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## FACIAL ATTRACTIVENESS AND LIFETIME EARNINGS: EVIDENCE FROM A COHORT STUDY

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### Abstract

We use unique longitudinal data to document an economically and statistically significant positive correlation between the facial attractiveness of male high school graduates and their subsequent labor market earnings. There are only weak links between facial attractiveness and direct measures of cognitive skills and no link between facial attractiveness and mortality. Even after including a lengthy set of characteristics, including IQ, high school activities, proxy measures for confidence and personality, family background, and additional respondent characteristics in an empirical model of earnings, the attractiveness premium is present in the respondents' mid-30s and early 50s. Our findings are consistent with attractiveness being an enduring, positive labor market characteristic.

### I. Introduction

Beauty is a pervasive interest of many in the United States and around the rest of world. Worldwide annual expenditures on cosmetics, for example, were around \$18 billion in 2004, and fashion receives daily coverage in the nation's leading newspapers and on television.<sup>1</sup> Academics also pay considerable attention to beauty. A meta-analysis in psychology reviewed 1,800 empirical articles on beauty, ultimately including 919 in the published study (Langlois et al., 2000).

Beauty has received far less attention in the economics literature than in psychology, presumably because high-quality data on beauty, augmented with household economic and demographic characteristics, are rare. The limited evidence suggests that beauty is rewarded in the labor market, as good-looking people receive wage premiums (Hamermesh & Biddle, 1994; Biddle & Hamermesh, 1998; Harper, 2000; and the studies reviewed in Hamermesh, 2011) and ugly people are more likely than others to be criminals (Mocan & Tekin, 2010). Mobius and Rosenblat (2006) develop evidence from an experimental labor market that explores potential sources of the attractiveness premium in earnings.

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<sup>1</sup>See [http://news.nationalgeographic.com/news/2004/01/0111\\_040112\\_consumerism\\_2.html](http://news.nationalgeographic.com/news/2004/01/0111_040112_consumerism_2.html).

Prior studies using observational data have not been able to examine whether attractiveness simply proxies for unobserved characteristics that are valuable in the labor market, or whether attractiveness itself is rewarded, either because attractiveness enhances productivity or because employers simply choose to reward good looks. Using unusually rich data on facial attractiveness, the most commonly used measure of beauty in the literature, and life course outcomes of participants in the Wisconsin Longitudinal Study (WLS), ours is the first study of attractiveness and earnings that conditions on a standard measure of ability, IQ. We also examine the importance of several other factors that might account for an attractiveness premium, including health and teacher favoritism, high school activities, confidence, and personality. We are also the first to examine the long-run relationship between facial attractiveness and earnings.

This long-run relationship can provide insight into the causes of the attractiveness premium. For example, ideas in the psychology literature, also emphasized by Mobius and Rosenblat (2006), suggest that employers and others attribute unobserved characteristics such as work ethic, intelligence, or productivity to people based on observable characteristics like attractiveness (Feingold, 1992). If this type of status generalization underlies the premium, we would expect the correlation of attractiveness and earnings to dissipate with age as individuals develop documentable, observed signals of true productivity. We particularly think this type of learning would take place for individuals employed in the same organization over time.<sup>2</sup>

As is well understood in the wider literature on labor market discrimination, being a member of an ethnic group can cause a person to have lower earnings, without such membership being directly penalized in the labor market; for example, ethnic minorities may go to lower-quality schools and earn less because of their poorer education. A related consideration is important when analyzing the beauty premium. If healthier people are more productive, for example, and tend to be more attractive, adding a health measure to a beauty regression could make the attractiveness coefficient become insignificant (let us say the coefficient is precisely estimated and close to 0). We would then be warranted in saying that these results shed doubt on the hypothesis that attractiveness has a causal impact on earnings, as it is hard to come up with an argument in which attractiveness causes better health. But if we have the same scenario, except the added variable is some measure of confidence rather than health, then this does not count as evidence against the claim that beauty has a causal effect on earnings, at least not if we believe that beauty affects confidence. Similar considerations arise with many other potential covariates.

