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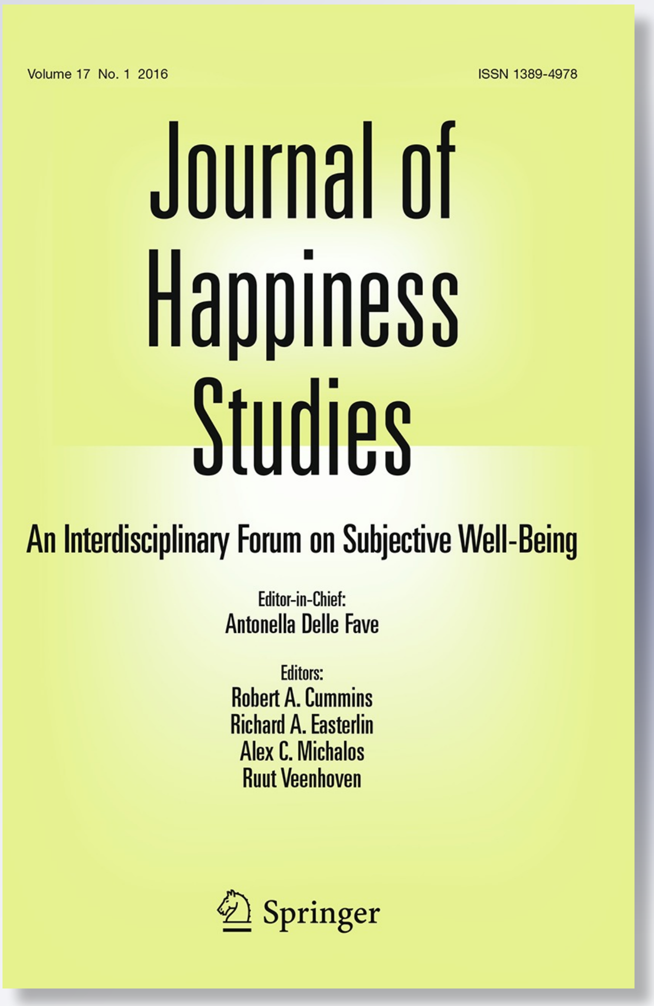

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RESEARCH PAPER

Height and Happiness in a Developing Country

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Abstract This paper analyzes the Indonesian Family Life Survey to estimate the relationship between height and happiness in a developing country, Indonesia. This paper finds that tall men and women are happier than their short counterparts and that the magnitude of the relationship is large. More important, a parsimonious set of channels is identified to substantially explain the relationship between height and happiness: education and earnings for men, and education and relative position of earnings for women. However, for men but not for women, height still exhibits a non-negligible relationship with happiness even after controlling for an extensive array of covariates.

Keywords Height · Happiness · Developing country · Indonesian Family Life Survey

1 Introduction

It has long been understood that tall people in general enjoy a variety of positive attributes. They are healthier, stronger, smarter, better educated, more sociable, more liked, and more confident. Hence, it is not surprising that they are richer, more influential, more often married, more fertile, happier, and longer-lived (see references in Mueller and Mazur 2001; Carrieri and De Paola 2012). Sometimes, the relationship remains even when a range of covariates are held constant. Although Easterlin (1974) pioneered a modern economic approach to happiness four decades ago, only recently has this approach been extended to estimate the relationship between height and happiness. For example, Deaton and Arora (2009) confirmed that taller US individuals were happier whether this was unconditional or conditional on socio-demographic and income variables. Similarly, Carrieri and De Paola (2012) found that taller men and women in Italy were happier; however, the relationship

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lost statistical significance once educational, health, and economic covariates were controlled for. They also considered relative height in addition to own height and argued that people taller than the reference group were also happier. Rees et al. (2009) shed a different light on the relationship between height and happiness. They focused on the depression symptoms and self-esteem of adolescents rather than happiness per se and found that taller male (but not female) adolescents in the US exhibited fewer symptoms of depression and higher self-esteem. Because their sample consisted of adolescents, they could exploit changes in height. Their findings were robust to including individual fixed effects; however, statistical significance notwithstanding, the effects of height on the outcomes were very small. On the other hand, Keyes (1980) highlighted the importance of height in life in general, but he did not consider happiness specifically, and his methodology was crude compared with the usual economic approaches in the literature.

Despite some attempts to estimate the relationship between height and happiness, the literature has largely ignored developing countries. This is not due to a lack of interest but to a lack of micro-data that contain both height and happiness. Because studies on the relationship between height and happiness produced subtly different results even between developed countries, there is no reason to believe that the idea of taller being happier applies to developing countries. Furthermore, despite the proliferation of studies on happiness since Easterlin's (1974) seminal paper, little light has been shed on Indonesia, except as a single observation in cross-country analyses. To the best of our knowledge, only two exceptions have been published by Sohn (2013a, b); however, these papers do not address height at all. In addition, Sohn (forthcoming a) related height to earnings in Indonesia but failed to extend the idea to happiness. Indonesia is of great interest because it is the fourth most populous country in the world, leading Southeast Asia and Islamic countries. Moreover, as Islamic countries share vastly different lifestyles, perspectives, and cultures than Western countries, it is worth examining the relationship between height and happiness in the most populous Islamic country. This exercise can help one determine whether the positive relationship between height and happiness can be generalized to an Islamic country.

Drawing on the Indonesian Family Life Survey (IFLS), this paper investigates the relationship between height and happiness in Indonesia. A novel feature of this survey is that providing an extensive range of usually unavailable variables, it allows us to isolate the channels through which height enhances happiness. It turns out that there are not many channels for Indonesians; at most two (even one) channels are enough. Identifying a parsimonious set of channels is another contribution of this paper to the literature. The results suggest that conditional on only age and its squared term, a one SD taller man feels very happy (instead of very unhappy/unhappy) 14.5 % more, while a one SD taller woman does so 10.0 % more. When the two most important channels are further controlled for, the effect drops to 5.4 % for men and 3.6 % for women; the latter effect is not statistically significant. The 5.4 % for men is considered potentially causal.

2 Conceptual Framework

The literature provides ample evidence that height and happiness-enhancing factors are influenced by common factors. For example, from the prenatal period to adolescence, environmental factors such as nutrition, disease, and temperature influence both height and cognitive skills, while cognitive skills raise happiness. Some studies on the height premium showed that height and wages were spuriously correlated (e.g., Persico et al. 2004; Case and Paxson 2008; Lundborg et al. 2014). Given these studies, it stands to reason that the positive relationship between height and happiness is also spurious. Based on this idea, we provide a simple set-up under no uncertainty for estimation strategies.

