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The Effects of Peoples' Height and Relative Height on Well-being

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Abstract. *Using a rich Italian survey, we investigate the effect of height on individual happiness. From our analysis it emerges that a large part of the effect of height on well-being is driven by a positive correlation between height and economic and health conditions. However, for young males the effect of height on happiness persists even after controlling for these variables, implying that height may produce some psycho-social direct effects on well-being. Consistent with this hypothesis, we find that males care not only about their own height but also about the height of people in their reference group. Well-being is greater for individuals who are taller than other subjects in their reference group. Results are robust to different definitions of reference group and controlling for a number of other reference group characteristics. We speculate that the beneficial effect of height on young males' well-being may be related to the fact that in some countries, such as Italy, and especially for men, height is considered as a proxy for handsomeness.*

JEL classification: D6; I10; I30
Keywords: height; social comparison; subjective well-being

1.Introduction

Many facts suggest that there are numerous aspects of life where being tall might have some advantages. Tall people (excluding the extremely tall) are more likely to have a long term partner and to have children (Nettle, 2002); they attain higher levels of education (Magnusson *et al.*, 2006) and receive higher wages than shorter people, even after controlling for the level of education acquired and the type of job performed (see Persico *et al.*, 2004; Case and Paxson, 2008). In addition, they have more chance of playing sports at a professional level or becoming supermodels.[1] Last but not least, height seems to have a strong inverse association with suicide risk (Magnusson *et al.* 2005). All these facts together seem to indicate that there is more chance of tall people enjoying a better life. This is

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We would like to thank Siliana Congiurato, Edoardo Di Porto, Leandro Elia, Nick Powdthavee, all the participants at the 2011 Italian Health Economics Association Annual Conference for useful comments and suggestions.
[1] Tall people also seem to do better in political competitions, given that, in US presidential elections over the last one hundred years, the taller candidate received more popular votes in 88% of the elections, and won 84% of the times (see Sorokowski, 2010).

confirmed by some empirical papers that find a positive correlation between height and subjective well-being (Rees *et al.*, 2009; Deaton and Arora, 2009; Denny, 2010).

The advantages deriving from being tall are also discussed in some popular books, such as Keyes (1980) and more recently Cohen (2009). However, the reasons for which tall people enjoy better lives are more controversial. Disentangling the channels through which height might affect well-being is not an easy task. Researchers are typically not able to observe all the factors affecting an individual's well-being and height may be correlated to some unobserved individual characteristics which may lead to a spurious correlation. For example, many empirical investigations show a strong effect of height on well-being, which vanishes or is massively reduced once individual income, education and health conditions are controlled for (see Deaton and Arora, 2009; Denny, 2010, Steckel, 1995; Strauss and Thomas, 1998). Thus, the positive effect of height on well-being is mostly due to the effects of income, education and health. Why, though, are taller people better educated, better paid and in better health than shorter people? Two main explanations have been advanced so far. The first is based on the idea that height is the result of growth during adolescence and fuller growth correlates with greater cognitive abilities, physical and mental health. Children who are not well nourished or suffer from diseases that slow their growth during childhood might not reach their potential height and might also not develop their full physical and cognitive potential, which in turn may lead to worse health, educational attainment and earnings in adulthood (Case and Paxson, 2008). The second explanation points to a positive effect of height on self-esteem and on the acquisition of some forms of soft skills, such as social adaptability, confidence and abilities in social interactions (Loh, 1993; Persico *et al.*, 2004; Magnusson *et al.*, 2006). According to this view, taller people may be lead to develop a better opinion of themselves and feel at an advantage in social interactions as they are perceived more positively by their peers. Persico *et al.* show that being relatively short when a teenager is crucial in explaining wage returns to height and speculate that it may be due to the fact that shorter teenagers, stigmatized because of their stature, may find it more difficult to acquire social and soft skills. This also helps to explain the lower suicide rate of tall people as has been recorded in the literature (Magnusson *et al.*, 2005).

Other than indirect effects, such as better outcomes in the labor market, self-esteem and social skills can have some more direct effects on well-being. These effects may also derive from the fact that, in some cultures, height is a proxy for social status and being good looking. The association between height and good looks seems to be particularly relevant

for men, since according to a number of studies, in western societies, women tend to prefer men who are taller than they are (Nettle, 2002a; Pawlowski *et al.*, 2000), while men prefer women who are shorter than they are (Nettle, 2002b). According to Barber (1995) and Jackson and Ervin (1992), the preference shown by women for taller men has to be found in the relationship between height and the perceived social status and handsomeness of a man.[2] Another explanation is proposed by evolutionary theories arguing that, as greater height signals better health, this translates into a preference for taller mates and explains why, ceteris paribus, shorter people may be viewed as less appealing.[3]

Results from the empirical literature seem to support the idea that the effects of height on individual well-being are mainly related to human capital factors (indirect effects), while little attention is given to direct effects deriving from psycho-social aspects.

