The College Admissions Beauty Premium

DAVID ONG[*], MAN (AMANDA) XIE[†], AND JUNSEN ZHANG[‡]

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Beautiful people earn more. Surprisingly, this premium is larger for men than for women, and is independent of degree of customer contact. Overlooked is the possibility that beauty can influence college admissions. We investigate this academic contributor to the labor market beauty earnings premium by sampling 1,800 social media profiles of students from universities ranked from 1 to 200 in China and the US. Chinese universities use standardized test scores for admissions In contrast, US universities use also extracurricular activities and grades, which are not necessarily beauty-blind. Consistent with beauty-blind admissions, student's beauty is uncorrelated with the rank of the school they attended are in China, suggests that neither beauty nor its correlates (e.g., family income, intelligence, and genetic quality) are necessarily related to academic ability. In the US, White men who attended higher ranked schools are better-looking, especially among private schools, which have more discretion. A one percentage point increase in beauty rank raises the school rank attended by two. A 10 percent increase in beauty rank increases salary 10 years after graduation by six percent. Our evidence indicates a college admissions contribution to the labor market beauty premium for males (who are mostly White).

Keywords: beauty premium, labor market discrimination, college admission

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[*] Email: dvdong@gmail.com, phone: +86 755 2603 2655 Peking University HSBC Business School, University Town, Shenzhen, Guangdong, 518055, PRC

[†] Email: man.xie@warrington.ufl.edu, Department of Marketing, Warrington College of Business Administration, Bryan Hall 100, PO Box 117150, University of Florida, Gainesville, FL 32611-7150

[‡] Corresponding author email: jszhang@cuhk.edu.hk, phone: +85239438186, Department of Economics, Chinese University of Hong Kong, Shatin, NT, Hong Kong, SAR, PRC

I. Introduction

Beautiful people earn more. Such is the conclusion of a burgeoning literature initiated by Biddle and Hamermesh (1994). Surprisingly, beauty seems to matter more for men than for women, and in most jobs, instead of being limited to those with extensive dealings with customers who might indulge a taste for beauty. (See A-Table 1 in the Appendix for a summary of the beauty premium for men and women across studies.) To explain these unexpected findings, several authors have proposed employer discrimination through human resource (HR) managers as a potential cause. However, overlooked is the possibility that the beauty premium originates prior to the labor market, specifically in the college admissions process, within which the discretion of teachers, guidance counselors, and admissions officers to discriminate, are comparable to that of HR managers. (See the Appendix also for a review of the labor market studies of the labor market beauty premium.) Indeed, if HR managers do discriminate by beauty or its potential correlates in extracurricular activities (Rivera 2011), colleges can improve their placement record by discriminating by these same correlates in their admissions decisions. In fact, colleges seem to do precisely that when seeking talent in "leadership, performing arts, or athletics" among high school students.[1] Beauty may well contribute to the physical charisma or confidence (Mobius and Rosenblat 2006), which may be necessary for election to leadership positions among high school students, considering that the voting public (Berggren, Jordahl, and Poutvaara 2010) and even economists (Hamermesh 2006) exhibit such a bias in the election of their leaders.

We test for this potential college admissions contribution to the labor market beauty premium by sampling 1,800 online social media profiles across a wide range of universities (ranked 1−200) in China and in the US. Given that US universities use also extracurricular activities and grades in the decision to admit students (Green, Jaschik, and Lederman 2011), we hypothesize that the beauty of students may increase the rank of the university they attended in the US. In contrast, Chinese universities use standardized test scores almost exclusively to admit students (Bai and

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[1] According to a recent New York Times article (Cain 2017), 'Harvard's application informs students that its mission is "to educate our students to be citizens and citizen-leaders for society." Yale's website advises applicants that it seeks "the leaders of their generation". On Princeton's site, "leadership activities" are first among equals on a list of characteristics for would-be students to showcase. Even Wesleyan, known for its artistic culture, was found by one study to evaluate applicants based on leadership potential…Whatever the colleges' intentions, the pressure to lead now defines and constricts our children's adolescence….It seemed no activity or accomplishment meant squat unless it was somehow connected to leadership.'
https://www.nytimes.com/2017/03/24/opinion/sunday/not-leadership-material-good-the-world-needs-followers.html?_r=1

Chi 2014; Li et al. 2012; Yang 2014).[2] Despite the shortcomings of such an admissions system in terms of the stress it imposes on students (Cai et al. 2014), it is necessarily beauty-blind. In light of a recent large sample study of twins which finds no relationship between facial attractiveness and intelligence (Mitchem et al. 2015), we hypothesize that no association exists between the beauty of students and the rank of the university they attended in China.

Our hypothesis for China was confirmed: the beauty of Chinese students is uncorrelated with the rank of the school they attended. Our hypothesis for the US was confirmed only for White men. A one percentage point increase in beauty rank corresponds to a 2 school increase in the rank of the school attended for White men. This outcome translates into a roughly six percent increase in salary 10 years after graduation for a 10 percent increase in beauty rank, an effect which seems sufficient to explain the previously found labor market beauty premium which ranges from 5-20 percent for the coarser measure of below, at, or above average looks (A-Table 1).

Our finding in China suggests that neither beauty nor its correlates, e.g., family income,[3] intelligence…etc (see Literature Review section below for the full discussion of such confounders) have a necessary relationship with academic ability, at least as measured by standardized tests. Our finding for the US that better-looking White men are admitted into much higher ranked schools would suggest that these men are favored in the admissions process, e.g., by teachers, guidance counselors, or admissions officers, either directly through their beauty or indirectly through correlates of beauty, e.g., "leadership qualities". Further robustness checks indicate that the effect of beauty on the rank of the school attended is stronger for private schools. Compared to public schools, private schools should have greater discretion in selecting for leadership qualities than public schools, because they are less regulated. We also find that the effect of beauty on the rank of the school attended is weaker for technology schools than non-technology schools. Technology schools should attach less importance to leadership qualities than technical ability as indicated by standardized test scores than non-technology schools.[4] We

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[2] A number of top-tier universities in China admit some outstanding students, e.g., winners of international mathematics competitions through special channels that involve the university's own admissions exams, followed by oral exam type interviews. However, details on the policies for specific universities are not publicly available.

