

## HEIGHT DYNAMICS WITH LATITUDE AND LONGITUDE IN MODERN HUMANS *HOMO SAPIENS* LINNAEUS, 1758

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### Abstract

*In this short paper, a test for relationships between height, longitude, and latitude in modern humans Homo sapiens was made. No relationship appeared between height and latitude across all latitudes ( $r=0.31$ , Z score=1.28,  $n=19$ ,  $p=0.10$ ). A relationship appeared between male height and positive latitudes across countries ( $r=0.64$ , Z score=2.76,  $n=16$ ,  $p<0.01$ ) ( $y=2.12x-327$ ). A relationship appeared between male height and latitude excluding Australia ( $r=0.48$ , Z score=2.02,  $n=18$ ,  $p=0.02$ ) ( $y=2.90x-468$ ). Female height was marginally related to latitude ( $r=0.35$ , Z score=1.44,  $n=19$ ,  $p=0.07$ ) and was related to positive latitudes across countries ( $r=0.48$ , Z score=1.87,  $n=16$ ,  $p=0.03$ ) ( $y=1.65x-227$ ). Male height was marginally related to eastern latitude ( $r=0.44$ , Z score=1.48,  $n=13$ ,  $p=0.07$ ) and was negatively related to (eastern) longitude ( $r=-0.49$ , Z score=-1.70,  $n=13$ ,  $p=0.04$ ). Female height was marginally related to eastern latitude ( $r=0.42$ , Z score=1.42,  $n=13$ ,  $p=0.08$ ) and was negatively related to (eastern) longitude ( $r=-0.50$ , Z score=-1.75,  $n=13$ ,  $p=0.04$ ).*

**Key words:** relationship, longitude, latitude, male, female

### INTRODUCTION

Human mating preferences for height are modestly reflected in actual pairings (Stulp et al. 2013). Height is positively related to Intelligence Quotient which is genetically determined (Keller et al. 2013). Height-associated variants demonstrate assortative mating in human populations (Li et al. 2017). The effect of latitude and longitude on height was investigated to examine covariance in this behavior.