In this paper we try to understand better whether height might also matter in relation to psycho-social factors deriving from how individual appearance and status is judged in a given society. In doing so, we focus our attention on a country, Italy, in which height is traditionally considered as a proxy for physical attractiveness and we try to understand whether the eventual psycho-social effects of height on well-being are greater among those subjects who are more likely to care about their appearance, such as young people.

In addition, we test whether some important psycho-social benefits of height derive from relative height - that is one's own height compared to the average height within a comparison group – other than one's own absolute height. We expect that "being tall" is also a social construct that might depend on the average height of people living within a given context.

The relevance of social comparison for individual well-being has already been highlighted in several papers with respect to a number of important aspects of well-being, such as income (Clark *et al.*, 2007; Easterlin, 2001; Diener *et al.*, 1993; Ferrer-I-Carbonell, 2005; Mcbride, 2001), health (Carrieri, 2011; Powdthavee, 2009), obesity (Blanchflower *et al.* 2009, Felton and Graham, 2005; Maximova *et al.*, 2008) and unemployment status (Clark, 2003; Powdthavee, 2007), but, to the best of our knowledge, it is novel with respect to height.

[2]In the paintings of the ancient Egyptians, the height of figures was closely linked to their social status.

[3] In modern societies, social status and physical attractiveness are more likely to be related to height when the average height of the population is low. For instance, in Italy, a country with a relatively short population, a very popular saying states "Altezza mezza bellezza", which means that height is half of a man's beauty.

We base our analysis on data from the Italian Health Conditions Survey 2004-4005, which include a fairly large number of observations (98,687) and provide information on several health and socio-economic factors other than height. We estimate an ordered probit model to explain happiness in relation to an individual's own height and the average height of his/her reference group. Conditional on variables measuring economic and health status, we find that own height does not produce any statistically significant effect on the well-being of females, but, with regards young males, we find a positive and statistically significant effect. More interestingly, we also find a positive relative height effect for males. This is particularly marked among younger people, probably because they are more likely to consider physical appearance to be of importance in social comparison. This effect emerges even after controlling for human capital and health variables, thus our results support the hypothesis that relative height has a direct positive effect on the subjective well-being of males.

The paper is organized as follows. The next section presents the data, the main variables and the econometric methodology used. Section three reports and discusses our main results regarding the effects of an individual's own height on well-being. In Section four, we focus our attention on the effects of relative height. The last section summarizes and provides some final remarks.

2. Data and Empirical Model

We base our investigation on data from the last Italian Health Conditions Survey, 2004-2005, (*ISTAT- Condizioni di Salute e Ricorso ai Servizi Sanitari*). The survey is conducted every 5 years on a nationally representative sample of 128,040 individuals. The survey gathers information on health conditions, disabilities, life-styles, prevention and health-care use as well as information on individual and household socio-economic conditions. Furthermore, despite the survey's lack of a longitudinal dimension, it provides information on happiness scores and on individual height, which renders this data-set particularly suitable for our research focus.[4] Happiness scores are only collected for people of more than 13 years of age and height is only collected for people over the age of 18, so the analysis is

[4] Other surveys with a longitudinal dimension, both Italian (Bank of Italy- SHIW) and European with data from Italy (European Community Household Panel) do not collect information on individual height. As explained in the introduction, we base our investigation on a country where it is likely that physical appearance is judged in relation to height. For this reason, other data-set with information on height such as German Socio Economic Panel and the British Household Panel Survey have not been used.We come back on this issue in the concluding remarks.

carried out on a sample of 98,687 individuals aged 18 or more (excluding missing values).[5] Height is self reported and measurement errors are likely to occur. Unfortunately, this is a common problem in social science studies, given the lack of data obtained through physical examinations (such as those frequently used in medical literature). Notwithstanding this, there are some important findings in the literature on misreporting that seem to suggest a negligible bias in our case. For instance, Gil and Mora (2011) find that reporting bias for height is more relevant for older individuals and for females. Thus, misreporting should not affect our results significantly given that they mainly refer to young males (as will be made clearer later in the paper).