[3] We are unaware of studies which show that a person's beauty increases on their family income. However, income likely increases grooming ability, nutrition, and other factors that would improve beauty.

[4] A former director of admissions at Dartmouth, an elite private college, revealed that it was very difficult to choose from among the many academically well-qualified candidates of the two thousand applications she read per year (Sabky 2017). In her view, personal essays by the

discuss potential reasons why White men in particular would be affected by such a beauty bias after the main results.

In summary, our evidence suggests a college admission contribution to the labor market beauty earnings premium for men (who are mostly White) in the US and other Western countries.[5] Our findings indicate a discriminatory element may be present in US college admissions through the use of extra-curricular activities in admissions decisions. This consequence could be an unintended side effect of using non-academic/high school extracurricular activities in college admissions. This academic contribution could help explain the greater beauty premium for men found in prior studies in Western countries.

II. Methodology

We selected 30 universities in China and the US ranked from 1 to 200. Each selected school has similar rankings in at least two commonly used ranking systems. The rankings for US schools include the U.S. News & World Report Ranking,[6] the Academic Ranking of World Universities (ARWU),[7] whereas the Chinese University Alumni Alliance Ranking (CUAA)[8] and the Wu Shulian's Chinese University Rankings[9] are for Chinese schools. School rankings are shown in the A-Table 2 in the Appendix.

We randomly sampled 30 profiles (15 for each gender) for each school on Facebook. In the US, 72 percent of college students have a profile on Facebook.[10] We used the social media site Renren in China, which had a reported membership of 280 million in 2013.[11] In both services, users can create profiles for free with photos, other images, list of personal interests, contact information, accounts of memorable life events, and other personal information, such as educational background and employment status. Registration on the two social media sites

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candidate and letters of recommendation from illustriousness mentors are generally uninformative. Rather, she must resort to idiosyncratic signals such as "inappropriate email addresses", behavior on a campus visit, or an unusual recommender—in the case of the article--the janitor of the student's high school. Additionally, she sometimes give those signals greater priority than standardized test scores in her admissions decision. See: https://www.nytimes.com/2017/04/04/opinion/check-this-box-if-youre-a-good-person.html?mtrref=query.nytimes.com&assetType=opinion

[6] http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/national-universities/data

[7] http://www.shanghairanking.com/World-University-Rankings-2015/USA.html

[8] http://www.cuaa.net/cur/2015/index_700

[9] http://edu.qq.com/zt2013/2013wsl/

[10] http://www.pewinternet.org/2015/08/19/the-demographics-of-social-media-users/

[11] Renren is the Facebook analog for college students in China, as Facebook is blocked by the Chinese Government.

requires filling in: name, gender, and email address or phone number. Renren also requires a birth date and educational information (either high school or college). The educational information of a Renren account can also be "verified" by a school IP address or the school email. Such verification is indicated in the profile. We used only such verified accounts. A user is also required to upload a personal photo for the profile picture.

After registration, users can add other users as "friends" with whom they can share their profile content. Users can also join common-interest user groups which are organized by workplace, school, or other categories. Users determine who can browse their pages or receive their updates with their privacy settings. On both websites, users can make their profile "public," (anyone with a membership can see their profile) or "open to friends" (only "friends" can see their profile) or "private" (only the user themselves can view their profile). Both websites allow users to search for public profiles with specific educational backgrounds.

Search engines generally employ confidential proprietary algorithms to enhance the efficiency of searches. To avoid any unobserved influences from such algorithms on our results, we selected the profile photo based on random numbers from 1 to 200 generated prior to our searches. Hence, if we drew a number 67, we would select the 67th profile in the search engine results. We drew two sets of random numbers: the second to be used in cases where the profile indicated by the first number did not have the required information or photo quality.[12] Each selected profile was that of a student who graduated from the school as an undergraduate in 2012. The profile photo must be a clear color front-view photo without any head covering. Other people or backgrounds in the photos were cropped to highlight the face of the subject. We paid raters (5 RMB/100 pairs in China and 0.75 USD/100 pairs in the US) to evaluate all profile photos using a proprietary beauty rating program, which they could access through a standard web browser.[13]

The rating program matched each photo randomly with 10 other photos of the same gender in the same country. 4,500 photo pairs are generated for each gender in each country. We used multiple raters to rate the same photo. The final rating is based on the averaging rating of all raters. Raters were asked to choose the more physically attractive within each pair. Instead of

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[12] These criteria are available on request.

[13] At the time of writing, the exchange rate was 1 USD for 6.5 RMB. Given the few minutes it takes to rate all 100 photos, our payment was relatively high for both Mechanical Turk and China. A high wage was set to attract sufficient numbers of raters in a short time span.

asking raters for a numerical rating within a certain range of numbers, as is standard in the field (Hamermesh and Biddle 1994), we asked raters to decide only which photo of the pair is better-looking. Such a judgment may be easier and more precise than assigning a number to indicate how good-looking someone according to a numerical scale (Negahban, Oh, and Shah 2012). Numerical beauty ratings could cluster around specific numbers, e.g., 7 or 8 out of 10. A given subject may not be consistent in their beauty rating across a number of photos, because of fatigue, lapses in memory, or because their reference point changes as they rate photos. In contrast, binary decisions require only recognizing the minimal difference in beauty between two photos in side-by-side comparison. The effect of fatigue is therefore minimized. Subjects do not need to compare different pairs across time. Memory cannot be an issue. We use the well-established Bradley–Terry model for aggregating ratings into a ranking. [14] The binary decision also avoids potential scale differences across individuals, genders, and countries (e.g., where Chinese females choose higher numbers than American male raters), which can add noise to the data. To deal with these sources of noise, prior studies coarsen their data further into three categories: below, at, or above average beauty. However, this may sacrifice the precision we exploit to establish our hypotheses below.

Each rater rated 100 pairs of photos. The software aggregates the ratings for each photo into a continuous number between 0 percent (least attractive) and 100 percent (most attractive). For each photo, these numbers represent the attractiveness percentile, namely, the share of other photos that reviewers on average found less attractive.

