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Anthropometry of Love
Height and Gender Asymmetries in Interethnic Marriages

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Abstract

Both in the UK and in the US, we observe puzzling gender asymmetries in the propensity to outmarry: Black men are more likely to have white spouses than Black women, but the opposite is true for Chinese: Chinese men are half less likely to be married to a White person than Chinese women. We argue that differences in height distributions, combined with a simple preference for the husband to be taller than the wife, can help explain these ethnic-specific gender asymmetries. Blacks are taller than Asians, and we argue that this significantly affects their marriage prospects with whites. We provide empirical support for this hypothesis using data from the Millennium Cohort Study. Specifically, we find that ethnic differences in propensity to intermarry with Whites shrink when we control for the proportion of suitable partners with respect to height.

Keywords: Intermarriage, gender, height
JEL codes: J12, J15

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1 Introduction

Ethnic diversity has become an important and prominent feature of modern Western societies. Yet, the growing diversity has found so far only limited reflection in the areas of intimacy and marriage. Even in melting-pot countries such as the US, and the UK, despite their increasing ethnic heterogeneity, the vast majority of people have spouses who belong to the same ethnic group.

Interethnic marriages are not only rare but, where they do occur, they exhibit rather puzzling ethnic-specific gender asymmetries. In both the UK and the US, Black women are less likely to have a White spouse than Black men while the pattern is reversed for East-Asians, in particular the Chinese.[1] Specifically, Black Caribbean men in the UK are twice more likely than Black Caribbean women to have a White spouse. On the other hand, the pattern is reversed for the Chinese: men are half as likely as Chinese women to have a White spouse. A very similar pattern is observed in the US as well: Black men and Asian women are two to three times more likely to have a White spouse than their counterparts of the opposite gender.[2] Despite extensive work elaborating theories of marriage since the seminal contributions of Merton (1941) and Becker (1973, 1974), these asymmetries in intermarriage remain little understood (Fryer, 2007; Wong, 2003; Jacobs and Labov, 2002).[3] This is surprising given the well-documented roles of other attributes such as age and social status.[4]

We propose a new explanation of the observed ethnic-specific gender asymmetries in intermarriage: a preference for hypergamy with respect to height, that is, a norm requiring the husband to be taller than his wife.[5] Adherence to this norm is remarkably strong across

[1] This seems to apply not only to marriages but also to dating and sexual intimacy: Sailer (1997) observes that white women are more likely to say that their last sexual partner was black than white men.

[2] These figures are based on the UK 2001 and US 2006 censuses, respectively. More detailed figures, also for other ethnic groups, are reported in the next section.

[3] In contrast, evolutionary biology tends to be concerned with conditions under which racial homogamy is optimal (Thiessen and Gregg, 1980; Bereczkei et al., 2002; Bateson, 1983). Averett, Sikora and Argys (2008) and Oreffice and Quintana-Domeque (2010), on the other hand, explore the impact of weight (measured by the body-mass index, or BMI) on marriage.

[4] Mailath and Postleiwaite (2006) and Saint-Paul (2008), for example, formulate models that consider wealth and socio-economic status.

[5] *Hypergamy* typically refers to the practice of marrying someone of a higher socio-economic status or caste. We use this term more generally, as marrying someone with a higher value of any attribute of interest.

both genders as well as across ethnic groups: Higgins et al. (2002), in a survey of university students in the UK and China, find that students in both countries report a strong preference for being in a relationship where the husband is taller than the wife; this preference appears especially strong among female students.[6] Similarly, hypergamous preferences with respect to height were observed in studies based on data from dating websites and speed-dating sessions (Vaillant and Harrant, 2008, and Belot and Francesconi, 2006).

A crucial element of our explanation is the fact that height varies with ethnicity whereas it is positively correlated across genders within the same ethnicity (the latter holds also for the distribution of other observable characteristics, including socio-economic ones). Hence, men and women from the same ethnic group occupy similar relative position within the distribution of height among Whites. If members of a particular ethnic group are on average taller than Whites, and the hypergamous norm is shared by all ethnic groups, then men of the taller group face a larger share of suitable partners among the White population than women of the same group (a similar norm can also prevail with respect to other characteristics such as education). The opposite holds for ethnic groups whose members tend to be shorter than Whites. For example, Black people are taller than Asians so that their height distribution is closer to that of Whites. Hypergamous preferences with respect to height predict that Black men should fare better on the White marriage market than Asian men. For women, the reverse is true and, correspondingly, Asian women should do better on the White marriage market than Black women.

Evolutionary anthropologists, psychologists and biologists have long recognized the relevance of height in the marriage market due to its correlation with reproductive success and parenting capacity.[7] Taller men marry earlier (Herpin, 2005) and have more attractive and better educated wives (Oreffice and Quintana-Domeque, 2010). Taller men and women of intermediate height tend to have the best health outcomes (Buunk et al., 2008). Height brings about the benefits of greater life satisfaction, enjoyment and happiness and is associated with

[6] The survey also reveals a similar, though weaker, preference in both countries for the husband to be older than, and at least as, educated as the wife.

[7] In addition, such a norm may have evolutionalry origins whereby females sought safety provided by bigger and stronger mates. We are grateful to John Komlos for proposing this explanation.

less pain, sadness, worry, stress or anger (Deaton and Arora, 2009), better education, earnings as well as better social skills (Persico et al., 2004), and better careers (Herpin, 2005). Case and Paxton (2008) confirm that the economic benefits of height apply to women as well as to men.[8] Yet, while taller women – like men – share such better psychological and socio-economic outcomes, Buunk et al. show that they tend to have worse health and are in turn seen as less attractive compared to women of intermediate height.[9]

The norm of hypergamy that we propose implies that a person's marriage-market success depends on his/her height as well as on the distribution of heights of potential spouses. This is why intermarriage rates may vary across ethnic groups. An ethnic-minority man's desirability depends on the share of women who are shorter than him. The opposite reasoning applies to women: her attractiveness depends on the share of potential spouses who are taller than her. Traditional models of marriage and sorting seek to explain gender-specific asymmetries in intermarriage by introducing ethnic and gender-specific elements in the utility of marrying.[10] What we do here is propose a reduced-form approach to address these specific elements. The goal of our study is to investigate to what extent such a norm – defined not only with respect to height but also considering other socioeconomic attributes such as education – helps explain the observed patterns of intermarriage. While we use data from the UK, as the norm appears to be espoused across all ethnic groups, it is likely to be at work in the US and in other ethnically-heterogenous countries.