In our empirical investigation, we use happiness scores as a measure of subjective well-being (SW_i). We consider answers to the following five point scale question: "Would you usually define yourself as: Happy and interested in life; Rather happy; Rather unhappy; Unhappy with few interests in life; So unhappy that life seems not interesting at all?". Answers are scaled from 1 (So unhappy that life seems not interesting at all) to 5 (Happy and interested in life). Response categories have been psychometrically tested. About 38% of individuals said that they felt happy and interested in life, 52% of them felt rather happy, while the others were feeling unhappy and chose between the last three categories (7%, 2%, and 1%).[6]

We are aware that the response categories for the well-being question are relatively unusual. Even though we do not expect them to produce any bias, as a robustness check, we also look at the answers that people gave to 9 questions asking them about their feelings over the previous 4 weeks. People were asked how often, over the previous four weeks, they had felt (following the order in the questionnaire) serene; plenty of energy; discouraged and sad; agitated; very depressed; happy; brilliant; exhausted; tired. For each question six answers were possible (scaled from 1 to 6): Never, Almost Never, Sometimes, Quite Often, Almost Always, Always. Using the answers to these questions (we rescale those concerning negative feelings inversely - never is scaled 6, almost never 5 etc.), we undertake a principal component analysis to obtain a comprehensive measure of individual feelings (only the first component was considered), which we call *Attitudes Toward Life*. This variable is continuous and takes values from -3.82 to 8.51. The correlation between this measure and that

[5] There are 99,240 individuals aged over 18 in our sample. For these individuals, we do not have missing values concerning either their height or their happiness, however due to some missing values in the control variables we lose 553 subjects. These missing values are very likely to be random and they should not affect our results.

[6] Given the distribution of this variable we have also experimented by aggregating the last three categories. Nothing relevant changes in the results we are interested in.

concerning individual happiness is quite high: 0.59 (statistically significant at the 1 per cent level).

We estimate the following model of latent subjective well-being (SW^*):

$$[1] \qquad SW_i^* = \beta H_i + \gamma H_i^r + \delta X_i + \varepsilon_i$$

where H_i is the height of individual *i* (in decimetres), H_i^r is the height of people in the reference group of individual *i*, X_i is a vector of other explanatory variables and ε_i is an error term.

Considering the reported level of happiness as an ordinal measure, we estimate equation [1] using an ordered probit estimator. However, in some cases, to make the interpretation of coefficients easier, we also carry out OLS estimations. Regressions are run correcting the covariance-matrix for intra-reference group correlation, in order to avoid the so-called "Moulton problem" (Moulton, 1986).

Individual height is recorded in decimetres and the height of the reference group is the average height of individuals with whom we assume individual *i* compares himself/herself; thus, around each individual *i*, we build a reference group made up of people who have the same age, gender and educational level and who live in the same region. Such an approach is quite common in literature dealing with social comparison (see Ferrer-I-Carbonell, 2005; Mcbride, 2001).

Vector X_i contains three sets of control variables. A first set includes *Age* and *Age^2*. (we have divided Age by 10 in order to make regression coefficients easily readable), marital status (*Single* – reference category-, *Married*, *Divorced*, *Widowed*), a dummy variable equal to one if the individual has any *Children*, a dummy *Female*, a dummy *Housewife*, a dummy *Student* and regional fixed effects. In addition, we control for a dummy *Stressful Events* which takes a value of one in the case that a negative event, such as an economic downturns, divorce, familiar problems, death or severe diseases of relatives, occurred to the individual in the course of the last four weeks. This last control should greatly reduce any bias that may derive from contingent circumstances, which is considered particularly important in defining the reliability of happiness scores (see Kahneman et al. 1999).

A second set of control variables refers to human capital variables: individual socio-professional status (*Employed* – reference category – *Unemployed*, *Self-employed*) years of completed *Education* and economic circumstances. Unfortunately the data-set we use does not provide information on income, but it does offer information (self-evaluations) on family

economic resources on a four point scale: "*Optimum Circumstances*, *Fair Circumstances*, *Insufficient Circumstances*, *Absolutely Insufficient Circumstances*". Using this information, we build four dummy variables to take into account the effect of economic circumstances ("*Optimum Circumstances*" is left as a reference category). In order to control for economic circumstances better, we also add the number of *Bathrooms* in the house to the regressors, as a proxy for household wealth, and a dummy variable *Villa* for subjects living in a villa or in a detached house.

Table 1. Summary statistics

	Males		***Females***	
Variable	*Mean*	*Standard Deviation*	*Mean*	*Standard Deviation*
Happiness	4.313	0.689	4.204	0.760
Attitudes Toward Life	0.432	2.393	0.316	2.163
Height (decimetres)	17.345	0.726	16.235	0.634
Age/10	4.7945	1.765	5.012	1.853
Single	0.297	0.457	0.228	0.419
Married	0.621	0.485	0.563	0.496
Divorced	0.050	0.218	0.057	0.232
Widowed	0.015	0.121	0.020	0.141
Children	0.594	0.491	0.504	0.500
Education	9.757	4.291	9.195	4.579
Employed	0.620	0.485	0.379	0.485
Unemployed	0.050	0.217	0.044	0.206
Self-Employed	0.238	0.426	0.103	0.304
Housewife	0.000	0.000	0.341	0.474
Student	0.049	0.216	0.052	0.222
Economic Circumstances Absolutely Insufficient	0.038	0.192	0.035	0.184
Economic Circumstances Insufficient	0.671	0.470	0.649	0.477
Economic Circumstances Fair	0.252	0.434	0.272	0.445
Economic Circumstances Optimum	0.039	0.194	0.043	0.204
N. Bathrooms	1.477	0.601	1.451	0.595
Villa	0.158	0.365	0.153	0.360
Stressful Events	0.011	0.103	0.014	0.117
Physician Visit	0.319	0.466	0.244	0.429
Contingent Health Problems	0.266	0.442	0.336	0.472
Disability	0.047	0.211	0.065	0.247
Reference Group Average Height	173.506	3.370	162.384	2.231
Relative Height	1.000	0.038	1.000	0.037
Observations	47372		51315	

