Human Assortative Mating for Height: Non-Linearity and Heteroscedasticity

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> "I see nothing to admire so much in those dimin-
> itive women; they look silly by the side o' the men
> - out o' proportion. When I chose my wife, I chose
> her the right size - neither too little nor too big."
> George Eliot, The Mill on the Floss

ABSTRACT

factors. In this paper we access human assortative mating by re-analyzing data collected by the National Child Development Study (NCDS) (Butler and Bonham, 1963; Davie et al, 1972; Fogelman, 1976)

The NCDS commenced as the Perinatal Mortality Survey and involved every child born in the Britain during one week of March, 1958. These children were subsequently followed up at ages 7, 11 and 16. In this analysis we will concern ourselves with the 11 year old follow-up. The mother of each child was asked, amongst a large number of other questions, to give her own height and that of her husband. Since measure-
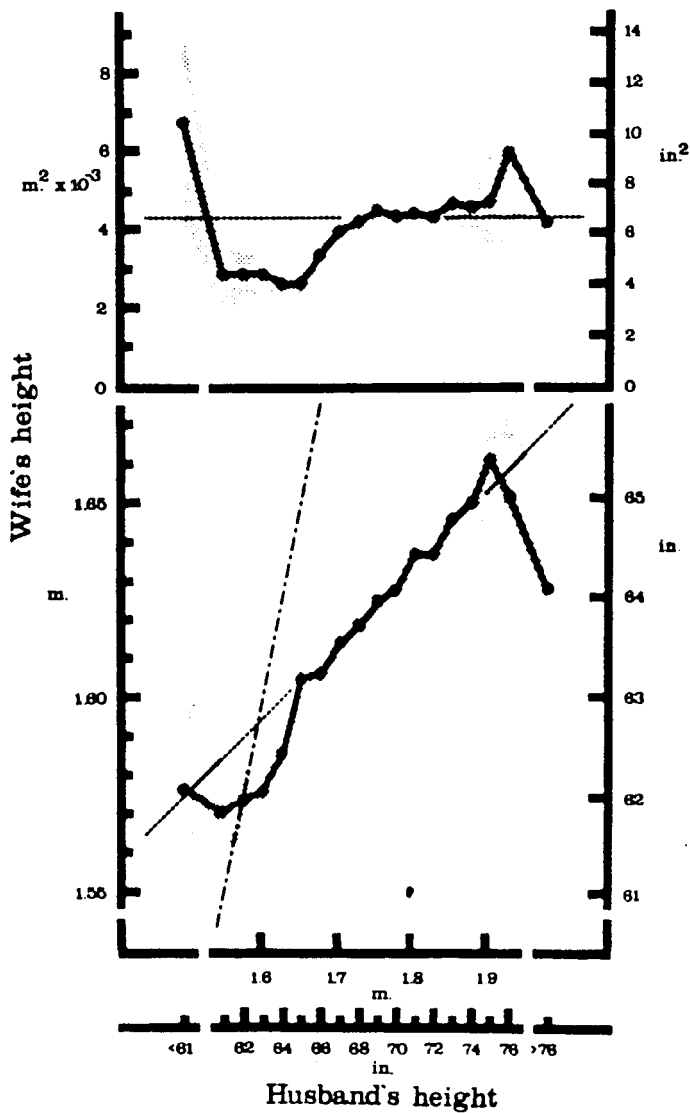
1. Shows the wife's height as a function of the husband's height (as given to the nearest inch). The lower portion of the figure shows the mean height of the wife for a particular husband's height (in meters on the left ordinate and inches on the right ordinate) and the upper portion shows the variance of the wife's height for a
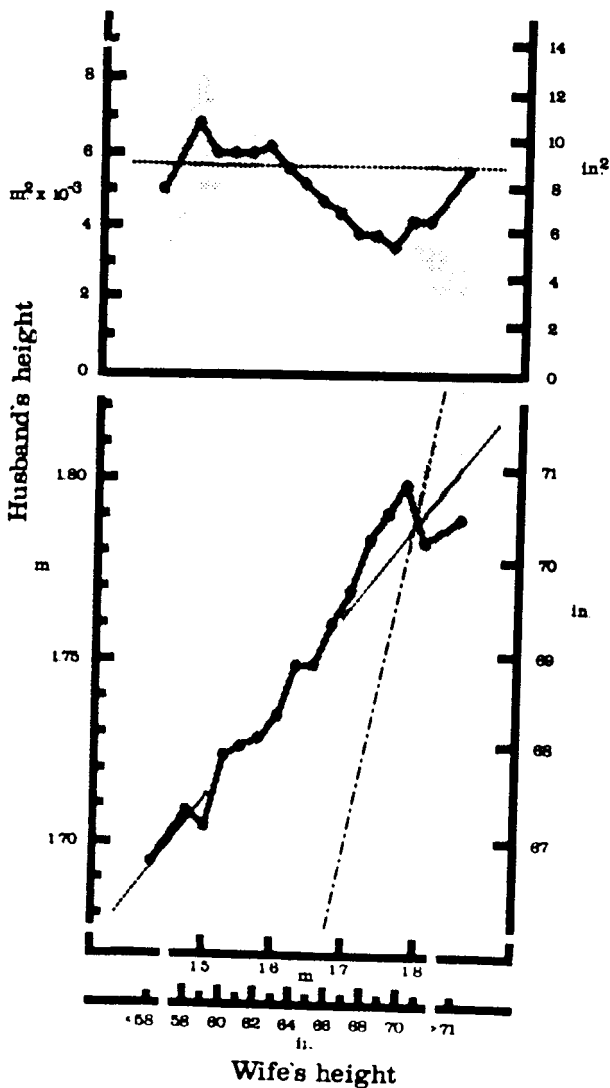
FIG. 2. Shows the husband's height as a function of the wife's height. Conventions as for Figure 1. The expected values are for a bivariate normal distribution based on the values for a wife's height in the range 58 to 65 inches.

ionship between husband's height and wife's height is non-linear (test for

non-linearity of mean $p < 0.001$ for Figure 1; $p = 0.0023$ for Figure 2). It may also be readily seen that the variance of wife's height is not independent of husband's height (Figure 1) (Bartlett's test $\chi^2 = 183.23$ 15 df, $p < 0.001$), and the variance of husband's height is not independent of wife's height (Figure 2) ($\chi^2 = 179.65$, 13 df, $p < 0.001$): in both cases the two extreme groups have been omitted from the calculation (since they are not homogenous as their ranges are undefined). In the case of wife's height (Figure 1), there is no significant heterogeneity of variance between husband's heights of 1.55 and 1.65 meters ($\chi^2(4) = 1.97$) or husband's

shown by reduction of husband's height below the expected value, and
some evidence for negative assortative mating (i.e. a regression line with

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