Suppose that height and happiness-enhancing factors are determined as follows:

$$H = H(c; X_H, \varepsilon_H)$$

$$v^k = v^k(c; X_k, \varepsilon_k), \quad k = 1, \ldots, n,$$

where H refers to height, v^k is a happiness-enhancing factor, c consists of a vector of common factors, and X_H and X_k are a vector of factors that affect H and v^k, respectively. We assume that $c \perp X_H$, X_k and $\{\varepsilon_H, \varepsilon_k\}$are mutually independent error terms.

Happiness is determined as follows:

$$hp = hp(v^1, \ldots, v^n; \varepsilon_h),$$

where ε_h is an error term. Note that c, X_H, and X_k do not directly enter the happiness function and c and X_k affect happiness only through v^k. Similarly, H does not play a direct role in determining happiness. Note that H and v^k are produced by the same factors (c), so even if height plays no role in increasing happiness, it is possible to see that tall people are happier than short people. However, if a sufficient number of v^k are controlled for, tall people would no longer be happier than short people. In the literature on the height premium, researchers have tackled the issue of a spurious relationship between height and wages by controlling for factors relevant to wages. For example, Persico et al. (2004) emphasized the role of social activities in high school in determining the height premium, Case and Paxson (2008) cognitive skills in childhood, and Lundborg et al. (2014) cognitive and noncognitive skills and physical capacity. All of them demonstrated that height and wages were spuriously correlated and that once these factors were controlled for, the coefficient on height was no longer statistically significant. Below, we also show that H and hp are spuriously correlated and that once a sufficient number of v^k are controlled for, the coefficient on H is no longer statistically significant. Further, we show that education is the most important among v^k.

3 Data

The main data set for our analysis is the IFLS, an on-going longitudinal survey in Indonesia. The RAND commenced this survey in 1993, covering over 22,000 individuals from 7,224 households in 13 out of 27 provinces in Indonesia (ILFS1). For reasons of cost, the survey is representative of 83 % of the Indonesian population in 1993. Because the sample is close to a nationally representative sample, respondents in the survey cover all ages, genders, and education levels. The IFLS1 sampling scheme stratified on provinces and then randomly sampled within provinces. For IFLS1, three groups of household members were interviewed: the household head and his/her spouse; two randomly selected children aged 0–14 of the head and spouse; and an individual aged 50+ and his/her spouse, randomly selected from the remaining members. However, for the next follow-up in 1997 (IFLS2), interviews were conducted with all current members of the IFLS origin households. In addition, when some of the 7,224 origin households moved, they were tracked as long as they were thought to be within one of the 13 IFLS provinces. When some household members in IFLS1 moved out of the IFLS1 households (e.g., due to marriage), they were also tracked and reinterviewed in their new locations. Because of the efforts, despite the subsequent follow-ups in 1998 (IFLS2+), 2000 (IFLS3), and 2007 (IFLS4), attrition is minimal: 93.6 % of the IFLS1 origin households were re-contacted for IFLS4.

Rich information has been collected at the individual, household, and community levels. Demographic, educational, economic, and health variables are readily available, and this paper taps into this rich information. Although not used in this paper for the reasons provided in Sect. 5. 6, an array of economic variables at the household and community levels are also available.

Although the data are longitudinal, this paper mainly draws on the last survey (IFLS4) because the variable of happiness is available *only* in it. This feature inevitably prevents us from exploiting the panel scheme. However, the next section explains this should not be of great concern for the relationship between height and happiness. Furthermore, IFLS4 contains many interesting variables that the other follow-ups do not include. In the results section, as more variables are introduced, explanations of the variables are provided. In this section, two variables of interest—happiness and height—are explained.

Happiness is measured by the answer to the following question: "Taken all things together how would you say things are these days—would you say you were very happy, pretty happy, or not too happy?" This question is the same as that in the US General Social Survey and is almost the same as that in the Euro-Barometer Survey Series; both surveys have been widely used for happiness studies. This IFLS question conained three possible responses (very happy, pretty happy, not too happy) in itself, but respondents were actually presented with four possible responses (very happy, happy, unhappy, and very unhappy). Because the US General Social Survey and the Euro-barometer Survey Series provide three responses and because, in our sample, only 29 men and 32 women said very unhappy, the categories of unhappy and very unhappy are combined in our analysis. Kahneman and Deaton (2010) emphasized the distinction between evaluative and hedonic subjective wellbeing; the former is more suitable for long-term wellbeing, while the latter is more suitable for short-term wellbeing. The happiness question in IFLS4 is not a pure form of either evaluative or hedonic subjective wellbeing: "Taken all things together" invites the respondent to evaluate their lives, but "happy" invites contamination by the respondent's current hedonic state. One needs to keep this point in mind in interpreting results.

Height is measured by two specially trained nurses, so measurement error is probably minimal. This characteristic of height in IFLS4 is appealing because studies that employed other data had to rely on self-reported height (e.g., Deaton and Arora 2009; Carrieri and De Paola 2012; Persico et al. 2004), which is likely to be plagued by not only measurement error but also by systematic bias stemming from gender, age, education, and income (Danubio et al. 2008; Gil and Mora 2011).

4 Empirical Methods

Happiness in the survey was measured with ordinal instead of cardinal values. Hence, an ordered probit is a natural choice for estimating the relationship between height and happiness, and most happiness studies using cross sectional data have employed the same method. However, not all researchers favor ordinalism. For example, Ng (1997) favored cardinalism and proposed assigning positive and negative numbers to happiness and unhappiness, respectively. In this case, ordinary least squares (OLS) is a better choice. Furthermore, Ferrer-i-Carbonell and Frijters (2004) demonstrated specifically for longitudinal data that using a fixed effects model changed the results to some extent, but for cross sectional data, using an ordered probit, ordered logit, or OLS did not alter the results. Our preliminary exercises (results not shown) indicated that the three methods produced qualitatively the same results. The results from an ordered probit model, favored in the literature, are provided below.

Whenever cross sectional data are used for happiness, the concern of endogeneity looms large. For this reason, Ferrer-i-Carbonell and Frijters (2004) checked the robustness of their results by using various methods. This concern is inherent in this paper as well. In the relationship between height and happiness, however, it is extremely difficult to address the endogeneity of height to happiness. A fixed effects model is not an appropriate option, because height does not change in adulthood until the late 40s, when aging begins to decrease height—but only slightly (see Huang et al. 2013 and references therein). Even if a fixed effects model were feasible, the model would have its own problems such as over-controlling. Neither is a random effects model feasible because the dependent variable, happiness, is only available in one time period.

