education (less than two years) (higher professional education)
20. hbo (higher professional education), institutes of higher education, new style
21. teacher training school
22. conservatory and art academy
23. academic education (including technical and economic colleges, former style) bachelor's degree (kandidaats)
24. academic education (including technical and economic colleges, former style) master's degree (doctoraal)

25. academic education, bachelor
26. academic education, master
27. doctor's degree (Ph.D, including doctoral research program to obtain Ph.D)
28. other

# B Regression analysis

The results for the OLS regressions are plotted below. The distribution between height and happiness is plotted in Figure 8. The regression models are plotted in Appendices B.2 B.3 and B.4.

## B.1 Distribution

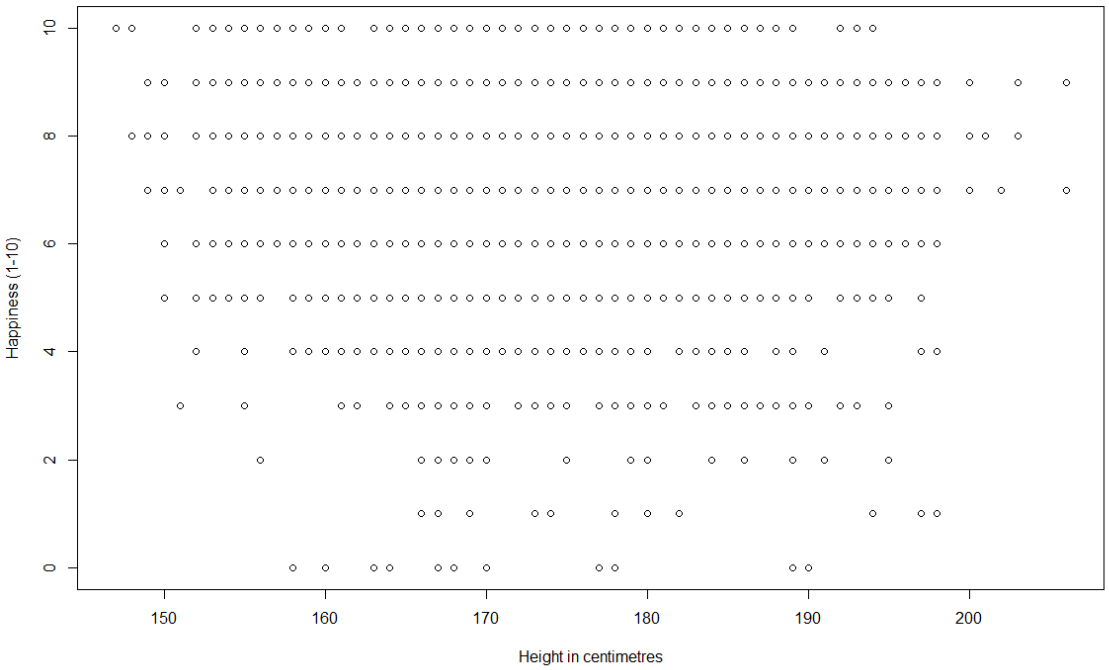


Figure 8: Distribution of happiness as a function of height

## B.2 OLS model 1

### B.2.1 Linear model

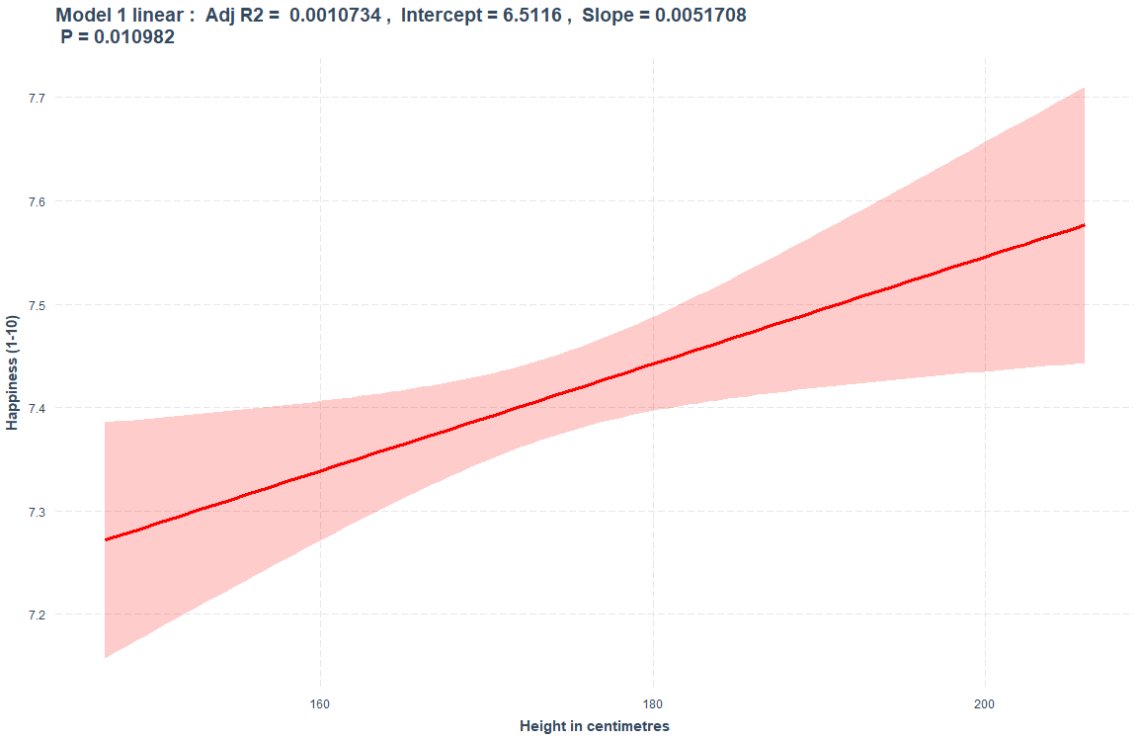


Figure 9: Linear OLS model 1