In the US, each photo was rated 12−37 times by US raters, with a mean of 22 times. In China, each photo was rated 12−28 times, with a mean of 20 times. Such rating frequencies are comparable to other studies (Deryugina and Shurchkov 2015). In total, 90 Chinese raters (60 male) rated all 900 Chinese photos, and 103 US raters (49 males, 86 White) rated all 900 US photos. Chinese raters were graduate students recruited from the Peking University HSBC School of Business through a mass email. The US raters were recruited through Amazon Mechanical Turk, a project-based employment service offered by Amazon.

We also hired an additional 27 US raters to categorize the race (White, Black, Hispanic, and Asian) and age ranges (age categories: 23−26 and 27 or older) of all US photos. Chinese students

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[14] See https://en.wikipedia.org/wiki/Bradley%E2%80%93Terry_model.

are almost always of the Han majority and within the 23−26 age range because they rarely take time off before college.[15] Unlike US Facebook profiles, age is listed with the Chinese profiles on Renren. Each US rater was asked to categorize 100 US photos. Each US photo was categorized once each by three different US raters. The final race and age categories of the US photos were determined by the ratings of the US majority raters, i.e., two or three out of three. The results of the race and age categorization for the US sample are shown in A-Table 4.

The following equation is estimated for each country:

$$Schoolrank_i = \alpha + \beta_1(Rating_i) + \varepsilon \qquad \text{Eq. (1)}$$

where i is the index of individual students. $Schoolrank_i$ refers to the log of school rank within each country. $Rating_i$ is a number between 0 percent and 100 percent representing the aggregate rating given by the raters. We invert the ranking, i.e., use $1 - Rating_i$ so that a smaller beauty percent number (high beauty rank) corresponds to smaller school rank number (high rank school). We abuse notation slightly and omit the inversion from the text. The $Rating_i$ variable is derived from the residual of a regression in which we control for subject's age (using a dummy variable which takes on the value of 0 for the age range 23−26 and the value of 1 for 27 and older) based on the listed age of the profile in China, and the age attributed by the raters for profiles in the US. In this regression, we also controlled for display rank of the photo in the search engine results, which could be affected by the unobserved search algorithm.

III. Results

The coefficient for *beauty percentile* (0.032) in column (1) of Table 1 is small and statistically insignificant indicating

Observation I.   The beauty of students in China exerted no economically or statistically significant effect on the rank of the school they attended.

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[15] The Han race constitutes 91 percent of the population of China, See https://en.wikipedia.org/wiki/Ethnic_minorities_in_China. The share of Hans is likely even higher among university students.

We separate the data by gender because the correlation between beauty and ability can vary by gender. Columns (2) and (3) of Table 1 show that

Observation II. The beauty of men (0.0832) or women (-0.00931) in China exerted no economically or statistically significant effect on the rank of the school they attended.

In contrast, column (1) of Table 2 indicates that the coefficient is not small for students as a whole (0.131) in the US, though it is still statistically insignificant due to the large standard error.

Observation III. The beauty of students in the US exerted no statistically significant effect on the rank of the school they attended.

Similarly, columns (2) and (3) of Table 2 indicate that

Observation IV. The beauty of men (0.370) or women (-0.114) in the US exerted no statistically significant effect on the rank of the school they attended in the US.

Thus, while the insignificant and near zero coefficients for students in China indicate a true zero effect of beauty on the rank of school attended, the larger but insignificant coefficients and along with large standard errors for students in the US implies that our estimates are imprecise. Such imprecision could be due to heterogeneous effects of the US student's beauty on the rank of the school they attended, depending upon race. The association between students' beauty and the rank of the school they attended can also vary by race, especially if schools may seek different qualities from different races. White men and women make up the largest part (660/900 = 73%) of the sample. Figure 1 displays the plot of the beauty rank of students at a given school vs. the numerical value of school rank for US White men and women. The right panel shows that the men's beauty rank monotonically increases on the rank of the school attended, whereas the rank for women does not.

Column (4) of Table 2 reveals that *school rank* becomes significant for Whites (0.441) and columns (5) and (6) reveals that this trend is driven by White men.

Observation V. The beauty of White men (0.740), but not White women (0.126) significantly increases with the rank of the school attended in the US.

The 0.740 coefficient for *log* school rank implies that for every percentage point increase in beauty rank, there is a $2.1 = e^{0.74}$ increase in the rank of the school attended. The significance of the coefficient of school rank for White men and the insignificance for White women hold also when we use school rank without the log transformation. We perform a simple back-of-the-envelope calculation of regressing the median and the expected salary (not broken down by race or gender) on school rank to obtain very rough estimate of the economic impact of beauty on earnings. An incremental increase in college rank for a student enrolled in 2001 increases their expected salary by 139 USD and actual median salary 172 USD per year in 2011. (See A-Table 2 for the data.) Thus, a one percentage point increase in beauty rank increases expected salary by 0.6 percent (2*139/42,740USD) in mean salary and a 0.4 percent (2*172/41,500 USD) per year in median salary.

This effect is sizeable when compared to prior studies which use coarsened ratings: below, at, or above average looks. When we categorize our ratings into bottom-, middle-, and top-, our findings suggest that a 33 percent increase in beauty rating would result in a 24 percent increase in salary. Given these data are based on salaries 10 years after graduation, differences in salary across schools of different rank could also be due to increasing returns from graduating from higher ranked schools. However, the change in expected salary per increase in the rank of the school attended is approximately 0.3% (137/42,740), which is similar to new graduates in China (0.25%).[16] The effect of school rank on salary may also be large because our data are across schools and could tend toward picking up across-industry effects, whereas prior studies are generally within industries.