One possible way is to adopt the idea of minimizing bias by selection on observables. Because our more interesting aim is to find the channels through which height increases happiness, selection on observables better suits this aim. In this spirit, it is not of critical concern that covariates in the following model are related to one another. This is because, empirically speaking, our aim is to tease out a set of covariates that greatly reduce the coefficient on height, although they are potentially related to other covariates. In a sense, such a set is considered to win the race. Furthermore, this method has also been adopted by others (e.g., Deaton and Arora 2009; Carrieri and De Paola 2012). As a result, employing the same method facilitates comparisons between their results and ours, as explained in Sect. 5. 8.

Specifically, we estimate the following model:

$$y^* = \beta_1 H + \mathrm{x}\beta_2 + e, \quad \text{and} \quad e|H, \mathrm{x} \sim \text{Normal } (0, 1), \tag{1}$$

where y^* is the latent variable of happiness, H refers to own height (or reference group height), x is a vector of covariates that are explained in the next section, e indicates the error term, and β_1 and β_2 are coefficients to be estimated. In addition, happiness levels can be defined as follows:

$$\begin{aligned} y &= 0 \quad \text{if} \quad y^* \leq \alpha_1 \text{ for very unhappy or unhappy} \\ y &= 1 \quad \text{if} \quad \alpha_1 < y^* \leq \alpha_2 \text{ for happy} \\ y &= 2 \quad \text{if} \quad y^* > \alpha_2 \text{ for very happy,} \end{aligned}$$

where α_1 and α_2 are unknown cut points and are estimated, along with β_1 and β_2, by maximum likelihood. Age is an exogenous and important covariate for happiness. Because the U-shaped relationship between age and happiness is typical in the literature (e.g., Frey and Stutzer 2002), age and its squared term are entered into the specification together. Controlling for age is also important for height because height begins to decrease, although slightly, in the late 40s. When only these two terms are included in x we denote the specification as the basic specification. According to our empirical strategy, we incrementally introduce covariates relevant to happiness and examine changes in the marginal effect of height. To the extent that the covariates are based on selection, changes in the marginal effect of height estimate the importance of the covariates as channels through which height affects happiness. Because an ordered probit is a nonlinear model and β_1 and β_2 are difficult to interpret, marginal effects are presented below. We agree that an ordered probit based on selection on observables does not address all econometric issues. However, this is a quite feasible one, considering the topic and data. "Appendix A" further discusses methodological issues.

Because men and women are likely to have different happiness generating functions, both genders are analyzed separately as in Rees et al. (2009) and Carrieri and De Paola (2012). Age is restricted to 20–65 because growth generally stops by age 20 and the inclusion of people older than 65 would entail survival bias—happier people survive longer. Our sample consists of a total of 20,373 observations (9,725 men and 10,648 women), but sample sizes change depending on the covariates used. Cross-section person weights with attrition correction are applied for all estimations to make them nationally representative. In addition, standard errors are clustered at the county level to account for possible grouped errors across individuals. The statistical software is STATA, version 12.0.

5 Results

5.1 Descriptive Statistics

Descriptive statistics by gender are provided in Table 1. Means and standard deviations (SDs) are presented for continuous variables, while percentages are presented for discrete variables. We mention the two variables of interest at this point—happiness and height.

The majority of both men and women are happy in general: 85.1 % of men and 85.8 % of women reported that, all things considered, they were happy. This fact is consistent with Diener and Diener's (1996) finding that most people are happy. According to them, the mean happiness response was above neutral in 86 % of the 43 countries for which nationally representative samples were available. Regarding height, men's mean is 162.4 cm, whereas women's is 151.0 cm. The small stature of both men and women is consistent with the finding of Baten and Blum (2012) that South and Southeast Asians were the shortest people in the world (156 countries compared) for the period of 1810–1989. Thus, as far as happiness and height are concerned, the data do not deviate much from the trends. When similar scrutiny is applied to other variables, the same conclusion is reached.

5.2 Benchmark and Cognitive Skills

Empirical results for men are provided first, followed by those for women. Table 2 presents the relationship between height and happiness with covariates of cognitive skills. To understand the bivariate relationship, only height is entered into the specification as in Column 1. The sign of the marginal effect of height indicates a positive relationship between height and happiness, and its size is not small: a one SD increase in height (6.2 cm) increases the probability of saying very happy (instead of very unhappy/unhappy) by 1.17 % points, or 18.8 % relative to the percentage of very happy (6.24 %); henceforth, marginal effects are explained relative to the percentage of very happy. Because height varies across age cohorts, it is possible that height captures some of the age effects on happiness. Hence, age and its square term are included in the specification as in Column 2; the square term is intended to capture the widely found U-shape relationship between age and happiness. Surprisingly, age and its square term together do not display the usual relationship; we explain this anomaly in detail in Sect. 5. 6. Looking at height, it is notable that the marginal effect of height diminishes 23 %. This finding implies that height reflects

Table 1 Descriptive statistics

Continuous variable	Men		Women	
	Mean	SD	Mean	SD
Height (cm)	162.4	6.2	151.0	5.6
Age (years)	37.7	11.8	37.2	12.0
Years of schooling	8.6	4.3	7.8	4.6
Number of words recalled	8.8	3.5	8.4	3.7
BMI (kg/m^2)	22.1	3.6	23.5	4.3
Lung (L)	3.78	0.94	2.53	0.67
Hemoglobin level (g/dL)	14.7	1.6	12.6	1.4
Depression symptoms (index)	−0.048	1.540	0.042	1.632
Grip strength (kg)	37.4	9.3	23.4	7.9
Household members (persons)	6.0	3.1	6.2	3.1
Positive logged earnings	13.43	1.00	12.90	1.13
Discrete variable		Percent		Percent
Unhappy/very unhappy		8.7		7.6
Happy		85.1		85.8
Very happy		6.2		6.6
Unknown impatience		1.8		1.6
Impatience Level 1		7.2		7.9
Impatience Level 2		5.4		5.7
Impatience Level 3		15.6		13.0
Impatience Level 4		70.0		71.8
Unhealthy/somewhat unhealthy		11.4		15.3
Somewhat healthy		77.7		75.2
Healthy		10.9		9.5
Without hypertension		74.6		75.2
With hypertension		25.4		24.8
Non-participation in arisans		85.2		62.2
Participation in arisans		14.8		37.8
Zero Ln (earnings)		23.2		57.7
Positive Ln (earnings)		76.8		42.3
Perceived Income Ladder 1		5.4		4.6
Perceived Income Ladder 2		24.5		23.3
Perceived Income Ladder 3		53.8		53.7
Perceived Income Ladder 4		15.0		17.0
Perceived Income Ladder 5/6		1.2		1.3
Main activities: not work		11.6		52.6
Main activities: work		88.4		47.3
Non-Javanese		57.7		58.6
Javanese		42.3		41.4
Not religious/somewhat religious		25.5		16.3
Religious/very religious		74.5		83.7
Never married		16.8		9.4

Table 1 continued

Discrete variable	Percent	Percent
Cohabitation/married	80.5	80.1
Separated/divorced/widowed	2.7	10.5
Children absent	71.0	71.0
Children present	29.0	29.0
Not self-owned house	25.5	24.2
Self-owned house	74.5	75.8
Electricity unavailable	3.2	3.5
Electricity available	96.8	96.6
Main water source not piped	44.0	43.1
Main water source piped	56.0	56.9
Toilet not owned	23.8	23.4
Toilet owned	76.3	76.6
No sewage	43.5	42.8
Sewage	56.5	57.2
Without refrigerator	69.7	68.0
With refrigerator	30.3	32.0
Without TV	20.1	20.0
With TV	79.9	80.0
Rural	46.0	45.1
Urban	54.1	54.9
N	9,725	10,648

age effects to some extent. Also note that the marginal effect of 0.147 is used below as a benchmark to assess the explanatory power of additional variables on happiness.