We find a robust, positive correlation between beauty measured late in high school and earnings of men in their middle 30s and early 50s, even after conditioning on IQ. These results also hold conditioning on IQ and other family background and individual characteristics. The magnitude, particularly when men are in their early 50s, is roughly the same as the height premium, which has received considerable attention in the literature. Previous studies also document a beauty premium in earnings, though we are the first to show a persistent long-run effect.

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<sup>2</sup>Also see the models of employer learning in Farber and Gibbons (1996) and Altonji and Pierret (2001).

The positive correlation between attractiveness and earnings does not appear to be driven by attractive men's superior cognitive skills or health, since attractiveness is not significantly correlated with high school class rank, total years of schooling, or mortality, and we always condition on IQ.

There is a link between attractiveness and extracurricular high school activities, such as varsity sports and student government. These activities may help develop skills that are valued in adult labor markets (Persico, Postlewaite, & Silverman, 2004). Attractiveness is also positively correlated with proxy measures of confidence, one channel emphasized in the experimental labor market paper of Mobius and Rosenblat (2006), and with some of the so-called big 5 personality traits, particularly extroversion and the absence of neuroticism.<sup>3</sup> The measures of high school experience, confidence, and personality, however, have little effect on the magnitude of the attractiveness premium when WLS respondents are in their mid-30s and early 50s. Our evidence is consistent with the idea that attractiveness is an intrinsically productive attribute in early and midcareer labor markets, distinct from skills acquired in high school, personality traits, and cognitive ability. We discuss other potential explanations for the attractiveness-earnings correlation below.

## II. Attractiveness Data in the WLS

The WLS is a cohort study of 10,317 graduates of Wisconsin public, private, or parochial high schools in 1957. The survey data were collected from the original respondents or their parents in 1957, 1964, 1975, 1992, and 2004 (Sewell et al., 2004). They contain a wide variety of socioeconomic background measures as well as complete educational, occupational, and marital histories. The directly-elicited data are supplemented with information obtained from school and public records on IQ (the eleventh-grade Henmon-Nelson score), school performance, communities, and characteristics of employers.

The WLS attractiveness measure was constructed from ratings of senior-year high school yearbook photographs. The yearbooks used in our study were collected in two rounds. The first took place in 2001 and covered 93 randomly selected schools. In 2007–2008, a sweep of all remaining schools produced 222 more yearbooks. Combined, the two samples yielded 8,924 photographs: 8,623 were successfully rated for attractiveness.<sup>4</sup> The 119 schools not coded were small, averaging fewer than twelve WLS participants per school.

The yearbook photographs were coded using a scale ranging from Not at All Attractive ( $n = 1$ ) to Extremely Attractive ( $n = 11$ ). Separate scales were developed for men and women, each anchored with five photographs representing scores of 2, 4, 6, 8, and 10 on the eleven-point scale.<sup>5</sup> During coding, the raters saw the WLS photographs one at a time, displayed on a computer screen beneath the scale augmented with the anchoring photographs. Each

<sup>3</sup>See Borghans et al. (2008) for a thorough discussion of personality traits and their potential relevance for economic analysis.

<sup>4</sup>A potential concern is that the passage of time and use of different coders resulted in attractiveness measures that are not comparable between our two subsamples. A two-sample Kolmogorov-Smirnov test fails to reject the null hypothesis that the two subsamples are drawn from the same distribution (the corrected  $p$ -value is 0.28). We therefore treat the two subsamples as coming from a single, consistent sample.

<sup>5</sup>The anchors were chosen based on comparisons of 190 pairs of out-of-sample photos performed by 29 judges. For more details on the attractiveness measures, see Meland (2002).

respondent was rated twelve times by six male and six female judges, whose ages ranged from 61 to 89 for the first subsample and 64 to 71 for the second subsample.

We normalize the raw attractiveness scores by subtracting the specific judge's mean rating and dividing by his or her standard deviation across all photographs. We then standardize the variable, normalizing aggregate scores to have a mean of 0 and a standard deviation of 1.