### B.2.2 Squared model

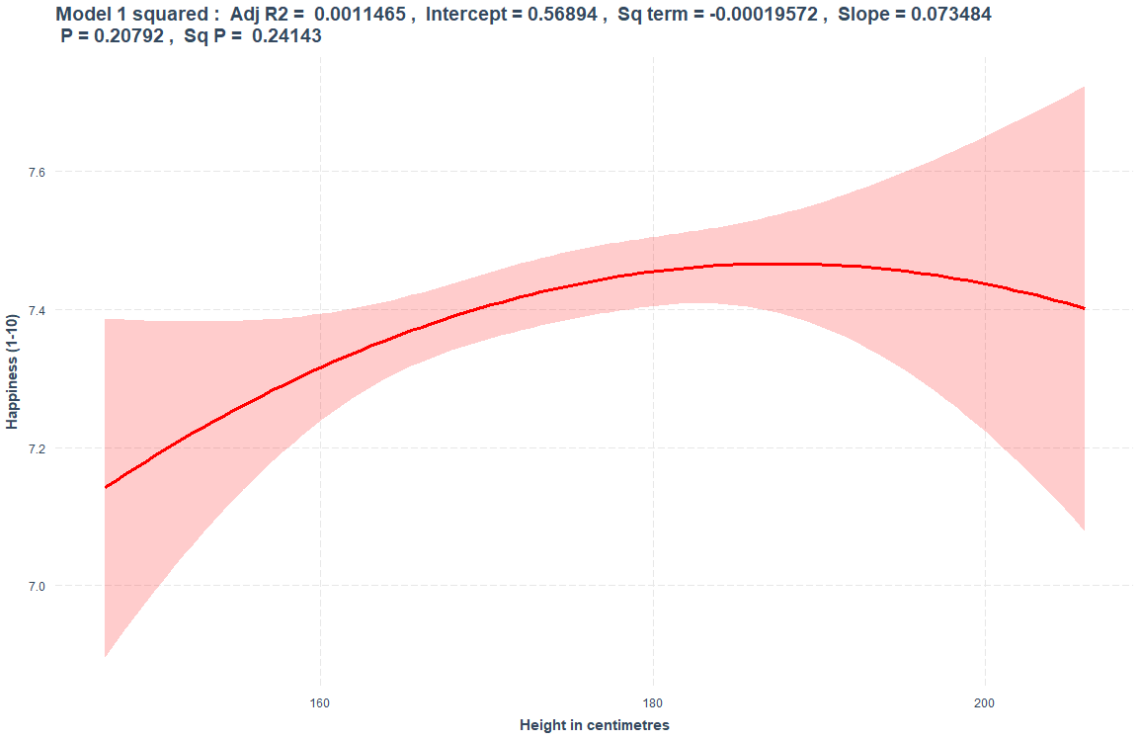


Figure 10: Squared OLS model 1

### B.2.3 Logarithmic model

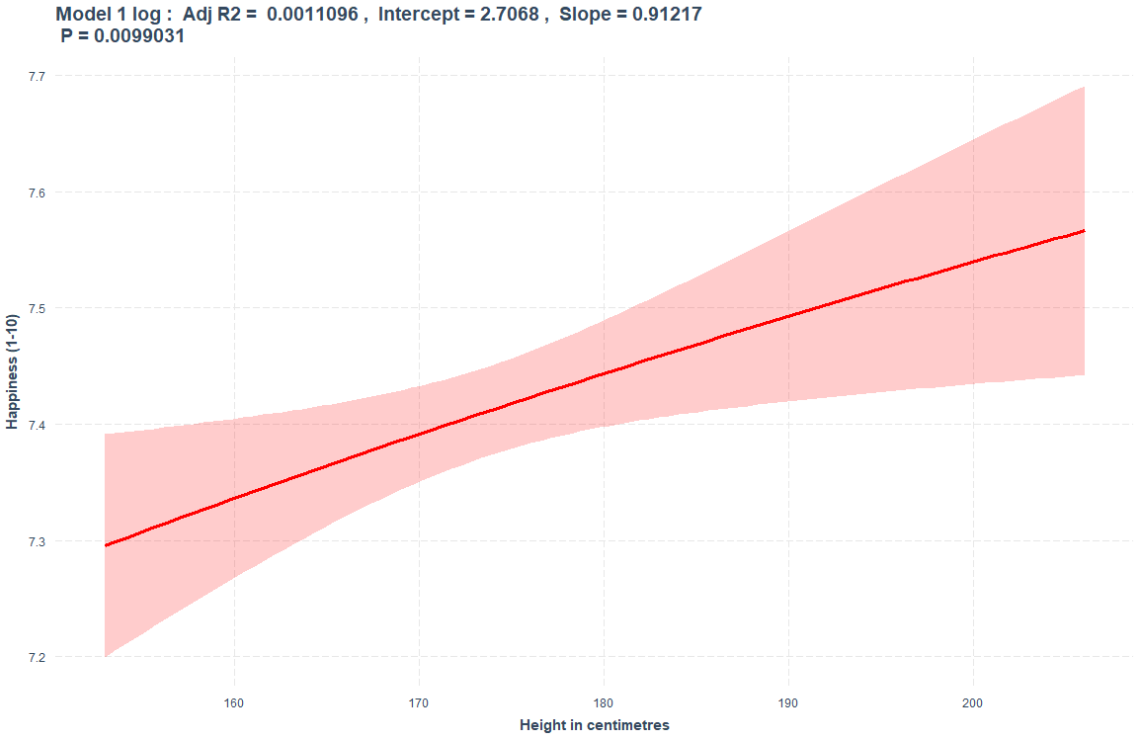


Figure 11: Logarithmic OLS model 1

## B.3 OLS model 2

### B.3.1 Linear model

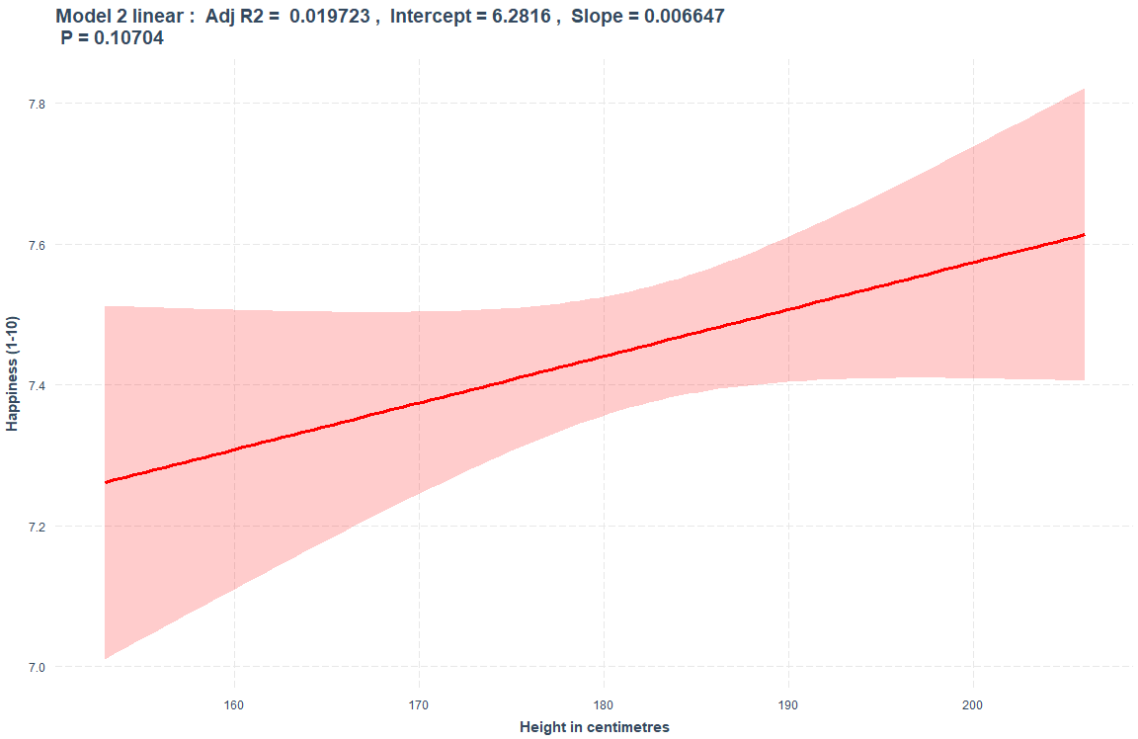


Figure 12: Linear OLS model 2

### B.3.2 Squared model

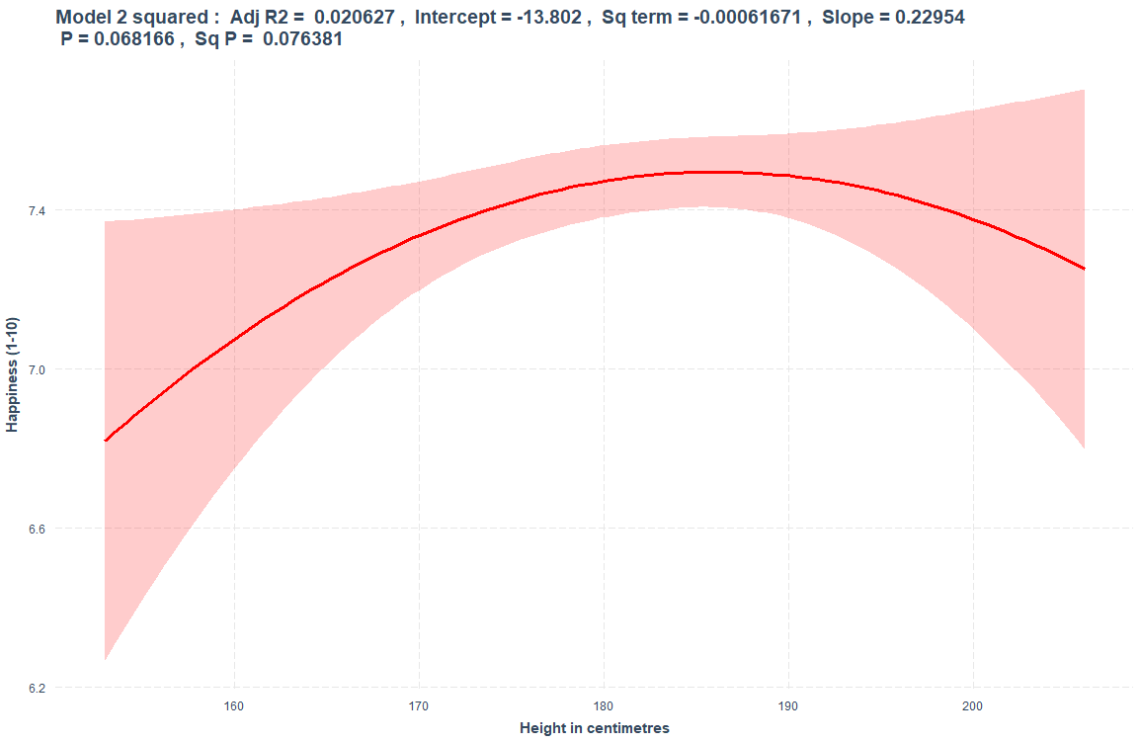


Figure 13: Squared OLS model 2

### B.3.3 Logarithmic model

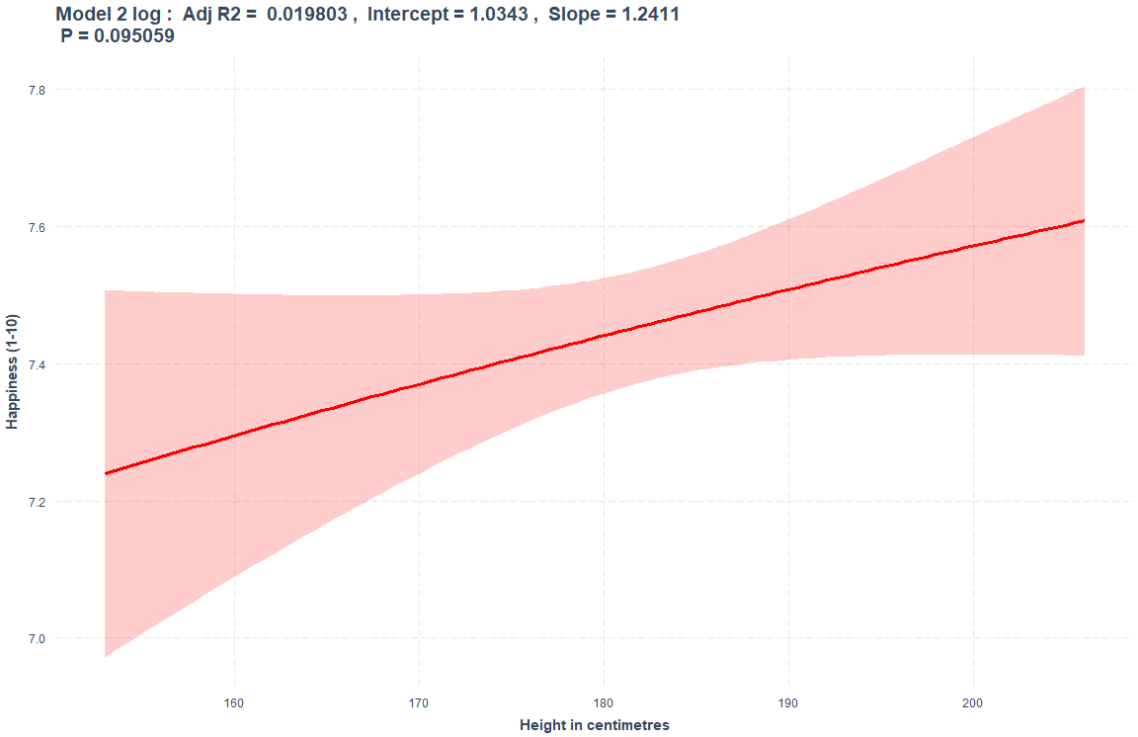


Figure 14: Logarithmic OLS model 2