Case and Paxson (2008) argued that the positive relationship between height and wage was driven by the positive correlation between cognitive skills and height. That is, height did not contribute to wage once cognitive skills were held constant. When their finding is extended to happiness because wages are an important v^k for happiness, it is possible that the relationship between height and happiness is spurious. Two measures of cognitive skills are available in IFLS4. One is years of regular schooling, and the other is word recall. The variable of years of schooling is constructed by combining the highest education level attended (e.g., junior high school or senior high school) and the highest grade completed at the school (e.g., second grade or graduated). It is of merit to combine these two variables because grade repetition is not a negligible concern in developing countries and the combination of the variables can avoid mistakenly counting 1 year of grade repetition as 1 year of schooling. Word recall in IFLS4 is borrowed from the Health and Retirement Study. Interviewers read 10 words slowly to respondents and then asked the respondents to repeat the list, once immediately after the list was read and a second time some minutes later. The sum of the correctly recalled words in the two sessions is used to measure cognitive capacity. Because few respondents correctly recalled all ten words in each session, right censoring is not an issue.

When the variable of years of schooling is added to the basic specification as in Column 3, the marginal effect of height diminishes to about half the benchmark estimate in Column

Table 2 Height and happiness with covariates of cognitive skills: men

	1	2	3	4
Height (m)	0.190 (0.029)***	0.147 (0.030)***	0.080 (0.029)***	0.128 (0.031)***
Age (/100)		0.092 (0.099)	0.104 (0.095)	0.100 (0.099)
Age^2 (/100)		−0.002 (0.001)*	−0.002 (0.001)	−0.002 (0.001)*
Schooling (years) (/10)			0.049 (0.004)***	
Words Remembered (/10)				0.028 (0.006)***
N	9,725	9,725	9,725	9,725

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

2. When the number of words recalled is entered instead of years of schooling as in Column 4, the marginal effect of height becomes smaller, but not as much as in the case of years of schooling. One explanation of the smaller reduction is that education provides a better channel through which height increases happiness than cognitive capacity. Alternatively, the measure of cognitive capacity is too crude to accurately capture the channel effect. Subsequently, it will be shown that education reduces the marginal effect of height most, which suggests that the first explanation is more likely to be true.

5.3 Noncognitive Skills

Persico et al. (2004) and Lundborg et al. (2014) emphasized the role of noncognitive skills in explaining the height premium, meaning that tall people earn more because they are endowed with more noncognitive skills than short people. Specifically, when Persico et al. (2004) drew on the NLSY and controlled for participation in high school athletics and the number of nonvocational, nonacademic high school clubs, the marginal effect of youth height was reduced from 0.024 to 0.016 and was no longer statistically significant even at the 10 % level. They interpreted participation in social activities in high school as social adaptability. On the other hand, Lundborg et al. (2014) employed data on Swedish enlistees and found that noncognitive skills played some role in explaining the height premium. Their measures of noncognitive skills is of a high quality because certified psychologists interviewed the enlistees and assessed a variety of aspects of noncognitive skills: psychological stability, endurance, ability to take initiative, responsibility, social competence, and leadership.

As with cognitive skills, it is possible that the relationship between height and wage is applicable to that between height and happiness. Hence, it is worth controlling for noncognitive skills in the specification. A measure of noncognitive skills in IFLS4 that is close in spirit to that of Persico et al. (2004) is the status of participation in arisans. An arisan is a form of rotating savings and credit association (ROSCA) in Indonesia. Like ROSCAs in other developing countries, arisans are formed among individuals whose circumstances and characteristics are well-known to each other. Hence, defaults are socially sanctioned,

Table 3 Height and happiness with covariates of non-cognitive skills: men

	1	2
Height (m)	0.143 (0.030)***	0.147 (0.030)***
Age (/100)	0.059 (0.095)	0.094 (0.098)
Age^2 (/100)	−0.002 (0.001)*	−0.002 (0.001)*
Participation in arisans	0.025 (0.006)***	
Impatience Level 1		0.016 (0.018)
Impatience Level 2		0.012 (0.019)
Impatience Level 3		0.006 (0.017)
Impatience Level 4		0.010 (0.017)
N	9,725	9,725

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

and a defaulter cannot join the same arisan in the future and possibly any other arisans in the community. Arisans are built on the social connectedness of those among whom they operate. Therefore, participation in arisans reflects one's social adaptability. In addition, participation in arisans requires honesty (for non-cheating), punctuality (for contributions to the "pot"), and patience (for the pot); all of these requirements are good examples of noncognitive skills. Respondents in IFLS4 were asked about various aspects of arisans during the past 12 months if they had participated in any. For our estimations, the dummy for participation in arisans is entered to capture social adaptability. As shown in Column 1 of Table 3, respondents who participated in arisans are 40 % more likely to be very happy. This large magnitude is possibly the product of endogeneity, meaning that happier people more often joined arisans. A more important point is that the inclusion of this variable leaves the marginal effect of height almost unchanged.

IFLS4 does not provide measures of noncognitive skills as accurate as those of Lundborg et al. (2014), but it contains two sets of a series of questions regarding time preferences. Time preferences are a fundamental concept of human activities because they affect any activity that involves two time periods. Saving is a typical example, but other examples include education, dieting, exercise, crime, and smoking. In fact, Sohn (2014) used this variable to understand whether education affected smoking through time preferences in Indonesia. Each set of questions yields four levels of impatience, and one additional group provided an irrational answer even if it was pointed out to them that the choice was irrational.[1] Hence, four dummy variables (the irrational group is omitted) are entered to capture a possible channel of height to happiness. Column 2 shows that time preferences measured by the first series of questions are not related to happiness at all; consequently, the marginal effect of height remains the same. Using the second series of questions yields the same results (not shown).

[1] The irrational choice in the first set of questions is the choice of Rp. 1 million today over Rp. 1 million in 1 year. A similar answer is considered irrational for the second set of questions.