Observing hypergamy with respect to height, however, need not imply that preferences are hypergamous. In particular, since men are on average taller than women, in equilibrium, most relationships will appear hypergamous.[11] However, the evidence discussed above clearly suggests that both men and women derive a disutility from a relationship where the spouses

[8] Case and Paxton argue that the benefits of height are due to the better cognitive ability of taller men and women, which in turn is due to better nutrition and health care during early childhood.

[9] To the extent that marrying across the racial line might entail more uncertainty, it could be that people who are more willing to take risks might be more likely to intermarry. Dohmen et al. (2010) find that taller people are more willing to take risks and thus this could also be a mechanism linking height and the probability of intermarrying.

[10] Dagsvik (2000) is an example of general theoretical model that allows for the possibility of hypergamous preferences.

[11] We are grateful to an anonymous referee for making this point.

are mismatched on height (i.e. the woman is taller). Herpin (2005) even posits that such mismatched couples are subject to ridicule and other social sanctions. Nevertheless, we will consider this possibility explicitly in our analysis.

We start by presenting descriptive evidence based on the UK Census 2001 and the UK Labour Force Survey in Section 2. We find that Asian men in exogamous relationships have more favorable socioeconomic attributes than endogamous individuals of the same ethnicity while the opposite is true for Black men. A similar disparity appears also for ethnic-minority women. Asian women. furthermore, tend to attract White husbands with relatively favorable socio-economic attributes, unlike Black Caribbean women. These findings point at an asymmetry beyond standard socioeconomic characteristics determining the relative attractiveness of men and women of these different ethnic groups. We argue that height could be the missing attribute underlying this asymmetry. In Section 3, we investigate empirically the extent to which a norm dictating hypergamy can explain the observed ethnic-specific gender asymmetries. We use data from the Millennium Cohort Survey (MCS), which includes detailed individual information on socioeconomic characteristics including, importantly, height. The respondents in the survey are the parents of babies born in the year 2000, so the data by construction capture a sample of relatively long-term relationships. We explicitly consider preference for hypergamy with respect to two attributes: height and education. We show that hypergamous preferences do a much better job at explaining gender asymmetries when defined with respect to height than education. However, they do not explain the pattern of intermarriage entirely: gender-specific asymmetries in intermarriage remain significant – although diminished – after controlling for hypergamous preferences. Nevertheless, our results highlight the importance of investigating the role of other attributes, besides the "traditional" socioeconomic attributes. Finally we conclude in Section 4.

2 Interethnic marriages in the UK

2.1 Descriptive statistics using census data

Interethnic marriages are generally a rare occurrence. Despite the increasing heterogeneity of modern Western societies such as the UK, endogamy is still the rule[12]. According to the UK 2001 census (Tables 1 presents the figures for men while Table 2 reports them for women), 97 percent of White British men and women had a spouse of the same ethnicity. The share of endogamous marriages is even higher, 98 percent, if White British and White Irish are counted as a single group and 99 percent if all Whites are taken together.

Among ethnic minorities, endogamy is the predominant pattern too, especially among South-Asians (Tables 1-2).[13] However, we observe striking gender-specific differences. In particular, Chinese women are much more likely than Chinese men to intermarry with Whites: 23 percent of Chinese women in the UK have a White British spouse, compared to 9 percent of Chinese men. Hence, a Chinese woman is more than twice as likely to marry a White person than a Chinese man. The opposite pattern prevails among Black Caribbeans, although the differences are somewhat less dramatic: 22 percent of men have a White spouse, as opposed to 15 percent of women.[14]

Insert Tables 1-2 about here.

The different intermarriage rates described above could be driven by differences in either gender composition or socioeconomic characteristics. For example, if for some reason more East Asian women than men migrated to the UK, then this might explain their higher propensity to intermarry: there would simply not be enough East Asian men for them to marry in the

[12] This holds not only for interethnic marriage but, as documented by Bisin et al. (2004), also for religious intermarriage.

[13] Note that certain ethnic labels can have different meaning in the UK and US: for example, Asians in the US are typically of East Asian ancestry whereas in the UK this label is given to those of South Asian extraction. Therefore, where confusion is likely, especially in the UK context, we distinguish between East Asians and South Asians rather than refer to both groups collectively as Asians. Similarly, UK statistics tend to distinguish those of Black Caribbean ancenstry from Black Africans; we retain this distinction.

[14] The patterns of intermarriage observed in the US are similar: most Whites (98 percent) live in endogamous marriages, 7 percent of Black men have White spouses compared with 3 percent of Black women and 17 percent of Asian women do so as opposed to 6 percent of Asian men.

UK. Table 3 addresses this possibility. The gender composition of the different ethnic groups varies substantially. Among White Brits (considering only those aged 16 and over), women outnumber men by 8 percent.[15] The female/male ratio is much higher among the Black groups, especially Black Caribbeans and other Blacks, with 1.20 woman per man. On the other hand, the populations of Pakistanis, Bangladeshis and especially other Asians have an excess of males. The Chinese, finally, differ little from the Whites in their female/male ratio.[16] Educational endowments also differ considerably across the various ethnic groups. Among non-Whites, Chinese and Indians have the highest educational attainments, while Pakistanis, Bangladeshis and Black Caribbeans are at the bottom of the distribution. Importantly, there is a clear correlation in educational attainments across genders within the same ethnicity. It is worth noting that Black Caribbeans are the only ethnicity for which women are more educated than men.

Insert Table 3 about here.

Given that there is an excess of Black Caribbean women who also tend to be better educated than Caribbean men, we might expect them to intermarry more often than Black Caribbean men. Given the positive value attributed to education in marriage-market theories (Merton, 1941; Becker, 1973, 1974), we should also expect the Indian and Chinese intermarriage rates to be relatively high for both genders because of their high educational attainments. The actual pattern for Black Caribbeans and the Chinese, however, seem to defy both the conventional wisdom and the theoretical predictions.