We hypothesize that the correlates of beauty might affect admissions in the US through the exercise of discretion as to the merits signaled by extracurricular activities. According to this hypothesis, we should find a greater effect of the correlates of beauty for private schools, which have greater discretion because they are less regulated. To test this hypothesis, we redo these regressions by comparing results without and with only private schools (namely, Harvard, Columbia, Penn, Massachusetts Institute of Technology, New York University, Boston University, Stevens Institute of Technology, Illinois Institute of Technology, and New Jersey Institute of Technology) in Table 3. The coefficient for beauty rank increases from 0.339 in

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[16] Data available on request.

column (1) for public schools to 1.726 in column (2) for private schools, suggesting that an incremental increase in the beauty rank has a much greater impact on the rank of school attended among private schools. This larger effect is confirmed in column (5) with the positive coefficient for the interaction of the private dummy variable and beauty rank (1.388) for the full sample of both private and public schools. These results suggest that the correlates of beauty have a larger effect on the rank of schools for students who attended private schools. For White men who attended private schools, a one percent increase in beauty rank corresponds to a $5.6 = e^{1.726}$ increase in the rank of the school attended or an almost two percent increase in salary for a one percent increase in beauty rank. Interestingly, the negative coefficient for private school without interaction with beauty (-2.411) indicates that on average, White males who attended private schools may also be less attractive.

This finding raises the possibility that private schools could themselves be heterogeneous in terms of how much the correlates of beauty may affect the chance of admissions of White men. Higher ranked schools might have a greater need to resort to soft criteria in order to reject more otherwise similar high-quality students. To test this hypothesis, we drop the top-4 private schools from our sample: Harvard, Columbia, Penn, MIT, that are top-10 in column (3), while leaving in the bottom 5 private schools in the sample. The coefficient decreases to 0.289. If we drop the bottom-4 ranked private schools: Boston University, Stevens, IIT, and NJIT in Column (4), the coefficient increases to 0.814. These results suggest that beauty rating may have a much larger effect for top private schools than for bottom private schools.

Columns (6-8) show results for technology schools, which may rely less on discretion and more on standardized tests. This conjecture is confirmed by 1) the contrast between the significant coefficient for beauty rank (0.836) in column (6) which drops technology schools and the insignificant coefficient for beauty rank (0.256) in column (7) which contains data only from technology schools and 2) by the insignificance of the technology beauty rank interaction in column (8).

Similar to our other results for White women in the US, Table 4 shows that the coefficients for non-White races of either gender are imprecisely measured.

Observation VI. The beauty of Black, Hispanic, or Asian students in the US has no statistically significant effect on the rank of the school they attended, either in aggregate

as non-Whites, or as separate individual races, even when further separated into genders.

One potential explanation for this lack of association is non-White students are more likely to be foreign. They may be more likely to be represented at higher ranked schools and less likely to be fully acculturated to American grooming and fashion standards. Moreover, their admission to college may depend less on their participation in extracurricular activities for the following possible reasons; they are culturally less likely to participate in them, should they have graduated from US high school, or they come from countries that do not consider extracurricular activities in admissions decisions. We discuss other possible reasons for the difference between non-White and White men below.

IV. Discussion

We find, aggregating across genders, the beauty of students does not have an economically or statistically significant effect on the rank of the school they attended in China either as a whole (Observation I) or when separated by genders (Observation II). The statistical insignificance held also for US students as a whole (Observation III) and when we separated by gender (Observation IV). However, beauty does significantly contribute to the rank of the school attended by White men, but not by White women (Observation V). A one percentage point increase in the beauty rank of White men increases the rank of school attended by two schools. Such an advantage corresponds to roughly a 0.6 percent increase in salary 10 years after graduation using the salary of the lowest ranked school as the benchmark. When we categorize into three categories (top-, middle-, bottom-thirds), this effect seems sufficient to explain the previously found labor market beauty premium which ranges from 5-20 percent for the coarser measure of beauty: below, at, or above average looks (A-Table 1). Furthermore, he effect is driven by higher ranked presumably less regulated private schools that likely have to reject more applicants by softer criteria (Table 3). In contrast, the beauty of students in technology schools has no significant effect on the rank of the school they attended.

Importantly for interpreting these results, our finding in China suggests that neither beauty nor its correlates, e.g., family income, intelligence…etc have on average any economically or statistically significant relationship with school rank. This outcome suggests that academic

ability, at least as measured by standardized tests, is unaffected by beauty. While we find no statistically significant effect of beauty on the rank of the school they attended for non-White male and female students and White women, the non-zero coefficients for all these groups suggests the possibility that the lack of significance could be due to measurement error (Observation V and Observation VI). For now, we can conclude that better-looking White men, in particular, are advantaged within the admissions system.

The contrast with our findings for China suggests that this effect of beauty or its correlates are not related to academic ability as measured by standardized tests. Thus, the labor market beauty premium for men in the US (who are mostly White) may in part reflect the use of non-academic high school extracurricular activities in their admissions decisions.[17] Unlike the US outcomes, our results for China support the view that the labor market beauty premium found in China (Hamermesh, Meng, and Zhang 2002; Maurer-Fazio and Lei 2015) may originate in the labor market.

In principle, endogeneity issues could exist with our results due to self-selection into social media. However, self-selection into social media by better-looks alone is not sufficient to explain our findings for China. Although self-selection into social media by better looks and school rank can in principle explain our findings in the US, still left unexplained would be why such self-selection, if it occurs in the US, is stronger for men more than for women.

Another potential issue with our data is reverse causality. We use photos of graduates from 2012. The corresponding photos could have been taken in 2012 or even later, and likely much later than the year in which the admission decision was made. Consequently, the rank of the school attended could potentially affect beauty rank if school rank increases salary and salary increases beauty by rendering better grooming and clothing more affordable. However, if the direction of causality were reversed, we should find a similar effect of school rank on beauty in China where graduates of higher ranked schools earn comparably higher salaries. However, we find no college beauty premium in China, suggesting that merely graduating from a higher ranked school does not increase the beauty of graduates.

As to why better-looking White men in particular may be favored in the admissions process, a correspondence study in Israel offers a potential clue (Ruffle and Shtudiner 2015). They find a

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[17] White men constitute the larger part of the population across all studies of the labor market beauty premium in the West.

beauty premium only for men, and surprisingly, a beauty penalty for women. Notably, this beauty penalty was driven by firms using in-house HR personnel, who they also find, are almost always younger women. The authors infer that the bias against hiring more beautiful women is driven by female sexual jealousy. The potential favoritism of teachers, who tend to be female, or admissions officers, for better-looking male students can help explain our findings for men, particularly if they are White themselves, given a same-race bias among women (Hitsch, Hortaçsu, and Ariely 2010). [18] However, there is no need to posit pervasive self-serving taste-based discrimination on the part of HR managers to explain our findings.

