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ABSTRACT

How Does the Beauty of Wives Affect Post-Marriage Family Outcomes? Helen's Face in Chinese Households*

Research on the economics of beauty has persistently emphasized beauty premiums in the labor market but ignored its influence within existing marriages. We examine the physical appearance of the wives and its influence on several post-marriage family outcomes using a conceptual framework that is widely applicable. Based on two data sets from China, we find beautiful women have at least 0.43 fewer children than average- or plain-looking women when controlling for other factors. The negative effect remains robust controlling for wages and the possible endogeneity of beauty. In terms of mechanisms, the negative impact seems to operate by altering bargaining power within the family and the opportunity cost of having children, but not through the quantity-quality interaction of children. For other outcomes, wives' good looks reduce the probability of their taking care of or tutoring their children and increase the probability of parents or in-laws caring for children or performing household chores in urban areas.

JEL Classification: J10, J13

Keywords: beauty, household bargaining power, number of children, intergenerational care, opportunity cost

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1. Introduction

Almost everyone loves beauty.[1] The love of beauty is innate in humankind. Beauty, which is the most direct and distinct individual characteristic, affects a person's social interactions, occupation, and income. The pioneering work by Hamermesh and Biddle (1994) discovers important roles of beauty in the labor market, thereby establishing the economics of beauty. Numerous follow-up studies demonstrate the existence of beauty premiums, manifesting in better career options (Biddle and Hamermesh, 1998; Judge et al., 2009), larger probability of being employed (Ruffle and Shtudiner, 2015; Deng et al., 2020), higher chances of being promoted (Rhode, 2010) and higher earnings (Hamermesh et al., 2002; Hamermesh, 2011; Doorley and Sierminska, 2015; Gu and Ji, 2019; Stinebrickner et al., 2019). However, except for a general remark on the potential role of beauty in the marriage market by Hamermesh (2011, p. 126), little attention has been paid on beauty's role in the family in economics, let alone a rigorous analysis.

This study extends the effect of beauty from the labor market to the family by focusing on the impact of women's appearance on post-marriage family outcomes. Under a framework of household bargaining power, a spouse's bargaining power is influenced by opportunities outside the marriage (Haddad and Kanbur, 1992; Chiappori et al., 2002). As everyone loves beauty, beautiful wives have more opportunities outside their marriage, thereby enjoying greater bargaining power within the family than plain-looking wives. Considering that wives' desired number of children is usually lower than that of husbands (Rasul, 2008), a family will have fewer children when the wife's bargaining power is stronger. Consequently, given the beauty premium in the labor market and the higher opportunity cost of doing non-market productions, good-looking women are expected to have fewer children and engage less in child care and household chores.

[1] In Doctor Faustus, a late 16th century play, Christopher Marlowe said "Helen's face can launch a thousand ships".

China is a traditional and developing country. Women are usually perceived as having a low family status and have the responsibility to bear children. Thus, China provides a good setting to examine how women's beauty affects fertility and other family behaviors. In this study, we use data from the 2016 China Family Panel Studies (CFPS) to estimate the impact of wives' appearance on the number of children, child quality, child care activities, and the help received from parents or in-laws, and to analyze underlying mechanisms. First, on fertility related issues, the empirical results show that wives' beauty reduces the number of children born in the family. All other factors being constant, good-looking wives have at least 0.17 fewer children than plain-looking wives. Women's beauty can mitigate the need to have more children if the first child is a girl, as expected. We also control for the wage effect to examine the robustness of the negative effect of wives' beauty on the number of children. In addition, we conduct a falsification test by adding the husband's beauty to the equation. We find no significant influence of husband's beauty on the number of children.

Second, wives with good looks participate less in child care. We find that attractive wives in urban areas are less likely to take care of their children and help them with their homework. Third, wives' attractiveness increases the likelihood of their parents or in-laws helping them look after their children or performing household chores in the urban sample. Finally, in probing the mechanisms, we find that wives' appearance affects the number of children mainly by altering the bargaining power within the family and the opportunity cost of having children, but not through the quantity-quality interaction of children. While these results indicate negative role of beauty within existing marriage, they also imply that the status of women is enhanced and gender inequality is reduced.

We further apply the data set used by Hamermesh et al. (2002) (the 1996 "Family Survey of Permanent and Transient Populations" conducted by the Population Research Institute of Shanghai Academy of Social Sciences (1996 SASS)). During the period when the one-child policy was strictly enforced, wives' beauty had a negative impact on the

number of children, though the magnitude of the impact is slightly less than that observed in the 2016 CFPS data.

Beauty could be endogenous in family decisions. The current work addresses the potential endogeneity of the appearance variable using household expenditure,[2] dummy variables constructed from the number of interviewees being surveyed by an interviewer, and father's and mother's appearance as instrumental variables.[3] Accounting for the endogeneity of the appearance variable, we still observe that wives' good looks exert a negative impact on the number of children robustly, beautiful women have at least 0.43 fewer children than plain-looking women.

This paper contributes to the literature in two aspects. First, this paper enriches the literature on the economics of beauty by extending the effect of beauty from the labor market to the family. Research on the economics of beauty persistently emphasizes the beauty premiums in earnings and employment, but litter attention has been paid to beauty's role within existing marriage. Our analysis contributes to the literature by focusing on several novel implications of the role of wives' beauty within marriage. We argue that wives' appearance influences internal decisions and behaviors within the family by altering intra-household bargaining power and the opportunity cost of having or taking care of children.

Second, this paper also contributes to the study of beauty's effects in other disciplines. Although most empirical studies have confirmed the prevalence of beauty premiums in economics, there is some work on the cost of beauty in psychology and sociology showing that beautiful people are easily rejected in social interactions, and are perceived to be less upright, less modest, and less caring of others (Dion and Stein, 1978; Eagly et al., 1991;

[2] We control for family non-labor income in the fertility equation to maintain the conditional exogeneity of the household expenditure variable.

[3] Hamermesh et al. (2024) also use mother's appearance as an instrumental variable for the individual appearance variable.

Andreoni and Petrie, 2008). Some women are discriminated against or even fired for being too beautiful, which is a phenomenon known as "beauty is beastly effect" (Braun et al., 2012; Johnson et al., 2014; Marson and Hessmiller, 2016). However, these studies have not examined beauty's effects in the family. The present paper examines beauty's negative impacts on the post-marriage outcomes, especially the number of children.

2. A Simple Analytical Framework: Mechanisms through which Wife's Beauty Affects Decision-Making and Behaviors within a Family

We consider two mechanisms through which wife's appearance affects behaviors within a family, that is, the bargaining power within the family and the opportunity costs of having children, as shown in Figure 1. Both mechanisms play a negative role in the number of children, child care, and housework. This conceptual framework is widely applicable.

The first mechanism is the bargaining power. Numerous studies have shown that before entering a stable relationship and marriage, one of the most important factors influencing a man's decision is a woman's appearance (Banerjee et al., 2013; Stopnitzky, 2017; Ong et al., 2020). After getting married, men's level of satisfaction can increase depending on their wives' beauty (Averett and Korenman, 1996; Patzer, 2008; Karraker et al., 2017). Opportunities outside the marriage increase wives' bargaining power within the family (Haddad and Kanbur, 1992; Chiappori et al., 2002). As beautiful women have considerably more opportunities outside their marriage, they enjoy higher bargaining power within the family, and have substantial influence on decisions regarding intra-household resource allocation. Wives' bargaining power alters their burden in caring for children, and determines their number of births (Doepke and Kindermann, 2019). As husbands' desired number of children is larger than that of wives (Rasul, 2008; Westoff, 2010), the number of children in a family will be smaller when the wife's bargaining power is stronger.

Nurtured by Confucian traditions and culture, women are frequently perceived as

having a low status in family decision-making in Chinese families, particularly under the traditional "patriarchal" and "masculine" social norms of the mainstream society. As a Chinese saying goes, "There are three ways to be unfilial, and having no offspring is the most severe one." In Chinese culture and tradition, women could be pressured by their family and society to have children. Given the strong preference for sons in traditional Chinese culture, many Chinese people believe that "a mother's status can be raised with a son." Thus, having a son can significantly enhance a woman's status and bargaining power in the family (Li and Wu, 2011; Fan et al., 2018). As beautiful women have more opportunities outside their marriage, they enjoy higher bargaining power within the family. Therefore, a woman's beauty as well as the birth of a son can enhance her bargaining power. In this study we hypothesize that good-looking women use beauty and rely less on the birth of sons to strengthen their position in the family.