To help illuminate these puzzles and motivate our own explanation, the last two columns of Table 3 add data on average height by ethnicity and gender. Black males are essentially as tall as White men and Black women are slightly taller than White women. The Chinese, Indians,

[15] This *excess* of women is the natural consequence of longer life expectancy of women. We consider all ages above 16 even though most marriages are formed at young to intermediate age because we are interested in the stock of marriages rather than the inflow into marriage.

[16] These differences in female/male ratios are likely to be mainly due to the nature of immigration. In addition, cultural norms may have contributed to it, for instance, if a particular ethnicity tends to favor either boys or girls in terms of health care and nutrition. However, although they are interesting, explaining these differences is beyond the scope of our paper.

Pakistanis and especially Bangladeshis, in contrast, are relatively short. Again, there is a clear correlation in the distribution of height within ethnic groups and across genders. Given the revealed preferences of men and women concerning their partner's height, anthropometric characteristics therefore promise to be a crucial element of any attempt to make sense of the observed patterns of interethnic marriage.

2.2 Analysis of intermarriage using the LFS

We now turn to documenting the patterns of inter-ethnic marriage in the UK more precisely using the Labour Force Survey (LFS) household data sets. These are produced each spring and autumn from the corresponding quarter's individual-level LFS data.[17] We use two quarters per year from 2002 up to 2007 (last quarter of 2007 included). In total, therefore, we have 12 quarters. Typically, households will be kept in the survey for five consecutive quarters. We use only the most recent wave for households appearing more than once. The LFS includes important information on socioeconomic characteristics of respondents, such as their education and occupation. There is no information on anthropometric characteristics, however.

We use the variable *ethcen15*, distinguishing 15 different ethnicities. We group some ethnicities together because we presume they are ethnically/culturally close to each other and because some groups are numerically too small to be analyzed on their own. In particular, we pool "Whites" with "Other Whites" and "Black Caribbeans" with "Other Blacks". We define as exogamous any relationship where there is no common ethnic background. Hence, those reporting mixed ancestry, such as "White and Black African", will be coded as endogamous if they are coupled either with a White or Black African person. Since the vast majority of inter-ethnic marriages in the UK involve a minority person marrying a White person, we exclude all exogamous relationships in which neither of the spouses is White; the number of such relationships is too small to involve them in a meaningful analysis.

Table 4 shows the frequency of exogamous relationships by ethnicity and gender, reporting both the percentages and numbers of observations for each category. We include all relationships where the couples live together, whether as spouses or as cohabitees (in the latter case,

[17] A more detailed description of the LFS is available at http://www.statistics.gov.uk/STATBASE/Source.asp?vlnk=358&More=Y.

we keep only those who report they are living together as a couple).We find a pattern very similar to that observed in the census data. This is the case also when we only consider those who were born or grew up in the UK: exogamy rates are generally higher but their variation across ethnicities and genders is similar to the pattern observed in the larger sample. Hence, the ethnic-specific gender asymmetries do not seem to be driven predominantly by *imported* preferences and/or characteristics.

Insert Table 4 about here.

To get a deeper insight into the determinants of intermarriage, we now turn to investigating who is marrying whom. The exercise remains largely descriptive at this stage. We run logistic regressions where the dependent variable distinguishes whether the relationship is exogamous or not. The regressors are ethnicity dummies interacted with dummies for socioeconomic characteristics. The goal is to see whether those who intermarry with Whites are positively or negatively selected along socioeconomic attributes and age, as compared to endogamous individuals with the same ethnicity. We report separate estimates for each gender and ethnicity in Tables 5 and 6 (here we focus on the ethnic-minority individuals only and not on their White spouses; we consider the latter in the following paragraph). We find a striking pattern among men (Table 5). South and East-Asian and especially Chinese men are positively selected in terms of education (as indicated by the positive coefficients on having a university degree). In contrast, Black Caribbeans and Black Africans are not: exogamous Black Caribbeans are no more or less likely to be university educated than endogamous individuals and, in fact, Black Africans in exogamous relationships are significantly less likely to be university educated. Furthermore, exogamous Black Africans tend to be younger than endogamous individuals while the opposite is the case for the Chinese.[18] For women, there is similar positive selection on education among almost all groups, the most notable exception being Black Africans (Table 6). The positive selection appears strongest among Indian women. Finally, exogamous Chinese and other Asian women appear older than endogamous women.

[18] Note that age refers to age at the time of interview and therefore it cannot be used to ascertain whether endogamous and exogamous marriages tend to be concluded at different ages

Insert Tables 5-6 about here.

Next, we add the exogamous Whites into the analysis. We compute the differences between the characteristics of the ethnic-minority respondents and those of their White partners along three dimensions: education, occupation and age. In particular, we construct a discrete variable equal to 1 if the minority's endowment of a given attribute is higher to that of their White spouse, 0 if they are both equal and -1 if it is lower.[19] We regress this difference on the ethnicity dummies for each gender separately (with an ordered probit), controlling for the minority's characteristics. The results are reported in Table 7.[20] We find no systematic differences between the characteristics of White women and their ethnic-minority partners (columns denoted 'Men'). White male partners' characteristics differ, however, depending on whom they marry (columns denoted 'Women'). Indian, Chinese, other Asian and also Black African women tend to marry White men who are more educated than them whereas the reverse holds for Black Caribbean women (the reference category). And Black Caribbean women tend to be significantly younger than their White partners, more so than the women belonging to other ethnic minorities.

Insert Table 7 about here.

In summary, we find that interracial marriages involve mostly men and women who are more educated than endogamous individuals. This is broadly consistent with the standard Becker argument and with intermarriage being costly: only those ethnic-minority individuals with relatively attractive socio-economic characteristics tend to marry Whites and their spouses in turn have relatively high educational endowments. The main exceptions to this pattern are Black men, and White men who marry Black Caribbean women.

[19] Education and occupation are measured by categorical variables, whereby higher values indicate higher education or occupational skill level (using the 9 categories of the ISCO classification, where 1 is the lowest occupational skill level and 9 is the highest occupational skill level). Age is reported also as a categorical variable (age bands) rather than the actual value.

[20] The results are very similar (although less precisely estimated) when we include only the individuals who were born in the UK or arrived before the age of 16. The only significant difference is that we find Other Asian women to have a higher educational level than their white husband when we restrict the sample, while they have a lower educational level in the full sample.