## B.4 OLS model 3

### B.4.1 Linear model

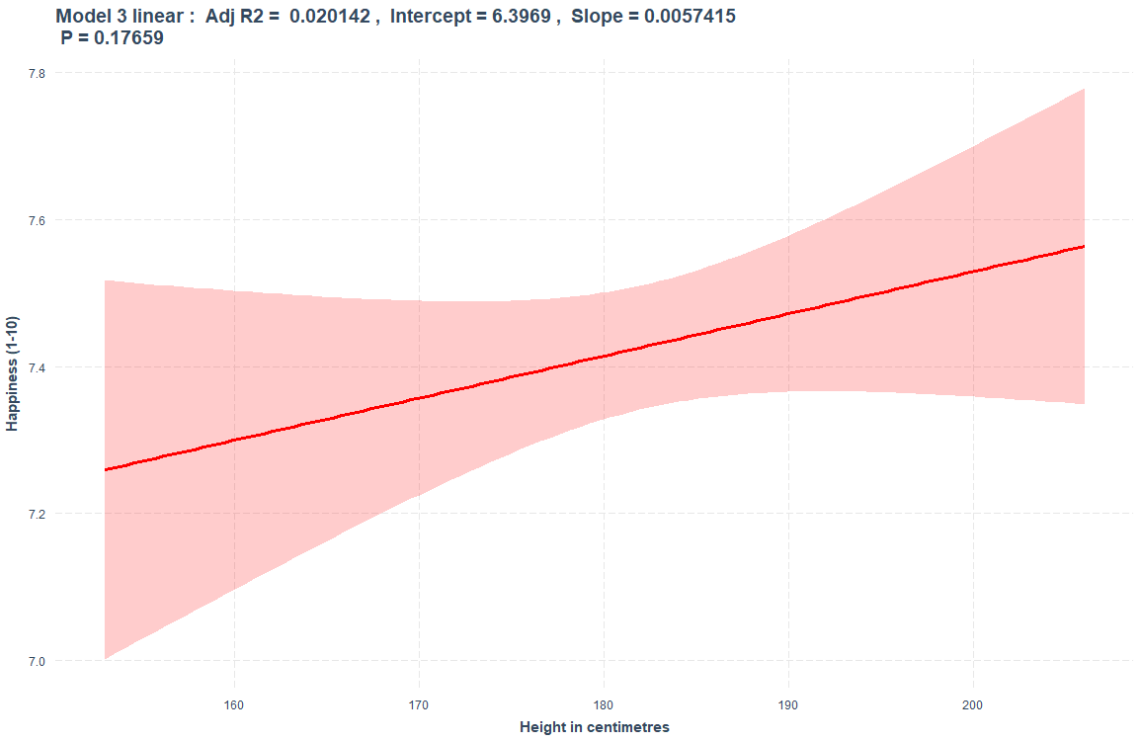


Figure 15: Linear OLS model 3

### B.4.2 Squared model

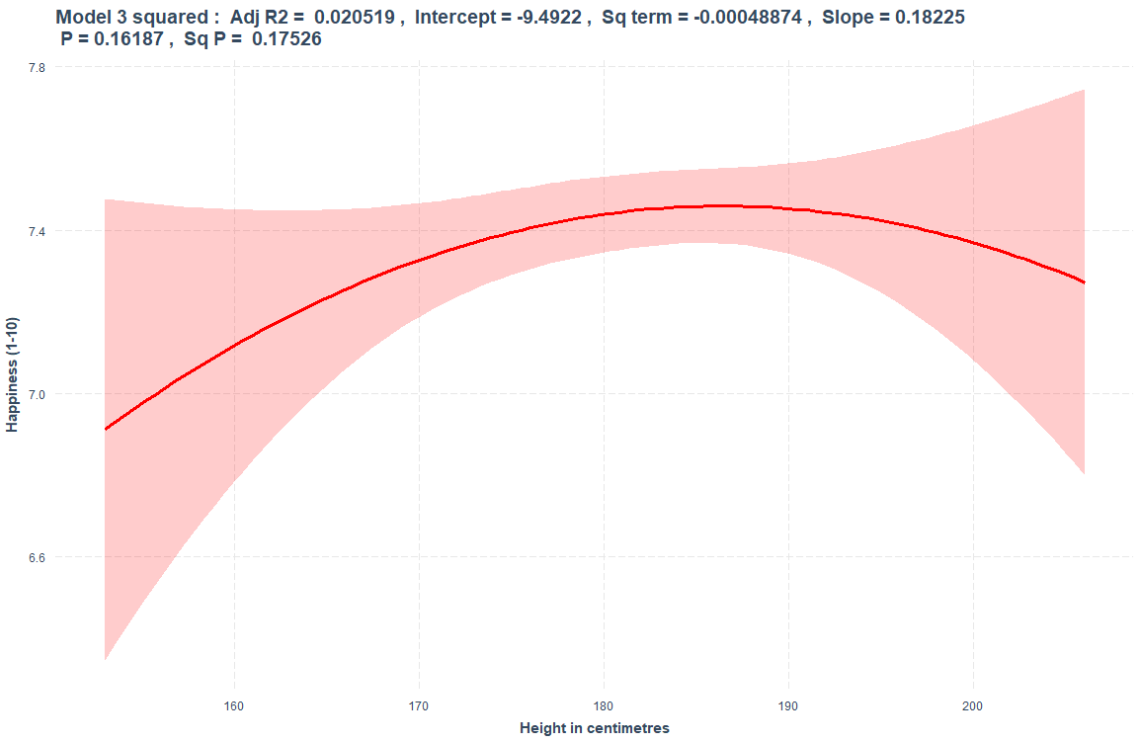


Figure 16: Squared OLS model 3

### B.4.3 Logarithmic model

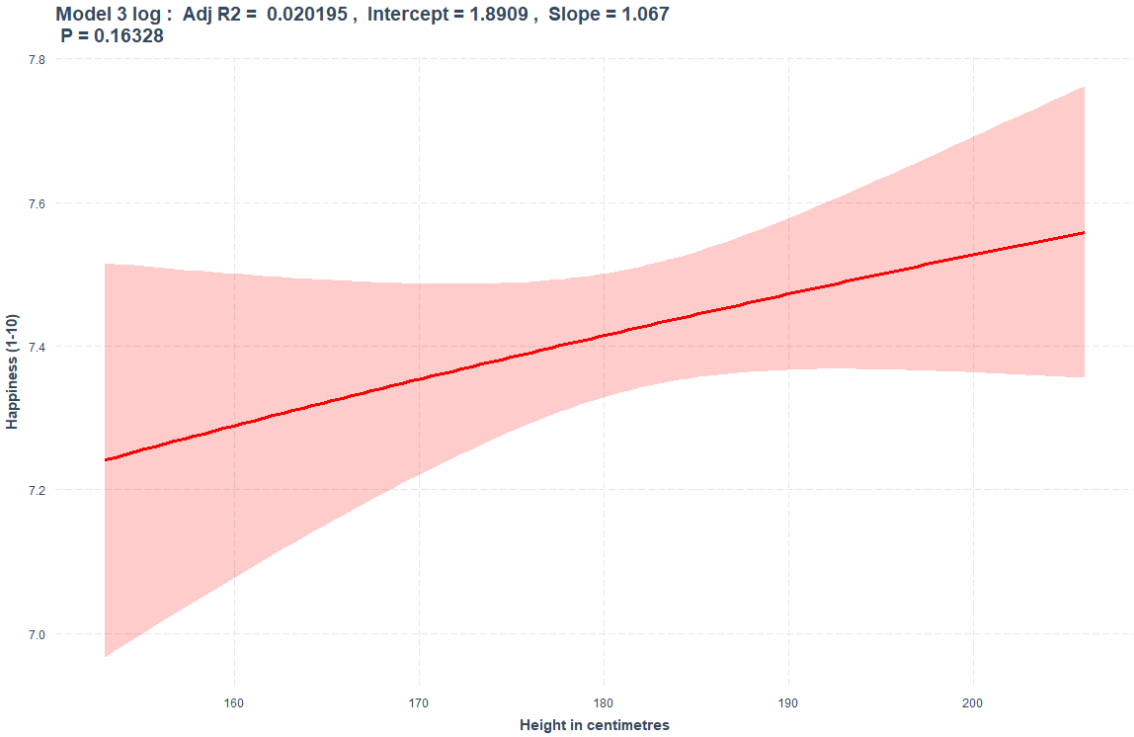


Figure 17: Logarithmic OLS model 3

# C Moderation Analysis

## C.1 Model A

Age = age where 1 >= mean, 0 < mean

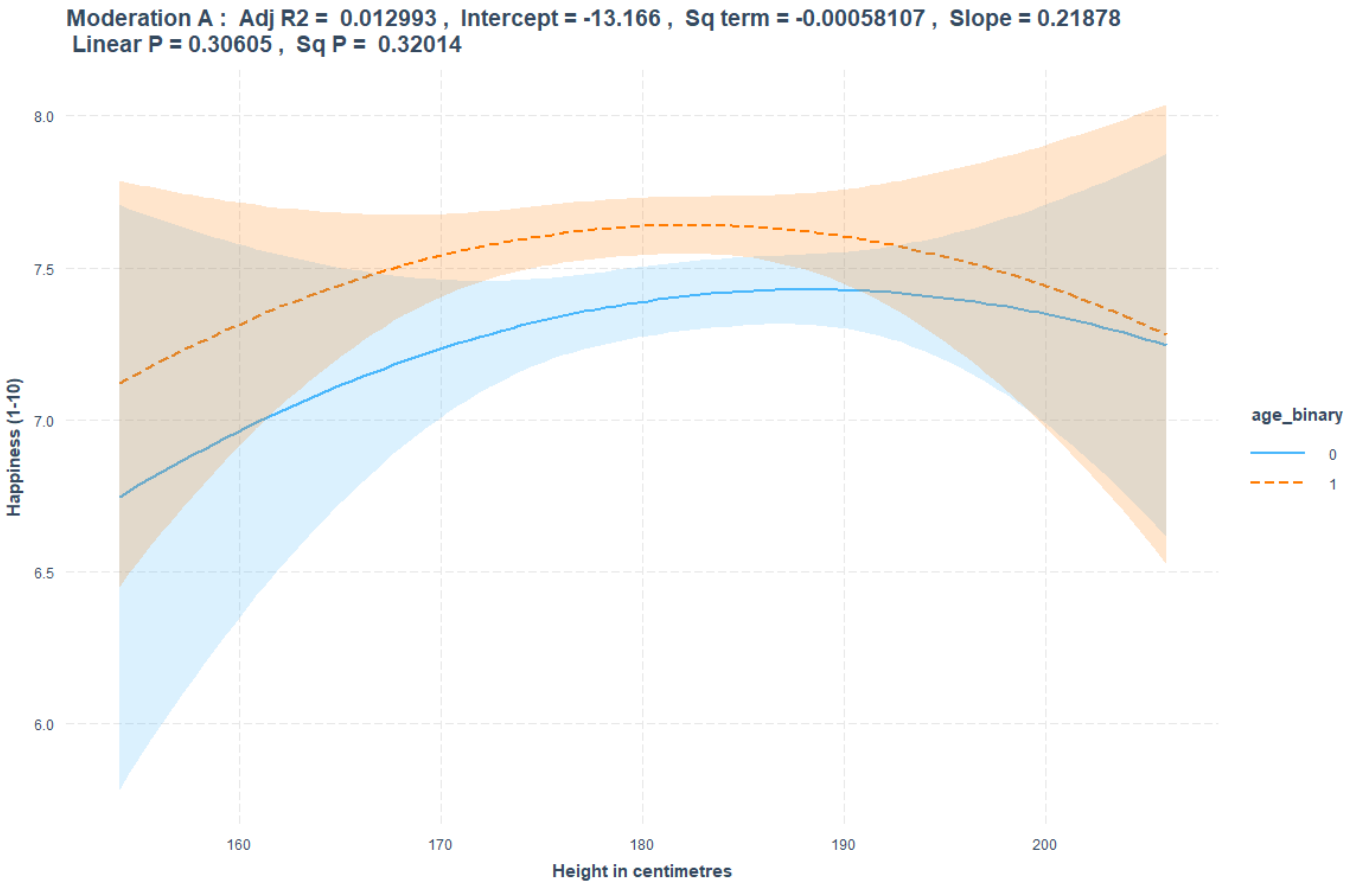


Figure 18: Moderation model A

## C.2 Model B

SMU = Social Media Usage (1 >= mean, 0 < mean)