5.4 Health

It is known that tall people are generally healthier and that healthier people are happier. In this case, it is likely that part of the relationship between height and happiness is driven by health. IFLS4 provides health variables of a high quality. Two specially trained nurses visited each household, often multiple times, and actually measured various aspects of health. For this paper, we employed BMI (see Sohn, forthcoming b, c for more about BMI in Indonesia), lung capacity, hemoglobin level, and hypertension status.[2] In addition to objective measures of health, the IFLS also records self-reported health data such as acute and chronic morbidity and inpatient and outpatient care. For brevity, self-reported health status is entered as a summary measure of subjective health. Respondents chose one of four responses to the following question: "In general, how is your health?" Because only 21 men and 34 women answered unhealthy, the category of somewhat unhealthy and unhealthy are combined and made into a reference category. As a result, two dummies for somewhat healthy and very healthy appear in the specification. In addition to physical health, IFLS4 provides information on mental health. Interviewers asked 10 questions to assess depressive symptoms. For our estimations, each answer is recoded with a one for depressive symptoms and zero otherwise, and then principal components analysis is performed to extract the score of the first component. This variable is entered into the specification to measure mental health.[3] When these variables are entered as in Column 1 of Table 4, some of them are statistically significant and exhibit the expected signs.[4] However, the marginal effect of height decreases only slightly.

Lundborg et al. (2014) highlighted the importance of physical capacity in determining earnings. They used maximum working capacity and grip strength to assess physical capacity. The former is unavailable in IFLS4, but the latter is available. Grip strength is believed to reflect muscular strength, and it is often used for this purpose. Grip strength was measured three times in a row for both hands. The variable for our estimations is the average of the three measures for the dominant hand. For a small number of respondents who did not report the dominant hand, the right hand is assumed to be the dominant hand. To explore the possible extension of the relationship between height and wage to that between height and happiness, grip strength thus measured is added to the basic specification. Including this variable lowers the marginal effect of height from 0.147 to 0.121, but the reduction is not large enough to qualify grip strength as an important channel for height. As explained in the following subsection, earnings would occupy this position.

5.5 Earnings

The literature on the height premium demonstrates that taller people earn more almost everywhere (Steckel 2009). Because richer people are happier, it is likely that height increases happiness through earnings. Earnings in this paper refer to salaries and wages (including the value of all benefits) during the month prior to the interview for paid employees and net profits (after taking out all business expenses) during the month prior to

[2] Some health measures are restricted as follows to remove unreasonable values: 120 cm $\leq$ height $\leq$ 200 cm; 30 kg $\leq$ weight $\leq$ 150 kg; 10 kg/m^2 $\leq$ BMI $\leq$ 45 kg/m^2; 0.4L $\leq$ lung capacity $\leq$ 6L; 1 g/dL $\leq$ hemoglobin level $\leq$ 30 g/dL; 70 mmHg $\leq$ systolic $\leq$ 300 mmHg; 50 mmHg $\leq$ astolic $\leq$ 200 mmHg. Hypertension is defined by a systolic pressure equal to or greater than 140 mmHg or diastolic pressure equal to or greater than 90 mmHg.

[3] Entering the number of symptoms of depression produces qualitatively the same results (not shown).

[4] The marginal effects of lung capacity, hemoglobin level, and hypertension are not listed because they are neither statistically nor economically significant.

Table 4 Height and happiness with covariates of health: men

	1	2
Height (m)	0.139 (0.031)***	0.121 (0.031)***
Age (/100)	−0.175 (0.107)	0.055 (0.104)
Age^2 (/100)	<0.000 (<0.000)	−0.001 (0.001)
BMI (/10)	0.037 (0.005)***	
Somewhat healthy	0.037 (0.006)***	
Very healthy	0.064 (0.009)***	
Depression symptom	−0.014 (0.002)***	
Grip strength (g)		0.892 (0.244)***
Objective health measures[a]	Yes	No
N	9,491	9,690

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

[a] Objective health measures refer to lung capacity, hemoglobin level, and hypertension

the interview for the self-employed; earnings are transformed into a natural log form.[5] As Sohn (2013a) did, a small number of observations with zero or negative net profits are converted to one to make their log values zero. A log value of zero is assigned to respondents who reported no earnings, and a dummy is created to indicate this value. Column 1 of Table 5 indicates that the addition of the two variables causes a 39 % reduction in the marginal effect of height. As described later, this is the second largest drop after that caused by including years of schooling. The results suggest that earnings are another important channel for height to affect happiness in men.

The debate on the Easterlin Paradox highlights the importance of relative versus absolute income in happiness (e.g., Easterlin 1974, 2001; Stevenson and Wolfers 2008, 2013). Easterlin explained that people adjust their aspirations upward as they become richer; consequently, their happiness levels remain the same. When the upward adjustment of aspiration is considered along with the importance of relative income, one may propose that people's *feelings* about their *relative* income position are crucial for happiness. If their aspiration is high, they may feel that their incomes are lower than those of others, although their objective levels of income suggest otherwise. In IFLS4, respondents answered the following question on a scale of one (poorest) to six (richest): "Please imagine a six-step ladder where on the bottom (the first step), stand the poorest people, and on the highest step (the sixth step), stand the richest people. On which step are you today?" Because only 15 men and 26 women in our sample reported feeling the richest (six), choices five and six are combined for our estimations. A series of dummy variables in Column 2 indicates that men who feel richer are monotonically happier. However, despite the importance of relative income in happiness, the marginal effect of height decreases only 16 %. It is also worth

[5] A small number of paid employees and self-employed workers reported very great earnings. For this paper, earnings over the 99th percentile value of earnings in the raw data for each type of workers (Rp. 5 million for paid employees and Rp. 9 million for self-employed workers) are replaced by the 99th percentile value of earning. Results are qualitatively the same without the adjustment or the observations.

Table 5 Height and happiness with covariates of earnings: men

	1	2
Height (m)	0.090 (0.028)***	0.123 (0.031)***
Age (/100)	−0.133 (0.097)	0.040 (0.101)
Age^2 (/100)	<0.000 (<0.000)	−0.002 (0.001)
Zero Ln (earnings)	0.304 (0.027)***	
Ln (earnings) (/10)	0.241 (0.021)***	
Perceived Income Ladder 2		0.054 (0.011)***
Perceived Income Ladder 3		0.092 (0.008)***
Perceived Income Ladder 4		0.108 (0.008)***
Perceived Income Ladder 5/6		0.136 (0.032)***
N	9,725	9,725

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

noting that the reduction in the marginal effect of height owing to perceived income ladders is much smaller than that owing to earnings; this implies that the correlation between height and earnings is stronger than that between height and perceived income ladders.