As mentioned in the introduction, leadership contests among high school students may well be little more than popularity contests. Popularity alone in high-school has been shown to predict future wages (Shi and Moody 2017). [19] Leadership contests may select for physically attractive men, as has been shown for adult voters in political elections and among economists. In addition, the favoritism of colleges towards athletes may also select for more muscular and taller men with more masculine facial features, i.e., more traditionally attractive men.[20] Favoritism towards high school leaders and athletes may contribute to the adolescent height premium in the adult wages of White men (Persico, Postlewaite, and Silverman 2004) and for White male athletes graduates when they enter the job market (Henderson, Olbrecht, and Polachek 2006; Long and Caudill 1991; Olbrecht 2009). These leadership and sports criteria may be more important at elite universities particularly for White men. These schools may have to resort to softer criteria that will allow them to select from a larger population of White male candidates who apply. White men may be in the best position to avail themselves of these preferred channels in the college application process. They may have a comparative advantage in winning non-academic high school leadership contests against their main academic competitors, women (Fortin, Oreopoulos, and Phipps 2015; Voyer and Voyer 2014), and certain minorities (Hsin and Xie 2014). They may also have the edge in major athletic tournaments against other minority groups (e.g., because of cultural and height differences) given that they can maintain relatively high academic standing.

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[18] http://data.worldbank.org/indicator/SE.PRM.TCHR.FE.ZS

[19] "Attractiveness" was rated after meeting with surveyor.

[20] 28 percent of four year college admissions directors in the US acknowledge using lower standards to admit athletes (Green, Jaschik, and Lederman 2011). Such lowered standards may potentially be motivated by the increase in the number (McCormick and Tinsley 1987; Pope and Pope 2009, 2014) and the quality of applications (Tucker and Amato 1993), the consequent increases in the tuition rates that the university can charge (Alexander and Kern 2009), as well as the increases in alumni donations (Martinez et al. 2010). These are the hypothesized consequences of the extra attention that winning sports tournaments can bring universities.

The correlation between exceptional ability in extracurricular activities and beauty may also be insignificant for women, because of women's traditionally greater use of makeup, which creates a potential endogeneity problem in the measurement of the correlation between the beauty of female students and the rank of the school they attended. Makeup and grooming has been shown to contribute to women's attractiveness (Hamermesh, Meng, and Zhang 2002). Less attractive women may wear more makeup obscuring any relationship we might find. Our results for women may also be statistically insignificant because of potentially heterogeneous standards of beauty across different socioeconomic backgrounds, e.g., with regards to wearing makeup. Women of high socioeconomic background may look "dowdy" or "nerdy" to our raters from Amazon Mechanical Turk, some of whom may be from lower socioeconomic backgrounds. Additionally, leadership positions and athletic ability may be less congruent with traditional notions of femininity and female beauty, relative to traditional notions of masculinity and male beauty. Thus, White women may be less able to exploit the extracurricular activity and sports channels to gain an edge in the admissions process. However, they may also have less need to do so due to their superior achievement in terms of grades (Hansen 2016).

A key question that all claims of discrimination in the labor market must address is why such discrimination, if based on the mere tastes of employers and not on productivity, would not prove ruinous to firms in the face of competition. However, to our knowledge, unlike the research on firms, very little economics studies are available on how colleges compete. Therefore, little is known on whether taste-based discriminating colleges would eventually be eliminated by competition. One clear difference from business firms is that most US colleges derive a portion of their revenues from government grants and charitable donations. Increasing the share of White men from relatively well-off backgrounds could decrease government grants and charitable donations if those are motivated by the public good arising from a greater share of women or minorities within a college. In that case, colleges would face a cost in the admission of White men that they would not encounter with those favored demographic groups.

Thus, the interests of colleges, may be better served by being especially selective of White men, e.g., favoring those who show exceptional "leadership" qualities. Leadership qualities, when manifested through elections in high school clubs (e.g., drama) and sports teams may well be related to physical charisma at some level. Individuals with such qualities, even if they are White men, are likely to add to the prestige of the university in their placement and ascendency

in elite firms [21] and perhaps also in their future donations as alumni. We leave it to future work to establish the validity of these conjectures. In any case, our findings indicate significant variation in the association between the rank of school attended and beauty, across genders, across private, public, and technical schools, within a non-beauty-blind college admissions systems, and thus, a potential academic source for the labor market beauty premium found in prior studies in the West.

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[21] http://www.shanghairanking.com/World-University-Rankings-2015/USA.html