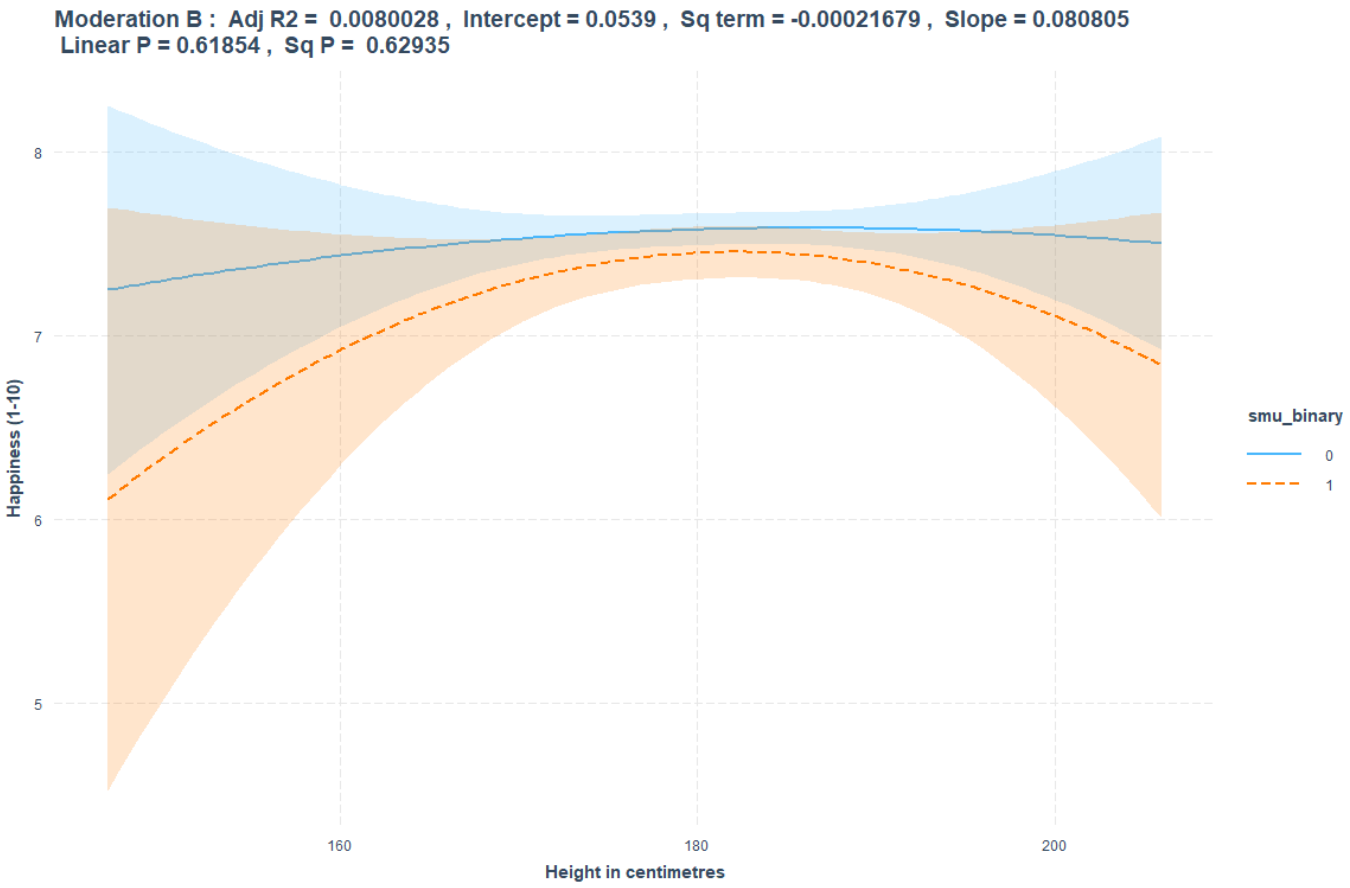


Figure 19: Moderation model B

## C.3 Model C

PV = political preference (1 >= mean, 0 < mean)

