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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 a taller husband, can partly 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 Millenium Cohort Study, which contains valuable and unique information on heights of married couples.

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Keywords: intermarriage, gender, height.

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1 Introduction

Ethnic diversity has become an important and readily apparent feature of modern Western societies, both because of continuing inflow of new immigrants and improved social and economic integration of existing minorities. Whites and members of other ethnic groups increasingly study and work side by side, socialize together and live in ethnically mixed neighborhoods. Yet, this integration does not extend equally into the area of intimacy and marriage: the vast majority of ethnic minority individuals in the UK and US, for example, have a partner or spouse who belongs to the same ethnic group. The share of mixed marriages is, correspondingly, rather low, far below the level that would arise if matching was purely random.

Interethnic marriages, moreover, exhibit puzzling ethnic-specific gender asymmetries. Both in 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 Chinese.¹ In the UK, Black Caribbean men are 50 percent more likely to have a White spouse than Black Caribbean women: 22 percent Black Caribbean men intermarry with Whites, compared to 15 percent of Black Caribbean women. On the other hand, Chinese men are only half as likely to have a White spouse as Chinese women: the rates of intermarriage with Whites are 9 percent for Chinese men and 17 percent for Chinese women. A very similar pattern is observed in the US as well: Black men and Asian women are more than two to three times more likely to have a White spouse than their counterparts of the opposite gender².

The incidence of interethnic marriage is the ultimate mark of successful social integration of minorities. A number of studies show that intermarriage has important implications for social mobility of ethnic minorities. Meng and Gregory (2005) and Meng and Meurs (2006), argue

¹Moreover, this seems to apply not only to marriages but also to sexual intimacy. Sailer (1997), for example, observes that white women are much more likely to mention that their last sexual partner was black than white men.

²These figures are based on the UK 2001 and US 2006 censuses, respectively. More detailed figures, also for other ethnic groups, are reported in Tables 1-4 below.

that immigrants who intermarry have higher earnings on average than endogamous immigrants. Wong (2003) finds that exogamous Black males enjoy an earnings premium of 12% over Black males in endogamous marriages (and their household income is higher by 7%).³ Van Ours and Veenman (2008) find that children from mixed marriages attain higher education. To this date, however, there is little understanding of the forces driving intermarriage. Fryer (2007) shows that the prevailing patterns of intermarriage across ethnicity and gender are hard to explain with the help of existing theories. For example, Merton's social exchange theory (1941) predicts that men and women from ethnic minorities who intermarry should have better socioeconomic characteristics than those who marry within their own ethnicity. However, the data show that Black men who intermarry tend to be *less* educated than those who intramarry and Black women are generally more educated than Black men yet is it the Black men who are more likely to intermarry with Whites. Wong (2003), similarly, finds that the low intermarriage rate of US Blacks can be attributed neither to differences in endowments (education and earnings) nor to limited opportunities for interactions between Whites and Blacks.⁴ Instead, she attributes nearly three quarters of Black males' marriage-rate gap to a mating taboo: cultural and social barriers that increases the subjective cost of intermarriage.

There is even less understanding of the forces that account for gender differences in intermarriage within the same race. Wong's concept of a mating taboo fails to explain why cultural norms, such as they are, apply less to Black males and East-Asian females than to their opposite genders. Gender specific differences are large and well known (and even found their reflection in art and popular culture), yet to the best of our knowledge, the reasons behind them are not well understood at all.

We identify a mechanism that helps explain the observed patterns of interethnic marriage

³While Wong does not discuss the issue of causality, Meng and Gregory and Meng and Meurs argue that their results are robust to the possible endogeneity of intermarriage. Kantarevic (2004), however, undermines their findings, arguing that the higher earnings of intermarried immigrants can be ascribed largely to self-selection of immigrants into intermarrying.

⁴Her estimates suggest that equalization of endowments would increase the intermarriage rate only marginally while ensuring equal meeting opportunities could in fact drive it down somewhat.

and especially the gender specific asymmetries in the propensity to intermarry: a simple preference for the husband to be taller than his wife. This preference is remarkably strong across both genders as well as across the various ethnic groups. Importantly, height varies with ethnicity: Black people are taller than Asians and their height distribution is closer to that of Whites. Because they are taller, Black men have better prospects on the White marriage market than Asian men. For women, the reverse is true and, correspondingly, Asian women should fare substantially better on the White marriage market than Black women.⁵

A norm such as this one, requiring the husband's attribute to be superior or equal to the female's attribute ("male superior norm"), offers a promising route to explain ethnic-specific gender asymmetries because the distributions of attributes - physical but also socioeconomic - tend to be positively correlated across genders within the same ethnicity. In other words, men and women from the same ethnic group tend to occupy similar relative position when compared with Whites. A "male-superior norm" with respect to a particular attribute - say height or education - combined with a positive correlation in attributes across gender could then generate differences in the propensity to outmarry between men and women of the same ethnic group. If an ethnic group is on average better endowed with this attribute than Whites, and there exists such a male-superior norm shared across all ethnic groups, then men of the better endowed group have a larger share of eligible partners among the White population than women of the same group. The opposite is, similarly, the case for ethnic groups whose average endowment falls short of that of Whites.