3 Hypergamous preference norm and intermarriage: The Millennium Cohort Study

We now turn to the implications of a norm favoring hypergamy for the patterns of intermarriage. We propose a simple reduced-form approach to investigate whether this norm could possibly explain the observed patterns. More precisely, we compute the proportion of suitable partners among the Whites and among the individual's own ethnicity, respectively, given his/her own height and education. We consider these two attributes because of the survey evidence (Higgins et al., 2002, as cited above) concerning the preferences of men and women over their potential partners' characteristics. Accordingly, suitable partners are those who satisfy the condition that the male's attribute should be at least as high as the female's one. Suppose, for simplicity, that x is the only attribute that matters for selecting one's spouse. Denote by $F_j(x)$ the corresponding distribution function of x in the female population of ethnicity j and $G_j(x)$ the distribution function of x in the male population of ethnicity j. Denote by $F_k(x)$ and $G_k(x)$ the respective distributions of this attribute in the female and male populations of ethnicity k. Then, preference for hypergamy implies that the proportion of suitable mates of ethnicity j for a woman of attribute x_f is equal to: $(1-G_j(x_f))$ and the proportion of suitable mates of ethnicity j for a man with attribute x_m is $F_j(x_m)$.If we have individual information on x, we can thus calculate individual-specific shares of suitable partners.

Note that the following implications hold, conditional on the gender groups within a given ethnicity being of identical size:

- When $F_j(x)$ and $G_j(x)$ stochastically first-order dominate $F_k(x)$ and $G_k(x)$, respectively, the probability that groups j and k intermarry should be higher for females of ethnic group j than males of group k, while the reverse is true for group j.

- Among the populations with relatively low mean value of x (relative to Whites), the average value of x should be higher for those intermarrying with Whites than for those in homogamous marriages.

We base our analysis on the Millennium Cohort Study (MCS). This dataset is built around

a sample of some 18,000 babies born during the year 2000 (over-sampling ethnic minorities). The data include information on the parents of the babies: the main respondent and her partner (the main respondent is a woman in 99.9% of the cases).[21] We have data on 13,066 couples where ethnicity information for both the respondent and her partner is available and where at least one of the partners is White. Out of these, 414 couples are mixed involving a White person and a person belonging to another ethnicity (if we considered also mixed marriages where none of the partners is White, the number of mixed couples would increase to 560). 240 of these couples involve a White woman and a non-White man while 174 involve a White man and non-White woman.

We examine how well can we explain the ethnic-specific gender differences in the propensity to intermarry by hypergamous preference norms with respect to height or education. For each individual, we construct the proportion of suitable White partners and the proportion of suitable partners of their own ethnicity, assuming hypergamous preferences with respect to these two attributes. For height, we use information from the Health Survey for England (2004). The calculation for education is based on the actual distribution of educational attainment in the 2001 UK census.[22] Figures 1 and 2 show that these proportions indeed vary with height across ethnic groups and gender. Obviously the proportion of suitable White partners is identical for all individuals of a given height, irrespective of their ethnicity. Also, with increasing height, the proportion of suitable partners unambiguously falls for women and rises for men. What differs across groups is the proportion of suitable partners of their own ethnicity, conditional on height. A 1.7m tall Bangladeshi man will be seen as a suitable spouse by a much larger share of Bangladeshi women than a 1.7m tall Black Caribbean man to Black Caribbean

[21] Since the MCS is limited to parents of newly-born babies, it is not representative of the UK population as a whole. In particular, the sample is likely to be biased towards relatively long-term relationships and most respondents are young to middle aged.

[22] Fraction of suitable partners with respect to education is computed at the regional level (12 regions of the UK) while the corresponding fraction with respect to height is computed at the national level only due to lack of regional data. For the distribution of height, we assume a normal distribution, where the mean and standard deviation correspond to the sample statistics of the Health Survey for England of 2004. We have assumed that the distribution of height for the group "other asians" was identical to the distribution of height of Chinese. We are unable to include age because the data that we could use to construct measures of availability of suitable partners – the UK census, Health Survey for England or the Labour Force Survey – only feature relatively broad age categories.

women.

Insert Figures 1-2 about here.

As we discussed earlier, height is correlated with other attributes, such as health and socio-economic outcomes, which in turn can affect the probability of intermarrying directly. Therefore, it is important to keep in mind that the mechanism we put forward does not predict a monotonic relationship between height and intermarriage. An increase in height may increase or decrease the probability of intermarrying depending on whether the share of suitable partners increases more or less in the White group in comparison to one's own ethnic group. Also, while height is correlated with socio-economic outcomes in a similar manner for men and women (taller people generally do better economically), the hypergamous rule we propose affects men and women's marriage prospects in opposite ways: while taller men are predicted to have a larger share of suitable partners, taller women face a lower share of suitable partners.

We conduct the analysis from the perspective of ethnic minorities, since it is reasonable to assume that they face a binary choice: either they marry within their own group or they marry a white person. We do not consider intermarriages between two different ethnic minorities because they occur relatively rarely. The analysis would be more complicated from the perspective of Whites since they face multiple ethnic groups. All these ethnic groups offer different marriage prospects to a potential white spouse so that it is much more difficult to predict how these would affect the overall probability of intermarrying.

The baseline model is a probit model which relates the probability of intermarrying with Whites to ethnicity and gender dummies, their interaction terms and the share of one's own ethnic group in the UK. The ethnicity dummies and their interactions with gender capture all possible reasons why men and women from different ethnic groups may have different propensities to intermarry – including cultural and social norms determining attitudes towards intermarriage (and possible differences in these attitudes across genders), taboos, prejudices, etc. That is, these parameters measure the *unexplained* differences in the propensity to intermarry for each combination of gender and ethnicity relative to Black Caribbean men as the reference

category. This baseline regression is presented in column (1) of Table 8. The marginal effects of each dummy variable are calculated assuming all other dummy variables take the value of 0 while the ethnic share (a continuous variable) is assumed to be at its mean value.