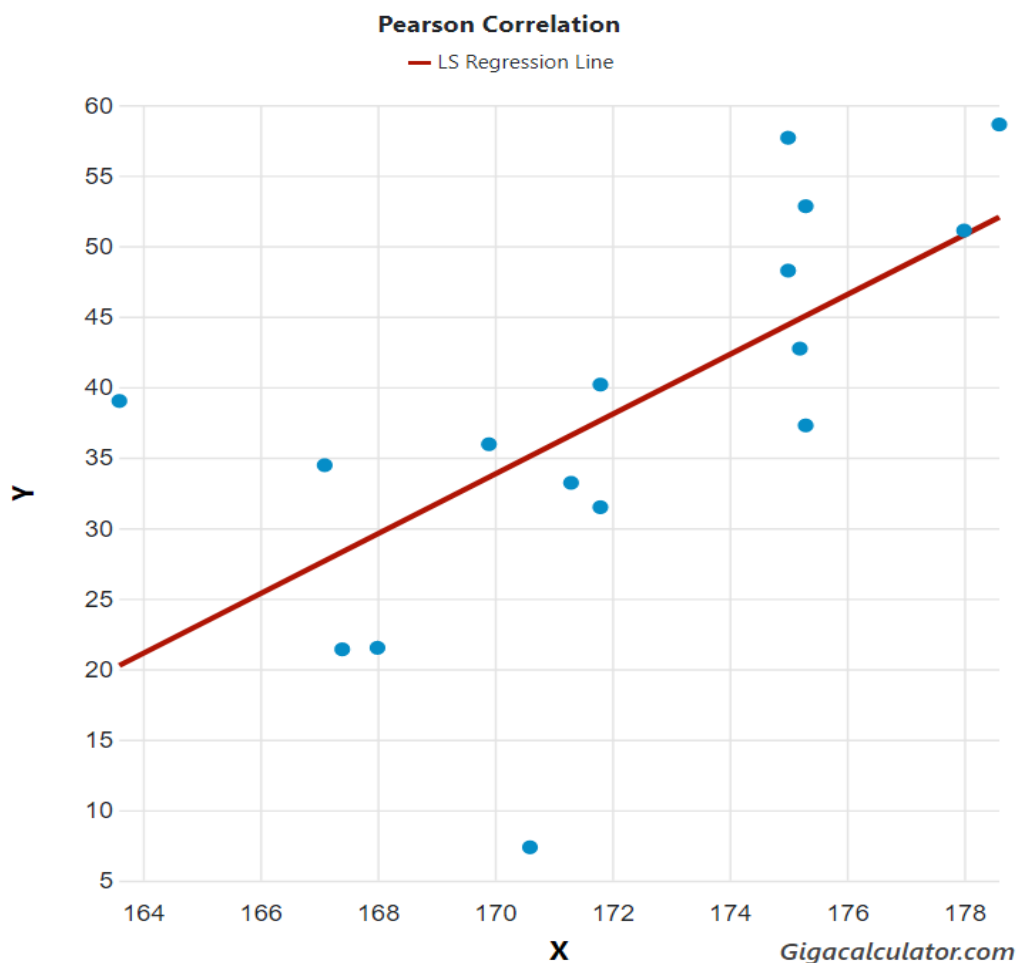
### MATERIALS AND METHODS

Average human height data for *Homo sapiens* Linnaeus, 1758 were obtained at [http://en.wikipedia.org/wiki/Average\\_human\\_height\\_by\\_country](http://en.wikipedia.org/wiki/Average_human_height_by_country). All cases including a 100% share of the population over 18 were selected. Latitudes and longitudes for countries were obtained at <http://www.google.co.za/maps>. Correlations between combinations of three factors (height, latitude, longitude) were constructed at <http://www.gigacalculator.com/calculators/correlation-coefficient-calculator.php>.

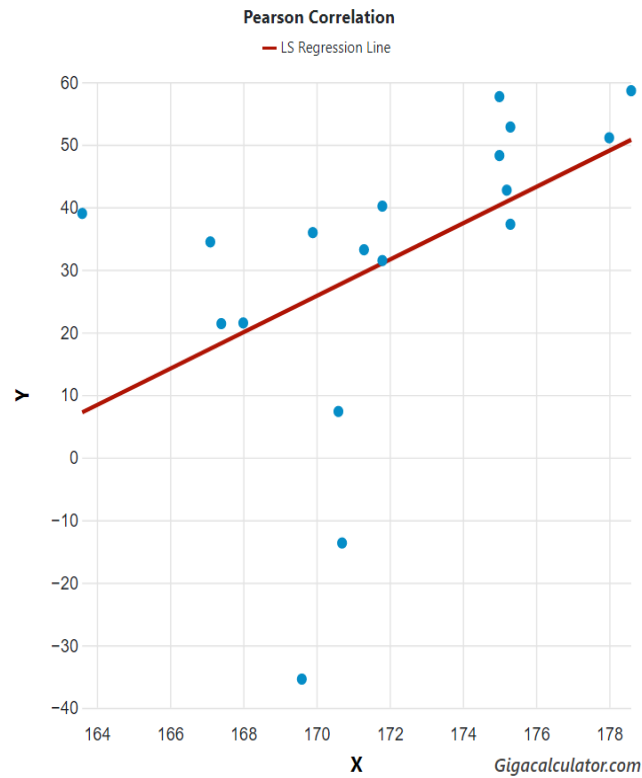
### RESULTS

I found no relationship between male height and latitude across all latitudes ( $r=0.30920613$ , Z score=1.27866949,  $n=19$ ,  $p=0.10050680$ ). I found a relationship between male height and northern latitudes across countries (Figure 1:  $r=0.64394007$ , Z score=2.75779975,  $n=16$ ,  $p=0.00290965$ ) ( $y = 2.11979343 \cdot x + -326.54474475$ ) and latitudes excluding Australia (Figure 2:  $r=0.47812782$ , Z score=2.01609869,  $n=18$ ,  $p=0.02189476$ ) ( $y = 2.90393869 \cdot x + -467.85892058$ ). Female height was marginally related to latitude ( $r=0.34597002$ , Z score=1.44343410,  $n=19$ ,  $p=0.07444915$ ) and was related to northern latitudes across countries independent of Australia (Figure 3:  $r=0.47632353$ , Z