There is some evidence supporting the "male superior norm" with respect to height but also with respect to other dimensions such as age or education (see discussion in the next section). One could even argue that such "male-superior norm" may be more salient among ethnic minorities which frequently espouse more conservative (or traditional) sociocultural norms than the majority White population (especially in areas of marriage and intimacy). We investigate therefore to what extent such a norm - defined not only with respect to height but

⁵This hypothesis has actually been mentioned in the popular press (see Sailer, 1997).

also other socioeconomic attributes such as education - explains the patterns of intermarriage, using data for the UK.

We start by presenting descriptive evidence based on the UK Census 2001 and the Labour Force Survey. We find that Asian men in exogamous relationships tend to be positively selected along socioeconomic attributes, while Black men are negatively selected. Also, we find that Asian women tend to attract White husbands with favorable socioeconomic attributes, more so than 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.

We then investigate empirically the extent to which a male-superior norm along the educational and height dimensions explains the ethnic-specific gender asymmetries. We use data from the Millennium Cohort Survey (MCS), which includes detailed individual information on socioeconomic characteristics and - importantly - on height. The respondents in the survey are parents of babies born in the year 2000, so the data by construction capture a sample of relatively long-term relationships. We first calculate the proportion of acceptable partners corresponding to each ethnic group and gender, defined as the proportion of partners in the population (White and non-White) satisfying the male-superior norm along height on the one hand and education on the other hand. Then, we examine the extent to which these proportions of acceptable partners explain intermarriage. We show that the male superior norm does a much better job at explaining gender asymmetries when defined along the height dimension than along the education dimension. Height does not explain everything though, thus, the puzzle is not entirely solved. But these results point at the importance of investigating the role of other attributes, besides the "traditional" socioeconomic attributes.

The paper is organized as follows. We first review the literature in Section 2. Section 3 presents summary statistics on intermarriage in the UK and the US, as well as descriptive statistics of the ethnic groups in terms of population share and education distribution and

presents an empirical analysis based on the UK labour force survey. Section 4 discusses the implications of a male-superior norm for the patterns of intermarriage and investigate its importance using the Millennium Cohort Study. Finally we conclude in Section 5.

2 Theories of intermarriage

Interethnic marriages have been studied extensively in sociological literature and, more recently, in economics. The seminal theory in sociology is Merton's (1941) exchange theory.⁶ The basic idea is that marrying across the racial line is costly to Whites but brings benefits to the ethnic-minority individuals. This is so because Whites, being the majority, enjoy a higher social status. In turn, gender differences in outmarriage rates could come from different abilities of men and women from the same minority ethnic group to compensate for their "inferior" social status. Traditionally, Black men were in a better position to do so, by being more likely to be employed and by possessing higher education and/or skills. Women, on the other hand, used to be mostly out of the labour force (at least at the time he proposed his theory). This explanation, however, fails to explain why East-Asian men are less likely than East-Asian women to intermarry with Whites and why the gender asymmetry in the rates of intermarriage of Blacks persists despite increasing labor-force participation of women and despite Black women currently attaining higher education than Black men.

The economic theories of marriage go back to the seminal insights of Becker (1973, 1974). Becker models marriage as an equilibrium outcome in which the spouses maximize their well-being which, crucially, includes consumption of household or relationship specific goods that cannot be purchased in the market – such as love, companionship, producing and raising children and so on. In the original work, utility is perfectly transferable such that the equilibrium on the marriage market maximizes the aggregate marital output. A key issue in Becker's analysis is whether the spouses' inputs (or characteristics) are complements or substitutes. If they

⁶See the detailed discussion of Merton's exchange theory as well as some other explanations of interethnic marriage by Jacobs and Labov (2002).

are complements, then the market will generate positive sorting (marriage of ‘likes’), if they are substitutes, the market will generate negative sorting. In the context of ethnicity or race, one could argue that the inherent heterogeneity of mixed marriages may generate positive returns to the spouses and their children, for example, by equipping them with additional linguistic skills or by helping them integrate (as argued above). On the other hand, the cultural (and especially religious) and linguistic differences between the spouses may lower their utility from marriage and therefore may come at a cost.