A third set of controls considers health status. We control for a dummy variable *Physician Visit* which takes a value of one when the individual has visited his/her physician in the course of the last four weeks and zero otherwise. In addition, we control for health problems which have occurred in the last four weeks through a dummy variable *Contingent Health Problems*, which is likely to influence contingent well-being considerably. Finally, we include a dummy variable which takes a value of one if the individual suffers from any *Disability.*[7]

[7] In a previous version of the paper we also controlled for self-assessed health conditions, obtaining results which were very similar to those reported in Section 3.

It is worth noting that the variables used to identify the reference group of individual *i* (age, education and region of residence) are all included in the set of regressors. This should ensure that the effect of relative height is not contaminated by the variables chosen to identify the reference group. Summary statistics of all variables are separately presented for males and females in Table 1. In the case of qualitative variables, the first category presented is always the one chosen as the reference category in the model.

3.The Effect of an Individual's Own Height on Well-Being

In this section we focus our attention on the effects that an individual's own height may produce on his/her happiness (Table 2). We run separate regressions for females and males, since, as was explained in the introduction, the effect of height might differ in relation to gender. In the first specification (columns 1 for females and 2 for males) we only control for a number of demographic characteristics such as *Age* (and *Age^2*), marital status, a dummy for children and regional fixed effects. It emerges that height affects the well-being of both males and females and taller people enjoy greater happiness.

As far as other control variables are concerned, we find results that are consistent with those emerging from the happiness literature. Older people are less happy, but the marginal effect of *Age* on happiness is decreasing since *Age^2* shows a positive and statistically significant coefficient.[8] Being married and having children produce positive effects on happiness.[9]

So as to better understand what drives the positive effect of height on well-being, in columns 3 and 4 (respectively for females and males), we add our measures of health and economic conditions as further regressors. We find that happiness is strictly related to these variables. Happiness is greater for people with better economic conditions. Being unemployed produces a strong negative effect for men (for women the effect is not statistically significant). The self employed are happier. Education increases happiness even after controlling for family economic conditions and labor market position. Stressful events negatively affect well-being. Health is also crucial in explaining happiness: the dummies

[8] We have also experimented by considering *Height^2* and by including interaction terms between this variable and *Age* and *Age^2*. The results we are interested in remain substantially unchanged. *Height^2* is not statistically significant.

[9] As marital status may be affected by height, we have also run our regressions excluding this type of control. The effect of height on well-being slightly increases.

Physician Visit and *Contingent Health Problems* produce a marked impact on an individual's self-assessed well-being.