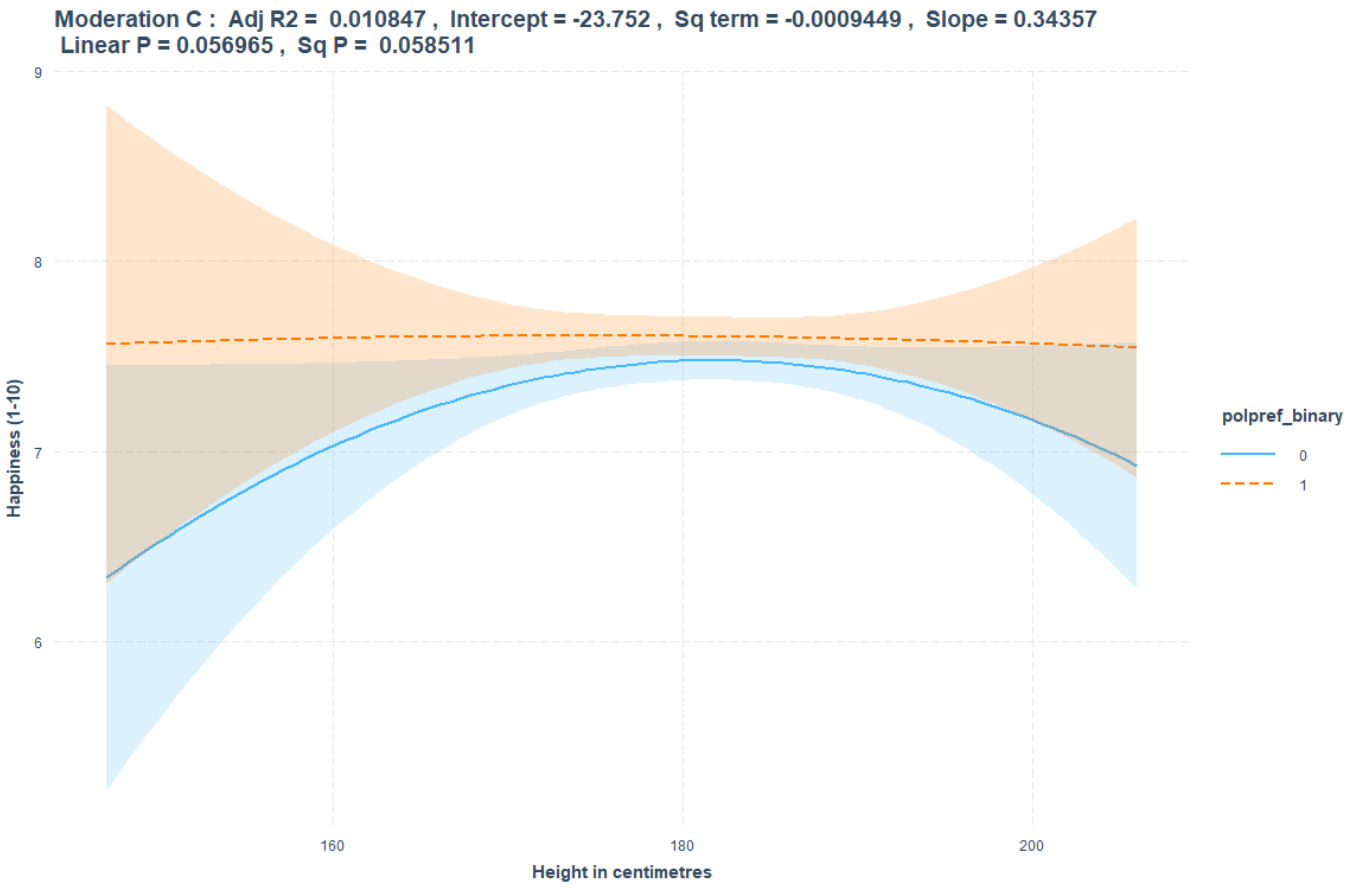


Figure 20: Moderation model C

## C.4 Model D

### C.4.1 Age

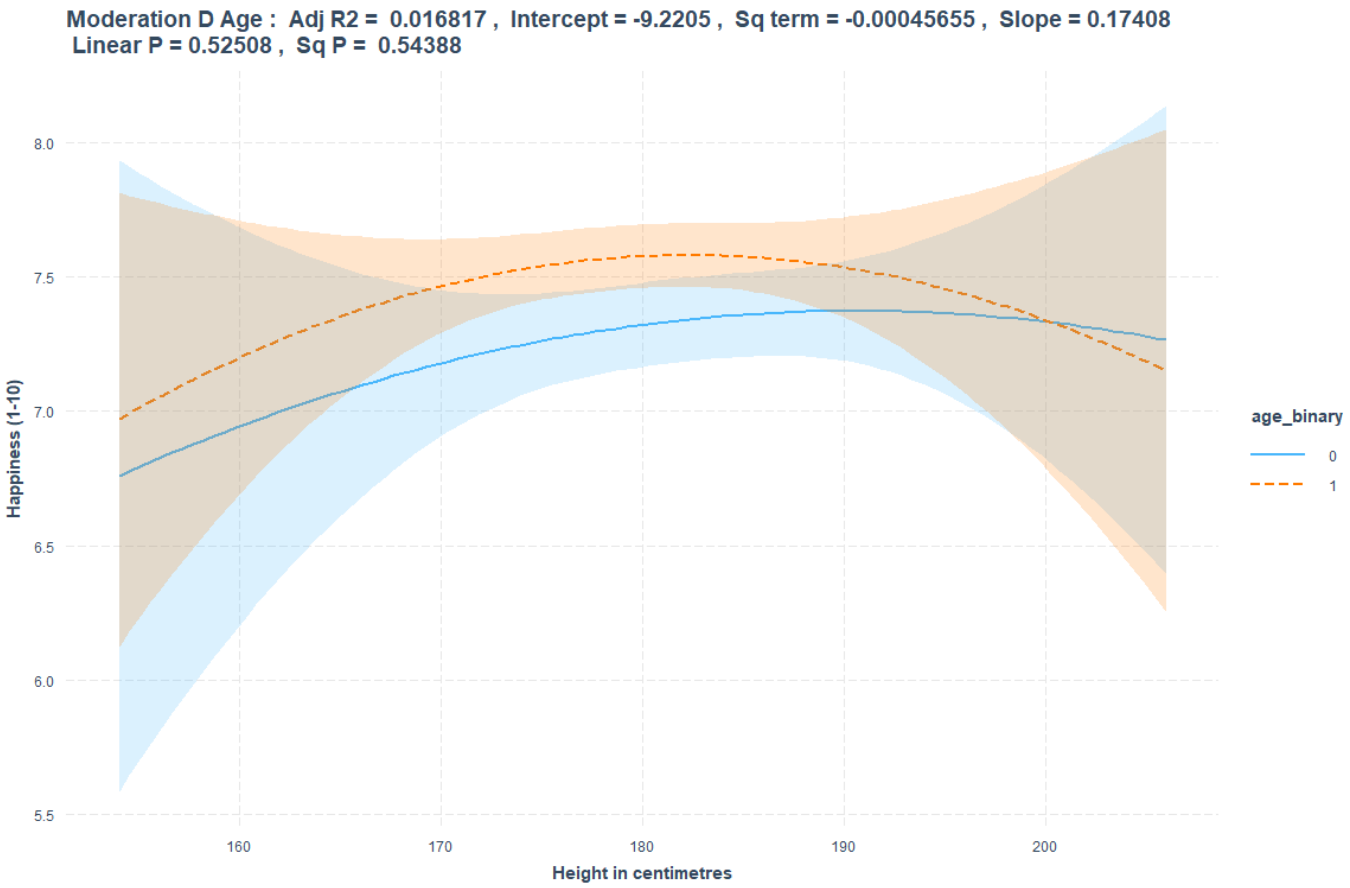


Figure 21: Moderation model D for the binary age moderator

### C.4.2 Political preference

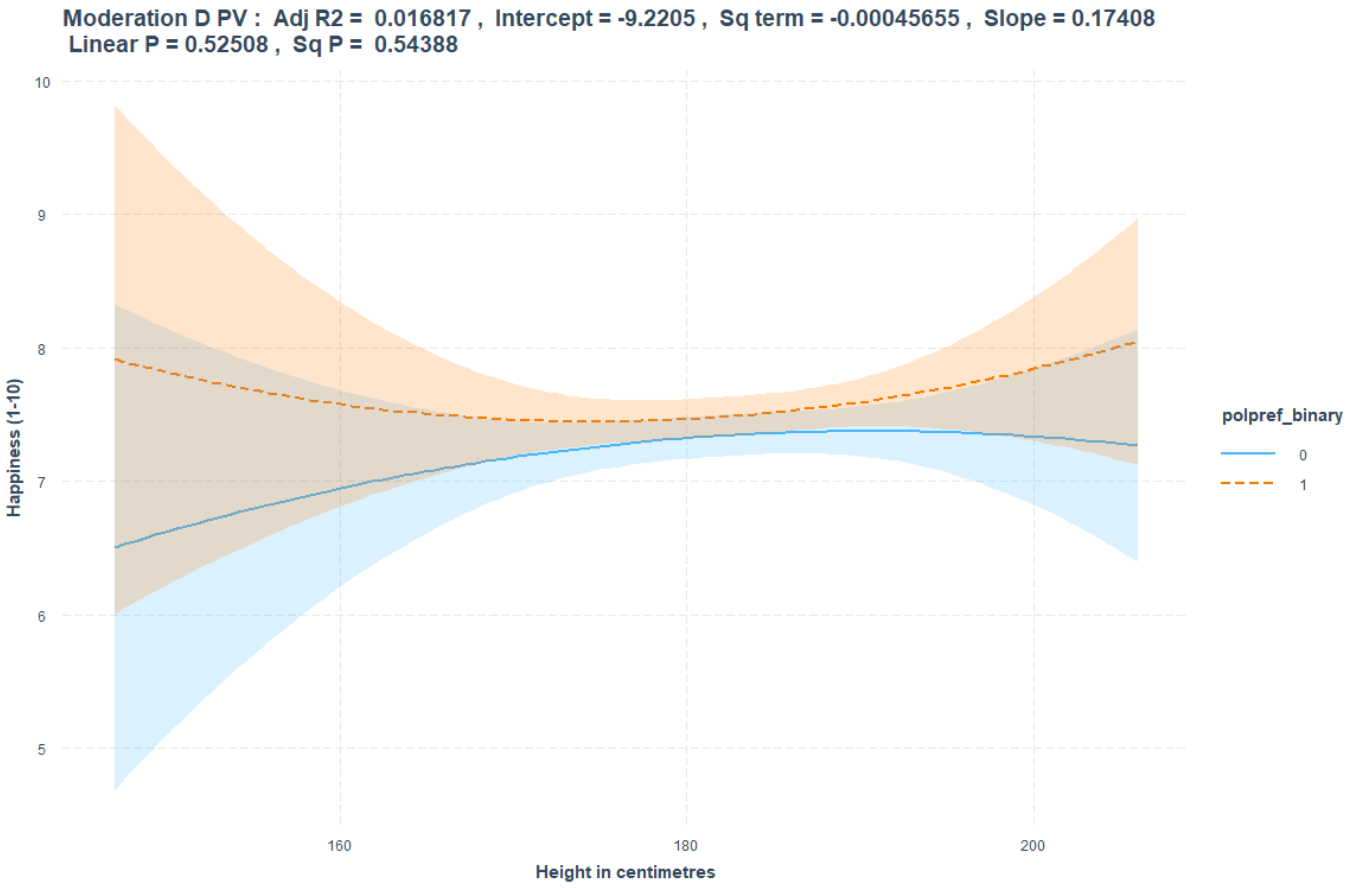