5.6 Additional Covariates

Thus far, our findings suggest that education provides the largest channel through which height enhances happiness; the second most important channel is earnings. When only these two variables are entered into the basic specification, as in Column 1 of Table 6, the marginal effect of height drops 62 %. The next two columns suggest that these two variables are sufficient to identify possible channels through which height affects happiness. In Column 2, all the variables that have been considered are included together. Age and its squared term gain precision to a large extent and display the familiar U-shaped relationship with happiness. Moreover, the marginal effect of height is now weakly significant, but this is because the inclusion of many correlated variables reduces estimation precision. More noteworthy is that the size of the marginal effect is almost the same as that in Column 1.

An extensive set of additional covariates is entered for Column 3 that could affect happiness: ethnicity, religiousness, type of religion, marital status, working status, number of household members, presence of children under five, house ownership, availability of electricity, the main source of drinking water, ownership of a toilet, and household sewage system, urbanity, and province fixed effects. Age and its squared term are now precisely estimated; the trough is age 57. The changes in the size and statistical significance of the marginal effects of age and its squared term across columns imply that young, middle-aged, and old men in Indonesia are all equally happy, unconditional on human capital and

Table 6 Height and happiness with a set of covariates: men

	1	2	3
Height (m)	0.056 (0.028)**	0.055 (0.032)*	0.058 (0.032)*
Age (/100)	0.076 (0.095)	−0.265 (0.112)**	−0.570 (0.145)***
Age^2 (/100)	<0.000 (0.001))	0.002 (0.001)*	0.005 (0.002)***
Schooling (years) (/10)	0.034 (0.004)***	0.024 (0.005)***	0.024 (0.005)***
Words remembered (/10)		0.001 (0.005)	0.005 (0.005)
Impatience Level 1		−0.002 (0.016)	−0.001 (0.016)
Impatience Level 2		−0.007 (0.017)	−0.010 (0.016)
Impatience Level 3		−0.012 (0.016)	−0.017 (0.015)
Impatience Level 4		−0.003 (0.015)	−0.008 (0.014)
Somewhat healthy		0.033 (0.005)***	0.030 (0.005)***
Very healthy		0.059 (0.009)***	0.055 (0.008)***
BMI (/10)		0.017 (0.005)***	0.013 (0.005)**
Depression symptom		−0.013 (0.002)***	−0.013 (0.002)***
Grip strength (g)		0.571 (0.238)**	0.300 (0.262)
Participation in arisans		0.010 (0.006)*	0.015 (0.005)***
Zero Ln (earnings)	0.240 (0.029)***	0.194 (0.031)***	0.167 (0.029)***
Ln (earnings) (/10)	0.190 (0.022)***	0.153 (0.024)***	0.127 (0.022)***
Perceived Income Ladder 2		0.048 (0.010)***	0.042 (0.010)***
Perceived Income Ladder 3		0.070 (0.007)***	0.062 (0.007)***
Perceived Income Ladder 4		0.075 (0.008)***	0.067 (0.008)***
Perceived Income Ladder 5/6		0.110 (0.033)***	0.101 (0.031)***
Objective health measures[a]	No	Yes	Yes
All other covariates[b]	No	No	Yes
N	9,690	9,459	9,459

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

[a] Objective health measures refer to lung capacity, hemoglobin level, and hypertension

[b] They consist of ethnicity, religiousness, type of religion, marital status, working status, number of household members, presence of children under five, house ownership, availability of electricity, the main source of drinking water, ownership of a toilet, and household sewage system, urbanity, and province fixed effects

material goods, but differences in happiness among them emerge only when human capital and material goods are considered.

More important, despite the large number of covariates, the marginal effect of height hardly changes. One can think of many other sources of happiness. For example, Sohn (2013b) considered variables at the community level. However, those variables turned out to be unimportant for happiness. Furthermore, the patterns of the marginal effect of height across columns suggest that including more covariates would instead obfuscate possible channels for height. Overall, if our results offer some clue, it would be that only education and earnings provide important channels through which height increases happiness.

It is not straightforward to interpret the size of the marginal effect of height in Table 6. Its weak statistical significance in Columns 2 and 3 implies that height may not affect happiness after accounting for the covariates in Column 2 or 3. On the other hand, the statistical significance at the 5 % level in Column 1 indicates that height still has some influence on happiness. When only the size of its marginal effect is considered, it is obvious that controlling for the covariates leaves the size intact. It seems that adding more covariates just reduces estimation precision without aiding the identification of possible channels for height. Given the stability of the size of the marginal effect, it appears that height may directly enhance happiness.

5.7 Height and Happiness for Women

Women's happiness generating function is similar to that of men to a large degree, although not entirely. The procedure for men is also applied to women, and the corresponding tables are provided in Tables 8, 9, 10 and 11 in "Appendix B". In this process, two important channels are identified: education and perceived income ladders. To save space, we directly consider the final table for women.

When only these two factors are considered as in Column 1 of Table 7, the marginal effect of height becomes less than half of the benchmark estimate (Column 2 of Table 8) and is no longer statistically significant. This result changes little when all variables are together held constant as in Column 2. When the full set of covariates is taken into account as in Column 3, the substance of the results in Column 2 remains the same. The marginal effect of height decreases further to some extent, and it is still not statistically significant; perceived income ladders exhibit the same patterns.

Comparisons across columns suggest that controlling for more covariates would not radically change the results; it would only reduce estimation precision. Furthermore, when the marginal effect of height is compared across columns, it is obvious that years of schooling and perceived income ladders (along with age and its squared term) are sufficient to channel the effects of height on happiness. The continuous reduction in the marginal effect of height in Columns 1–3 implies that happiness enhancing channels for height are more diverse for women than men. However, the fact that even a parsimonious set of covariates as in Column 1 makes the marginal effect of height statistically insignificant implies that this parsimonious set contains sufficient channels through which height increases happiness.