Table 2. Happiness and Height: Ordered Probit and OLS Estimates

	(1) Females	*(2) Males*	*(3) Females*	*(4) Males*	*(5) Females*	*(6) Males*	*(7) Males OLS*	*Marginal effects Model (6)*
Height (decimeters)	0.030***	0.054***	0.001	0.023	-0.004	0.154***	0.066**	0.059
	(0.009)	(0.008)	(0.009)	(0.018)	(0.063)	(0.055)	(0.028)	
Height*(Age/10)					0.001	-0.047**	-0.021*	-0.018
					(0.025)	(0.023)	(0.013)	
Age/10	-0.280***	-0.271***	-0.314***	-0.372***	-0.330	0.444	0.203	0.171
	(0.019)	(0.021)	(0.021)	(0.022)	(0.413)	(0.396)	(0.218)	
(Age/10)^2	0.006***	0.006***	0.015***	0.019***	0.015	-0.043	-0.023	-0.171
	(0.002)	(0.002)	(0.002)	(0.002)	(0.038)	(0.038)	(0.022)	
Height*(Age/10)^2					-0.000	0.004	0.002	0.001
					(0.002)	(0.002)	(0.001)	
Married	0.194***	0.229***	0.200***	0.233***	0.200***	0.235***	0.135***	0.089
	(0.013)	(0.016)	(0.014)	(0.016)	(0.014)	(0.016)	(0.009)	
Divorced	-0.059**	0.039	-0.036	0.031	-0.036	0.034	0.022	0.013
	(0.029)	(0.032)	(0.029)	(0.032)	(0.029)	(0.032)	(0.018)	
Widowed	0.084*	-0.057	0.090**	-0.032	0.090**	-0.032	-0.026	-0.012
	(0.045)	(0.053)	(0.046)	(0.052)	(0.046)	(0.052)	(0.031)	
Children	0.044***	0.030**	0.015	0.006	0.015	0.006	0.003	0.002
	(0.013)	(0.013)	(0.014)	(0.013)	(0.014)	(0.013)	(0.007)	
Education			0.019***	0.014***	0.019***	0.014***	0.008***	0.005
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Unemployed			-0.004	-0.127***	-0.004	-0.124***	-0.060***	-0.047
			(0.029)	(0.028)	(0.029)	(0.029)	(0.016)	
Self-employed			0.072***	0.023*	0.072***	0.024*	0.009	0.009
			(0.017)	(0.013)	(0.017)	(0.013)	(0.007)	
Housewife			-0.006		-0.006			
			(0.012)		(0.012)			
Student			0.101***	-0.011	0.101***	-0.020	-0.008	-0.007
			(0.030)	(0.032)	(0.031)	(0.032)	(0.015)	
Ec. Res. Optim			0.331***	0.383***	0.331***	0.383***	0.224***	0.151
			(0.040)	(0.042)	(0.040)	(0.042)	(0.025)	
Ec. Res. Fair			0.286***	0.274***	0.286***	0.274***	0.177***	0.104
			(0.028)	(0.031)	(0.028)	(0.031)	(0.020)	
Ec. Res. Insuf.			0.082***	0.077**	0.082***	0.077**	0.072***	0.029
			(0.029)	(0.032)	(0.029)	(0.032)	(0.020)	
N. bathrooms			0.017*	0.031***	0.017*	0.030***	0.015***	0.011
			(0.010)	(0.010)	(0.010)	(0.010)	(0.005)	
Villa			0.056***	0.068***	0.056***	0.068***	0.031***	0.026
			(0.015)	(0.016)	(0.015)	(0.016)	(0.008)	
Stressful Events			-0.241***	-0.462***	-0.241***	-0.463***	-0.273***	-0.163
			(0.048)	(0.058)	(0.048)	(0.058)	(0.037)	
Cont. Health Probl			-0.167***	-0.149***	-0.167***	-0.149***	-0.089***	-0.057
			(0.012)	(0.013)	(0.012)	(0.013)	(0.008)	
Disability			-0.641***	-0.716***	-0.641***	-0.716***	-0.546***	-0.238
			(0.024)	(0.030)	(0.024)	(0.030)	(0.023)	
Physician Visit			-0.075***	-0.072***	-0.075***	-0.072***	-0.039***	-0.027
			(0.012)	(0.014)	(0.012)	(0.014)	(0.008)	
N	51315	47372	51315	47372	51315	47372	47372	
Pseudo R2	0.066	0.050	0.090	0.073	0.090	0.073		
Log-likelihood	-49984.46	-42858.54	-48740.65	-41817.36	-48740.63	-41813.22		

Notes: The dependent variable is *Happiness*. Marginal Effects are computed on the probability of being "Happy and interested in life". Standard errors (robust to heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level. In all the regressions, we also control for regional dummies. The estimated cut points are not reported.

Controlling for economic and health conditions, we find that height does not produce any statistically significant effect on the well-being of either males or females. This implies that the effect of height on well-being, emerging in those estimates in which these controls were not included, is entirely explained by the positive association between height and economic and health conditions, which in turn are positively related to well-being. Similar conclusions are also highlighted in other empirical papers (Deaton and Arora, 2009; Denny, 2010) and hold true for both men and women.

Thus, estimates shown in columns 3 and 4 seem to suggest that there is no direct effect of height on well-being, such as those relating to self-esteem or social factors. However, we include the interaction terms *Height*Age* and *Height*Age^2* among the regressors so as to investigate this issue in greater depth. The idea behind the inclusion of these interaction terms is that, if any social effect is at work, we would expect it to be more relevant for younger people, who are more likely to consider physical appearance to be of importance in social interactions.

In column 6, we report ordered probit estimates for this specification. A joint significance test of all height variables shows that they are significant determinants of well-being (p-value 0.002). We find that the well-being of eighteen-year-old males is positively affected by height even when controlling for their economic and health conditions. It emerges from the interaction terms that as age increases the effect of height on happiness diminishes. Further calculations suggest that the height effect becomes statistically insignificant after 42 years of age.[10]

In the last column of Table 2, the marginal effects on the probability of being "Happy and interested in life" are reported (specification 6). An increase of 1 decimetre in height increases the probability of male individuals stating that they feel "Happy and interested in life" by 5.9 percentage points.

In column 7, we report OLS estimates for an easier interpretation of the effect of height according to an individual's age. In line with the ordered probit estimates, we find that height directly affects individual well-being but the effect decreases with age. For individuals aged 18, an increase of 1 decimetre in height produces an increase of 0.0337 in the happiness score. The interaction term *Height*Age* turns out to be negative and statistically significant at the 10 percent level, implying that height increases happiness significantly less for older males. *Height*Age^2* is positive but not statistically significant.