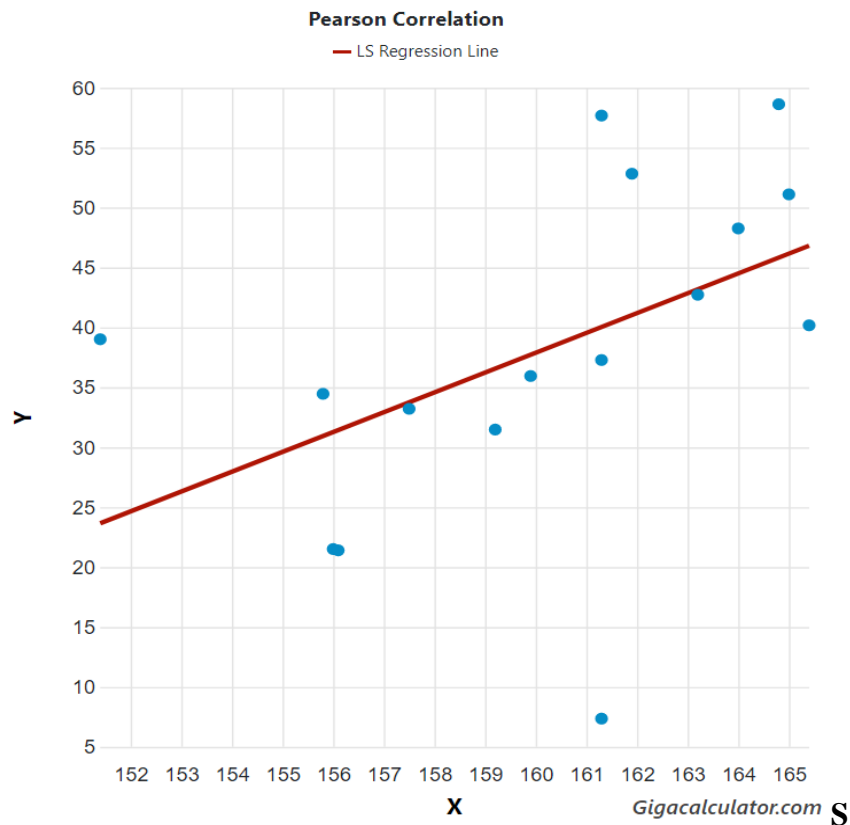
score=1.86846175, n=16, p=0.03084880) ( $y = 1.65435089 \cdot x + -226.80861962$ ). Male height was marginally related to eastern latitude ( $r=0.43546393$ , Z score=1.47558059, n=13, p=0.07002829) and negatively related to (eastern) longitude (Figure 4:  $r=-0.49098164$ , Z score=-1.69925927, n=13, p=0.04463514). Female height was marginally related to eastern latitude ( $r=0.42224562$ , Z score=1.42435863, n=13, p=0.07717139) and was negatively related to (eastern) longitude (Figure 5:  $r=-0.50223507$ , Z score=-1.74649654, n=13, p=0.04036231). Male height was not related to western latitude ( $r=0.59127369$ , Z score=0.96113084, n=5, p=0.16824318) or western longitude ( $r=0.48148507$ , Z score=0.74234295, n=5, p=0.22893971). Female height was not related to western latitude ( $r=0.53466919$ , Z score=0.84380576, n=5, p=0.19938893) or western longitude ( $r=-0.0715063$ , Z score=-0.10129814, n=5, p=0.45965684).