Furthermore, in the process of having children, women pay high physical and psychological costs.[4] After giving birth, women encounter various problems, such as having a post-baby body, thereby possibly losing their good looks. Meanwhile, some women suffer from depression. Problems associated with having children as well as the time and energy needed to take care of children tend to affect good-looking women even more. Therefore, good-looking women choose to have fewer children if possible. Consequently, considering the bargaining power within the family and the negative impacts of giving birth, good-looking women are expected to have fewer children. In addition, good-looking women use their increased bargaining power to reduce their participation in other family tasks, such as child care, homework assistance, and household chores. Furthermore, such women tend to transfer non-market production tasks to other members of the extended family, including

[4] Having children exerts not only negative impacts, but also positive ones, such as improving one's sense of gain and happiness. However, these positive impacts do not demonstrate obvious differences between good-looking wives and average-looking ones. Therefore, we focus only on the negative impacts of having children.

their husbands and parents. In recent years, intergenerational care has become increasingly prevalent in China, thereby reflecting new characteristics of intergenerational relationships. In 2019, the population of children under the age of 3 was 50 million, and nearly 80% of them were cared for by their grandparents.[5]

The second mechanism is the opportunity costs. The literature confirmed the existence of beauty premiums in the Chinese labor market, manifesting as higher wages, higher employment probability, greater promotion opportunities, and better career options (Hamermesh et al., 2002; Gu and Ji, 2019; Deng et al., 2020; Peng et al., 2020). However, the high labor force participation and high wages of women increase the cost of rearing children, thereby reducing fertility (Becker, 1973; Becker and Barro, 1988). Compared with plain-looking women, beautiful women are more likely to be employed, and gain higher salaries; thus, their opportunity costs of engaging in non-market production is relatively higher. Therefore, beautiful wives tend to have fewer children to reduce the "motherhood penalty".

According to data from the World Bank, Chinese women are more active in the labor market, and their labor force participation rate is over 60% in 2019; whereas the female labor force participation rates of America, Brazil and Japan are 56%, 54%, and 53% respectively.[6] Thus, the opportunity cost of having children and child care may be fairly high in China. Hence, beautiful women have fewer children and participate less in child care and in tutoring children in their homework.

Even under the one-child policy (or two-child policy in rural China), considerable variations in fertility exist in urban and rural China. In the data we will introduce and use in subsequent sections, the average number of children is 1.4 in urban China, with a standard

[5] Xinhua News, http://www.gov.cn/zhengce/2019-05/11/content_5390716.htm

[6] The World Bank Open Data, https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=CN&view=chart

deviation of 0.67, ranging from 0 to 5, and 1.8 in rural China, with a standard deviation of 0.80, ranging from 0 to 6. These variations allow us to identify the effect of wives' beauty on the number of children. The ages of the focal women range from 21 to 60 in 2016, and the majority (approximately 74%) was born before the one-child policy in 1979. Most of the women gave birth for the first time after 1979 and were thus subject to the one-child policy, thereby reducing the variation in the number of children among the individual women. Thus, if an effect can be found, then it would be a lower bound.

In summary, through the mechanisms of bargaining power and opportunity costs, wives' beauty affects the number of children and other activities within the family. On the one hand, wives' beauty increases their bargaining power within the family and reduces the number of children and time spent on household chores. On the other hand, better-looking wives have their beauty premiums in the labor market, they incur higher opportunity costs for non-market production, and reduce the number of children and spend less time on the household chores. We test these mechanisms in subsequent sections.

3. Data and Descriptive Statistics

We mainly use the 2016 wave of the China Family Panel Studies (2016 CFPS) to examine the impact of wives' beauty on the post-marriage outcomes.[7] Designed and implemented by the Institute of Social Science Survey of Peking University, the CFPS aims to reflect social, economic, and demographic changes in China by collecting representative data on individuals, families, and communities over time. The CFPS surveys households and all household members in 25 provinces and municipalities in China, with a target sample size of 16,000 households. The CFPS is an excellent data set in China, as it includes rich information on family economic status, individual behaviors in the labor market, family

[7] We also use two variables from the 2014 CFPS dataset for robustness checks (i.e., interviewer's ID and wife's appearance) to construct a subsample in the 2016 data. Given that the measure of beauty changed very little over time, we cannot exploit the panel nature of the data.

members' characteristics, and child care, as well as individual appearance evaluations.

To maintain homogeneity, we restrict our sample to married women between the ages of 18 and 60 years from the Han ethnic group, with an employed or unemployed working status (we exclude those who are self-employed).[8] After removing observations with missing values, we obtain a sample of 2,323 married women with relevant information for the variables to be examined in our analysis. In the CFPS, the appearance (*wife's beauty*) of interviewees is rated by the interviewer at the end of the interview. The appearance rating ranges from 1 (worst) to 7 (best). The distribution of the appearance variable is illustrated in Table 1.

The following findings can be observed from Table 1. First, in terms of the appearance evaluation, only less than 1% of the women are rated as "worst" (homely), and 34% are rated as "best" (strikingly beautiful). The appearance evaluation distribution is asymmetric, which is consistent with the patterns in literature on the economics of beauty. Second, regarding the number of children, the more beautiful the wife, the fewer her children will be. The average number of children of wives with below-average looks (beauty =1, 2, and 3) is 2, whereas the average number of children of strikingly beautiful wives (beauty =7) is only 1.35. In the following empirical analysis, we define a woman as beautiful (good-looking) if she has an appearance evaluation score of 7, and not beautiful (plain-looking) otherwise (beauty = 1, 2, 3, 4, 5, or 6). With this definition, 66% of the women in this study are considered as plain-looking, which is consistent with the distribution of appearance in reality, in the sense that average or plain-looking women outnumber beautiful ones. We also use alternative definitions (e.g. defining a woman as beautiful if she has an appearance

[8] The family planning policy was significantly different between the Han ethnic group and ethnic minorities, and thus we restrict our sample to Han ethnic group. Self-employed women are very different from their employed counterparts: they might have higher bargaining power, and face different opportunity costs of having children. Therefore, we drop the former to maintain homogeneity (following Hamermesh et al., 2002).

evaluation score of 6 or 7, and not beautiful otherwise), and find robust results.

Measurement errors in appearance present an important challenge in the empirical research of the economics of beauty, and the accuracy of appearance is especially subject to questions when the appearance variable is based on interviewers' observation and evaluation. Given that different interviewers may have different aesthetic standards, appearance evaluations by different interviewers may not be comparable. However, Hamermesh and Biddle (1994) argued that aesthetic standards are homogenous among people in areas sharing the same culture and change slowly over time. In our dataset, over 63% of the women are given the same evaluation ratings in 2014 and 2016. A larger variation in the appearance ratings generated by the heterogeneous aesthetic standards of interviewers may be observed if we adopt a numeric or percentage scale. With a dichotomous rating of beauty, a stronger consistency on the appearance evaluation is observed by different interviewers. Thus, we adopt a dummy variable for beauty to mitigate the bias brought about by the heterogeneity of interviewers' aesthetic standards. Our instrumental variable estimates should also address the potential measurement error bias. In robustness checks, we assess the robustness of our estimates with an alternative method for measuring appearance, a sample with a relatively consistent appearance evaluation, and a different data set.

Table 2 presents the descriptive statistics of the main variables. The average number of children for the women in the sample is 1.55 and the standard deviation is 0.74. Their average age is 44 years, and their average educational attainment is middle school. The percentage of employment of these women is 46%, and the average hourly wage for those employed is 12.2 yuan. The percentage of working women is relatively low, because those who are self-employed are not included. The average number of wife's siblings is 2.9, as over 70% of the women in the sample were born before the one-child policy. We observe a decline in fertility in China, as reflected by the difference between the number of siblings of the women and their number of children in the sample. In terms of the characteristics of

the husbands, on average, they are two years older than their wives, and their average years of education is nearly one year more than that of their wives. The average household income is 25,037 yuan per year, of which the average non-labor income is 6,443.9 yuan per year. The average expenditure of the families is 13,921.6 yuan per year, of which the expenditure on cosmetics, beauty care, and hairdressing is 1,090.3 yuan per year, comprising 7.83% of the former. Moreover, 66.6% of the women in the sample are from urban areas, and 52.3% have a son as their firstborn. The percentage of parents or in-laws helping the women in the sample with child care and household chores is 35.9%.

To take a preliminary look at the differences in the number of children and household economic behaviors among wives with different appearance levels, we provide the descriptive statistics and t-test results for the groups with beautiful and plain-looking wives in Table 3. We provide the descriptive statistics for the groups with detailed appearance ratings (beauty ranging from 1 to 7) in Table A1 in the online Appendix.[9] The descriptive statistics show that for the beautiful wives, beauty premium exists in the labor market, and the proportion of intergenerational child care is larger but the number of children is fewer.

4. The Effect of Wives' Appearance on the Number of Children

4.1. Baseline Regressions

First, we use a simple specification to estimate the impact of the wives' appearance on the number of children, as shown in Eq. (1):

$$\text{Children}_i = \alpha_0 + \alpha_1 Wife's\ beauty_i + \beta X_i + \varepsilon_i, \quad (1)$$

where *Children*$_i$ represents the number of children of the *i*th woman. *Wife's beauty*$_i$ is a dummy variable for appearance (1 for beautiful, 0 for plain), and X_i denotes other control variables affecting the number of children, such as wife's age, education, health status, height, working status, number of years married to her current husband, residence in urban

[9] Additional tables can be found in the online Appendix. They are also available from the authors.

or rural areas, indicators of districts, logarithm of per capita non-labor income of the family, the gender of the first child, husband's age and education. ε_i is the random disturbance term. We summarize the regression results in Table 4. Given the presence of the gender of the first child in the equation, we focus on a sample of women with at least one child, which has a sample size of 2,306.[10]

We observe the following findings for the beauty effect. First, we control for individual and family characteristics in column (1) of Table 4, we observe that good-looking women having approximately 0.17 fewer children than plain-looking women, and the result is statistically significant at the 1% level. Moreover, as the average number of children is 1.55, beauty implies a reduction in the number of children by 11%. The effect of wives' appearance on the number of births may be driven by unobservable individual characteristics or genetic factors. We use *Wife's height* as a proxy variable for unobservable individual or genetic characteristics.[11] Second, we control for cohort fixed effects in column (2), and continue to observe a negative and significant effect of wives' beauty on the number of children. Third, we use the household net asset instead of the household non-labor income to control for the wealth effect of the family in column (3), and find a robust negative effect of wives' beauty on the number of children, which remains statistically significant at the 1% level. Finally, we control for interviewer fixed effects in the OLS to address potential bias (if any) from the correlation between the idiosyncrasies of the interviewers and the outcome variable.[12] The result shows that neither the sign nor the

[10] Only 17 women do not have children in our sample of 2,323 (less than 1%). Estimation results are qualitatively the same if the 17 women are included but the first child gender variable is dropped.