The literature has also identified various systematic patterns in attitudes and preferences regarding traits of potential partners. Given that marriage is an equilibrium outcome, it is challenging to identify the preferences driving the equilibrium. A few recent papers have used actual choices in a dating setting to shed light on the mechanisms driving the choice of a partner (see Fisman et al., 2006, 2008, Hirtsch, Hortacsu and Ariely, 2006, 2008, and Belot and Francesconi, 2006). The evidence suggests that people prefer a partner of similar age, educational background, ethnicity and culture, and both men and women prefer the man to be taller than the woman. Fisman et al. (2006) find some support for the male-superior norm along the intelligence and ambition dimensions. They find that a man’s demand for intelligence and ambition does not extend to women who are more intelligent or ambitious than he is. In fact, a man is significantly less likely to accept a woman who is more ambitious than him. The male-superior norm also receives support in Higgins et al. (2002). They carried out surveys among university students in the UK and China on preferences with respect to age, education and height of one’s potential spouse. They find that both Chinese and UK students are much more likely to express preferences for a “husband taller than wife” and for a “husband older than wife”: 92 percent of Chinese female students and 78 percent of British females prefer a taller partner and 72 percent of Chinese women prefer him to be older compared to 44 percent for UK females. These preferences are also present among men, although to a lesser extent: 50 percent of Chinese males prefer their partner to be shorter and 45 want a younger partner, compared with 43 and 14 percent, respectively, of UK males. Along the education dimension,

most women prefer a husband who is at least as educated as themselves (this is true for 63% of British women and 71.6% of Chinese women) and Chinese men also have preference for a partner that is at most as educated as them (62.3%). Most British men are indifferent (50.6%), followed by those who prefer someone with the same education (40.2%) and only 7.9% have a preference for partner who with a higher level of education than theirs. These findings suggest that, first, the male-superior norm seems to be more present along the height dimension than the education dimension and, second, the norm is possibly more present among ethnic minorities than among British Whites.

One interesting question is why would there be such a height rule guiding mate choice. Evolutionary anthropologists and biologists have long recognized the relevance of height in the marriage market, because it is an attribute correlated with reproductive and parenting capacity. Buunk et al. (2008) cite evidence that taller men and women of intermediate height tend to have best health outcomes; they are also seen as most attractive by the opposite gender and, equally, arouse more jealousy among their own gender. Importantly, while women's preference for taller partners can be attributed to the desire to find a spouse with better earning power, men's preferences are more likely to be driven by the future spouse's health (and thus her childbearing potential) than her socioeconomic outcomes. This is important because height does translate into similar socioeconomic benefits and psychological benefits for both genders. Indeed, Deaton and Arora (2009) find that with increasing height, individuals experience greater life satisfaction, enjoyment and happiness and report feeling less pain, sadness, worry, stress or anger.⁷ To a large extent, these psychological benefits arise because taller men and women tend to have better education and earnings. Persico et al. (2004) find that taller people do earn higher wages, and find that the height premium is driven by teenage height. They attribute this height premium to the development of better social skills in teenage years. Herpin (2005) also finds that taller men in France have better careers (even after accounting

⁷Crucially, the negative effect of height on stress and anger only obtains when controlling for race and ethnicity.

for the positive relationship between height and educational attainment). Case and Paxton (2008) confirm this finding for US and UK men and show that it extends to women as well; besides better occupational outcomes, taller men and women also have higher earnings.⁸

Preferences of the "male superior" type also offer new theoretical challenges. The theoretical literature typically derives conditions under which patterns of marital sorting (positive or negative) arise in equilibrium, conditions related to the marital output production function and the nature of preferences (Becker, 1973, and Shimer and Smith (2000) for a generalization within a search-theoretical framework). To our knowledge, there are no theoretical models of marriage studying the implications of preferences of the type we have just described - where both men and women prefer a partnership where the male attribute is higher than the female attribute. This is surprising given the well-documented pattern of heterogamy occurring along many dimensions (such as age and social status), whereby one type of heterogamic relationship - the one where the male attribute is higher than the female attribute - is much more frequent than the reverse.

Finally, we should note that to date, there is very little work attempting to explain ethnic-specific gender asymmetries in intermarriage (although those are noted repeatedly in the literature). One exception is a paper by Jabobs and Labov (2002), who argue that war brides explain part of the gender asymmetry in intermarriage rates in the US: some of the East-Asian women married to Whites are the wives of ex-servicemen stationed in Japan and Korea. Once they control for this effect, the differences in intermarriage rates across ethnicity do indeed shrink. But they do not disappear, thus, the existence of war brides seems to be only part of the puzzle. Furthermore, war brides are likely to play little role in explaining the patterns of intermarriage in the UK.

⁸Case and Paxton argue that the positive benefits of height are due to the fact that tall men and women have better cognitive ability, which in turn is largely due to better nutrition and health care during early childhood.