The WLS attractiveness measure has advantages relative to measures used in prior population-based studies. First, black-and-white photo-based measures reduce concerns that clothing or physical surroundings influence assessments of people's attractiveness. In the three surveys used in Hamermesh and Biddle (1994), for example, physical appearance was rated by interviewers at subjects' homes. If the socioeconomic status of the subject biases measures of facial attractiveness, a spurious correlation could arise between attractiveness and earnings.

Second, anchoring the WLS beauty measures addresses a concern that the judges' evaluation of attractiveness could depend on the sequence in which photos were rated. The photo scale addresses this issue by giving common reference points from the outset, showing every judge specific examples of photos rated 2, 4, 6, 8, and 10.<sup>6</sup>

Third, having multiple judges for the WLS attractiveness measures may be important. For WLS measures, the median difference between the highest and the lowest rating a photograph received is five points. The idiosyncratic variance of attractiveness measures based on a single score, combined with the relatively small samples in the Hamermesh and Biddle data sets, may account for the large range (1% to 13%) of their estimated premiums for above-average looks. As we discuss, our results are much noisier when we take beauty scores from a single judge, even when we include a judge-specific effect.

The WLS beauty measure, based on appearance in high school, might not reflect respondents' attractiveness in their mid-30s or early 50s. The evidence, although not definitive on this issue, suggests that measures of facial attractiveness seem to be quite stable over time in a relative sense (Zebrowitz, Olson, & Hoffman, 1993; Adams, 1977; Tatarunaite et al., 2005). Physical attractiveness typically declines with age, but an advantage of a cohort study like the WLS is that the deterioration of beauty has occurred for the same length of time for all sample members. We address measurement error issues later in the paper.

While there are reasons based on the literature to believe the WLS provides an excellent measure of adult attractiveness, our main argument about its validity is empirical. If we found no link between high school attractiveness and adult earnings, it would be impossible to distinguish competing hypotheses—namely, that we uncovered the “true,” nonexistent link between beauty and earnings with our arguably superior data versus the competing hypothesis that facial attractiveness in high school bears little relationship to facial attractiveness as an adult, so our central independent variable is simply noisy. Results

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<sup>6</sup>The attractiveness measure in Harper (2000) is also problematic. The data were collected prior to puberty by the child's teacher. The specific measure also conflates appearance and health (responses were based in part, for example, on whether the student looks “underfed”).

consistent with the prior literature, however, suggest that the measure is informative. The richness and longitudinal design of the WLS then provide insight into sources of the beauty premium.

### III. Attractiveness and Earnings

We focus on the log of annual earnings in 1975 and 1992, which avoids the potential division bias when calculating hourly wages from questions on typical compensation and hours worked (Borjas, 1980).<sup>7</sup> Moreover, annual earnings must be reported to tax authorities, which may help respondents recall it accurately. We nevertheless are concerned with measurement error in earnings. Consequently, we drop households with the highest and lowest 2% of reported earnings in the sample.

Facial attractiveness may result in different opportunities for men and for women. Becker (1973), for example, writes, “The popular belief [is] that more beautiful, charming, and talented women tend to marry wealthier and more successful men.”<sup>8</sup> Marriage and low rates of labor force participation for this cohort of women make the relationship between beauty and women’s labor market earnings more complicated than it is for men. Thus, we examine only WLS men. Interestingly, in describing their seminal results, Hamermesh and Biddle (1994) write, “If anything, the evidence goes in the opposite direction: men’s looks may have slightly larger effects on their earnings than do women’s.”

Following Neal and Johnson (1996) and Heckman (1998), our choice of conditioning variables differs from prior related papers on beauty. One specification estimates the correlation of beauty and earnings conditioning only on facial attractiveness and ability (through IQ). As we mentioned previously, beauty and ability may influence subsequent schooling, work experience, and occupational choices. By excluding these covariates, we avoid the problems that arise with potentially endogenous control variables. For comparability with prior empirical work, however, we also estimate empirical models that include father’s and mother’s education, family income in 1957, indicators for the size of the community of residence, number of brothers and sisters, employment status of the mother, the size of the high school class, and indicators for subsequent schooling, work experience, and occupational choices.