[11] When we use the correct Poisson estimator for our basic equation describing the number of children, the result shows that the coefficient of beauty remains significantly negative.

[12] For interviewer fixed effects, there are two strategies in the literature of the economics of beauty: the first strategy is to control for interviewer fixed effects in the OLS, such as in Hamermesh and Biddle (1994) and Hamermesh and Abrevaya (2013). This is because different assessors rate beauty differently and their idiosyncrasies may be correlated with the outcome variable (Hamermesh and Abrevaya 2013). The outcome variable in Hamermesh and Abrevaya (2013) is the subjects' happiness, and might be correlated with the idiosyncrasies of the interviewers. Therefore, interviewer fixed

magnitude changes obviously in column (4) of Table 4, i.e., beauty still has a negative and statistically significant role on the number of children.

As discussed in the conceptual framework, beautiful women earn more, and have fewer children due to the high opportunity cost. Thus, the negative impact of wives' beauty on the number of children may come from the wage effect. To examine this possibility, we add a wage variable in column (5) of Table 4. Given numerous missing values for the wage variable in the 2016 CFPS, and a lack of wage information on the unemployed women, we use Heckman's (1979) selection model to generate missing values for wages. The results with Heckman two-step estimation are provided in Table A2 in the online Appendix.[13] After controlling for the wage effect, i.e., the opportunity cost of having children, wives' beauty still plays a negative and statistically significant role in the number of children, though with a smaller coefficient of approximately -0.09, which represents the bargaining power effect.

Furthermore, we conduct a falsification test by examining the effect of husband's beauty on the number of children. If our hypothesis on the bargaining power and opportunity costs holds for women, then the effect should be non-existent or much smaller for men, as the bargaining power channel is positive and the opportunity cost channel is negative for men. The results provided in column (6) of Table 4 show that the coefficient of husband's beauty is indeed very small (-0.04) and statistically insignificant at a conventional level. Besides, when husband's beauty is controlled for, wife's beauty still plays a negative role in the number of children, with a coefficient of -0.12, and is statistically significant at the 1% level. One possibility is that relative beauty between wife and husband may matters. We

effects should be controlled for. In our setting, the outcome variable is the number of children, which very unlikely correlates with interviewers idiosyncrasies. The second strategy is using interviewer fixed effects as the IV of beauty, such as in Hamermesh et al., (2002). Because some interviewers' ratings of the women's beauty were generous (while others were harsh), interviewer fixed effects affect the ratings of beauty, but does not affect the outcome variable. In the robustness checks section, we follow Hamermesh et al. (2002) to use the interviewer fixed effects as IVs.

[13] The specification largely follows Zhang and Liu (2003). We use wife's parental education in the selection equation. In addition, we control for wife's beauty both in the wage equation and in the selection equation.

generate a dummy variable to represent whether wife is more beautiful than husband, represented by the variable of *relative beauty*, and regress the number of children on the relative beauty variable. The result shows the coefficient of relative beauty is negative but statistically insignificant.

On the effects of the control variables, older women tend to have more children than younger women. However, the effect is statistically insignificant after we control for the age and education of husbands, and years of marriage. Wife's education is included to control for career-related factors. Women with higher education tend to have fewer children. Moreover, fewer children are observed in urban areas relative to rural areas. Under the one-child policy, families in urban areas can only have one child. However, the family planning policy is not as strict in rural areas. Moreover, the higher the family non-labor income, the fewer the number of children in the family will be. For wives whose first child is a son, their number of children is 0.24 fewer than that of wives whose first child is a daughter (see column (1) in Table 4). In societies with a preference for boys, the decision to have children is often described as "stopping once there is a son." This mindset leads to having fewer children among women whose first child is a son. We also observe fewer children in families which husbands have higher education.

To further explore the heterogeneous impact of wife's beauty on fertility across different subgroups, we divide our sample based on residence in urban or rural areas, wife's age and education, the gender of the first child, and run regressions for each subsample. We find the negative effect is larger in less-developed regions or for wives with weaker bargaining power, e.g., in rural areas, older or less educated women, and for women whose first child is a daughter.[14]

[14] The negative effect of wife's beauty on the number of children can be argued to derive partly from the occupational effect. Professional women dress well to become attractive and are thus more likely to be rated as beautiful. To examine this possibility, we further control for occupations in the fertility equation. The estimate of the impact is at approximately

4.2. Robustness Checks

4.2.1. Alternative Beauty Measures

The appearance variable in empirical studies on the economics of beauty can be measured in two ways. The first way considers appearance as a continuous variable, which is typically used when the appearance variable takes numerous different values, such as 10 or more different ratings. The second and also the most frequently used way applies dummy variables for appearance. Some studies use a dichotomous dummy variable to indicate whether or not a person is good-looking, whereas others use multiple dummies to classify a person's appearance into groups of ratings. To assess the impacts of different measures, here we adopt three appearance measures to examine the robustness of the estimates of the impact of wives' good looks on the number of children in Table 5. First, we treat *wife's appearance* as a continuous variable in column (1). Second, we change the classification of good looks and define the original ratings in the CFPS of 6 and 7 as good-looking and 1 to 5 as plain, and construct the variable *Wife's beauty* in column (2). Third, we classify the appearance ratings into three groups, with CFPS ratings of 1 to 5 as below-average (the omitted group), 6 as average-looking, which is denoted by the dummy variable *average-looking*, and 7 as strikingly good-looking, which is denoted by the dummy variable *Above-average* in column (3). Regression results are reported in Table 5.

Table 5 displays a statistically significant and negative impact of good looks on the number of children using alternative measures on the appearance variable. First, with appearance as a continuous variable in the regression, the number of children is reduced by 0.08 with a unit increase in the appearance rating, which means that the number of children will be reduced by 0.5 if a wife's appearance is changed from homely to strikingly beautiful. In addition, the result is statistically significant at the 1% level. Second, defining the beauty

-0.16 (declining only slightly) and remains statistically significant at the 1% level.

ratings of 6 and 7 as beautiful, we obtain an appearance coefficient estimate of -0.15, which remains statistically significant at the 1% level. Thus, good-looking women will have 0.15 fewer children than average- or plain-looking ones. This result is similar to our estimation in Table 4. Third, classifying the appearance ratings into three groups, we still find a statistically significant difference in the number of children between the average-looking and below-average women with a coefficient of -0.1. Moreover, the number of children of the strikingly good-looking women is 0.22 fewer than that of the homely females, and the result is statistically significant. We conclude that the negative impact of wives' beauty on the number of children remains robustly negative across different appearance variable measures.

4.2.2. Endogeneity of Beauty

The appearance or beauty variable can be endogenous for several reasons, including omitted variables bias, reverse causality, measurement errors, interviewer-interviewee interactions and primping. We already include the *wife's height* variable in our baseline analysis as a proxy variable for unobserved individual characteristics to address the omitted variables bias. We observe that the impact of wives' good looks on the number of children remains negative and statistically significant. There may exist other characteristics that are observable to husbands and wives but unobservable to the researchers. We need to conduct IV regressions to address the endogeneity problem owing to missing and unobserved variables. Reverse causality originates from the deteriorating effect of giving birth on beauty. Pregnancy and child birth may lead to skin pigmentation, weight gain, or an unshapely body, thereby reducing attractiveness. The heterogeneity of the interviewers leads to measurement errors in the beauty variable. Interviewers with varying ages, genders and other characteristics have different aesthetic standards, contributing to measurement errors in their evaluation of interviewees' appearance. However, the CFPS interviewers are all college students in China, with a relatively high degree of homogeneity. With relatively low

heterogeneity in aesthetic standards, the issue of measurement errors in the appearance variable may not be very serious.

In addition, the end-of-interview beauty rating might be determined through interviewer-interviewee interactions and is thus endogenous. Hamermesh and Abrevaya (2013) use a German data set which had ratings both at the beginning and the end of the interview, and showed that they are very highly correlated. Therefore, interviewer-interviewee interactions do not change the beauty ratings remarkably. Last, the women's appearance observed by the interviewers may result from primping, such as makeup and dressing up, which leads to an endogeneity issue. In our everyday life, the appearances we observe constitute two aspects: natural beauty and primped beauty. Defining natural beauty is difficult; thus, the beauty we observe is influenced by clothing and makeup, which constitutes primping. Hamermesh et al. (2002) argue that the observed beauty can be influenced by beauty expenditures. However, beauty expenditures are endogenous and influenced by family expenditures. By developing a simultaneous equations model to address the endogeneity of the beauty variable, Hamermesh et al. (2002) use family expenditures and interviewer fixed effects to identify the effect of the appearance variable.