3 Interethnic marriages in the UK and the US

3.1 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 largely the rule⁹. According to the UK 2001 census (see Tables 1-2), 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, similarly, endogamy is similarly the predominant pattern.¹⁰ This is especially the case for South-Asians, with between 91 and 95 percent of their marriages being endogamous.

For the remaining groups, we observe striking gender-specific differences in the propensity to intermarry. Black women are more likely to be in endogamous marriages than men: 75 and 82 percent of Black Caribbean and Black African women, respectively, have a spouse of the same ethnicity whereas the same holds only for 68 and 76 percent of Black Caribbean and Black African men. The opposite pattern prevails among Chinese: 71 percent of women have a Chinese husband, compared with 86 percent of men who have a Chinese wife. Exogamy figures illustrate the dramatic differences in propensities to marry out across genders even better: 23 percent of Chinese women in the UK have a White British husband, compared with 9 percent of Chinese men who have a White British wife. Hence, a Chinese woman is more than twice as likely to marry a White person than a Chinese man. The differences in exogamy for Black groups are less dramatic but still noteworthy. The rates of exogamous marriages with ethnic groups other than Whites are much smaller, except for Black Africans and Black Caribbeans marrying each other or other Blacks or Blacks marrying a person of

⁹This holds not only for interethnic marriage but, as documented by Bisin et al. (2004), also for religious intermarriage.

¹⁰Nevertheless, in the UK at present, ‘mixed race’ is the fastest-growing ethnic category, although this can be driven by the increased propensity of mixed-ancestry individuals to report their ethnicity as ‘mixed’ instead of choosing the ethnicity of one of the parents.

mixed White/Black ancestry (to conserve space, figures for mixed races and for other Blacks are not reported in Tables 1-2).

Besides South Asians displaying much lower rates of exogamous marriage, the pattern is different compared to the one found for Chinese: the proportion of exogamous men exceed the one observed for women. We will come back on this point later in the analysis.

US statistics are similar (see Tables 3-4). Again, most Whites, 98 percent, live in endogamous marriages. Black men and Asian women are more likely to intermarry with Whites than their ethnic counterparts of the opposite gender. Specifically, 96 percent of Black women have endogamous marriages compared with 92 percent of Black males, and 80 percent of Asian women versus 93 percent of Asian men. Again, the disparity is especially striking for Asians: with 17 percent of Asian women married to Whites, they are almost three times more likely than Asian males to intermarry with Whites.¹¹

The populations of the various ethnic groups in the UK differ not only in their relative weights within the British society but also in their composition and average socioeconomic characteristics, as Table 5 illustrates. The gender composition of the different ethnic groups varies substantially. Among White Brits, women outnumber men by 8 percent (considering only those aged 16 and over). The female/male ratio is much higher among the Black groups, especially for 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.

The various ethnic groups differ also with respect to their socioeconomic attributes such as education. Among non-Whites, Chinese and Indians have the highest educational attainment, while Pakistani, Bangladeshi and Black Caribbeans are at the bottom of the distribution. There is a notable difference between Black Africans and Black Caribbeans, the former being

¹¹Note that the same ethnic label 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.

twice more likely to hold a university degree than the latter (for males). It is notable, however, that there is a clear correlation in educational attainments across genders within the same ethnicity.

Based on these numbers, and in light of the theories put forward by Becker and Merton, we should expect Black Caribbean women to display a higher propensity to intermarry with Whites than their ethnic male counterparts: there is an excess of Black Caribbean women in the UK and they are also more educated on average than Black Caribbean men. We should similarly expect Indian, Pakistani and Bangladeshi men to marry out more often than women because of their numerical supremacy, while Indian and Chinese rates of exogamy should be relatively high for both genders because of their high educational attainments. The actual patterns of intermarriage, however, differ strikingly from these predictions. Blacks (and especially Black Caribbeans) and Chinese in particular seem to defy both conventional wisdom and predictions of theories formulated within sociology and economics.

To help explain these puzzles, the last two columns of Table 5 add data on average height by ethnic groups and gender. Black males are essentially as tall as White men and Black women are slightly taller than White women. The Chinese, Indians, Pakistanis and especially Bangladeshis, in contrast, are relatively short. Again, there is a clear correlation in the distribution of physical stature 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 our attempt to make sense of the observed patterns of interethnic marriage.

3.2 Analysis of intermarriage using the LFS

We can obtain further and more profound insights on the patterns of inter-ethnic marriage in the UK 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. The household data sets include a number of new derived variables at household and family unit level. 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 level and occupation. There is no information on anthropometric measures though.