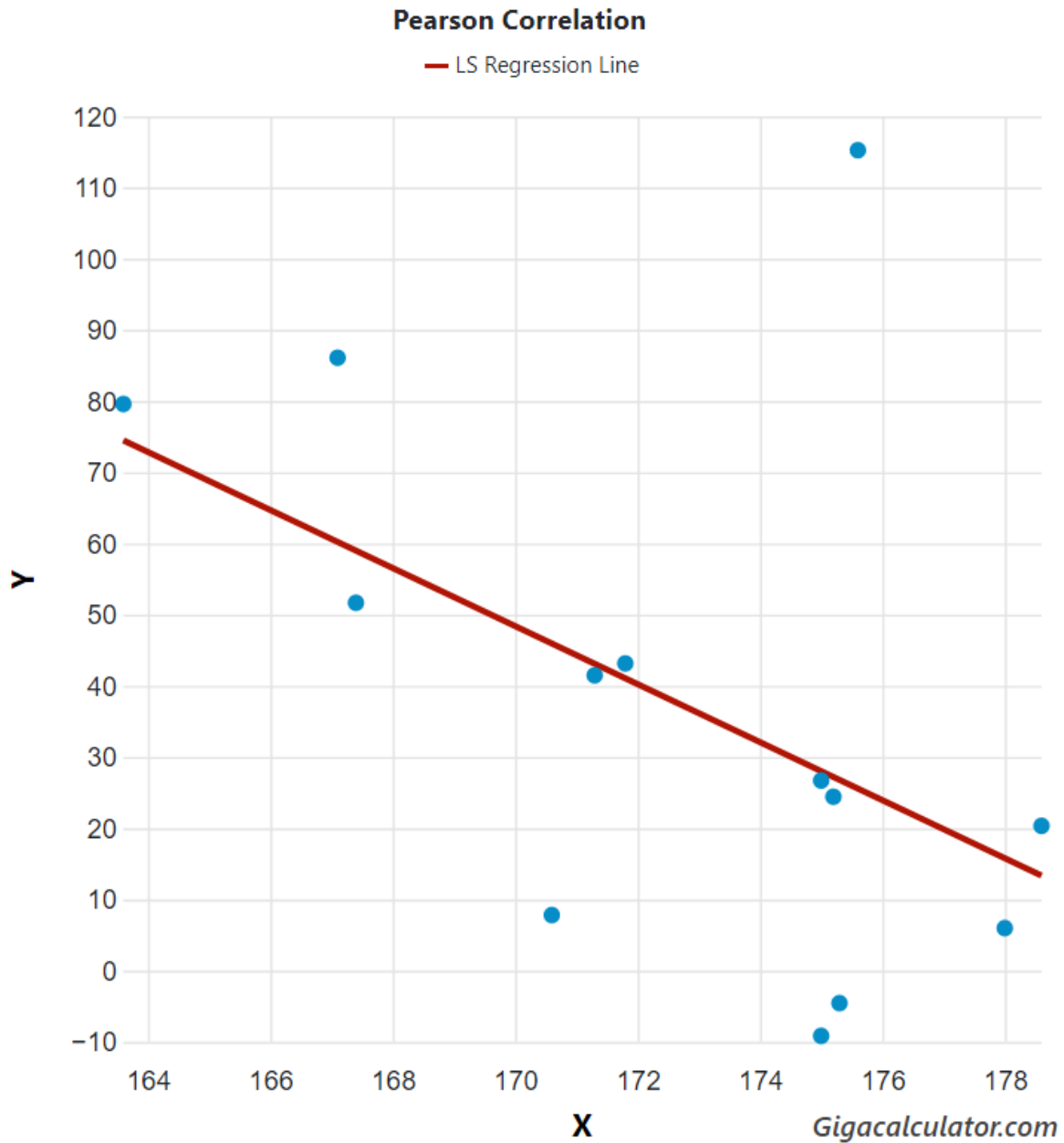
**Figure 1.** Relationship between male height and positive latitudes across countries in modern humans *Homo sapiens*.