There are two important differences in the surveys between the data used by Hamermesh et al. (2002) and the data we use in this study, i.e., the number of interviewers, and the number of interviewees surveyed by each interviewer. Given these two differences, we adapt Hamermesh et al. (2002) to use family expenditures and dummy variables of the group size of interviewees for each interviewer as instrumental variables to address the potential endogeneity of the beauty variable. One may even argue that household expenditure violates the exclusion restriction given the correlation between family income and the number of children. In order to maintain the conditional exogeneity of the IV, we control for family non-labor income in the fertility equation. As a robustness check, we also use the same instrumental variables as Hamermesh et al. (2002) later, i.e., family

expenditures and interviewer fixed effects.

The group size of interviewees for each interviewer may affect the beauty ratings in the CFPS. As noted, each interviewer in the CFPS surveyed a different number of interviewees, with 1 woman as the least and 71 women as the most. Based on the number of interviewees surveyed, that is, 1-9, 10-19, 20-29, 30-39, 40-49, 50-59,60-69, and 70-79, we create seven dummy variables as the instruments for the appearance variable. Notably, the group that a female interviewee was assigned for interview should not affect the number of children, but it may be correlated with the rating of beauty. As the number of interviewees to be surveyed increases, interviewers likewise face a larger burden. Consequently, the interviewers may not have enough time to evaluate the appearance of the interviewees given the large number of female interviewees. Hence their evaluation standard may be much more relaxed, which may lead to a higher rating of beauty among the group where more interviewees must be investigated. Therefore, the interviewer group size dummies are likely to be correlated with beauty ratings.

The first stage regression results reported in column (1) of Table A3 in the online Appendix show that household expenditure and interviewer group size dummies are important for explaining wives' beauty with a Cragg-Donald Wald F-statistic above 10. On the one hand, household expenditure improves wives' appearance. On the other hand, large variations in the coefficients of the group size dummies can be observed, but the general trend is that beauty ratings are higher among the groups with more interviewees. This observation is consistent with our reasoning above.

The second stage regression results are reported in Table 6. These results show that, when we address the endogeneity of the appearance variable with instrumental variables, the impact of good looks on the number of children remains robustly negative. Compared with plain-looking women, good-looking ones have 0.43 fewer children, as shown in column (1). This result is statistically significant at the 1% level. Since the coefficient of the

gender of the first child is -0.22, being beautiful is approximately twice as important as having a son. Moreover, the magnitude of the estimates is higher than that of the OLS estimates, with measurement error in the beauty variable as a plausible explanation, as measurement error in an independent variable tends to bias its estimated coefficient towards 0 in the OLS. Furthermore, the result in column (1) of Table 6 shows there is no weak IV problem as the Cragg-Donald Wald F statistic is 19.77. As the number of instruments exceeds the number of endogenous variable, we compute the Sargan statistic to test the over-identifying restrictions. The over-identification test p-value is larger than 0.1, which implies the validity of our instruments. Thus far, we have demonstrated that the instrumental variables used in the study pass both the weak IV and over-identification tests.

To mitigate the impact of the interviewers' heterogeneous aesthetic standards on the estimates, we select observations with consistent evaluations from 2014 and 2016 and the same interviewers respectively, as two subsamples to perform regressions. The estimates are presented in columns (2) and (3) of Table 6.

The consistent evaluation subsample contains observations of women whose beauty was rated the same in 2014 and 2016, regardless of whether they are good-looking or not. The negative effect of wives' beauty on the number of children using the consistent evaluation subsample remains significant at the 1% level in column (2) of Table 6. We construct the same interviewers subsample by using the interviewers' ID. In our 2016 women sample, 294 of the 2,306 observations have the same interviewers as in 2014. We observe that the difference in the negative impacts of good looks on the number of children is less than 0.02 using samples with either the same or different interviewers (compare column (1) with column (3) in Table 6). Restricting attention to the subsamples with consistent evaluation and the same interviewers, the impact of appearance on the number of

children remains consistently negative.[15]

Hamermesh et al. (2024) use mother's appearance as an instrumental variable for the individual appearance variable. Because appearance is inherited, parents' appearance affects personal beauty. Parents' appearance also satisfies the exclusion restriction, because it does not affect a woman's number of children. We also have such information in our data. Thus, we utilize fathers' and mothers' appearances as instrumental variables for women's appearance, and the regression results are reported in the last three columns in Table 8.[16] Despite the significant reduction in the sample size owing to missing values on parents' appearance, the impact of good looks on the number of children remains robustly negative and stable in magnitude. When both parents' appearances are used in column (6) of Table 6, they pass the over-identification test. The results in the last three columns of Table 6 show there is no weak IV problem.

Furthermore, we follow Hamermesh et al. (2002) to use family expenditures and interviewer fixed effects to identify the effect of beauty on the number of children to address the endogeneity of the beauty variable. The results are reported in Table A5 in the online Appendix. We observe that compared with plain-looking women, good-looking ones have 0.19 fewer children, which is significant at the 1% level. Moreover, the specification passes the over-identification test with a p-value of 0.68.[17]

[15] We also conduct a regression in the sample of self-employed, and the result shows wife's beauty plays a negative and statistically significant role on the number of children as reported in Column (1) of Table A4.

[16] The assessment of parents' appearance is the same as the woman's beauty. For the three first-stage regressions, the results are as follows: in the regression of wife's beauty on her mother's beauty, the coefficient is 0.618 and statistically significant; in the regression of wife's beauty on her father's beauty, the coefficient is 0.655 and also statistically significant; in the regression of wife's beauty on her parents' beauty, the coefficient of mother's beauty is 0.225 and statistically insignificant, while the coefficient of father's beauty is 0.443 and statistically significant.

[17] We also control for wife's cohort fixed effects, and observe that the impact of good looks on the number of children remains negative and statistically significant. In order to obtain completed number of children, we restrict the sample to women aged 45 to 60. We continue to see a negative and statistically significant impact of wife's beauty on the number of children.

4.2.3. Estimation with an Alternative Dataset

To further check the robustness of the impact of wives' good looks on the number of children, we perform estimations with the data used in Hamermesh et al. (2002), which are from "the Family Survey of Permanent and Transient Populations" conducted by the Population Research Institute of Shanghai Academy of Social Sciences (SASS) in 1996. Conducted in Shanghai, the 1996 SASS includes 3,000 individuals aged 15 to 64. We restrict our sample to married women from the Han ethnic group between the ages of 18 to 60. Then, we use the *Wife's beauty* dummy variable for appearance. The average number of births for the women in this sample is 1.33, which is lower than that of the 2016 CFPS (1.55). With relatively few questions, the 1996 SASS does not include certain variables such as husband's age and family non-labor income. Although we do not include as many control variables as those listed in Table 4, Table 7 shows that during the period of strict enforcement of the one-child policy, wives' appearance negatively affected the number of children, albeit with a smaller estimate on the impact (-0.12) compared with that from the 2016 CFPS (-0.17). This finding is consistent with our expectation that when the family planning policy is strictly enforced, wives' good looks have a smaller impact on the number of children. Based on the estimation results from the subsamples, appearance does not have a statistically significant impact on the number of children for the women with at least one son. This finding is expected, as having a son is expected to reduce the importance of women's beauty in their position in the family following the social norm claiming that "a mother's status can be raised with a son." However, appearance has a statistically significant impact on the number of children for the women with no son. This finding is also consistent with the regression result using the 2016 CFPS subsamples. Women without a son do need good looks to increase their bargaining power within the family, thereby reducing the number of children.

5. An Analysis of the Mechanisms of How Wives' Beauty Affects the Number of Children

In the conceptual framework, we propose two mechanisms through which women's appearance affects the number of children, that is, bargaining power within the family, and opportunity costs of having children. In this section, we investigate these two mechanisms. Regarding our identification strategy, we use the appearance of wife's name in the house deed as the proxy variable for her bargaining power and denote it as the *Housing* variable in Table 8. The presence of the wife's name in the deed implies that she has a stronger bargaining power. To measure the opportunity cost, we use the logarithm of the hourly wage, that is, *log wage*, as the proxy variable. The results of testing the mechanisms are reported in Table 8.

Table 8 shows that on the one hand, good looks significantly affect wives' bargaining power within the family. Controlling for wives' age, education, indicators of districts, family's non-labor income, the gender of the first child, and the gender of the village or community director, we observe a significantly higher probability of the names of good-looking wives appearing in the deeds compared with those of plain-looking wives in column (1). On the other hand, for beautiful wives, the opportunity cost of having children is higher. Compared with the hourly wage of women without good looks, that of the good-looking women is 24.6% higher and is statistically significant at the 5% level in column (2).