We use the variable *ethcen15* for ethnicity. The LFS distinguishes 15 different ethnicities. We group some ethnicities together because we presume they are ethnically/culturally close and because there are few observations in some sub-groups. In particular, we pool "Whites" and "Other Whites" and "Black Caribbeans" and "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 with a Black African person. According to this definition, those with a mixed ethnicity can never be in an exogamous relationship with a White partner: the number of mixed race individuals who do not have White ancestry is negligible and therefore they are omitted from our analysis. Since we are interested in explaining ethnic-specific gender asymmetries in marriage rates with Whites in particular, we exclude all the other types of exogamous relationships. They represent a very small number of observations anyway.

Table 6 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, either as spouses or cohabittees (in the latter case, we keep only those who report they are living as a couple). We find a pattern very similar to that obtained with the census data. Notably, a very similar pattern appears also when looking only at 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.

To get a deeper insight into the determinants of intermarriage, we now turn to investigating who is marrying whom, still using the LFS data. The exercise remains largely descriptive at this stage. We present simple logistic regressions where the dependent variable distinguishes whether the relationship is exogamous or not and the regressors are ethnicity dummies interacted with dummies for socioeconomic characteristics. The goal is simply to see whether those who are in exogamous relationships are positively or negatively selected along socioeconomic attributes and age. We report separate estimates for each gender and ethnicity in Tables 7 and 8. We find a striking pattern among men. Both South and East-Asians, and especially Chinese, are all positively selected in terms of education. In contrast, Black Caribbeans and Black Africans are not; in fact, Black Africans in exogamous relationships are significantly less likely to be university educated than their endogamous counterparts. Furthermore, exogamous Black Caribbeans and Black Africans tend to be younger than endogamous individuals while the opposite is the case for the Chinese¹². For women, we find similar positive selection on education among almost all groups, the most notable exception being Black Africans. The positive selection appears strongest among Indians. Chinese and other Asian women appear older when in exogamous relationships than endogamous women.

Next, we add the characteristics of Whites who intermarry into the analysis. We compute the difference between the characteristics of the ethnic-minority respondent and the characteristics of their White partner along three dimensions: education, occupation and age. We then construct a discrete variable equal to 1 if the minority's characteristics are higher, 0 if they are equal and -1 if they are lower.¹³ Then we regress this difference on ethnic dummies, for each gender separately (with an ordered probit), controlling for the minority's characteristics. The results are reported in Table 9.¹⁴ We find no systematic differences in the characteristics

¹²Note 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

¹³Education and occupation are measured by categorical variables, whereby higher values indicate higher education or skill level. Age is reported also as a categorical variable (age bands) rather than the actual value.

¹⁴The results are very similar (although less precise) when we only include individuals who were born in the UK or arrived before the age of 16. The only significant difference is that we find that Other Asian women tend to have a higher educational level than their white husband when we restrict the sample, while they have

of White female partners (columns denoted 'men'). White male partners differ, however, depending on whom they marry. 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.

In summary, we find that interracial marriages involve mostly men and women who are more educated than endogamous individuals. The main exceptions to this pattern are Black men, and White men who marry Black Caribbean women.

4 The "male-superior norm" and intermarriage

We now turn to the implications of a male-superior norm for the patterns of intermarriage. As we mentioned earlier, there is surprisingly little theoretical literature on the conditions for an asymmetric equilibrium pattern of sorting (whereby men are better endowed than their wives) or attempting to derive the implications of this type of preferences.

We propose a simple reduced-form approach to investigate whether this norm could possibly explain the prevailing patterns of intermarriage. More precisely, we construct a measure of the proportion of acceptable partners in the White and own ethnicity populations, respectively, given the individual's own attribute. We consider two attributes, height and education, because of the survey evidence cited above (Higgins et al., 2002) concerning attitudes that men and women have with respect to their potential partners' characteristics.¹⁵ Acceptable partners are those who satisfy the condition that male's attribute should be at least as high as the female's attribute. Suppose, for simplicity, that x is the only attribute that matters for selecting a future spouse. Denote by $F_j(x)$ the corresponding distribution function of attribute x in the female population of ethnicity j and $G_j(x)$ the distribution function of attribute x in the

a lower educational level in the larger sample.

¹⁵We are unable to include age because our data only feature relatively broad age categories.

male population of ethnicity j . Denote by $F_k(x)$ and $G_k(x)$ the respective distributions of the attribute in the female and male populations of ethnicity k . Then, the male-superior norm implies that the proportion of acceptable mates of ethnicity j for a woman of attribute x_f is equal to: $(1 - G_j(x_f))$ and the proportion of acceptable 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 calculate individual-specific shares of acceptable partners.

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

- When $F_i(x)$ and $G_i(x)$ stochastically first-order dominate $F_j(x)$ and $G_j(x)$, respectively, the probability that groups i and j intermarry should be higher for females of ethnic group i than males of group i , 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.