Figure 22: Moderation model D for the binary political preference moderator

### C.4.3 Social media usage

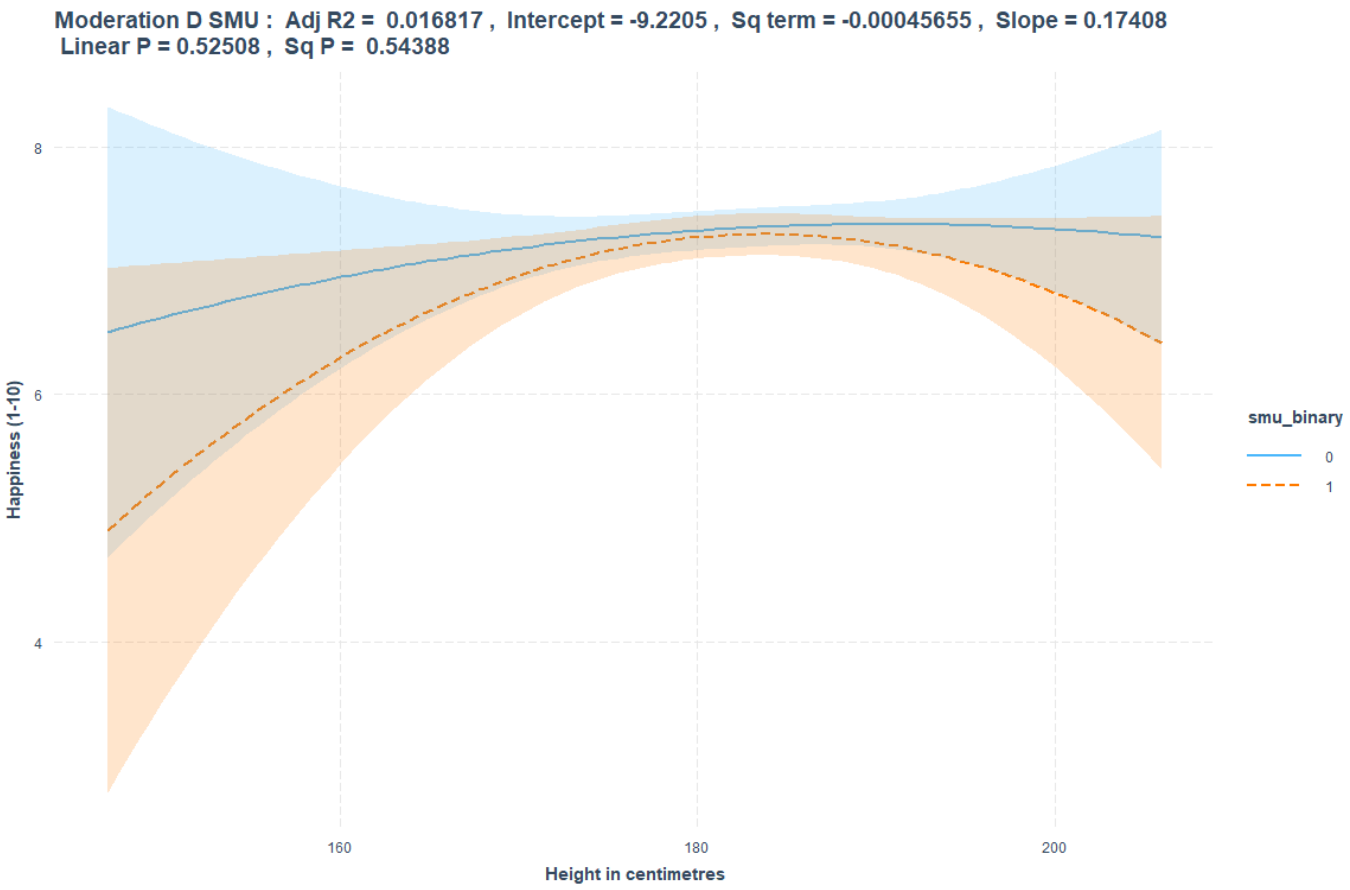


Figure 23: Moderation model D for the binary social media usage moderator

# D Mediation Analysis

## D.1 Income

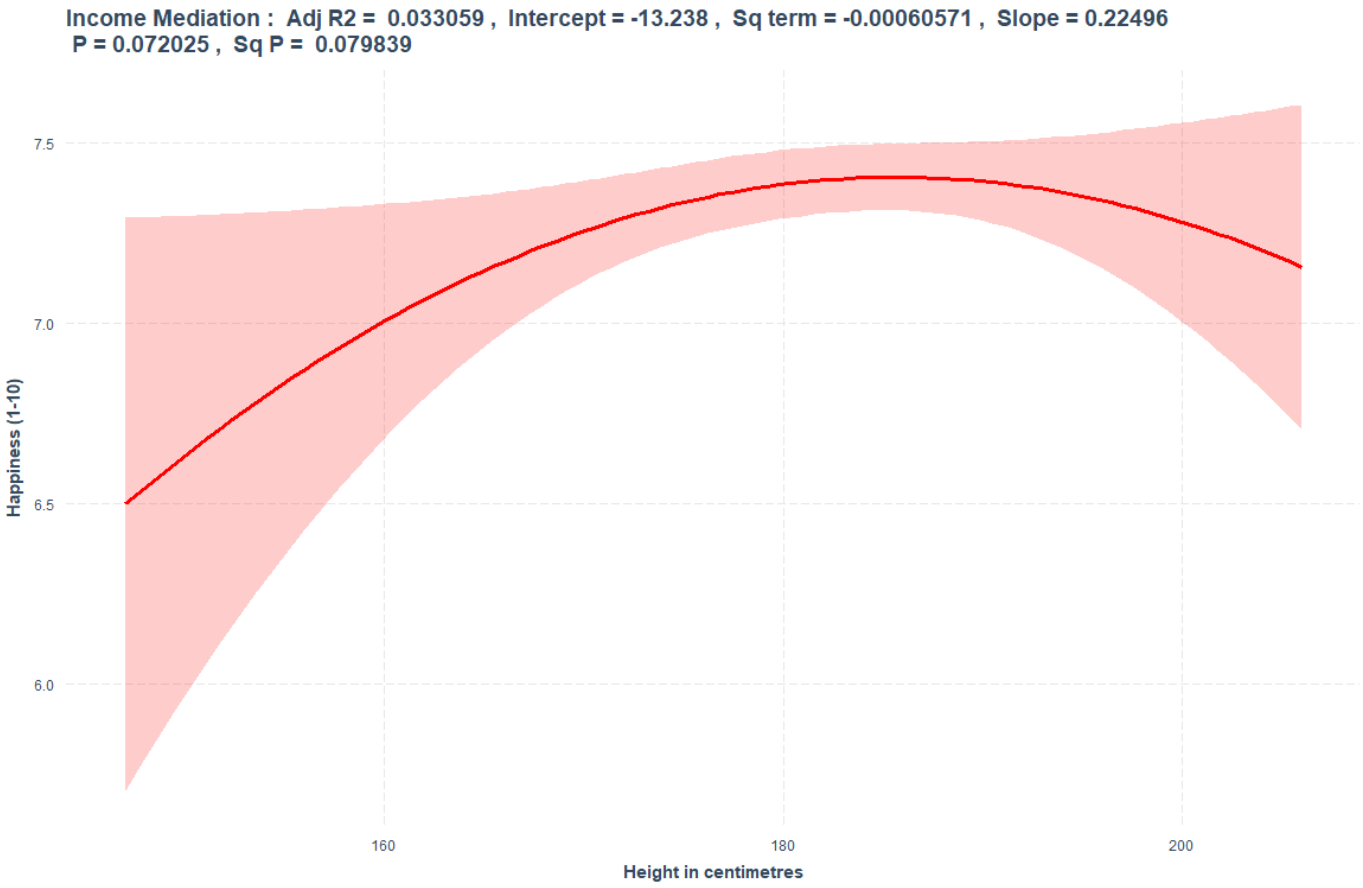