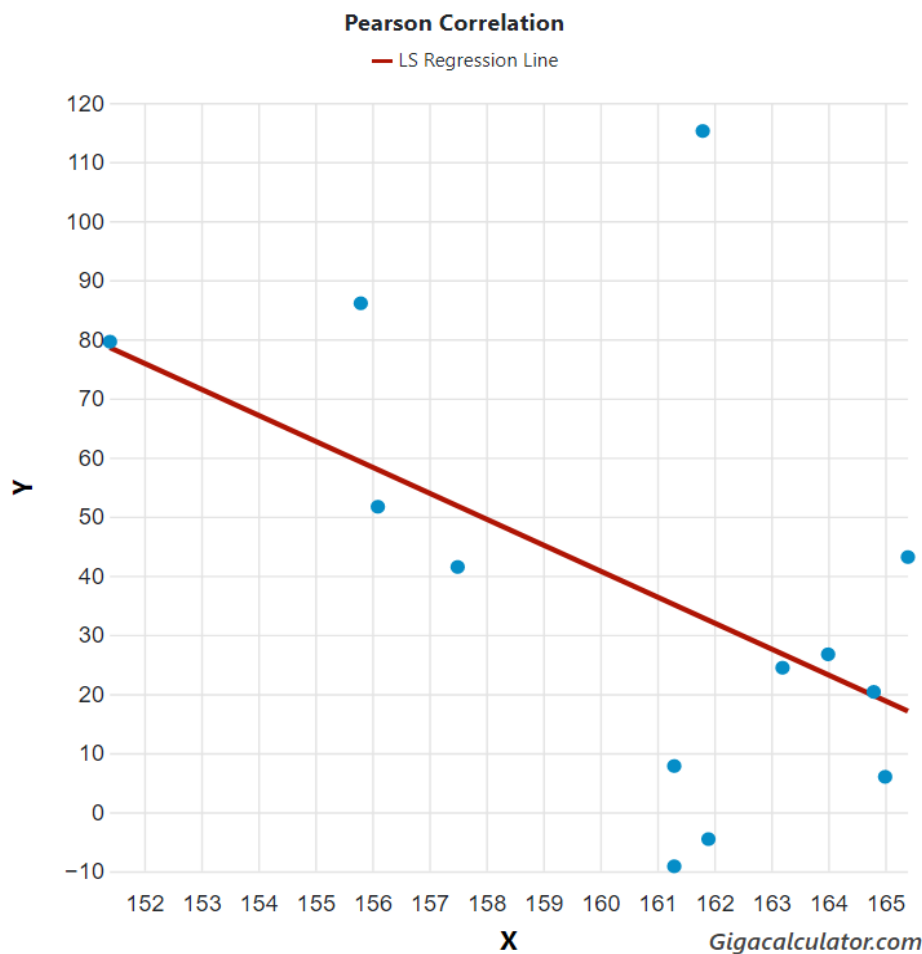
**Figure 2.** Relationship between male height and latitudes across countries excluding Australia in modern humans *Homo sapiens*.



**Figure 3.** Figure showing female height is related to positive latitudes across countries in modern humans *Homo sapiens*.



**Figure 4.** Figure showing male height related to eastern longitude across countries in modern humans *Homo sapiens*.



**Figure 5.** Figure showing female height related to eastern longitude across countries in modern humans *Homo sapiens*.

## DISCUSSION

Height data ranged from short males (and females) in Sri Lanka (163.6cm, 151.4cm) to tall males (and females) in Estonia (178.6cm, 164.8cm) (when Sexual Size Dimorphism = 1.08). Relationships between male and female height data and northern latitudes and eastern longitudes across countries were shown in this short paper. Both male and female heights are responsible for the positive trends across countries in northern latitudes and negative trends across countries in eastern longitudes. There is a relationship between male height and latitude excluding Australia. Female height was related to latitudes across countries independent of Australia. The positive relationships with latitude and the negative relationships with eastern longitude provide evidence for human mating preferences evolved for height may be modestly reflected in actual pairings variation with latitude and longitude (Stulp et al. 2013).

## REFERENCES

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