Given that the bargaining power (*Housing*) and opportunity cost (*log wage*) variables are endogenous, we use their predicted values in columns (3), (4), (5), and (6). The results in columns (3) and (4) show that either bargaining power or opportunity cost has a negative impact on the number of children. Wives' beauty still plays a negative and statistically significant role in the number of children when the wage effect is controlled for, with a coefficient of -0.28 in column (5). However, when *Housing* and *log wage* enter the

regression at the same time and the endogeneity of the appearance variable is dealt with, the coefficient of the appearance variable declines from -0.43 (see column (1) in Table 6) to -0.23 (see column (6) in Table 8), and becomes statistically insignificant even at the 10% level. Both *Housing* and *log wage* still have an expected negative effect on the number of children. Therefore, the negative impact of wives' beauty on the number of children mainly comes from the bargaining power within the family and the opportunity cost of having children.

We examine the interaction effect of beauty and the gender of the first child (*female=1*) to further examine the impact of wives' beauty on the number of children through bargaining power. The results show that the interaction term is negative and statistically significant (Table A6), implying that women's beauty can mitigate the need to have more children if the first child is a girl.

To what extent can we generalize our empirical results? We believe that our bargaining power mechanism is applicable to many developing countries where son preference is prevalent and women rely heavily on having sons to strengthen their family position. Under such circumstances, beauty can be a suitable substitute for sons. Moreover, the consideration of the opportunity costs of having children is applicable to both developing and developed countries.

As a quick test of these considerations, we look at the data in the 1978 wave of Quality of American Life (1978 QAL) in the US. This data set is also used by Hamermesh and Abrevaya (2013) in their study of the beauty's effect on happiness. Results in Table A7 in the online Appendix show that in a similar fertility regression on wives' beauty, the coefficient is -0.15 and statistically significant in column (1). However, when we control for women's wages (and thus the opportunity cost), the coefficient becomes much smaller (-0.02) and statistically insignificant in column (2).

6. The Impact of Wives' Appearance on Other Behaviors in the Family

6.1. The Effect of Wives' Appearance on Child Quality

We find that women with good looks tend to have fewer children in the preceding sections. One possible explanation is that good-looking women have higher quality children and thus fewer children due to the quantity-quality interaction of children (Becker and Lewis, 1973; Rosenzweig and Zhang, 2009). To examine this possibility, we use two outcome variables about children's academic performance in Table 9, i.e., *whether the child ranks among the top 25% in the class*, and *whether the child ranks among the top 25% in the grade*.

Columns (1) and (2) of Table 9 show that mother's beauty only increases her child's probability of ranking among the top 25% in the class by 0.07-0.08, but this effect is statistically insignificant. Moreover, mother's beauty increases child's probability of ranking among the top 25% in the grade by 0.06-0.14, which is also insignificant, as shown in columns (3) and (4) of Table 9. Both the results of the OLS and 2SLS consistently show that no strong evidence indicates that mother's beauty improves child's academic performance. Moreover, we also examine the effect of mother's beauty on child's wage in Table A8, and find no statistically significant results. Therefore, the negative effect of wives' beauty on the number of children does not seem to be the result of the quantity-quality interaction of children.

6.2. The Effect of Wives' Appearance on Child Care Activities

Thus far, we have demonstrated the negative effect of wives' beauty on the number of children, and explore its mechanisms through bargaining power and opportunity cost. In this section, we further investigate the impact of wives' appearance on other behaviors in the family, including child care, and engagement in tutoring children in their homework. As interpreted in the conceptual framework, beauty changes wives' allocation of time between

the labor market and the household. On the one hand, given that beautiful wives have higher bargaining power, they can transfer household chores to their parents or in-laws. On the other hand, beautiful women have larger premiums in the labor market. Specifically, by having better careers or gaining higher salaries, they have higher opportunity costs of doing housework, such as child care, and tutoring their children in their homework.

However, the difference in women's labor force participation between urban areas and rural areas should be taken into account. Compared with rural women, urban women are more likely to participate in the labor market and to be employed. Hence, their opportunity costs of performing child care activities are higher. Thus, the impact of mother's beauty on the probability of taking care of their children or tutoring their children in their homework works through both bargaining power and opportunity cost. Therefore, mother's beauty will play a negative role in child care activities in urban areas. By contrast, in rural areas, as most women are not active in the labor market, the opportunity cost mechanism is weaker. Moreover, for rural women, the bargaining power brought by beauty is mainly reflected in having fewer children.[18] Therefore, mother's beauty may not exert a significant impact on the probability of performing child care activities in rural areas. In addition, rural women are less likely to be involved in tutoring their children in their homework as they are less educated compared with their urban counterparts, which also leads to the fact that rural women's looks may not play a significant role in such kind of behaviors.

We present the results of the IV Probit estimation in Table 10. In the urban subsample, we observe that women's good looks reduce their probability of taking care of their children at night as shown in Column (1) of Table 10. First, good looks increase women's bargaining power. Second, urban women have a higher opportunity cost of taking care of their children

[18] The regressions based on the urban/rural subsample shows that wives' appearance exerts a more negative impact on the number of children in rural areas. All other factors being constant, good-looking women in rural areas have 0.26 fewer children than plain-looking women, whereas in urban areas, good-looking women have 0.11 fewer children.

as their percentage of being employed is 10.5 percentage points higher than that of rural women. Third, beautiful urban women have premiums in the labor market, they encounter an even higher opportunity cost of doing non-market productions. Thus, for all these three reasons together, they reduce their time in taking care of their children. Conversely, as discussed above, the effect is small and statistically insignificant in the rural sample.

Similarly, in terms of tutoring their children in their homework, Column (3) of Table 10 shows that the mothers in the urban subsample with good looks are less likely to spend time tutoring children in their homework, which can be explained by bargaining power and opportunity cost channels. In addition, compared with the rural females, urban females are better educated. In our sample, the average number of years of schooling of the rural female is 7, whereas the average number of years of schooling of the urban female is 9.5. Furthermore, the difference between the husband's education and the wife's education is smaller in urban families compared with that in rural families, with 0.68 years in urban families and 1.21 years in rural families. Therefore, urban females are more capable of tutoring their children in their homework compared with the rural females, who may have difficulties understanding their children's homework. Given that rural females are less likely to be involved in tutoring children in their homework, their looks do not play a statistically significant role in such kind of behaviors. Since the coefficient of the gender of the first child is much smaller and statistically insignificant, being beautiful is more important than the gender of the child per se. Thus, we conclude that wives' good looks reduce not only the number of children, but also their probability of participating in child care and in tutoring their children in their homework in urban areas.

6.3. The Effect of Wives' Appearance on Intergenerational Care

After exploring the significant negative impacts of wives' good looks on the number of children and performing child care activities, we now investigate the impact of wives' appearance on intergenerational care. In the section on the mechanisms of how beauty

affects various post-marriage outcomes, we confirm that wives' good looks can enhance their bargaining power in the family. Given their higher bargaining power, wives will devote less time to household chores. Owing to lack of social care services in China, the intergenerational care of grandchildren by their grandparents is prevalent. Compared with those in rural areas, women in urban areas exhibit a higher labor participation rate, and a considerable portion of them are employed. Thus, they have strict time schedules and experience substantial pressure to balance work and life. Consequently, urban families have higher demands for child care and household chores services. Recently, the cost of social care services has increased gradually, with the average wage of maternity matrons and nannies being over 5,000 yuan per month (which is approximately 66% of the urban average wage in 2019). Thus, urban families rely increasingly on grandparents for intergenerational care. We hypothesize that in urban areas, wives' good looks can significantly increase their probability of receiving help from their parents or in-laws for intergenerational care for their children and household chores. The results in Columns (5) and (6) of Table 10 confirm our hypothesis. In rural subsample, wives' appearance exerts no statistically significant impact on intergenerational care. However, in the urban subsample, the probability of the parents or in-laws providing child care and participating in household chores is significantly higher for the wives with good looks at the 10% level. We also find that being beautiful is more important than the gender of the child, as the coefficient of the latter is much smaller and statistically insignificant,

7. Conclusion

In this study, we examine the role of wives' beauty within marriage on the number of children, child quality, child care behaviors, and intergenerational care using the 2016 China Family Panel Studies (CFPS) data. Most importantly, we find an interesting phenomenon that beautiful women have at least 0.17 fewer children than average- or plain-looking

women when controlling for other factors. Women's beauty can mitigate the need for more children if the first child is a girl. The negative effect of wives' beauty on the number of children remains robust when the wage effect is controlled. In terms of the mechanisms, we find that wives' appearance influences the number of children mainly through the bargaining power within the family and the opportunity cost of having children but not through the quantity-quality interaction of children. For other outcomes, we find that beautiful wives are less involved in child care and homework assistance in urban areas. Moreover, wives' beauty increases the probability of their parents or in-laws participating in child care and in household chores in urban areas.

We adopt several instrumental variables to address potential endogeneity of the appearance variable. We observe a very robust and negative impact of good looks on the number of children by using instrumental variables estimation, specifically, between -0.3 to -0.4. Moreover, we use an alternative data set to perform the estimations. We find that even during the period when the one-child policy was more strictly enforced, wives' good looks still have a negative and statistically significant impact on the number of children, though the impact is smaller than that obtained from 2016 CFPS.