The results confirm what we have found before. Black Caribbean men are more likely to marry Whites than men of other ethnicities: this is indicated by the negative coefficients for most of the other ethnic groups, as Black Caribbean men are the reference category. Black Caribbean women, in contrast, are substantially less likely to intermarry with Whites than either Black Caribbean men or women belonging to other ethnicities: the coefficient for 'female' is negative (with Black Caribbean men as the reference category, the negative and significant coefficient for *female* captures the lower propensity to intermarry for Black Caribbean women while the corresponding propensities for women of other ethnicities are measured by the remaining interaction variables, several of which are significantly positive). For both genders, the differences with respect to Chinese and other Asians are particularly large; note also that they go in opposite directions for men and women.

Next, we extend the baseline model to control for the shares of suitable partners with respect to height (column 2) and education (column 3). If these shares matter in determining marriage prospects, then we should see that the coefficient estimates of the ethnicity dummies and their interactions with gender move closer to 0, that is, we should see a reduction in the unexplained components of the propensities to intermarry with Whites. The results suggest that controlling for the share of suitable partners with respect to the education does not help explain intermarriage. In contrast, controlling for the proportions of suitable partners based on height makes an important difference. The ethnic/gender effects shrink when we include the proportion of suitable partners with respect to height whereas they remain almost identical when we control for suitable partners based on education. The fractions of suitable partners based on the height rule predict intermarriage in the direction we would expect: the larger the share of suitable White partners and the lower the share of suitable partners within one's own ethnicity, the higher the probability of intermarrying. On the other hand, both proportions of suitable partners based on education are insignificant. Hence, hypergamy with respect to

height is indeed an important determinant of the probability of intermarrying.

Insert Table 8 about here.

We should stress that this norm alone does not explain all of the variation in inter-ethnic marriage. The ethnic-specific gender asymmetries do not disappear entirely: the various dummies and interaction terms remain significant. For example, we find that South Asian women are less likely to intermarry with Whites than South Asian men, which goes against the predictions based on height since South Asians are shorter than Blacks. Clearly, there must be other mechanisms driving this gender difference than height alone.[23] Even for these groups, nevertheless, it does seem that height plays a role. For example, the interaction term for Pakistani women diminishes when we control for height, although Pakistani women continue to be, on average, less likely to intermarry with Whites than men.

Controlling for the hypergamous preference norm is different from simply preferring taller spouses (both male and female). As we mentioned earlier, height preference and hypergamous preference affect men and women differently: hypergamous preference introduces a non-monotonic relationship between height and the probability to intermarry. In principle, a pattern such as the one we observe (where men tend to be taller than their spouses) is consistent also with symmetric preferences (that is, whereby both men and women prefers taller spouses): since men are on average taller than women, in equilibrium, most relationships will appear hypergamous with respect to height. However, if this were the mechanism at work, we should expect that controlling for height would work even better than controlling for the proportion of suitable partners. To investigate this alternative explanation, in column (4) we present a regression where we control for height (together with education and occupation dummies). We find a positive relationship between height and the probability of intermarrying with Whites; this is not surprising given that Whites (along with Blacks) are the tallest ethnic group in the UK. However, the coefficients reflecting ethnicity and gender are not affected in the same way as when we control for the share of suitable partners based on height. On the one

[23] Cultural and religious norms are a likely candidate; however, considering these is beyond the scope of our paper.

hand, the dummies corresponding to different ethnicities for men become smaller. However, the opposite is true for women: ethnic effects become larger. This is because taller individuals are, all else equal, more likely to intermarry with Whites, which does not explain at all why East-Asian women (who are relatively short) are more likely to marry Whites. That is, what matters is not height per se, it is height in combination with the position within the height distributions of the White and one's own populations. Therefore, the hypergamous norm does better explaining differences across genders and ethnicities than this alternative mechanism.

Furthermore, as we pointed out above, members of ethnic minorities who intermarry should be taller than endogamous ethnic-minority individuals if the distribution of height first-order stochastically dominates the distribution of height among whites. That is, we should see that Asian men and women who intermarry are taller than those who do not. Therefore, the positive coefficient of height in column (4) of Table 8 is in line with the hypergamous norm. However, this coefficient could also capture other factors predicting intermarriage, such as health or socio-economic well-being. To get a further insight into this, we regress height on ethnicity indicators and a dummy variable distinguishing whether the respondent is in an exogamous relationship with a White person or not. These regressions are reported in Table 9: columns (1) and (3) report the estimates for men and women, respectively. On average (across all ethnic groups), exogamous men are taller by 1.3cm than endogamous men while for women the difference is even larger, 2.5cm. In columns (2) and (4), we add socioeconomic characteristics as additional controls. However, rather than diminishing the difference between endogamous and exogamous individuals, the positive selection on height appears just as pronounced or even stronger. Thus, we conclude that these results indeed provide convincing evidence that the hypergamous preference norm with respect to height is at work and that the results do not simply capture the effects of socio-economic attributes correlated with height.

Insert Table 9 about here.

4 Conclusion

We investigate the determinants of ethnic-specific gender asymmetries in intermarriage rates. Both in the UK and in the US, we observe a larger propensity to intermarry with Whites among Black men than among Black women while the reverse is true for Asians, in particular for the Chinese. We show that this pattern cannot be explained by socioeconomic attributes such as education or occupation. Using data from the Labour Force Survey for the period 2002-2007, we show that intermarriage occurs mainly among more educated people, except for Black men marrying White women and White men marrying Black Caribbean women. These results suggest that there are other factors besides socioeconomic characteristics that affect the relative success of the various ethnic groups in the White marriage market.

We show that a hypergamous-preference norm with respect to height, requiring the husband to be taller than the wife, helps explain these gender asymmetries. On average, Black people are taller than Asians and are of similar height to Whites. This implies that Black males should fare better in the White marriage market than East and South Asian men while the opposite should hold for Black and Asian women. We present empirical evidence in support of this hypothesis using data from the Millennium Cohort Study, which shows that the height preference rule is indeed a very good predictor of ethnic-minority individual's probability of intermarrying with Whites. In contrast, a similarly formulated preference rule based on education holds little explanatory power with respect to the patterns of inter-ethnic marriage.