4.1 Evidence based on the Millennium Cohort Study

The Millennium Cohort Study (MCS) is based on a sample of babies born in the year 2000. It reports information on parents of around 18,000 babies, while over-sampling ethnic minorities. The main respondent is typically a woman (in 99.9% of the cases). Crucially, the data include information on ethnicity of the main respondent and her partner. We have data on 13,066 couples with ethnicity information on both the respondent and partner, where at least one of the partners is White. These include 414 mixed couples (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, 174 involve a White man and non-White woman.

We examine how much of the ethnic-specific gender differences in propensities to outmarry can be explained with the male-superior norm. For each individual, we calculate the proportion of acceptable White partners and the proportion of acceptable partners of their own ethnicity. We calculate these proportions along two attributes, height and education, using information on the distribution from the 2001 UK census for education and the Health Survey for England (2004) for height.¹⁶ We show in Fig.1 and 2 how these proportions vary with height, across ethnic groups and gender. Obviously the proportion of acceptable White partners is identical across ethnic groups, conditional on height. Also, height unambiguously reduces the proportion of acceptable partners for women and increases it for men. What differs across groups is the proportion of acceptable partners of the same ethnicity, conditional on height. A 1.7m tall Bangladeshi man is acceptable to a much larger share of Bangladeshi women than a 1.7m tall Black Caribbean man is to Black Caribbean women. The idea is therefore to see whether these proportions of acceptable partners do indeed predict the rates of intermarriage.

The results are shown in Table 10. The first column only includes ethnicity and gender, interacted with each other, and the share of one's own ethnic group in the region of residence. The results confirm what we have found before: Black Caribbean women are substantially less likely to outmarry than women from other ethnicities, in particular Indians and Chinese. In column (2), we add the proportion of acceptable partners based on the respondent's height while in column (3) we augment the regression with the proportion of acceptable partners based on the respondent's education. The results are quite striking. While controlling for acceptable partners with respect to the education does not help explain intermarriage, controlling for the proportions of acceptable partners based on height makes an important difference: the ethnic differences in outmarriage rates shrink when we include the proportion of acceptable partners with respect to height while they remain almost identical when we control for acceptable

¹⁶Fraction of acceptable 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.

partners based on education. These results suggest that height does indeed help explain part of the puzzle of gender specific differences in intermarriage rates across ethnicities. Moreover, the fraction of acceptable partners based on the height rule predicts outmarriage in the direction we would expect: the larger the share of acceptable White partners and the lower the share of acceptable partners within one's own ethnicity, the higher the probability of outmarrying. On the other hand, the proportions of acceptable partners based on education have estimated coefficients close to 0 and are insignificant.

Thus, these results show that height is indeed an important determinant of the probability of intermarrying. But we should point out that height does not explain the patterns of intermarriage completely. The ethnic-specific gender asymmetries do not disappear entirely and the ethnic-specific dummies remain significant. For example, we find that South Asian women are less likely to outmarry than South Asian men, which goes against the predictions based on height, since South Asians are also shorter than Black people. Clearly, there must be other mechanisms driving this gender difference than height.¹⁷ But we should point out that even for these groups, it does seem that height does play a role. For example, the interaction dummy for Pakistani women does fall when we control for height. Nevertheless, overall, it is still the case that for these groups, women are on average less likely to outmarry than men.

As a next step, we compare mean heights of those who intermarry with those who marry an individual of their own ethnicity. A straightforward implication of the "height-rule" is that among ethnic groups that are on average shorter, those who intermarry with Whites should tend to be taller on average than those who marry within their own ethnicity. Moreover, this should be true for both men and women.

Tables 11-12 present mean heights of men and women, per ethnicity and type of relationship.¹⁸ Let us look at women first. The positive selection into exogamous relationships is

¹⁷Cultural and religious norms are a likely candidate; however, considering these is beyond the scope of our paper.

¹⁸The figures in column denoted as 'all' refer to the mean height for all individuals, including those who are single, based on the Health Survey for England rather than the Millennium Cohort Survey.

observed for all ethnicities, with the exception of Chinese. The pattern is especially striking for Bangladeshi women: those in exogamous relationships are on average 6.5 cm taller than their endogamous counterparts. Exogamous Black Caribbean and Indian women also stand out by being taller than endogamous women. Moving on to men (Table 12), we again see positive selection according to height into exogamous marriage. The difference is largest for Bangladeshi men although the difference is not as striking as for Bangladeshi women. Exogamous Indian and Chinese men also tend to be taller. Exogamous and endogamous Black Caribbeans are little different – which is not surprising given that Black Caribbean men are on average the same height as Whites.