#### A. Facial Attractiveness Is Significantly Correlated with Mid- and Late-Career Earnings

Table 1 shows results for our baseline empirical models.<sup>9</sup> Columns 1 and 2 show the coefficients of a regression of log earnings in 1975 (column 1) and 1992 (column 2) on beauty, standardized to have a mean of 0 and standard deviation of 1, and IQ, also standardized to have a mean of 0 and standard deviation of 1. Facial attractiveness measured as a senior in high school is significantly correlated (at a 1% level) with earnings in both the respondent’s middle 30s and early 50s. A 1 standard deviation increase in facial attractiveness is associated with log earnings that are 2.0 percentage points higher than those

<sup>7</sup>A substantial fraction of the WLS sample was retired in the 2004 interview wave. We avoid complications arising from endogenous decisions to retire by focusing on the 1975 and 1992 interview waves.

<sup>8</sup>Also see Bergstrom and Bagnoli (1993). Sicinski (2009) provides WLS-based evidence consistent with this idea.

<sup>9</sup>Descriptive statistics for variables used in our analyses are given in the appendix at the end of this paper.

with average attractiveness in 1975 and 3.3 percentage points higher in 1992.<sup>10</sup> Our estimates are at the lower end of the range reported by Hamermesh and Biddle (1994) for men's log hourly earnings, which ranged from 1% to 10.9% (but several estimates were not significant at usual levels of confidence). The major conceptual differences between our estimates and others in the literature are that, first, we document a significant correlation between beauty and earnings many years after beauty was assessed, and second, we condition on IQ, which Case and Paxson (2008) argue is fundamental in interpreting results from the literature on the labor market returns to height.

IQ is strongly associated with earnings. The coefficient estimates are roughly five times the size of the attractiveness coefficient in 1975 and 1992. The estimates suggest that ability, as proxied by IQ, is an increasingly important determinant of earnings as men age.

Columns 3 and 4 of table 1 include covariates that commonly have been included in regressions of beauty and earnings as well as a set of unique family background characteristics (also see Zax and Rees, 2002, for a similar analysis that does not examine facial attractiveness). Consistent with the arguments of Neal and Johnson (1996), including educational attainment, job tenure, marital status, and other covariates sharply reduces the correlation between IQ and earnings. The additional characteristics included in columns 3 and 4, however, do not substantially affect the facial attractiveness coefficient.

Other papers examine the relationship between another immediately identifiable physical characteristic, height, and labor market outcomes (see Persico et al., 2004; and Case & Paxson, 2008). Self-reported height data are collected in a 1992 WLS mail interview. Response rates to the mail questionnaire were not as high as the response rates to the phone interview, so we lost 312 to 755 cases when estimating corresponding empirical models of height. Nevertheless, as shown in table 2, including height has only minor effects on the estimated correlation between facial attractiveness and earnings. Height also has very little effect on other estimated coefficients in the empirical model (the results are not shown but are available on request). The magnitude of the facial attractiveness coefficient is roughly half the size of the height premium when only IQ and height are included in the empirical models, and the facial attractiveness and height premiums are similar when the lengthy set of covariates is included.

Having multiple assessments of a respondent's facial attractiveness is empirically important. We estimate the column 3 empirical model in table 1 10,000 times, where in each draw, we take one random coder of the available twelve attractiveness assessments. We get coefficients ranging from -0.002 to 0.029. The mean estimate is 0.013, or 40% smaller than the preferred estimates in table 1. The attractiveness estimate is significant at the 5 percent level only 67% of the time when a single assessment is used. The qualitative result is, of course, what we would expect given idiosyncratic variation in single attractiveness ratings.