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Figures
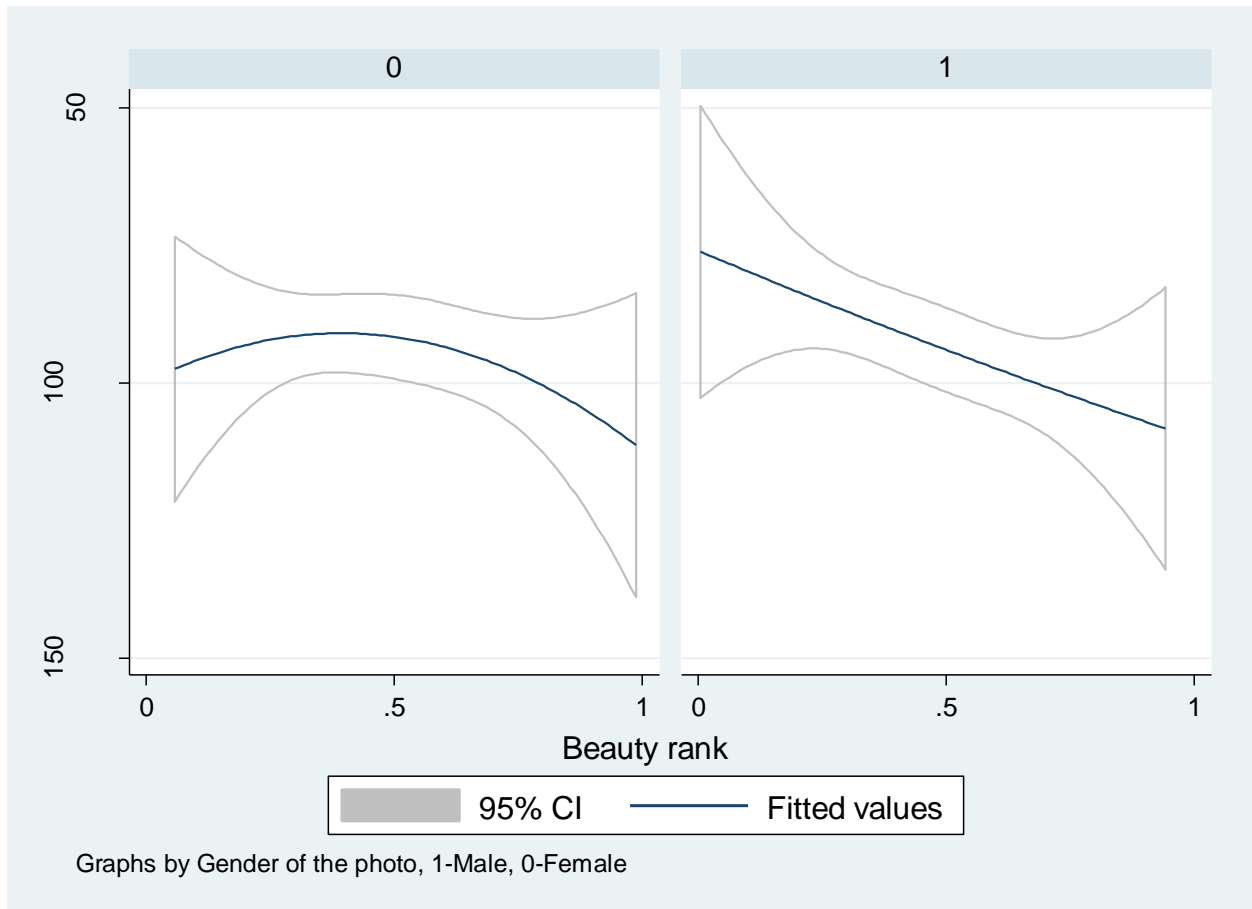
FIGURE 1: SCHOOL RANK VS. BEAUTY RANK FOR US WHITE WOMEN
(LEFT PANEL) AND WHITE MEN (RIGHT PANEL)

Tables

TABLE 1: REGRESSION RESULTS FOR CHINA

Dependent variable	School rank		
	(1) China	(2) Men	(3) Women
Beauty percentile	0.032	0.0832	-0.00931
	(0.204)	(0.310)	(0.270)
Observations	900	450	450
R-squared	0.000	0.000	0.000

Robust standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Notes: The dependent variable is school rank is in *log* form. Chinese profiles are rated by Chinese raters. The control variables include the display rank (the position of the profile in the search result) and the age.

TABLE 2: REGRESSION RESULTS FOR THE US

Dependent variable	School rank					
	(1) US	(2) Men	(3) Women	(4) White	(5) White men	(6) White women
Beauty percentile	0.131	0.370	-0.114	0.441**	0.740**	0.126
	(0.184)	(0.272)	(0.246)	(0.193)	(0.291)	(0.249)
Observations	900	450	450	660	331	329
R-squared	0.001	0.004	0.000	0.007	0.019	0.001

Robust standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Notes: The dependent variable is school rank is in *log* form. US profiles are rated by US raters. The dependent variable is the beauty rating by the US raters of the US profiles. The control variables include the display rank (the position of the profile in the search result) and the age.

TABLE 3: REGRESSION RESULTS FOR THE US WHITE MEN

Dependent variable				School rank				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Only public	Only private	Drop top private	Drop bot private	Full sample	Drop tech	Only tech	Full sample
Beauty percentile	0.339**	1.726**	0.289**	0.814***	0.339**	0.836**	0.256	0.836**
	(0.137)	(0.748)	(0.142)	(0.311)	(0.138)	(0.326)	(0.615)	(0.327)
Private					-2.411***			
					(0.404)			
Private*school rank					1.388*			
					(0.755)			
Tech								-0.580
								(0.691)
Tech*school rank								0.199
								(0.369)
Observations	256	75	293	304	331	265	66	331
R-squared	0.021	0.061	0.013	0.0219	0.500	0.026	0.002	0.022

Robust standard errors in parentheses: ***p < 0.01, **p < 0.05, *p < 0.1

Notes: The dependent variable is school rank is in *log* form. US profiles are rated by the US raters. Column (1) uses data only from public schools. Column (2) uses data only from private schools. Column (3) drops the top-4 private schools. Column (4) drops the bottom-4 private schools. Column (5) uses the full data set for White men and includes the private school dummy along with its interaction with school rank. Column (6) uses data only from non-technology schools. Column (7) uses data only from technology schools. Column (8) uses the full data set for White men and includes the technology school dummy along with its interaction with school rank. The control variables include the display rank (the position of the profile in the search result) and the age.

TABLE 4: WITHIN GENDER REGRESSION RESULTS FOR US NON-WHITES

Dependent variable	School rank							
	Non-White		Black		Hispanic		Asian	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Men	Women	Men	Women	Men	Women	Men	Women
Beauty percentile	-0.177	-0.263	-0.441	-1.901	0.158	0.666	1.770	-0.321
	(0.668)	(0.625)	(0.839)	(1.629)	(1.172)	(0.963)	(1.155)	(1.027)
Observations	119	121	24	27	46	35	39	49
R-squared	0.001	0.001	0.007	0.039	0.000	0.009	0.050	0.003

Robust standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Notes: The dependent variable is school rank is in *log* form. The beauty rank of the US profiles rated by the US raters. The dependent variable is the beauty rating by all US raters. The control variables include the display rank (the position of the profile in the search result) and the age.