Recall that for men, height matters for happiness even when controlling for an extensive range of factors. In contrast, height does not matter much for women as long as they attain the same level of education and perceive the same position of income as others. It appears that for men, height has something for happiness that is more than

Table 7 Height and happiness with a set of covariates: women

	1	2	3
Height (m)	0.049 (0.033)	0.043 (0.032)	0.037 (0.035)
Age(/100)	−0.363 (0.104)***	−0.430 (0.111)***	−0.546 (0.107)***
Age^2(/100)	0.003 (0.001)**	0.004 (0.001)***	0.006 (0.001)***
Schooling (years) (/10)	0.027 (0.005)***	0.017 (0.006)***	0.013 (0.007)*
Words remembered (/10)		0.015 (0.006)***	0.017 (0.005)***
Impatience 1		0.024 (0.013)*	0.023 (0.013)*
Impatience 2		0.021 (0.015)	0.019 (0.016)
Impatience 3		0.012 (0.014)	0.011 (0.015)
Impatience 4		0.017 (0.012)	0.015 (0.013)
Somewhat healthy		0.017 (0.004)***	0.016 (0.004)***
Very healthy		0.036 (0.009)***	0.033 (0.008)***
BMI (/10)		0.009 (0.003)***	0.006 (0.003)*
Depression symptom		−0.012 (0.001)***	−0.012 (0.001)***
Grip strength (g)		0.526 (0.218)**	0.403 (0.213)*
Participation in arisans		0.008 (0.005)*	0.006 (0.004)
Zero Ln (earnings)		0.138 (0.037)***	0.127 (0.033)***
Ln (earnings) (/10)		0.100 (0.028)***	0.097 (0.025)***
Perceived Income Ladder 2	0.029 (0.010)***	0.022 (0.011)**	0.019 (0.011)*
Perceived Income Ladder 3	0.073 (0.010)***	0.063 (0.011)***	0.054 (0.011)***
Perceived Income Ladder 4	0.097 (0.010)***	0.082 (0.010)***	0.073 (0.010)***
Perceived Income Ladder 5/6	0.108 (0.018)***	0.090 (0.018)***	0.081 (0.017)***
Objective health measures[a]	No	Yes	Yes
All other covariates[b]	No	No	Yes
N	10,648	10,433	10,433

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

[a] Objective health measures refer to lung capacity, hemoglobin level, and hypertension

[b] They consist of ethnicity, religiousness, type of religion, marital status, working status, number of household members, presence of children under five, house ownership, availability of electricity, the main source of drinking water, ownership of a toilet, and household sewage system, urbanity, and province fixed effects

human capital and material goods offer. This result makes sense because the evolutionary process assigned special importance to male height. Height reflects physical strength, and physical strength was crucial for ancestral men. The female preference for male height in mate selection, which is almost universal, is also a product of evolution (e.g., Symons 1979, pp. 196–198; Gregor 1979; Ellis 1992, pp. 279–281; Buss 1994, pp. 38–40). On the other hand, there is no compelling evidence of male preference for female height (Courtiol et al. 2010).

5.8 Comparisons with Developed Countries

Although the focal country of this paper is a developing country, it appears that the patterns exhibited by Indonesia are similar to those of developed countries. As described in the introduction, the relationship between height and happiness is positive in the US and Italy (Deaton and Arora 2009; Carrieri and De Paola 2012), just as in Indonesia. More interestingly, even the channels appear similar. The two studies are comparable to ours in terms of empirical methods and variables. Specifically, when Deaton and Arora (2009) regressed happiness on height and gender, the coefficient on height was 0.0022. When they added dummies for race and ethnicity, for age, and for marital status, the coefficient only slightly decreased to 0.0017. However, once education and income were further controlled for, although the coefficient continued to be statistically significant, it dropped to 0.0004 (their Table 2). Because men and women were not separately considered and perceived income ladder was not controlled for, their results are not as detailed as ours. However, the dramatic drop in the coefficient suggests that education and income are the main channels through which height increases happiness in the US.

Similarly, when Carrieri and De Paola (2012) employed an ordered probit estimator and controlled for age, age squared, and dummies for marital status and for presence of children, the coefficient on height was 0.030 for women and 0.054 for men; both were statistically significant. However, once they added a large set of education, economic, and health variables, the coefficient dropped to 0.001 for women and 0.023 for men; both lost statistical significance (their Table 2). Because they did not incrementally enter the set of variables as we do, it is difficult to tease out a parsimonious set of variables to substantially explain the relationship between height and happiness. However, their results illustrated the importance of education, economic, and health variables in explaining the relationship in Italy.

Overall, it appears that the channels for the relationship are universal, just as is Diener and Diener's (1996) finding that most people in the world are happy. It could be too hasty for such a conclusion with only three countries examined. However, the US population greatly differs from the Italian population in many aspects (e.g., history, culture, religion, and food), and it is needless to say that the Indonesian population differs from both. Given the similar results among the vastly different populations, our tentative conclusion merits attention.

6 Conclusions

Research shows that tall people enjoy more benefits in life, and it stands to reason that tall people are happier. Recently, some attempts have been made to understand this positive relationship between height and happiness. These studies usually confirm that tall people are happier, although subtle differences remain. Because not much light has been shed on developing countries in the literature on happiness, it is not surprising that no study, to the best of our knowledge, has tested whether the relationship between height and happiness is also found in developing countries. The studies on developed countries exhibited some differences between them, so it is likely that developing countries could produce interesting results.

This paper draws on the IFLS to understand the relationship between height and happiness by gender. This survey is appealing because it provides a large array of variables of a high quality. Most of all, concerns about measurement error and bias inherent in self-reported height are reduced because trained nurses measured height. In addition, the patterns of happiness do not deviate much from those of the world population. Our results generally agree that tall men and women are happier in Indonesia. More important, much effort is made to identify possible channels through which height enhances happiness, which is another contribution to the literature. Parsimonious sets of such channels are identified. For both men and women, education appears to be the most important channel. For men, however, earnings emerge as the second most important channel, whereas for women, perceived income ladders act as such. More interesting, for men, some effects of height remain even when accounting for an extensive set of covariates. By contrast, for women, the two important channels are enough to remove the effects of height on happiness.

We acknowledge that this paper has some limitations. The most obvious regards the establishment of causality. It is best to find plausible instrumental variables for own height, but unfortunately, this general survey lacks such variables. However, the examination of changes in the marginal effect of height in response to additional covariates suggests that height probably exerts causal effects on happiness for men to some degree, but not for women. The differential effects of height by gender are also consistent with the evolutionary benefits afforded to tall men. The second limitation concerns generalization. This paper considers only one developing country in depth. Given the subtle differences between developed countries, it is likely that different relationships between height and happiness would be found in other developing countries. However, Sect. 5. 8 suggests that such differences would be small. The third limitation concerns the sophistication of covariates. In particular, the measures of cognitive capacity and time preference are rather crude. Given the importance of cognitive skills in wages (Case and Paxson 2008) and the initially strong relationship between word recall and happiness, a more sophisticated measure for cognitive capacity may produce different results. Similarly, it is surprising to find that time preference has little relationship with happiness, as this variable is influential in many aspects of life; this is probably attributable to the crude nature of the measurement. Nevertheless, other sophisticated variables compensate for these crude variables. Furthermore, because the first and second channels for men and women are clearly identified, the overall results would remain mostly unchanged even if more sophisticated measurements were available.