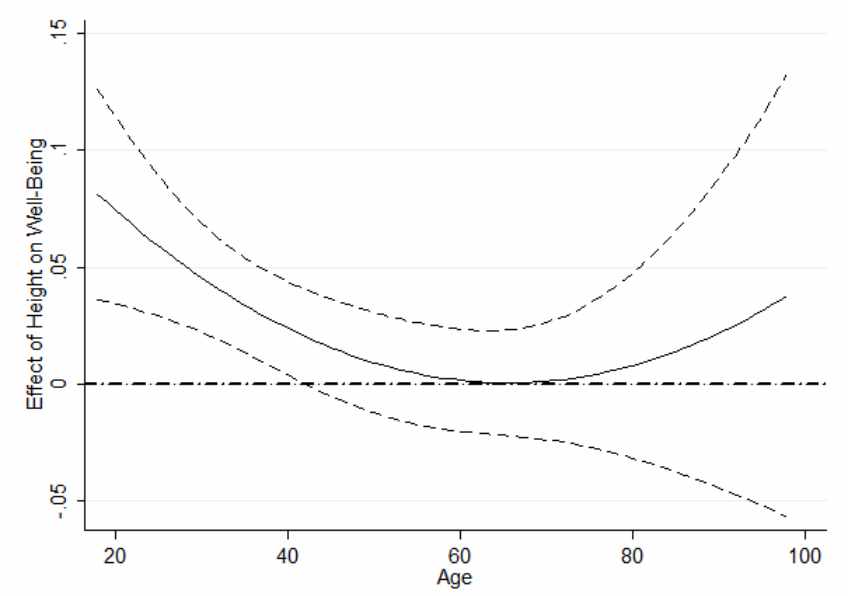
[10] We test the linear combinations of coefficients of *Height, Height*Age, Height*Age^2* varying age from 18 to 100 years old.

From OLS estimates it turns out that the effect of height on males' well-being is no longer statistically significant when their age reaches 38 (similar to what calculations on ordered probit estimates suggest).

The heterogeneous effect of height on males' well-being with respect to their age is represented in Figure 1, where the impact of height on happiness (as estimated in specification presented in column 6) is graphed against *Age*. In the figure, we plot the coefficient estimates along with 95% confidence intervals. The figure shows that the effect of height on well-being is positive and significant for younger men, decreases with age and vanishes for men by the time they reach 42 years of age, when confidence intervals include zero.

Rees *et al.*, 2009, examining the well-being of individuals aged from 12 to 19, found similar results, i.e. a positive effect of height on the well-being of men. Interestingly, we find that the positive effect of height continues for men even after adolescence, decreasing significantly only when they reach their forties.

Figure 1. The effect of height on latent happiness in relation to individual age (95% confidence intervals)



To check the robustness of our results we have used our variable "Attitudes Toward Life" as an alternative measure of well-being. As shown in Table 3 (same specifications as reported in Table 2), our main findings remain substantially unchanged.

Table 3. Attitudes toward Life and Height: OLS estimates

	(1) Females	(2) Males	(3) Females	(4) Males	(5) Females	(6) Males
Height	0.104***	0.066***	0.030	0.014	0.004	0.236**
	(0.027)	(0-014)	(0.025)	(0.013)	(0.105)	(0.086)
Height*(Age/10)					0.005	-0.131***
					(0.044)	(0.038)
Height*((Age/10)^2					0.002	0.015***
					(0.004)	(0.004)
Observations	51315	47372	51315	47372	51315	47372
R-squared	0.149	0.110	0.282	0.247	0.282	0.247

Notes: The dependent variable is Attitudes toward Life. Standard errors (robust to heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level.

One may argue that the interaction terms we are concerned with may be capturing cohort differences in some, time-invariant, individual fixed traits. However, cohort effects can only bias our results if we are missing an aggregate variable that is only specific to tall males of a certain age-group. While we can think of some particular cultural traits or experiences affecting a certain age-group,[11] it is much more difficult to think of aggregate variables relevant for men but not for women, particularly aggregate variables which are only relevant for tall men.

Moreover, as our data does not contain any information on income and the self-assessed economic situation refers to that of the individual's family, it could be that our results are biased as a consequence of the fact that young people tend to leave home quite late in Italy. As a consequence, we might miss the economic resources of the interviewed subject, which may still be related to height, given that our controls for economic conditions actually refer to the individuals' parents. However, our results are also robust when we estimate our model by restricting the sample to individuals aged 28 and over (the median age for leaving home for Italian males is 27), who typically do not live with their parents.