Appendix

A-Table 1: Effect of beauty on wages across countries[*]

Country	Paper	Gender	Occupation	Wage effect		Notes
				Above-average looks (%)	Below-average looks (%)	
Canada & US	Hamermesh & Biddle (1994)	Men	General	5.4	-8.9	Stacked estimates
		Women		3.9	-5.5	
US	Mocan & Tekin (2010)	Men	General	10.8	-7	
		Women		4.5	-7	
United Kingdom	Harper (2000)	Men	General	Not significant	-14.9	
		Women		Not significant	-10.9	
Netherland	Pfann et al. (2000)	Both	Advertising Firm	18000 DFL increase in wage with average beauty changes from 10th to 90th percentile (assuming a 7.5% effect on wages averaging 150000 DFL per year)		Wage effect inferred from extraneous estimates
China (Shanghai)	Hamermesh et al. (2002)	Men	General	-	-	
		Women		17.9	-	
Brazil	Sachsida et al. (2011)	Men	Salesmen	Not significant	Not significant	
		Women		9	Not significant	
Germany	Doorley & Sierminska (2012)	Men	General	14	-	
		Women		20	-	
Luxembourg	Doorley & Sierminska (2012)	Men	General	-3	-	
		Women		10	-	
Australia in 1984	Borland & Leigh (2014)	Men	General	11.6	Not significant	
		Women		Not significant	Not significant	
Australia in 2009	Borland & Leigh (2014)	Men	General	Not significant	-12.9	
		Women		Not significant	Not significant	

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[*] Reproduced from Liu X, Sierminska E (2014) Evaluating the effect of beauty on labor market outcomes. Work Pap.

A-TABLE 2: US UNIVERSITIES

Name	State	US News rank	Mean starting salary	Median starting salary
Harvard University	MA	2	$74,469	$87,200
Columbia University	NY	4	$75,676	$72,900
University of Pennsylvania	PA	8	$68,816	$78,200
Massachusetts Institute of Technology	MA	7	$83,418	$91,600
New York University	NY	32	$60,530	$58,800
Georgia Institute of Technology	GA	35	$43,259	$41,500
University of California-Davis	CA	38	$50,971	$57,100
Boston University	MA	42	$66,818	$67,000
University of Florida	FL	48	$53,141	$51,300
University of Texas–Austin	TX	53	$54,495	$52,800
University of Georgia	GA	62	$52,772	$46,500
University of Iowa	IA	71	$45,999	$48,700
University of Massachusetts-Amherst	MA	76	$51,204	$49,600
Stevens Institute of Technology	NJ	76	$75,347	$82,800
University of Vermont	VT	85	$37,139	$44,000
Florida State University	FL	95	$46,005	$44,000
University of Missouri	MO	99	$46,141	$46,000
University at Buffalo-SUNY	NY	103	$50,187	$49,700
University of Tennessee	TN	106	$42,580	$42,300
Illinois Institute of Technology	IL	116	$69,999	$68,200
University of Arizona	AZ	121	$43,698	$44,400
University of Arkansas-Fayetteville	AR	135	$46,247	$43,600
Oklahoma State University	OK	145	$45,431	$43,400
Texas Tech University	TX	156	$47,291	$46,100
San Diego State University	CA	149	$46,622	$48,700
New Jersey Institute of Technology	NJ	149	$64,065	$65,300
Mississippi State University	MS	156	$42,506	$39,600
University of Idaho	ID	166	$38,390	$39,900
University of Central Florida	FL	173	$46,925	$43,000
Southern Illinois University -Carbondale	IL	189	$42,740	$41,500

Notes: The median salary data is the salary of alumni in 2011 who enrolled in 2001. The data is from the US Department of Education College Scorecard, which we collected from The Economist magazine's website: http://www.economist.com/blogs/graphicdetail/2015/10/value-university
The mean salary is the expected salary in 2011 calculated by The Economist, using a number of controls, again based on data from the US Department of Education College Scorecard. The difference between the median and the mean salaries is a measure of value added by the school.

A-TABLE 3: CHINESE UNIVERSITIES

Name	Province	CUAA rank
Peking University	Beijing	1
Fudan University	Shanghai	3
Nanjing University	Jiangsu	8
Sun Yat-Sen University	Guangdong	14
South China University of Technology	Guangdong	18
Central South University	Hunan	19
Xiamen University	Fujian	22
Hunan University	Hunan	34
Lanzhou University	Gansu	36
Beijing Jiaotong University	Beijing	44
Southwest University	Chongqing	56
Beijing University of Post and Telecommunications	Beijing	61
Hohai University	Jiangsu	72
Donghua University	Shanghai	78
Fuzhou University	Fujian	84
Guangxi University	Guangxi	89
Shanxi University	Shanxi	95
Shenzhen University	Guangdong	105
Hainan University	Hainan	104
Taiyuan University of Technology	Shanxi	105
Jiangsu University	Jiangsu	133
Shanghai Normal University	Shanghai	136
North University of China	Shanxi	151
Qinghai University	Qinghai	139
Huaqiao University	Fujian	160
Guangzhou University	Guangdong	165
Harbin University of Science and Technology	Heilongjiang	167
Changsha University of Science and Technology	Hunan	170
Ji'nan University	Shandong	183
Lanzhou University of Technology	Gansu	190

A-TABLE 4: RACE AND AGE CATEGORIZATIONS FOR THE US SAMPLE

| | Number of observation | | |
	Women	Men	Total
Race:			
White	329	331	660
Black	27	24	51
Hispanic	35	46	81
Asian	49	39	88
Unknown	10	10	20
Total	450	450	900
Age range:			
23−26	308	248	556
27 or older	142	202	344
Total	450	450	900

I.   Review of labor market studies on the labor market beauty premium

Several empirical studies have demonstrated a robust labor market beauty premium for workers around the world in various sectors beginning with the seminal work of Biddle and Hamermesh (1994). The theories of labor market discrimination by beauty parallel those of other forms of labor market discrimination, e.g., by race. These fall under two broad categories: taste-based (Becker 1971) (where the discriminated characteristic, in this case, beauty, enters directly into the utility function) and productivity-based or statistical (Arrow 1973) (where the observable characteristic, also beauty, is correlated with the characteristic that that influences productivity, e.g., good social skills, which is not immediately observable). Both forms of discrimination apply to employers and customers alike. On the one hand, employers can merely like better-looking employees without believing they are more productive, in which case, the discrimination is taste-based. On the other hand, they can use looks as an indicator of social skills that enhance productivity, e.g., promoting cooperative behavior among other workers, in which case, the discrimination is statistical. Similarly, customers, e.g., purchasers of fashion magazines, can derive utility directly from better-looking workers. Alternatively, they can use beauty to infer other characteristics, e.g., competence in doctors, because of a possible statistical relationship between beauty and cognitive and non-cognitive skills.