Our paper shows that wives' beauty has some negative effects on the family. Specifically, wives' beauty decreases the number of children and reduces the probability of wives participating in child care and homework assistance, but increases the probability of their parents or in-laws participating in child care and in household chores. The negative effects of beauty on post-marriage outcomes imply that the status of women is enhanced and gender inequality is reduced. However, it is hard to examine the overall welfare implications for all individuals involved. The utility of wives may be higher, whereas that of children and grandparents may be lower. Furthermore, how to treat unborn children would be a difficult issue.

Our work extends the effect of beauty from the labor market to the family, thereby

enriching the literature on the economics of beauty. Specifically, we provide the first set of empirical evidence on the negative effects of wives' beauty on the number of children and other family behaviors under the framework of household bargaining power and opportunity costs of having children that is applicable to numerous countries in the world. Our analysis suggests interesting directions for future research. First, the economic causes and consequences of social or cultural idioms in various societies can be explored. While this paper finds a negative effect of wives' beauty on some of the post-marriage outcomes based on the Chinese idiom "dangerous beauty," to what extent it holds in other societies remains an open question.

Second, we realize that assortative matching in the marriage market makes it hard to estimate a reliable causal relation between wives' beauty and intrahousehold resource allocation. Revamping the theoretical framework to take assortative matching, labor market opportunity costs, and intrahousehold bargaining into consideration would be left for future endeavors.

Finally, the interaction between economic forces and natural selection may be further examined. According to the survival of the fittest theory which was used by Spencer (1864) to illustrate the human evolution, beautiful people are perceived to should have genetic advantages and are more likely to be preserved in the struggle for life, whereas plain-looking people would be at a disadvantage in natural selection. Ample research on evolution and social psychology indicates that physical attractiveness is positively correlated with reproductive physiology and genetic quality (Hume and Montgomerie, 2001; Jasienska et al., 2006; Rhodes, 2006; Maestripieri et al., 2017). Under this natural mechanism, the process of evolution should lead to the growth in the number of beautiful people. However, the present paper illustrates an interesting phenomenon, that is the economic considerations might be contrary to the natural selection. As shown in this work, beautiful people have economic advantages. However, these advantages will decrease their desired number of

children, thus becoming a disadvantage in reproduction. Therefore, the economic force seems to be a counter power to the natural survival of the fittest.

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Tables and Figures

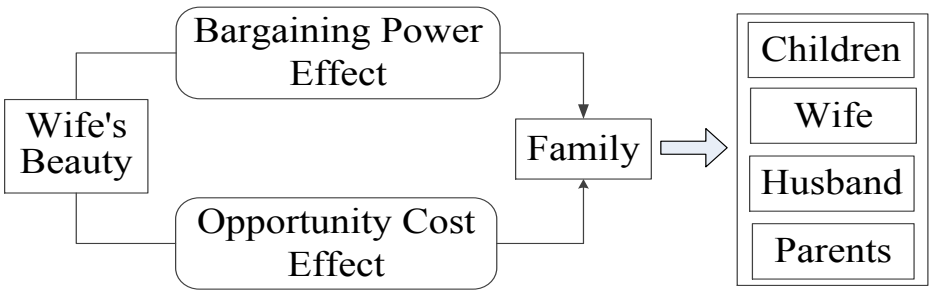

Figure 1

Mechanisms through Which Wives' Appearance Influences Family Decisions and Behaviors.

Table 1

Distribution of Wife's Beauty and the Number of Children.

Wife's Beauty	Frequency	Percentage	Number of children (Mean)
1	2	0.09%	2
2	10	0.43%	2.2
3	57	2.45%	1.93
4	189	8.14%	1.84
5	511	22.00%	1.69
6	762	32.80%	1.54
7	792	34.09%	1.35

N = 2,323

Table 2

Descriptive Statistics of Main Variables.

	Mean	Standard deviation	Min	Max
Number of children	1.55	0.74	0	6
Wife's beauty	0.34		0	1
Wife's age	44.27	9.97	21	60
Wife's education	8.66	4.30	0	19
Number of wife's siblings	2.87	1.81	0	10
Wife's health	2.88	1.16	1	5
Wife's hourly wage	12.24	12.04	0	129
Husband's age	46.22	10.28	22	81
Husband's education	9.51	3.75	0	19
Average household income(yuan/year)	25037.21	61883.54	83	1904667
Average household non-labor income(yuan/year)	6443.94	54002.34	0	1804667
Average household expenditure (yuan/year)	13921.60	21970.99	3	540000
Average household beauty spending (yuan/year)	1090.32	1298.68	0	18333
Beauty spending %	10.95%		0	1
Urban %	66.64%		0	1
Wife is working %	45.98%		0	1
First-born son %	52.26%		0	1
Wife's name appears in the deed %	18.38%		0	1
Grandparents taking care of children %	35.89%		0	1
N = 2,323				

Notes: Non-labor income is the sum of the property income and the transfer income. *Household beauty spending* is the sum of money spent on beauty products, that is, hairdressing, cosmetics, beauty care and so on. *Beauty spending* % = average household beauty spending/average household expenditure. Given the numerous missing values in the wage variable in the 2016 CFPS, the observations for wife's hourly wage are 403.

Table 3

Descriptive Statistics of Each Beauty Group.

	Beautiful women	*Plain-looking women*	*t-statistic*
Number of children	1.35	1.65	-9.16
Number of wife's siblings	2.51	3.06	-6.35
Wife's age	43.08	45.05	-4.54
Wife's education	9.65	8.14	8.01
Wife's hourly wage	14.47	11.04	2.72
Husband's education	10.03	9.23	4.88
Average household expenditure(yuan/year)	16000.37	12846.23	3.37
Average household beauty spending(yuan/year)	1330.99	965.90	6.51
Wife's name appears in the deed %	21.72%	16.66%	2.97
Grandparents taking care of children %	41.88%	32.80%	4.13
N	792	1,531	

Notes: "*Beautiful women*" means that the *beauty* variable is equal to 7, and "*plain-looking women*" means that the *beauty* variable is smaller than 7, that is, 1, 2, 3, 4, 5, or 6. The null hypothesis is that the mean difference between beautiful women and plain-looking women is zero.

Table 4

The Effect of Wife's Beauty on the Number of Children.

Dependent variable	Number of children					
	(1)	(2)	(3)	(4)	(5)	(6)
Wife's beauty	-0.169	-0.169	-0.145	-0.095	-0.091	-0.120
	(0.028)	(0.028)	(0.029)	(0.041)	(0.034)	(0.043)
Wife's working status	-0.070	-0.097	-0.043	-0.017	-0.060	-0.062
	(0.028)	(0.029)	(0.029)	(0.028)	(0.029)	(0.029)
Wife's age	0.003	0.006	0.008	0.007		-0.0004
	(0.005)	(0.007)	(0.005)	(0.005)		(0.006)
Wife's education	-0.029	-0.028	-0.023	-0.015		-0.029
	(0.004)	(0.004)	(0.004)	(0.004)		(0.004)
Wife's height	0.0001	-0.0004	0.0005	0.002	-0.0003	0.0004
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Log non-labor income	-0.016	-0.017		-0.005	-0.018	-0.015
	(0.003)	(0.003)		(0.003)	(0.003)	(0.003)
Gender of first child (son)	-0.236	-0.235	-0.231	-0.259	-0.237	-0.241
	(0.026)	(0.026)	(0.027)	(0.025)	(0.026)	(0.027)
Urban	-0.244	-0.245	-0.203	-0.151	-0.199	-0.241
	(0.030)	(0.030)	(0.031)	(0.036)	(0.034)	(0.031)
Husband's age	-0.002	-0.003	-0.004	0.002	-0.004	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.005)
Husband's education	-0.017	-0.017	-0.012	-0.013	-0.023	-0.015
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Years of marriage	0.016	0.016	0.014	0.010	0.015	0.018
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)
Log household net asset			-0.098			
			(0.011)			
Predicted log wage of wife					-0.345	
					(0.070)	
Husband's beauty						-0.040
						(0.043)
Wife's cohort fixed effects	No	Yes	No	No	No	No
Interviewer fixed effects	No	No	No	Yes	No	No
Constant	1.962	1.876	2.719	0.832	2.472	1.953
	(0.402)	(0.488)	(0.421)	(0.443)	(0.409)	(0.416)
Observations	2,306	2,306	2,175	2,306	2,306	2,089
R-squared	0.288	0.289	0.302	0.526	0.279	0.293

Notes: The *predicted log wage of wife* is the predicted value using a Heckman's selection model, which is reported in Table A2 in the online Appendix. As wife's age and education are used in the prediction of the *log wage* variable, these two variables are not included in Specification (5). *Husband's beauty* is a dummy variable, it is 1 if the original ratings in the CFPS is 7; otherwise, it is 0. We also control for wife's health and district fixed effects in each regression. Standard errors are in parentheses.

Table 5

The Effect of Wife's Beauty on the Number of Children Using Other Measures of Beauty.