Of course, these differences could be driven by the correlation between height and socioeconomic characteristics, since we have shown that, for example, Asians who intermarry tend to be more educated than those who do not. To account for this possibility, in Table 13, we regress height on ethnicity and a dummy variable distinguishing whether the respondent is in an exogamous relationship (with a White person) or not. These regressions are reported in columns (1) and (3) 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 as 2.5cm. In columns (2) and (4), we add socioeconomic characteristics as additional controls. However, rather than diminishing the difference between endogamous and exogamous individual, the positive selection on height appears just as pronounced if not even more pronounced once we control for socioeconomic attributes.

In Tables 14-15, finally, we present figures on mean heights of Whites depending on their spouse ethnicity, in a manner similar to Tables 11-12. The general pattern is again perfectly in line with what we would expect. In particular, White women married to Black Africans and especially to Black Caribbeans tend to be taller than endogamous White women while those married to Chinese and Indian men tend to be shorter. White men married to Black Africans are taller than endogamous Whites (although we do not observe a similar pattern for those married to Black Caribbean women) and those married to Bangladeshi women are

substantially shorter.

5 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 Black women, while the reverse is true for Asians, in particular 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 Whites and White men marrying Black Caribbean women. These results suggest 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 simple “husband taller than wife” behavioral rule helps explain part of these gender asymmetries. On average, Black people are taller than Asians and are of similar height as Whites. This rule 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 (2000), which shows that the height preference rule is indeed a very good predictor of the 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 interethnic marriage.

We do not claim though that height explains everything. The ethnic-specific gender asymmetries do not disappear entirely, nor the ethnic-specific dummies. In particular, it is still the case that South Asian women are less likely to outmarry 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 (and Chinese) 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.¹⁹ And, rather ironically, the relaxation of laws or social norms against interethnic marriages²⁰ 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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¹⁹Future 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.

²⁰The 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)

Female ethnicity	Male 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)

Male ethnicity	Female 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: Distribution of marriages conditional on male ethnicity (percentage of total marriages)

Female ethnicity	Male ethnicity			
	White	Asian	Black	Other
White	97.80	6.48	6.61	46.24
Asian	1.03	92.81	0.79	3.54
Black	0.23	0.22	91.57	1.99
Other	0.94	0.48	1.04	48.23
All	100	100	100	100

Source: US Census bureau (2006)

Table 4: Distribution of marriages conditional on female ethnicity
(percentage of total marriages)

Male ethnicity	Female ethnicity			
	White	Asian	Black	Other
White	98.06	17.11	2.85	43.95
Asian	0.34	80.47	0.15	1.18
Black	0.56	1.10	96.45	4.09
Other	1.04	1.32	0.56	50.77
All	100	100	100	100

Source: US Census bureau (2006)

Table 5 Basic statistics by ethnic groups and gender

	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 6: 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 (biamual).

Table 7: Probability of exogamous relationship with whites (men)

	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/n.man.	.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	

Standard errors in parentheses, *, ** and † denote 10%, 5% and 1% significance levels, respectively.

Table 8: Probability of exogamous relationship with whites (women)

	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/n.man.	.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	

Standard errors in parentheses, *, ** and † denote 10%, 5% and 1% significance levels respectively

Table 9: 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

Table 10: Determinants of the propensity to outmarry with a white (probit regressions)

Marginal effects	(1)	(2)	(3)
Black Caribbeans	-	-	-
Indian	-.15 (.04)***	-.09 (.05)**	-.15 (.04)***
Pakistani	-.23 (.05)***	-.20 (.04)***	-.23 (.05)***
Bangladeshi	-.12 (.02)***	-.09 (.02)***	-.12 (.02)***
Other Asian	-.12 (.02)***	-.11 (.01)***	-.12 (.02)***
Black Africans	-.04 (.06)	-.03 (.07)	-.05 (.06)
Chinese	-.09 (.01)***	-.08 (.01)***	-.09 (.01)***
Female	-.08 (.04)**	-.07 (.03)**	-.08 (.04)**
Indian x Female	.04 (.04)	-.02 (.05)	.04 (.05)
Pakistani x Female	.08 (.05)*	.04 (.05)	.08 (.06)
Bangladeshi x Female	.06 (.06)	-.04 (.07)	.06 (.08)
Other Asian x Female	.20 (.06)***	.13 (.06)**	.20 (.06)***
Black African x Female	-.09 (.07)	-.10 (.07)	-.09 (.08)
Chinese x Female	.20 (.08)**	.13 (.08)	.20 (.08)***
Acceptable white partners (height)		.35 (.12)***	
Acceptable partners own ethnicity (height)		-.32 (.11)***	
Acceptable white partners (education)			-.01 (.01)
Acceptable partners own ethnicity (education)			.00 (.02)
Share own ethnicity	-2.98 (.40)***	-2.89 (.39)***	-2.99 (.40)***
N. obs.	1362	1362	1362
Pseudo R-squared	.22	.24	.20