Since the inception of the literature, a notable and surprisingly larger beauty premium/plainness penalty has existed for men than for women (Borland and Leigh 2014; Doorley and Sierminska 2015; Hamermesh and Biddle 1994; Harper 2000; Mocan and Tekin 2010). Moreover, the importance of looks as revealed through employer surveys on the amount of interaction with customers show little explanatory power for the cross-sectional beauty premium (Doorley and Sierminska 2015; Hamermesh and Biddle 1994). See A-Table 1 in the Appendix. While the constancy of the beauty premium across jobs can be explained by employer discrimination, that would not seem to predict a larger premium for men than for women.

These unexpected findings highlight other potential problems in identifying the source of the labor market beauty premium. Other factors can increase a person's ability to make themselves more beautiful, which, in turn, increases their wages. For example, intelligence, which is generally associated with productivity in most jobs, can potentially increase the skill with which flattering clothes are chosen (which has been shown to add to the income of women (Hamermesh, Meng, and Zhang 2002)) or it can be used to free up more time from other tasks

with which to choose these clothes. Intelligence can also increase confidence, which may enhance the impression a person makes, e.g., if confidence in one's ability makes one smile more easily, and if smiling enhances attractiveness. Accordingly, more intelligent workers can appear more attractive, thereby earning higher wages, although they are not necessarily more physically attractive. Furthermore, customers may not derive utility from the exceptional intelligence of those workers. Instead, these customers could derive utility from the friendliness of more confident workers, e.g., in a restaurant host/hostess. Aside from intelligence, a myriad of other factors related to productivity including health and family income can conceivably contribute to both the beauty of workers and their wages. Thus, important confounders for both taste-based and statistical discrimination for the labor market beauty premium exist. In addition to the identification problems, the gender difference in significance could also be due to out-selection by attractive/unattractive women from the labor market, which again, is difficult to control for in empirical studies of the labor market.

To minimize the effects of statistical discrimination and out-selection, several researchers in the beauty premium literature used CV correspondence in the studies of employers. These studies are widely used to explore ethnic and gender discrimination (Bertrand and Mullainathan 2004). Such field experiments/correspondence studies with employers can decrease the effects of these confounders through random assignment of beauty to the characteristics associated with beauty, e.g., intelligence, which is signaled by education in the CVs. Confirming prior empirical findings of a beauty premium, a CV correspondence study in Argentina finds that distorted photos of real people, designed to make them ugly, were much less likely to obtain a callback López et al. (2013). With the exception of the pronounced premium for better-looking women in office support, receptionist, and customer service jobs, they ascertained roughly the same positive premium for both genders across jobs, irrespective of the degree of customer contact. A significant premium across all four occupations was observed in China, including areas such as software engineering, which has minimal customer contact (Maurer-Fazio and Lei 2015). As in Argentina, the premium was also noticeably higher for women than for men. As mentioned in the discussion section, a resume correspondence study in Israel with randomized beauty shows that only better-looking men were more likely to receive a callback to a job application, whereas better-looking women suffered a penalty, and even in jobs which, as the authors point out, beauty

plays no obvious role: accounts management, budgeting, industrial engineering, and computer programming (2015).

However, despite the advantages of these CV correspondence studies over empirical studies, they remain unable to preclude statistical discrimination for unobservable characteristics, e.g., beauty as a signal of social skills. Moreover, they cannot control for hiring by stereotypes, e.g., people who look like actual engineers in engineering firms. Most importantly, despite the many positive findings on labor market discrimination by beauty, the existing literature has largely ignored the possibility that the beauty premium may begin before entry into the labor market.[†] The source of the beauty premium is important both to better understand labor market discrimination and also to better target antidiscrimination regulations based on personal appearance, which has already been enacted in some states and proposed elsewhere (Hamermesh 2011; Hamermesh and Biddle 1994).

The advantage of our study with respect to identification problems in the empirical and CV correspondence study literature is that we only look at the relation between beauty (as rated by impartial observers) and labor market productivity traits, as revealed by school rankings. Our raters are neither employers nor customers, either of whom might have a taste for beauty within particular industries (e.g., for very thin women in the modeling industry) or have concerns about unobserved productivity-related traits correlated with beauty. Thus, neither taste-based nor statistical discrimination by customers or employers are relevant to this study. Additionally, given that the profiles rated here are from pre-labor market university students; hence, they are also less likely to have systematically selected out of the labor market by gender and beauty.

Few studies in economics are available regarding the relation between academic performance and beauty. Grade point average is predicted by physical attractiveness for grade school students of both genders in England (Hansen 2016) and for female but not for male students upon entering high school (French et al. 2009). However, the association between attractiveness and grade point average becomes negative for males and insignificant for females when personality

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[†] Many studies exist on the correlates of beauty in educational settings in the psychology literature. Physically attractive students receive higher grades in high school and college (French et al. 2009). Attractive individuals are consistently perceived or judged more favorably than the unattractive in a number of dimensions, including intelligence, academic potential, grades, confidence, extroversion, and various social skills (Jackson, Hunter, and Hodge 1995; Mobius and Rosenblat 2006; Ritts, Patterson, and Tubbs 1992). These studies suggest that beauty is believed to be correlated with these traits. However, they do not control for these traits in their identification of beliefs. Thus, they failed to demonstrate that beauty causes the beauty premium in the labor market.

and grooming are controlled for (French et al. 2009). High school facial attractiveness can account for the attractiveness premium up to the mid-30s (Scholz and Sicinski 2015). Within an elite women's liberal arts college, a negative correlation was found between beauty and academic productivity-related traits, as measured by SAT scores (Deryugina and Shurchkov 2015). No correlation was found between beauty and productivity-related traits among lawyers who graduated from one law school (Biddle and Hamermesh 1998) and among experimental subjects (Mobius and Rosenblat 2006). Most importantly, with respect to our hypothesis, these prior studies either of single schools, or if not, they did not test for the effect of the attended university's rank. Consequently, they do not rule out that the beauty premium in earnings was due to a potential bias in the college application process.