We do not claim that height explains everything. The ethnic-specific gender asymmetries do not disappear entirely after we control for hypergamous preferences with respect to height. In particular, it is still the case that South Asian women are less likely to intermarry with Whites than South Asian men, and this goes against the predictions based on height. Thus, there are other mechanisms underlying these asymmetries and the puzzle is not entirely solved. We leave this unexplained part of the puzzle to further research.

Nevertheless, these results deepen our understanding of social and cultural integration of ethnic minorities in Western societies. Furthermore, they also point out a previously unrecognized implication of large immigration flows: they can potentially alter the sex ratio on the

marriage market – and in turn the bargaining power of the two genders – even if their gender composition is roughly balanced. For example, a large inflow of East Asian immigrants to the UK or the US will effectively increase the marriage-market opportunities, and the bargaining power, of White men relatively to White women, even if the influx is balanced with respect to genders.[24] And, rather ironically, the relaxation of laws or social norms against interethnic marriage[25] may implicitly increase the relative bargaining power of one gender in comparison to the other; and may even disadvantage some ethnic-minority individuals (in particular Black women) in the marriage market. It would be worthwhile to investigate what are the implications in terms of household behavior and distribution of resources within the household.

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[24] Future research will show whether the large influx of Polish and other Eastern European migrants to the UK will have also have an asymmetric effect on the UK marriage market.

[25] The most notable instance of this is the repeal of antimiscegenation laws in the US following the Supreme Court ruling on *Loving vs Virginia*.

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Table 1: Distribution of marriages by ethnicity: males (% of total marriages, UK, 2001)

	Male ethnicity							
Female ethnicity	White British	White Irish	Indian	Pakist.	Bangl.	Black Carib.	Black African	Chinese
White Brit.	96.58	56.15	4.53	3.47	2.06	22.13	10.11	9.07
White Irish	0.91	38.67	0.33	0.18	0.10	0.81	0.57	0.50
Indian	0.11	0.29	91.56	1.48	0.95	0.53	0.73	0.27
Pakist.	0.03	0.05	0.72	91.66	0.70	0.11	0.53	0.10
Bangl.	0.01	0.01	0.20	0.26	94.56	0.03	0.06	0.07
Bl. Carib.	0.10	0.24	0.11	0.07	0.05	67.53	4.53	0.10
Bl. African	0.05	0.16	0.11	0.20	0.08	1.62	76.31	0.04
Chinese	0.11	0.21	0.11	0.06	0.07	0.12	0.11	85.98
All	100	100	100	100	100	100	100	100

Source: Census UK, 2001

Table 2: Distribution of marriages by ethnicity: females (% of total marriages, UK, 2001)

	Female ethnicity							
Male ethnicity	White British	White Irish	Indian	Pakist.	Bangl.	Black Carib.	Black African	Chinese
White Brit.	97.20	57.69	4.24	1.95	1.31	15.30	9.51	22.81
White Irish	0.85	36.92	0.18	0.06	0.03	0.55	0.45	0.66
Indian	0.11	0.53	91.27	1.32	1.01	0.43	0.51	0.58
Pakist.	0.05	0.16	0.82	93.06	0.70	0.15	0.52	0.19
Bangl.	0.01	0.03	0.19	0.26	94.62	0.04	0.08	0.07
Bl. Carib.	0.16	0.37	0.15	0.06	0.04	74.63	2.22	0.19
Bl. African	0.06	0.21	0.17	0.22	0.07	3.94	82.11	0.13
Chinese	0.04	0.12	0.04	0.03	0.05	0.06	0.03	71.22
All	100	100	100	100	100	100	100	100

Census UK, 2001

Table 3 Basic statistics by ethnic groups and gender (UK, 2001/2004)

	Population aged 16 and above			University degree (%)		Mean height in cm (std dev)	
	M	F	F/M	M	F	M	F
British White	19,454,964	21,079,873	1.08	18.1	16.1	175.3 (7.3)	161.6 (6.8)
Irish White	305,187	345,474	1.13	23.4	25.0	174.2 (6.8)	161.4 (6.5)
Other White	562,356	664,530	1.18	19.7	21.8	n.a.	n.a.
Mixed	160,670	176,877	1.10	21.9	19.6	n.a.	n.a.
Indian	400,306	410,738	1.03	29.7	20.7	170.2 (7.0)	156.4 (6.3)
Pakistani	245,440	240,621	0.98	15.0	9.7	172.1 (7.9)	157.8 (6.1)
Bangladeshi	87,612	86,645	0.99	11.0	4.7	167.8 (7.2)	154.7 (6.2)
Other Asian	105,445	83,591	0.79	23.3	18.8	n.a.	n.a.
Black Caribbean	204,503	245,995	1.20	11.3	14.6	175.2 (7.4)	162.8 (6.7)
Black African	160,291	178,536	1.11	23.6	17.4	173.5 (6.9)	163.0 (6.5)
Other Black	27,510	32,914	1.20	13.9	16.3	n.a.	n.a.
Chinese	94,282	103,863	1.10	32.9	28.8	170.8 (7.4)	157.9 (6.0)
Any other	79,464	105,442	1.33	22.6	18.5	n.a.	n.a.
Source	UK Census 2001					Health Survey for England 2004	

Table 4: Frequency of mixed marriages (in all marriages)

	All		UK born or arrived before age 16	
	Men	Women	Men	Women
Indian	8.03%	8.09%	19.46%	20.18%
	235	237	87	110
Pakistani	4.80%	2.38%	10.46%	3.35%
	87	42	32	15
Bangladeshi	2.37%	1.28%	19.23%	8.97%
	15	8	5	7
Other Asian	17.65%	34.99%	65.12%	54.05%
	137	344	28	20
Black Caribbean and Other Blacks	39.14%	26.32%	55.16%	39.35%
	411	225	246	146
Black African	15.62%	10.55%	32.43%	15.29%
	144	92	36	13
Chinese	16.39%	37.80%	69.35%	75.34%
	80	248	43	55

Source : Labour Force Survey 2002-2007 (biannual).