Mocan and Tekin (2010) emphasize that for females, ugliness may be a hindrance rather than beauty being valuable. They write, "The level of beauty in high school has an effect on

<sup>10</sup>We tested for equality of coefficients between 1975 and 1992. The chi-squared statistic with 1 degree of freedom for the short (long) specification was 1.66 (0.65), so we could not reject the null hypothesis of the coefficients being equal.



criminal propensity seven or eight years later, which seems due to the impact of the level of beauty on human capital formation.” Hamermesh and Biddle (1994) also note that while attractive people are paid more, “The premia for good looks are considerably smaller than the penalties for bad looks and they are not statistically significant.” Like the prior literature, when we break the WLS attractiveness measure into quintiles, we find the coefficients have the expected signs: there is an ugliness/plainness penalty for those with below-average looks. It is generally significant in the second quintile. We also find a significant premium for those in the top quintile of the attractiveness distribution, except in a specification analogous to column 4 of table 1.<sup>11</sup> Interaction effects undoubtedly complicate efforts to determine whether beauty is rewarded or ugliness is penalized. Some attractive individuals, for example, may be unable to fully capitalize on their endowment as a result of deeply rooted introversion or neuroticism, precluding them from taking office jobs for which their looks would be highly remunerated.

#### IV. The Source of the Earnings Premium Associated with Facial Attractiveness

A central concern in the literature on attractiveness and earnings is whether attractiveness itself is rewarded in the labor market or whether it is just a proxy variable for remunerative labor market characteristics, such as ability or personality traits that make one a better worker. If attractiveness itself is rewarded, a second set of questions is whether attractiveness is intrinsically productive, perhaps facilitating better communication skills or enhancing customer satisfaction, or whether employers simply choose to pay a premium to have attractive workers.

Due to data limitations, little previous work examines the most direct ways that attractiveness might proxy for other productive attributes. A novel feature of our paper is that we are able to examine empirically many potential mechanisms through which attractiveness might influence earnings—specifically through ability, health, schooling, extracurricular high school activities, and personality.

Biddle and Hamermesh (1998) argue that customer discrimination, driven by either pure taste discrimination or the (correct) belief that attractive attorneys are more effective than other attorneys in front of judges and juries, explains the beauty premium among lawyers. Landry et al. (2006) found attractive female solicitors were more effective in collecting contributions for a charitable organization in a door-to-door fundraising field experiment. While attractiveness may enhance productivity, Hamermesh and Biddle (1994) write, “The strongest support is for pure Becker-type discrimination based on beauty and stemming from employer/employee tastes.”<sup>12</sup>

The most detailed inquiry into the source of the beauty premium comes from Mobius and Rosenblat (2006). They create an experimental labor market where “employers” hire

<sup>11</sup>Output for any result mentioned in the paper but not included in the tables is available from the authors on request.

<sup>12</sup>Harper (2000), who found a penalty for plainness using the British National Child Development Study, attributed the bulk of the pay differential to general employer discrimination.

“employees” for a task, in this case solving a maze. Attractive people were no more productive than others in solving mazes, but beauty was rewarded by 12% to 17% higher compensation for a 1-standard deviation increase in attractiveness. Only 40% of the pay differential came from visual interaction with the experimental employers. The remainder was attributed to more effective oral communication (40%) and higher confidence (20%) of attractive people. The findings Mobius and Rosenblat described are consistent with Jackson, Hunter, and Hodge (1995) and many other studies in psychology that suggest attractive people will be viewed as being more competent than those with average looks (also see Ruffle & Shtudiner, 2010). Moreover, this effect should be stronger when a direct measure of competence is absent than when it is present. Thus, the experimental literature suggests that the attractiveness premium originates from the characteristics of both employers and employees.

The WLS data open up new possibilities for investigating why there is a durable earnings premium for facial attractiveness in observational data.

### A. The Attractiveness Premium: Cognitive Skills and Health

The most direct way that facial attractiveness might be linked to earnings would be if those with greater facial attractiveness had better cognitive skills. A more subtle but related mechanism is suggested in the psychology literature, where it is conjectured that teachers in K–12 schools give preferential treatment to attractive children.<sup>13</sup> Hence, it might be the case in observational data that there is no link between attractiveness and ability, but attractive children nevertheless have higher class rank than otherwise identical but less attractive peers. This could lead to more total years of education or labor market opportunities that are not available to their peers.