Dependent variable	Number of children		
	(1)	(2)	(3)
Wife's appearance	-0.077		
	(0.013)		
Wife's beauty		-0.153	
		(0.029)	
Average-looking			-0.100
			(0.032)
Above-average			-0.215
			(0.032)
Constant	2.961	2.696	2.836
	(0.421)	(0.418)	(0.412)
Observations	2,306	2,306	2,306
R-squared	0.298	0.295	0.300

Notes: Other control variables are the same as those in Specification (1) in Table 4. In Specification (1), *wife's appearance* is a continuous variable. In Specification (2), *Wife's beauty* is 1 if the original ratings in the CFPS is 6 or 7; otherwise, *Wife's beauty* is 0. In Specification (3), two dummy variables are used, with CFPS ratings of 1 to 5 as homely (the omitted group), 6 as average-looking denoted by the dummy variable *Average-looking*, and 7 as strikingly good-looking denoted by the dummy variable *Above-average*. Standard errors are in parentheses.

Table 6 IV

Estimates of the Effect of Wife's Beauty on the Number of Children.

Dependent variable	Number of children					
	Whole sample	Consistent evaluation sample	Same interviewer sample	Whole sample	Whole sample	Whole sample
	(1)	(2)	(3)	(4)	(5)	(6)
Wife's beauty	-0.431	-0.334	-0.411	-0.312	-0.345	-0.352
	(0.113)	(0.148)	(0.214)	(0.128)	(0.141)	(0.147)
Wife's age	0.016	0.015	0.014	0.001	0.005	0.003
	(0.002)	(0.002)	(0.004)	(0.006)	(0.008)	(0.009)
Wife's education	-0.036	-0.042	-0.040	-0.036	-0.031	-0.042
	(0.004)	(0.005)	(0.009)	(0.011)	(0.013)	(0.013)
Wife's height	0.0001	0.001	0.003	0.006	0.003	0.004
	(0.002)	(0.003)	(0.007)	(0.006)	(0.007)	(0.007)
Urban	-0.276	-0.267	-0.232	-0.185	-0.079	-0.096
	(0.030)	(0.038)	(0.080)	(0.088)	(0.111)	(0.109)
Log non-labor income	-0.016	-0.021	-0.022	0.004	0.004	0.002
	(0.003)	(0.004)	(0.009)	(0.008)	(0.009)	(0.009)
Gender of the first child (son)	-0.222	-0.229	-0.173	-0.134	-0.173	-0.164
	(0.027)	(0.035)	(0.076)	(0.076)	(0.094)	(0.096)
Constant	1.622	1.866	2.187	0.797	0.956	0.952
	(0.403)	(0.519)	(1.152)	(1.063)	(1.222)	(1.207)
Observations	2,306	1,429	294	132	105	96
R-squared	0.249	0.284	0.269	0.237	0.257	0.287
Over-identification test p-value	0.103	0.149	0.251			0.998
Cragg-Donald Wald F statistic	19.77	22.07	23.57	63.95	70.26	29.48

Notes: IVs used in Specification (1) are household expenditure and interviewer group size dummies. IVs used in Specification (2) are interviewer group size dummies. Given the few observations in Specification (3), we use the number of women interviewed by the interviewer, instead of the several group size dummies as before. The other IV (i.e., household expenditure) is also used. IV used in Specification (4) is mother's beauty, while IV used in Specification (5) is father's beauty. IVs used in Specification (6) are mother 's beauty and father' s beauty. We also control for wife's health and district fixed effects in each regression. Standard errors are in parentheses.

Table 7

The Impact of Wife's Beauty on the Number of Children Using 1996 SASS.

Dependent variable	Number of children		
	Whole sample	Having a son	No son
	(1)	(2)	(3)
Wife's beauty	-0.120	-0.073	-0.146
	(0.065)	(0.094)	(0.084)
Constant	1.668	1.291	1.422
	(0.251)	(0.736)	(0.245)
Observations	1,047	561	486
R-squared	0.568	0.589	0.344

Notes: Other control variables are wife's age, hukou, education, height, health, whether she was employed or not, husband's education, and years she has been married to her current husband. Specification (1) also includes another control variable, i.e., whether she has a son. Standard errors are in parentheses.

Table 8

Bargaining Power and Opportunity Cost Effects.

Dependent variables	Housing	Log wage	Children	Children	Children	Children
	Probit	Heckman two-step	OLS	OLS	2SLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Wife's beauty	0.189	0.246			-0.282	-0.228
	(0.090)	(0.099)			(0.157)	(0.157)
Predicted housing			-0.503			-0.257
			(0.044)			(0.047)
Predicted log wage				-0.716	-0.659	-0.510
				(0.051)	(0.070)	(0.071)
Constant	-1.418	-0.350	2.602	2.679	2.718	2.619
	(0.145)	(1.769)	(0.536)	(0.523)	(0.505)	(0.486)
Observations	1,259	1,177	1,259	1,259	1,259	1,259
R-squared			0.214	0.249	0.251	0.267
Sargan statistic					9.06	4.66

Notes: Housing represents whether the wife's name appears in the deed, Specification (1) contains other independent variables, that is, Wife's age and education, urban, indicators of districts, gender of the first child, log non-labor income, and gender of the community director (0, if the director is male, 1 if the director is female). We present the coefficients here. Specification (2) is estimated by a Heckman's selection model, which is the same as Table A2 in the online Appendix. The predicted *housing* variable is predicted by Specification (1). The predicted *log wage* is predicted by Specification (2). Control variables in Specifications (3) - (6) are the same as those in Specification (1) in Table 8, except for age and education, as these two variables are used in the prediction of the *housing* and *log wage* variables. Specifications (5) and (6) are estimated in two stages. In the first stage, the beautiful variable is predicted by all the controls in these specifications and the IVs (i.e., household expenditures and interviewer group size dummies). In the second stage, the standard errors are bootstrapped from the existing sample using the results of 100 random replications. Standard errors are in parentheses.

Table 9

The Effect of Mother's Beauty on the Children's Academic Performance.

Dependent variables	*Rank among the top 25% in the class=1, not=0*		*Rank among the top 25% in the grade=1, not=0*	
	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)
Mother's beauty	0.076	0.070	0.055	0.139
	(0.055)	(0.173)	(0.060)	(0.203)
Mother's education	0.009	0.009	0.006	0.005
	(0.008)	(0.008)	(0.009)	(0.009)
Mother's age	-0.0005	-0.0005	-0.002	-0.002
	(0.006)	(0.006)	(0.006)	(0.006)
Child's age	-0.014	-0.014	-0.013	-0.014
	(0.020)	(0.020)	(0.022)	(0.022)
Child's gender (boy)	-0.171	-0.170	-0.168	-0.172
	(0.053)	(0.053)	(0.058)	(0.058)
Child's grade	0.010	0.010	0.005	0.004
	(0.018)	(0.017)	(0.019)	(0.019)
Urban	-0.037	-0.037	-0.005	-0.003
	(0.059)	(0.058)	(0.064)	(0.063)
Log non-labor income	0.010	0.010	0.014	0.014
	(0.006)	(0.006)	(0.007)	(0.007)
Constant	0.690	0.690	0.625	0.613
	(0.331)	(0.326)	(0.361)	(0.356)
Observations	355	355	299	299
R-squared	0.055	0.055	0.063	0.056
Over-identification test p-value		0.463		0.115

Notes: Specifications (2) and (4) are estimated by 2SLS, IVs are household expenditure and interviewer group size dummies. We also control for district fixed effects in each regression. Standard errors are in parentheses.

Table 10

The Effect of Mother's Beauty on Child Care Activities.

Dependent variable	*Mother taking care of the child at night=1, not=0*		*Mother tutoring children in their homework=1, not= 0*		*Grandparents doing housework or taking care of grandchildren=1, not=0*	
	Urban	Rural	Urban	Rural	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's beauty	-0.781	0.145	-1.059	0.614	0.698	-0.109
	(0.407)	(0.404)	(0.528)	(0.386)	(0.423)	(0.399)
Mother's education	0.006	-0.005	0.065	0.059	-0.022	0.015
	(0.017)	(0.023)	(0.019)	(0.024)	(0.013)	(0.017)
Mother's age	0.045	0.042	-0.009	-0.028	-0.073	-0.076
	(0.011)	(0.014)	(0.011)	(0.013)	(0.011)	(0.017)
Mother's working status	-0.235	-0.619	-0.058	-0.156	0.047	0.217
	(0.112)	(0.128)	(0.113)	(0.128)	(0.091)	(0.117)
Child's age	-0.108	-0.137	0.069	0.096	-0.042	-0.020
	(0.016)	(0.020)	(0.016)	(0.019)	(0.012)	(0.017)
Child's gender (boy)	0.022	-0.081	-0.032	-0.089	0.014	-0.061
	(0.093)	(0.119)	(0.101)	(0.117)	(0.082)	(0.114)
Log non-labor income	-0.023	-0.049	-0.008	0.023	0.058	0.057
	(0.010)	(0.016)	(0.011)	(0.016)	(0.009)	(0.015)
Constant	0.221	0.643	-0.717	-0.760	3.311	3.069
	(0.346)	(0.471)	(0.374)	(0.466)	(0.444)	(0.495)
Observations	814	565	814	565	1,507	756
Over-identification test p-value	0.897	0.428	0.138	0.482	0.891	0.684

Notes: Specifications (1) - (6) are estimated by IV Probit, and IVs are household expenditures and interviewer group size dummies. We also control for district fixed effects in each regression. Coefficients are presented in the table. Standard errors are in parentheses.

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Appendix

Table A1

Descriptive Statistics of Each Beauty Group.