Table 5: Probability of exogamous relationship with whites (men) - Logistic estimates

	Indians		Pakistani		Chinese		Other Asians		Black Car.		Black Afr.	
Higher educ.	-.02	(.34)	.79	(.53)	1.74	(.72)**	.43	(.45)	-.39	(.30)	-.31	(.36)
Univ. degree	.37*	(.20)	.81	(.36)**	1.34	(.44)***	.60	(.31)**	-.30	(.26)	-.86	(.30)***
Prof./manag.	.31	(.21)	-.27	(.36)	.49	(.45)	-.02	(.32)	-.19	(.22)	.44	(.30)
Skilled	.31	(.27)	.15	(.45)	.88	(.55)	-.01	(.37)	-.18	(.22)	-.15	(.32)
Age band	.05	(.05)	-.02	(.08)	.36	(.11)***	.06	(.07)	-.02	(.05)	-.13	(.08)*
Age arrival	-.05	(.01)***	-.03	(.02)	-.08	(.02)***	-.10	(.01)***	-.05	(.01)***	-.10	(.02)***
Born in UK	-.17	(.41)	.13	(.67)	-.76	(.88)	-1.40	(.83)	-.64	(.47)	-2.97	(.77)***
Constant	-2.04	(.65)***	-2.31	(.95)***	-3.91	(1.34)***	1.40	(.83)	1.19	(.72)	3.50	(.86)***
N. Obs.	2112		1358		355		566		711		689	

The dependent variable is a discrete variable equal to 1 if the spouse is White and 0 otherwise,
Standard errors are between brackets, *, **and *** denote 10%, 5% and 1% significance levels respectively

Table 6: Probability of exogamous relationship with whites (women) - Logistic estimates

	Indians		Pakistani		Chinese		Other Asians		Black Car.		Black Afr.	
Higher educ.	.50	(.28)			.15	(.30)	.93	(.39)**	.10	(.26)	-.06	(.39)
Univ. degree	1.13	(.19)***	.85*	(.46)	.48	(.23)**	.69	(.25)***	.64	(.24)**	-.10	(.36)
Prof/manag.	.62	(.22)***	1.79	(.55)***	.24	(.27)	.62	(.29)**	.07	(.26)	.40	(.41)
Skilled	.89	(.19)***	2.22	(.47)***	-.44	(.21)**	1.19	(.27)***	-.38	(.21)	.36	(.32)
Age bands	.08	(.05)	.10	(.11)	.09	(.04)**	.15	(.06)***	-.05	(.06)	.11	(.08)
Age arrival	-.06	(.01)***	-.05	(.02)**	-.01	(.01)	.00	(.01)	-.02	(.01)	-.05	(.02)**
Born in UK	-.85	(.37)**	-1.69	(.75)**	.21	(.53)	1.62	(.55)***	-.09	(.51)	-1.63	(.85)*
Constant	-2.14	(.57)***	-3.58	(1.08)	-.87	(.46)	-2.53	(.61)***	.01	(.74)	-1.19	(.82)
N. Obs.	2293		1416		750		509		636		699	

The dependent variable is a discrete variable equal to 1 if the spouse is White and 0 otherwise,
Standard errors are between brackets, *, **and *** denote 10%, 5% and 1% significance levels respectively

Table 7: Differences in characteristics between ethnic minorities and their white partners
Ordered probit regressions (all sample)

	Education differential				Occupation differential				Age differential			
	Men		Women		Men		Women		Men		Women	
Black Carib.	-	-	-	-	-	-	-	-	-	-	-	-
Indians	-.11	(.13)	-.25	(.12)**	-.05	(.16)	-.24	(.14)*	.13	(.12)	.20	(.12)**
Pakistani	.11	(.17)	-.09	(.22)	-.06	(.25)	.10	(.26)	.18	(.16)	.28	(.21)
Bangladeshi	-.32	(.41)	-.22	(.54)	-.10	(.49)	-.61	(.58)	.17	(.37)	-.49	(.49)
Chinese	.25	(.18)	-.53	(.12)***	-.18	(.21)	-.16	(.15)	-.11	(.17)	.38	(.12)***
Other Asians	-.02	(.14)	-.28	(.11)**	.15	(.18)	-.15	(.14)	-.01	(.14)	.35	(.11)***
Black Afr.	-.03	(.14)	-.33	(.17)*	.26	(.17)	.19	(.21)	-.05	(.13)	.81	(.17)***
N. Obs	776		995		538		669		795		1031	
Pseudo R-sqrd	.23		.25		.20		.10		.03		.05	

The dependent variable is a discrete variable equal to 1 if own characteristic is higher than the partner's, 0 if it is the same and -1 if it is lower. All regressions control for education dummies, age and occupational dummies, Standard errors are between brackets, *, **and *** denote 10%, 5% and 1% significance levels respectively

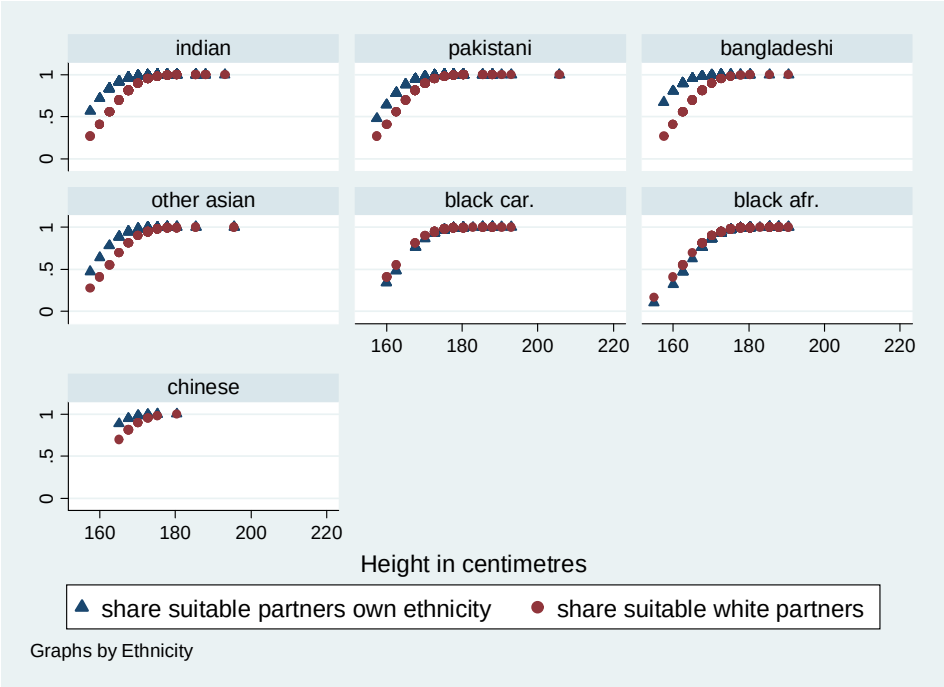

Figure 1: Share of suitable partners given individual's height: ethnic-minority men