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Appendix A

Possibility of Using Instrumental Variables (IVs)

One way to tackle endogeneity is to use IVs. However, the literature on the height premium illustrates difficulty and possible hazards in instrumenting height. Schultz (2002) used four sets of instrumental variables (IVs) for Ghana, Brazil, and the US and argued that, depending on the IVs used, the height estimates were several times (possibly as much as 20 times) larger than the corresponding OLS estimates. The finding that IV estimates were greater than OLS estimates is not surprising. The surprising point is the size of the differences. The literature on the return to education has generated many plausible IVs, so it is worth comparing the differences between OLS and IV estimates in this literature. In Card's (2001) survey, the effect of education on earnings with IVs is at most three times as great as that without IVs. Even a difference of three times is the exception rather than the rule. Schultz explained the large differences between the IV and OLS estimates by arguing that a large portion of height (at least 90 %, according to him) was determined by seemingly random genetic factors. He believed that the OLS estimates contained these substantial random effects, which artificially reduced the height premium.

However, the overidentifying restrictions are not testable in general (Parente and Santos Silva 2012), and using implausible IVs introduces an additional problem rather than addressing the original problem. Because of such difficulty and hazards, recent influential studies on the height premium regard height as a proxy for childhood conditions and do not attempt to instrument height (Persico et al. 2004; Case and Paxson 2008; Lundborg et al. 2014); the section on conceptual framework is consistent with this idea, and therefore, we do not employ IVs. In preliminary analyses, we considered instrumenting own height with parental height. However, parental height is provided in IFLS4 only for respondents who resided with their parents, and we suspected a sample selection bias for this subgroup. Thus, we did not use this IV.

Twin Fixed Effects

Böckerman and Vainiomäki (2013) used Finnish twin data in estimating the height premium to account for unobserved differences. Unfortunately, this option is not available to us. In addition, although they could remove unobserved differences possibly to a large extent, the question of why the twin pair exhibited a height difference in the first place remains. If the factors driving the height difference were related to the wage difference, their height premium would be biased. For the same reason, this concern cannot be addressed by instrumenting the height difference in 1975 with that in 1981, as they did. Even if these methodological issues are negligible, their estimates concern only twins not the general population; thus, the issue of generalizability remains.

Testing the Proportional Odds Assumption

One crucial assumption for an ordered probit is that β_1 and β_2 are the same for each value of y referred to as the proportional odds assumption. This assumption is testable. For illustration purposes, we perform this test with the covariates identical to those in Column 1 of Table 6 for men and in Column 1 of Table 7 for women, i.e., with the parsimonious set of covariates for each gender. Specifically, we take the assumption, which is equivalent to a standard ordered probit, and then relax the assumption for height; the first model is nested in the second model. Then, we run a likelihood ratio test. For both genders, the test fails to reject the null hypothesis that the assumption is violated.

If the null hypothesis were violated, one alternative could be a generalized ordered probit, which relaxes the assumption and makes the model more robust. However, Brant

(1990) explained that the rejection of the null hypothesis could result from three sources: misspecification of the latent regression, heteroscedasticity of *e,* and misspecification of the distributional form for the latent variable. As a result, the rejection does not automatically favor a generalized ordered probit as an alternative. He warned that it might be best to view the alternative not as a scientifically meaningful model but as a directional alternative helpful in validating the standard model. Even if a generalized ordered probit were favored, among others, the issue of interpretation of results from the model remains. The model is not even ordinal, meaning that rearrangement of the categories would hardly affect the fit. Thus, the spirit of continuous y^* is lost.

In addition, as the typical tradeoff between robustness and efficiency in econometrics suggests, the generalized model is less efficient than the standard model. If the less efficient model is used, β_1 and β_2 would lose statistical significance more often than if the more efficient model is used. Recall that one of our interests is to find whether a small set of covariates could substantially make β_1 and β_2 become small and possibly lose statistical significance and, if so, to identify such a set. If the model is less efficient, it is more likely that a small set of covariates emerge although it may not be the case if the more efficient model is used. It is more conservative to employ the more efficient model; if we identify such a small set even after using the more efficient model, this only reinforces our argument. As a result, the standard model is used in this paper. Furthermore, this model facilitates comparisons with other studies, which typically use the standard model probably for the above concerns.

Appendix B

See Tables 8, 9, 10 and 11.

Table 8 Height and Happiness with covariates of cognitive skills: women

	1	2	3	4
Height (m)	0.181 (0.031)***	0.119 (0.032)***	0.069 (0.033)**	0.098 (0.032)***
Age (/100)		−0.401 (0.105)***	−0.315 (0.109)***	−0.351 (0.107)***
Age^2 (/100)		0.003 (0.001)***	0.003 (0.001)**	0.003 (0.001)**
Schooling (years) (/10)			0.045 (0.005)***	
Words remembered (/10)				0.038 (0.007)***
N	10,648	10,648	10,648	10,648

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 9 Height and happiness with covariates of non-cognitive skills: women

	1	2
Height (m)	0.119 (0.032)***	0.113 (0.031)***
Age (/100)	−0.403 (0.105)***	−0.462 (0.107)***
Age^2 (/100)	0.003 (0.001)**	0.004 (0.001)***
Participation in arisans	0.022 (0.004)***	
Impatience Level 1		0.030 (0.012)**
Impatience Level 2		0.024 (0.015)
Impatience Level 3		0.021 (0.014)
Impatience Level 4		0.021 (0.012)*
N	10,648	10,648

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 10 Height and happiness with covariates of health: women

	1	2
Height (m)	0.120 (0.030)***	0.098 (0.033)***
Age (/100)	−0.518 (0.105)***	−0.431 (0.109)***
Age^2 (/100)	0.004 (0.001)***	0.004 (0.001)***
Somewhat healthy	0.019 (0.005)***	
Very healthy	0.040 (0.009)***	
BMI (/10)	0.019 (0.004)***	
Depression symptom	−0.013 (0.001)***	
Grip strength (g)		0.769 (0.206)***
Objective health measures	Yes	No
N	10,471	10,594

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

[a] Objective health measures refer to lung capacity, hemoglobin level, and hypertension

Table 11 Height and happiness with covariates of earnings: women

	1	2
Height (m)	0.093 (0.033)**	0.073 (0.031)**
Age (/100)	−0.415 (0.103)***	−0.415 (0.098)***
Age^2 (/100)	0.003 (0.001)***	0.003 (0.001)***
Zero Ln (earnings)	0.261 (0.034)***	
Ln (earnings) (/10)	0.200 (0.025)***	
Perceived Income Ladder 2		0.031 (0.010)***
Perceived Income Ladder 3		0.080 (0.011)***
Perceived Income Ladder 4		0.108 (0.011)***
Perceived Income Ladder 5/6		0.115 (0.018)***
N	10,648	10,648

Figures outside parentheses are marginal effects estimated by ordered probit models. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

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