These findings suggest that young Italian males obtain some additional benefit from being tall apart from those operating thought labor market outcomes, maybe because they care more about their physical appearance.[12]

[11] See Frijters and Beatton, 2011 and Kassenboehmer and Heisken-DeNew, 2011.

[12] In order to understand better whether the effect of height on well-being is related to some kind of "beauty effect", instead of considering the interaction term between height and age, we have included an interaction between height and marital status. In fact, we would expect single people to care more about their appearance since they are more active in the market for mates. It emerges that, after controlling for economic and health conditions, height matters less for married subjects than for individuals who are more active on the market for mates, such as the single, divorced and widowed (results not reported and available under request). It is worthwhile noting that these results have to be interpreted cautiously, since, while age is an exogenous variable, marital status could be endogenous (it could be affected by height). Notwithstanding, this positive association between the height and happiness of single individuals seems to support the presence of some "beauty effect" in the happiness-height relation.

4. Relative Height and Well-Being

As has already been noted in the economic literature with regards to a number of variables such us income, health and obesity, individuals tend to measure their position in relation to others. Social comparison might be relevant for height too. In fact, the social-psycho effects of height may be more related to relative height than absolute height. Perceptions about the ideal height may depend on the average height of individuals in one's reference group and social status and physical appearance may be more related to relative height than to absolute height.

To understand better whether individuals get some benefits from being tall because of social factors, we investigate whether comparison of one's own height with that of other individuals has a positive effect on well-being.[13] Thus, we test whether, beyond being a reflection of his/her own height, the happiness of individual *i* depends on the average height of subjects who are included in his/her reference group.[14] Furthermore, in some other specifications, we directly test whether happiness is explained by relative height, i.e. the ratio of one's own height to the average height in the reference group.

The reference group of individual *i* is composed of people of his/her own gender who live in the same region, are of the same age[15] and have attained the same educational level (4 categories: Primary School, Secondary School, High School, University).[16]

To take into account the fact that the height of the reference group may be correlated with the reference group's economic conditions, so leading to a spurious correlation, we add three measures of the reference group's wealth as controls: the proportion of people in the individual reference group reporting to be in a good or optimum economic situation, the average number of bathrooms in the houses of people in the reference group and the proportion of people living in a villa or a detached house in the reference group.

Estimation results are reported in Table 4. In columns 1 and 2, respectively for females and males, we report ordered probit estimates obtained when adding the height of the reference group to the full set of controls used in specifications 3 and 4 of Table 2 (the effects on the control variables are not reported in the Table to save space). The standard errors are adjusted for the potential clustering of residuals at the reference group level.

[13] Note that the bias discussed by Proto and Sgroi (2010), considering individuals who were asked to place themselves in the population distribution, should not affect our work given that the survey we use asked individuals about their own height and not their relative height.

[14] The height of individual *i* is not included in calculating the average height of his/her reference group.

[15] As a robustness check, we also experiment by considering people within a certain age interval as part of the reference group. Our results remain substantially unchanged.

[16] We have also experimented by considering only reference groups with at least 10 peers. Results remain substantially the same.

We find that *Height* and *Reference Group Height* are jointly significant determinants of well-being for males (p-value 0.002) but not for females (p-value 0.101). The coefficient on the *Reference Group Height* is negative and statistically significant at the 5 percent level, implying that an increase in the individual's reference group height reduces subjective well-being for males. On the other hand, in line with previous estimates, we find that controlling for economic and health conditions, and for the wealth of the reference group, own height does not produce any statistically significant effect either for males or for females.[17]

In columns 3 and 4, we focus our attention directly on the effects of relative height and instead of considering the individual's own height and the average height of his/her reference group as regressors, we include own height and the ratio between these two variables, *Relative Height*. Again, we find that both the individual's own height and relative height are jointly significant determinants of subjective well-being for males (p-value 0.042) but not for females (p-value 0.112). Notwithstanding this, the coefficient of individual own height is not significant, while the relative height coefficient is positive and significant. Thus, this result seems to suggest that it is relative height that really matters for well-being. The same conclusion arises when we control just for relative height (column 5 and 6): the relative height coefficient is positive and significant for males (but again not for females).[18]

These findings are similar to those found by the literature on happiness in relation to income, obesity, unemployment status and, more recently, also in relation to health. Indeed, many papers found that individual happiness is mostly driven by the relative position that an individual has with respect to his\her reference group. Thus, it has been shown that people obtain utility from being richer than others, less sick than others, less overweight than other and that they suffer less from being unemployed when there are many other unemployed subjects in the area in which they live.

In the case of height, the existence of a social comparison effect may be viewed as evidence of a positive direct effect of height on well-being related to psycho-social factors, such as self-esteem or social dominance. This interpretation is even more realistic if we consider that height, especially for men, is often considered as a proxy for physically

[17] Variables measuring the reference group wealth do not produce any statistically significant effect on individual happiness (not reported).