Figure 24: Mediation model for the income mediator

## D.2 Esteem

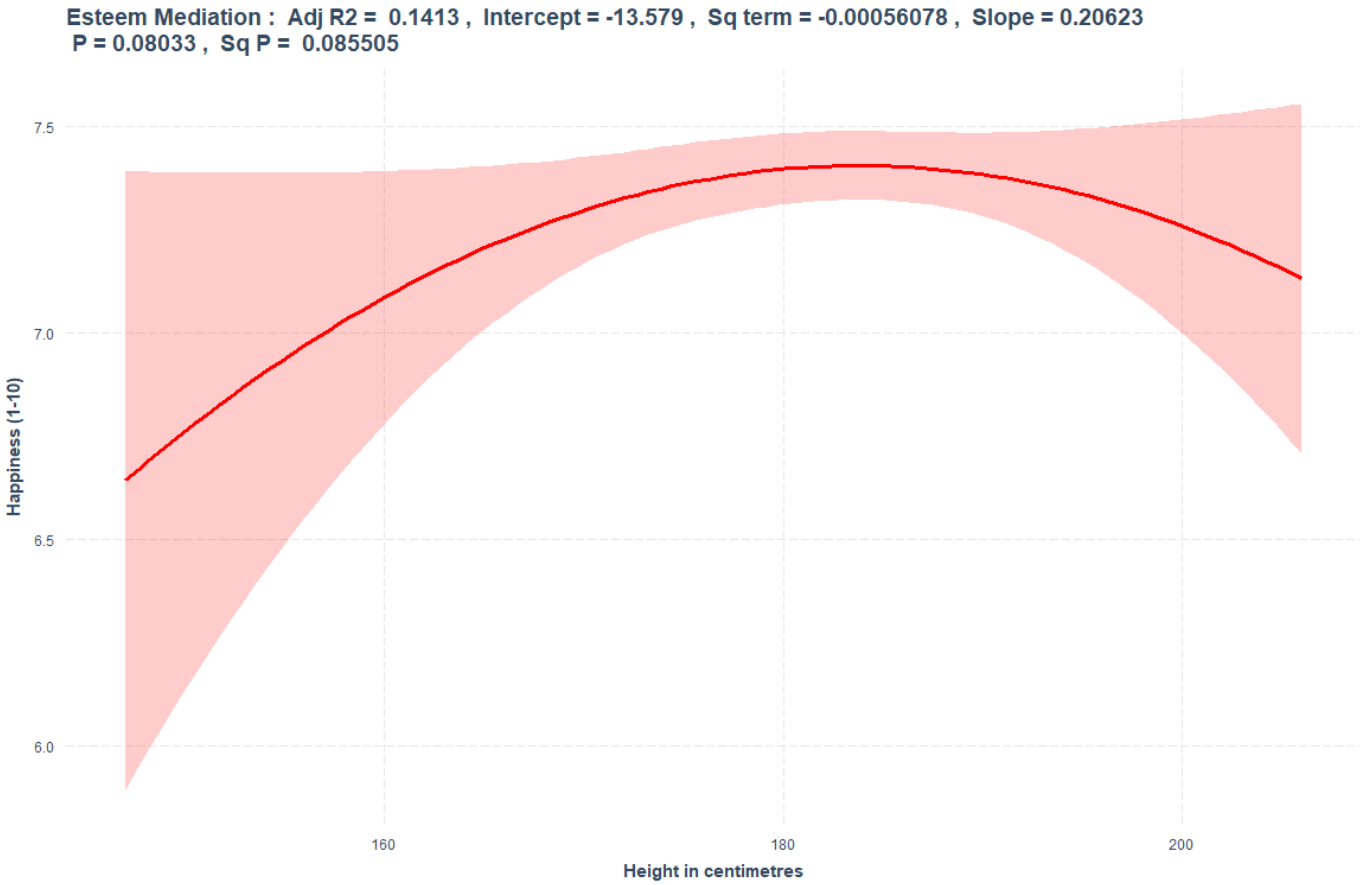


Figure 25: Mediation model for the esteem mediator

## D.3 Dating prospects

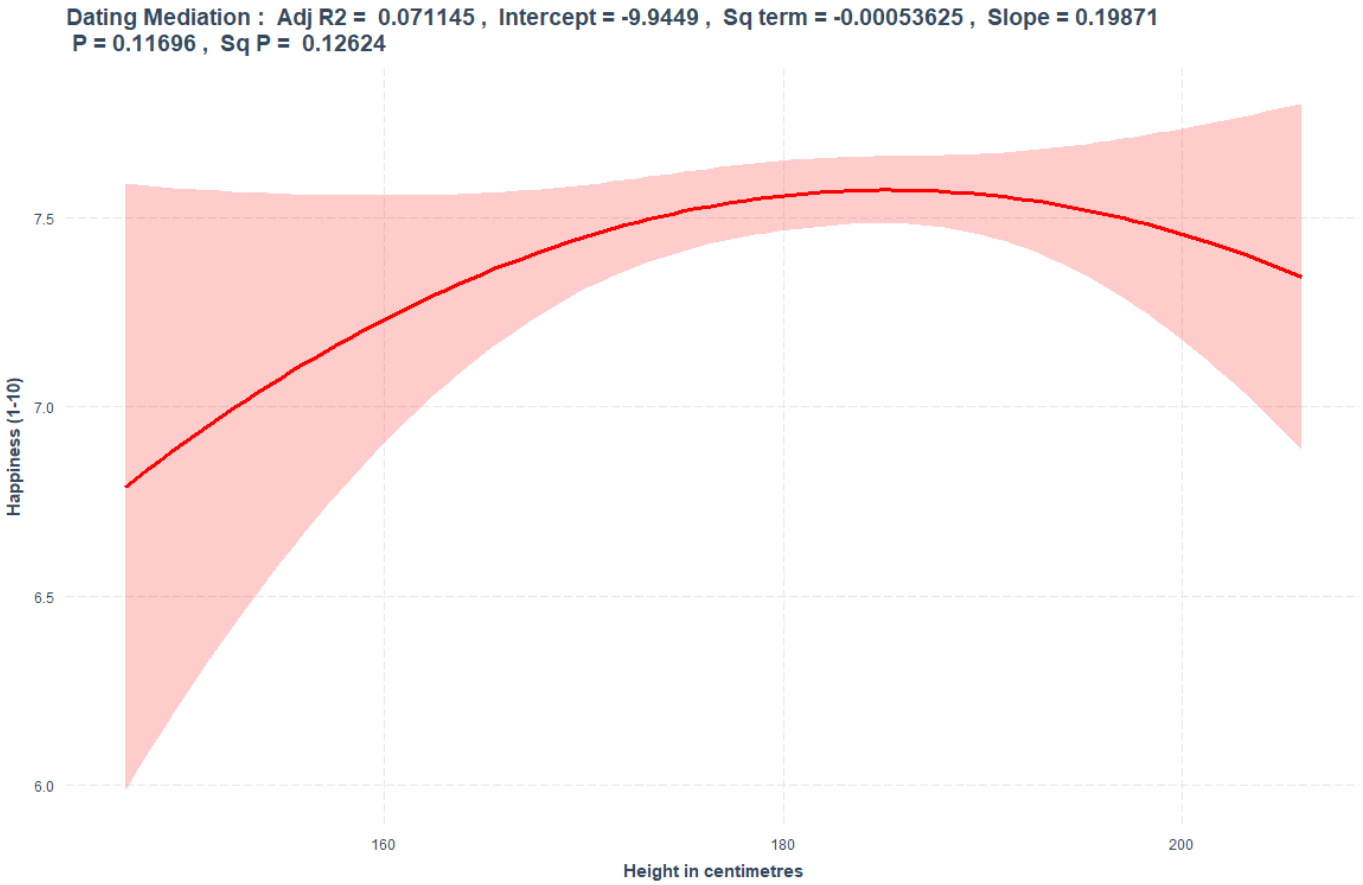


Figure 26: Mediation model for the dating prospects mediator