Table 11: Mean height of women from ethnic minorities (cm)

Ethnicity	All	Endogamous	Exogamous	Difference
Black African	163.0	165.1	165.8	+0.7
Black Caribbean	162.8	164.4	167.6	+2.8
Bangladeshi	154.7	156.1	162.6	+6.5
Pakistani	157.8	160.6	160.9	+0.3
Indian	156.4	159.2	161.3	+2.1
Chinese	157.8	161.1	160.7	-0.4

Table 12: Mean height of men from ethnic minorities (cm)

Ethnicity	All	Endogamous	Exogamous	Difference
Black African	173.5	176.1	177.2	+1.1
Black Caribbean	175.2	176.3	176.0	-0.3
Bangladeshi	167.8	168.7	171.7	+3.0
Pakistani	172.1	174.6	173.8	-0.8
Indian	170.2	173.5	175.6	+2.1
Chinese	170.8	171.2	172.7	+1.5

	Men				Women			
	(1)	(2)	(3)	(4)	(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	

Spouse's ethnicity	All	Endogamous	Exogamous	Difference
Black African	161.4	164.2	165.3	+1.1
Black Caribbean	161.4	164.2	166.6	+2.4
Bangladeshi	161.4	164.2	164.8	+0.6
Pakistani	161.4	164.2	164.2	+0.0
Indian	161.4	164.2	161.1	-3.1
Chinese	161.4	164.2	162.1	-2.1

Spouse's ethnicity	All	Endogamous	Exogamous	Difference
Black African	175.3	178.4	184.6	+6.2
Black Caribbean	175.3	178.4	177.3	-1.1
Bangladeshi	175.3	178.4	171.7	-6.7
Pakistani	175.3	178.4	177.1	-1.3
Indian	175.3	178.4	176.7	-1.7
Chinese	175.3	178.4	178.3	-0.1

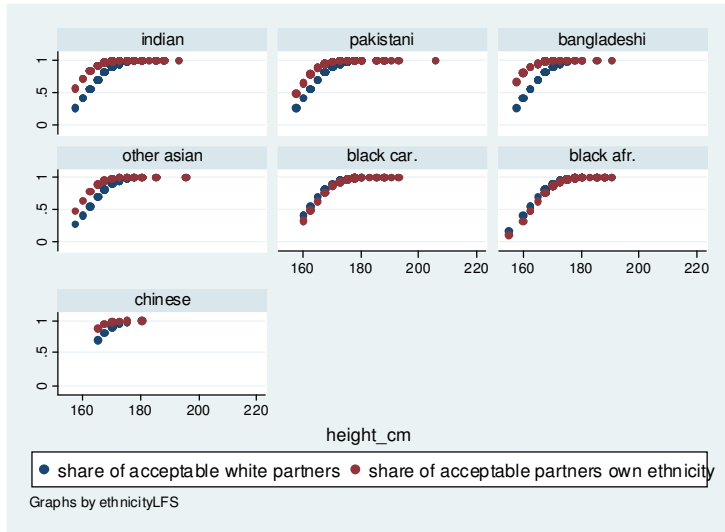


Figure 1: Share of acceptable partners (for men)

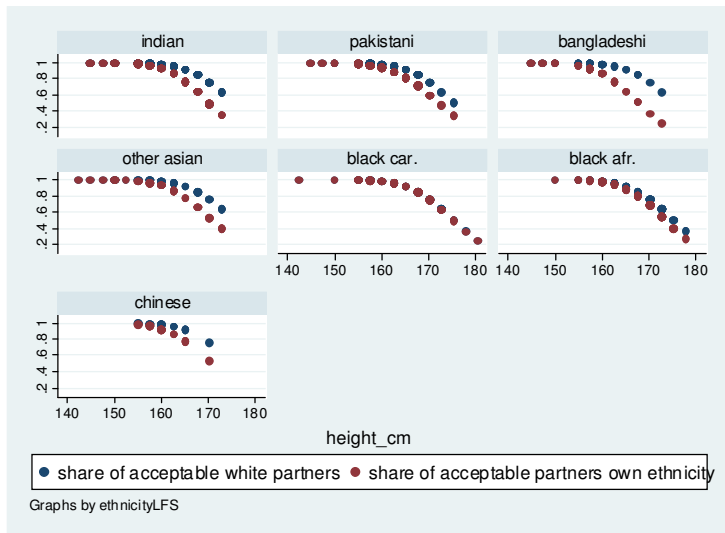


Figure 2: Share of acceptable partners (for women)

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