[18] We have also considered a linear specification, "height - reference height", as an alternative to the ratio between own and reference height. We find that own height is positive but not statistically significant, while "height - reference height" is positive and statistically significant at the 5 percent level. By comparing the Pseudo R2, it emerges that the two models fit almost the same.

attractiveness. In this perspective, being taller than others could mean being more attractive than others, which would imply direct benefits for individual well-being.

In column 7, we have included the interaction terms *RelativeHeight*Age* among the controls in order to investigate whether the effect of relative height varies with age. We find that both relative height and its interaction with age are jointly significant (p-value 0.000). In a way which is consistent with previous findings, it emerges that the effect of relative height is greater for younger males, while the effect is never statistically significant for females (not reported). OLS estimates are reported in column 8 and results remain substantially the same. The interaction term *RelativeHeight*Age* is negative and statistically significant at the one percent level. In line with previous results, the effect of relative height is less relevant for older people and tends to become statistically insignificant for older subjects.

Once again, these findings seem to support a direct effect of height on well-being due to social comparison, which may be more relevant at a younger age when physical appearance is considered more relevant for social comparison. Very similar results are obtained when estimating an OLS model where the dependent variable is "Attitudes Toward Life" (not reported).

Table 4. Happiness and Relative Height

	(1) Females	(2) Males	(3) Females	(4) Males	(5) Females	(6) Males	(7) Males	(8) Males OLS	Marginal Effects Model (7)
Height	0.002	0.023	-0.113**	-0.067					
	(0.001)	(0.019)	(0.055)	(0.055)					
Height Ref. Group	-0.012**	-0.011**							
	(0.005)	(0.005)							
Relative Height			1.769**	1.569**	0.073	0.434***	1.487***	0.736***	0.570
			(0.884)	(0.855)	(0.138)	(0.145)	(0.439)	(0.232)	
Relative Height*Age							-0.021***	-0.011**	-0.008
							(0.008)	(0.005)	
Observations	51315	47372	51315	47372	51315	47372	47372	47372	
Pseudo R-squared	0.088	0.072	0.0881	0.072	0.088	0.072	0.072		
Log-pseudolikelihood	-48711.34	-41770.70	-48714.33	-41772.49	-48714.34	-41772.49	-41768.71		

Notes: The dependent variable is Happiness. Standard errors (robust to heteroskedasticity) are reported in parentheses. Marginal Effects are computed on the probability of being "Happy and interested in life". The symbols ***, **, * indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level. In all the regressions we also control for regional dummies. The estimated cut points are not reported.

5. Concluding Remarks

In this paper, we have analyzed the effect of height on happiness using a sample of 98,687 individuals included in the Italian Health Conditions Survey, 2004-2005, (*ISTAT-Condizioni di Salute e Ricorso ai Servizi Sanitari*).

Using an ordered probit model of happiness, we test the main explanations of the beneficial effects of height on well-being. We control for a large number of demographic characteristics and for health and economic conditions. In addition, we have information on contingent circumstances (such as contingent health problems, stressful events like divorce, economic downturns and death of relatives, etc.) that have been proved to affect well-being significantly. Such information is not very common in the happiness literature and allows us to handle the problems deriving from the fact that happiness scores are typically very sensitive to changes in contingent circumstances.

In line with the existing literature, we find that human capital and health explanations account for a large part of the positive effect of height on well-being. However, we also find that the well-being of young males is positively affected by height even after controlling for their economic and health conditions. In addition, it emerges from our analysis that an individual's happiness depends not only on his/her own height but also on the height of his/her peers. Again this effect is only statistically significant for males and is greater in magnitude for younger subjects. Lastly, a closer look at the effects of relative height reveals that males' well-being increases when their height increases in comparison to the average height of individuals in their reference group.

Three aspects of our results seem to us particularly intriguing. The first is that a relative height effect has only been found for males. Since height is often considered a proxy for male good looks, this result might suggest a self-esteem or social dominance effect on well-being. The second aspect is that relative height is more important for younger men, which may be a consequence of the fact that social comparison related to physical appearance is typically more relevant for younger people. Finally, the relative height effect we found corroborates the well-established relationship between an individual's well-being and his/her relative position in society. Up to now, income, unemployment, obesity and health have been the only dimensions considered. In this paper, we realized that height is also a social construct that affects social comparison processes.

A potential limitation of this research is the use of cross-sectional data that do not allow individual fixed effects to be taken into account. However, we have a large number of observations and a rich data-set which allow us to control for many important observables and to perform some robustness analysis. In addition, as we focus our attention on people aged 18 and over, for whom height does not vary significantly over the years, a panel dimension would not bring important benefits.

For further research, it would be interesting to investigate whether the effect of relative height on well-being varies across countries. We would expect smaller direct effects

in those countries where physical appearance is generally not judged with reference to height .

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