Table 8: Determinants of the propensity to outmarry with a White person (probit estimates)

	Baseline		Hypergamy & height		Hypergamy & education		Baseline extended	
	(1)		(2)		(3)		(4)	
Black Caribbeans								
Indian	-.53	(.14)***	-.32	(.18)*	-.54	(.14)***	-.48	(.15)***
Pakistani	-.71	(.12)***	-.65	(.13)***	-.71	(.12)***	-.58	(.15)***
Bangladeshi	-.70	(.13)***	-51	(.22)**	-.70	(.13)***	-.58	(.15)***
Other Asian	-.72	(.12)***	-.68	(.13)***	-.73	(.12)***	-.59	(.15)***
Black Africans	-.14	(.24)	-.11	(.25)	-.16	(.25)	-.13	(.26)
Chinese	-.71	(.13)***	-.64	(.16)***	-.72	(.12)***	-.58	(.15)***
Female	-.18	(.04)***	-.17	(.05)***	-.18	(.04)***	-.13	(.09)
Indian x Female	.09	(.09)	-.05	(.12)	.10	(.09)	.12	(.11)
Pakistani x Female	.19	(.09)**	.09	(.11)	.19	(.11)*	.25	(.12)*
Bangladeshi x Female	.15	(.13)	-.09	(.19)	.14	(.17)	.18	(.17)
Other Asian x Female	.44	(.11)***	.33	(.13)**	.45	(.12)	.54	(.14)***
Black African x Female	-.21	(.20)	-.25	(.21)	-.19	(.20)	-.27	(.22)
Chinese x Female	.45	(.16)***	.34	(.17)**	.47	(.16)	.52	(.19)***
Share own ethnicity	-2.98	(1.75)***	-2.88	(.39)***	-2.99	(.39)***	-2.88	(.39)***
Height (in centimetres)							.003	(.001)***
Share suitable white partners (height)			.35	(.12)***				
Share suitable partners own ethnicity (height)			-.32	(.11)***				
Share suitable white partners (education)					.018	(.097)		
Share suitable partners own ethnicity (education)					-.007	(.118)		
N. obs.	1362		1362		1362		1362	
Pseudo R-squared	.23		.24		.23		.24	

The dependent variable is a discrete variable equal to 1 if the spouse is White and 0 otherwise, standard errors are between brackets, *, **and *** denote 10%, 5% and 1% significance levels respectively; column (4) controls for height, education and occupation dummies

Table 9: Height, ethnicity and intermarriage (cm)

	Men				Women			
	(1)		(2)		(3)		(4)	
Intermarry	1.32	(.81)	1.38	(.81)*	2.45	(.99)**	2.54	(.99)**
Black Caribbean	-		-		-			
Indian	-1.33	(.94)	-1.44	(.96)	-4.32	(.95)***	-4.98	(.97)***
Pakistani	-.39	(.97)	-.56	(1.01)	-3.34	(.97)***	-3.93	(1.01)***
Bangladeshi	-5.51	(1.13)***	-5.66	(1.15)***	-8.75	(1.14)***	-9.42	(1.19)***
Chinese	-3.70	(1.85)**	-3.86	(1.86)**	-4.35	(1.63)***	-4.85	(1.61)***
Other Asian	-2.46	(1.33)*	-2.28	(1.34)*	-4.86	(1.26)***	-5.25	(1.26)***
Black African	1.01	(1.08)	1.05	(.93)	1.60	(1.13)	1.13	(1.14)
Controls for age, education and occupation	No		Yes		No		Yes	
N	822		822		833		833	
R-squared	.07		.07		.13		.13	

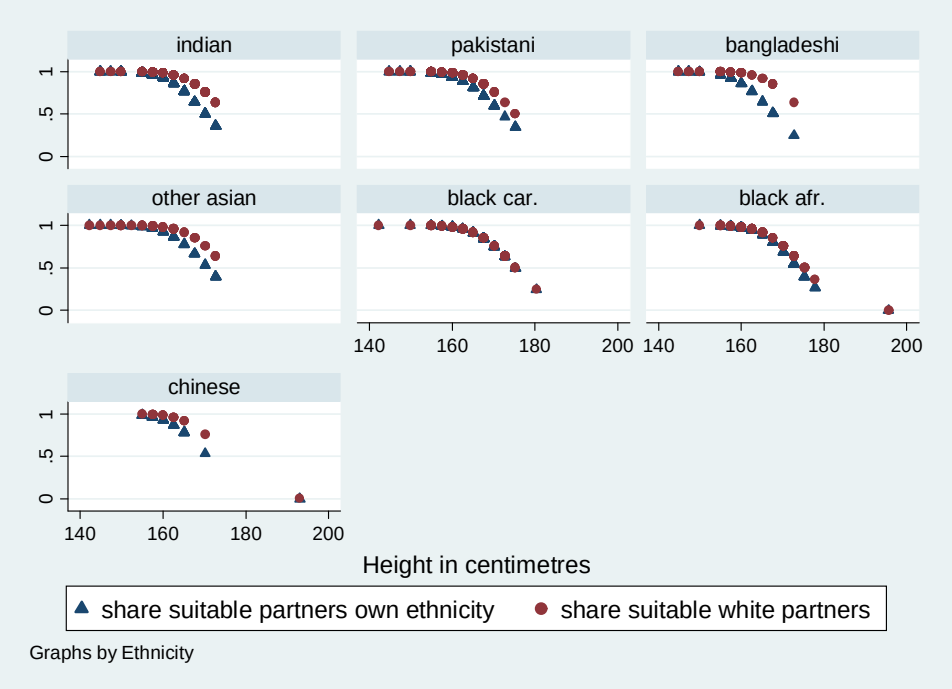

Figure 2: Share of suitable partners given individual's height: ethnic-minority women