	1-3	4	5	6	7
Number of children	1.97	1.84	1.69	1.54	1.35
Number of wife's siblings	3.82	3.38	3.01	2.95	2.51
Wife's hourly wage	10.91	12.97	10.14	11.23	14.47
Husband's education	7.47	8.09	9.14	9.73	10.03
Average household non-labor income	2300.74	2617.62	4606.35	4086.84	11171.42
Average household total spending	9329.64	10550.56	11765.36	14458.9	16000.37
Average household beauty spending	522.64	765	913.46	1091.2	1330.99
Average household beauty spending %	8%	9%	11%	11%	12%
Wife's name appears in deed %	17%	14%	16%	18%	22%
Grandparents taking care children %	13%	26%	34%	36%	42%
N = 2,323					

Note: Given the numerous missing values for the wage variable in the 2016 CFPS, the total observations for *wife's hourly wage* are less than 2323.

Table A2

Results of Heckman Two Step Estimation.

Dependent variables	Wife's log wage	Participation selection of wife
	(1)	(2)
Wife's beauty	0.246	0.061
	(0.099)	(0.092)
Wife's age	0.076	0.109
	(0.073)	(0.048)
Age square of wife	-0.001	-0.002
	(0.001)	(0.001)
Wife's education	0.048	0.019
	(0.015)	(0.013)
Urban	0.163	-0.069
	(0.102)	(0.094)
Preschool		-0.439
		(0.152)
Log non-labor income		0.011
		(0.010)
Mother's education		-0.022
		(0.013)
Father's education		0.016
		(0.012)
Lambda		0.714
		(0.405)
Constant	-0.350	-2.042
	(1.769)	(1.056)
Observations	1,177	1,177

Notes: Preschool = 1, if the woman has a child under 6 years of age, otherwise, *Preschool* = 0. Standard errors are in parentheses.

Table A3

First-stage Results.

Dependent variable	Wife's beauty					
	(1)	(2)	(3)	(4)	(5)	(6)
Number_2	0.082	0.090				
	(0.033)	(0.034)				
Number_3	0.042	0.051				
	(0.034)	(0.034)				
Number_4	0.214	0.170				
	(0.043)	(0.044)				
Number_5	0.180	0.317				
	(0.047)	(0.052)				
Number_6	-0.243	-0.114				
	(0.069)	(0.062)				
Number_7	0.697	0.786				
	(0.084)	(0.080)				
Number_8	0.611	0.364				
	(0.109)	(0.182)				
Number			0.012			
			(0.002)			
Household	0.008		-0.004			
expenditure	(0.004)		(0.025)			
Mother's				0.631		0.239
beauty				(0.079)		(0.139)
Father's					0.658	0.435
beauty					(0.079)	(0.135)
Wife's age	-0.003	-0.005	0.0002	0.001	0.002	0.006
	(0.001)	(0.001)	(0.003)	(0.006)	(0.007)	(0.008)
Wife's	0.015	0.015	-0.007	0.018	0.026	0.022
education	(0.002)	(0.002)	(0.006)	(0.011)	(0.011)	(0.012)
Urban	0.006	0.008	-0.064	0.075	0.011	0.013
	(0.021)	(0.021)	(0.054)	(0.087)	(0.094)	(0.097)

Table A3

First-stage Results (continued).

Dependent variable	Wife's beauty					
	(1)	(2)	(3)	(4)	(5)	(6)
Log non-labor income	-0.0005	-0.001	-0.002	-0.003	0.004	0.001
	(0.002)	(0.002)	(0.006)	(0.008)	(0.008)	(0.008)
Gender of first child	0.029	0.032	0.089	0.108	0.174	0.183
	(0.019)	(0.019)	(0.051)	(0.073)	(0.078)	(0.082)
Constant	0.261	0.134	-0.302	1.029	0.307	0.443
	(0.285)	(0.285)	(0.784)	(1.034)	(1.036)	(1.070)
Observations	2,306	1,429	294	132	105	96
R-squared	0.097	0.157	0.198	0.409	0.513	0.516
Cragg-Donald Wald F statistic	19.77	22.07	23.57	63.95	70.26	29.48

Notes: Number_2, *Number_3*, *Number_4*, *Number_5*, *Number_6*, *Number_7*, and *Number_8*, are seven interviewer group size dummies. We also control for wife's height, wife's health and district fixed effects in each regression. Standard errors are in parentheses.

Table A4

The Effect of Wife's Beauty on the Number of Children using Self-Employed Sample.

Dependent variable	Number of children 2SLS
Wife's beauty	-2.067
	(0.512)
Wife's age	0.018
	(0.004)
Wife's education	-0.014
	(0.007)
Wife's height	-0.0003
	(0.002)
Log non-labor income	-0.007
	(0.007)
Gender of first child (son)	-0.353
	(0.048)
Urban	-0.046
	(0.038)
Constant	1.855
	(0.381)
Observations	2,030
R-squared	-0.706
Over-identification test p-value	0.212
Cragg-Donald Wald F statistic	5.635

Notes: Other control variables are the same as those in Specification (1) in Table 8. IVs used in this regression are household expenditure and interviewer group size dummies. We also control for wife's health and district fixed effects in the regression. Standard errors are in parentheses.

Table A5

Estimates of the Effect of Wife's Beauty on the Number of Children.

Dependent variable	Number of children
Wife's beauty	-0.187
	(0.023)
Wife's age	0.015
	(0.001)
Wife's education	-0.040
	(0.003)
Wife's height	-0.001
	(0.002)
Urban	-0.312
	(0.023)
Log non-labor income	-0.016
	(0.002)
Gender of the first child (son)	-0.218
	(0.021)
Constant	1.814
	(0.345)
Observations	2,306
R-squared	0.268
Over-identification test p-value	0.679
Cragg-Donald Wald F statistic	11.00

Notes: Following Hamermesh et al. (2002) to facilitate comparison, IVs are household expenditure and interviewer's ID dummies. We also control for wife's health and district fixed effects in the regression. Standard errors are in parentheses.

Table A6

The Interaction Effect of Wife's Beauty and the Gender of the First Child on the Number of Children.

Dependent variable	Number of children	
	OLS	2SLS
	(1)	(2)
Wife's beauty	-0.122	-0.109
	(0.038)	(0.136)
First-child-female	0.268	0.428
	(0.032)	(0.078)
Wife's beauty×First-child-female	-0.099	-0.606
	(0.055)	(0.190)
Wife's working status	-0.093	
	(0.028)	
Wife's age	0.003	0.015
	(0.005)	(0.002)
Wife's education	-0.028	-0.036
	(0.004)	(0.003)
Wife's height	-0.000	-0.001
	(0.002)	(0.003)
Log non-labor income	-0.017	-0.017
	(0.003)	(0.003)
Urban	-0.243	-0.276
	(0.030)	(0.031)
Husband's age	-0.003	
	(0.004)	
Husband's education	-0.017	
	(0.004)	
Years of marriage	0.015	
	(0.004)	
Constant	1.847	1.435
	(0.398)	(0.455)
Observations	2,306	2,306
R-squared	0.289	0.268
Sargan Statistic		11.069

Notes: IVs used in Specification (2) are household expenditure and interviewer group size dummies. We also control for wife's health and district fixed effects in each regression. Standard errors are in parentheses.

Table A7

The Effect of Wife's Beauty on the Number of Children Using 1978 Wave of the Quality of American Life.

Dependent variable	Number of children	
	(1)	(2)
Wife's beauty	-0.152	-0.023
	(0.088)	(0.079)
Wife's age	-0.033	0.051
	(0.003)	(0.007)
Wife is white	-0.432	-0.441
	(0.125)	(0.112)
Wife's health	0.192	0.215
	(0.093)	(0.083)
Predicted log wage of wife		-1.648
		(0.111)
Wife's working status		-0.460
		(0.076)
Log family income	0.113	-0.024
	(0.057)	(0.055)
Wife's education	No	Yes
Constant	1.726	11.994
	(0.554)	(0.862)
Observations	929	929
R-squared	0.119	0.311

Notes: Wife's health is a dummy variable, and *predicted log wage of wife* is the predicted value using a Heckman's selection model. Standard errors are in parentheses.

Table A8

The Effect of Mother's Beauty on Child's Wage.

Dependent variable	Log of Hourly Wage	
	(1)	(2)
Mother's beauty	-0.124	
	(0.084)	
Mother is average-looking		0.002
		(0.109)
Mother is beautiful		-0.123
		(0.119)
Constant	1.003	1.000
	(0.544)	(0.556)
Observations	323	323
R-squared	0.228	0.228

Notes: Other control variables are child's age, gender, education, marriage status, member of Chinese Communist Party, Hukou status, experience and its quadratic term, whether work in state-owned sector, indicators of districts, BMI, health status, indicators of occupation and industry. The child sample contains employees aged 16-60. In Specification (1), *Mother's beauty* is 1 if the original rating in the CFPS is 7; otherwise, *Mother's beauty* is 0. In Specification (2), two dummy variables are used, with CFPS ratings of 1 to 4 as homely (the omitted group), 5 and 6 as average-looking denoted by the dummy variable *Mother is average-looking*, and 7 as strikingly good-looking denoted by the dummy variable *Mother is beautiful*. Standard errors are in parentheses.