We examine these potential links estimating the correlation between facial attractiveness and attributes mentioned above: IQ, high school class rank, and years of completed schooling. In bivariate regressions, the correlation between attractiveness and IQ is 0.031 (with a standard error of 0.016), significant at the 10% level. It is insignificantly correlated with class rank and educational attainment. When we include family background measures, there is no evidence that facial attractiveness is positively, significantly correlated with IQ for males or with class rank: there is no evidence that teachers bestowed advantage on attractive males, at least in this cohort of Wisconsin students. Facial attractiveness is also not correlated with total years of schooling.

Another possibility is that facial attractiveness is correlated with health. We examine two measures: mortality and self-reported health on a four-point scale (poor, fair, good, and excellent).<sup>14</sup> In columns 1 and 2 of table 3, we examine correlates of mortality. Several factors are significantly (at least at the 5% level) negatively correlated with mortality: educational attainment beyond high school, marital status, military service, and having a farm background. Facial attractiveness in high school is uncorrelated with mortality. A

<sup>13</sup>An early paper along these lines is Clifford and Walster (1973).

<sup>14</sup>In December 2011, the WLS sample was matched to the National Death Index: 23.9% of the sample had died by the end of 2011, when the typical WLS respondent was 72 years old.



positive relationship between facial attractiveness and self-reported measures of health in 1992 emerges (significant at the 10% level) only in ordered probit regressions when we condition on the long set of covariates (column 4 of table 3). Including measures of self-reported health has no effects on the results described in this paper.

To summarize, attractiveness is not positively, significantly correlated with IQ once family background is accounted for. It is not significantly correlated with class rank, with total years of educational attainment, or mortality. The attractiveness-earnings correlation is not a result of attractiveness capturing the effects of cognitive skills or health.

## B. The Attractiveness Premium: High School Experiences

There are few occupations where height is an obvious productivity-enhancing attribute, yet Persico et al. (2004) and Case and Paxson (2008) document a height premium in earnings. Persico et al. raise the possibility that tall children in K–12 school have disproportionate access to leadership-building activities that are remunerative in later careers. The WLS data, by having a high-quality measure of IQ and a rich set of high school activities, provide an ideal opportunity to look at links between facial attractiveness and high school experiences beyond class rank.

In table 4, we present empirical models examining correlates of participation in varsity sports (column 1), participation in student government (column 2), participation in service organizations (column 3), and the total number of high school activities (column 4) for male respondents. We include only family and community background characteristics in the empirical models that were predetermined at the time WLS respondents were in high school. We estimate columns 1 to 3 with probit regression (marginal effects are reported in the table). Column 1 shows that facial attractiveness is strongly, positively correlated with participation in varsity sports for high school boys. There is no a priori reason to think that facial attractiveness has an innate relationship to athletic ability. Rather, we conjecture that handsome boys get singled out by coaches for extra attention when playing youth sports. Note that IQ has no relationship, positive or negative, with participation in varsity sports. Similarly, facial attractiveness is strongly correlated with participation in student government and the total number of high school activities. As Persico et al. (2006) argued, high school activities may enhance leadership skills and develop discipline and interpersonal skills that are valuable in adult labor markets. Facial attractiveness in high school appears to convey benefits to students that may have a lifetime payoff.

Table 5 repeats the empirical specifications in table 1 but includes indicators for participating in varsity sports, student government, and a count of the total number of high school activities. We demonstrated in table 4 that these outcomes are positively associated with beauty, so we knowingly introduce potentially endogenous variables in table 5. Any decline in the coefficient on attractiveness is not necessarily evidence that attractiveness serves as a proxy for high school experiences, but rather that it operates through this channel. Inclusion of the high school activities indicators indeed reduces the magnitude of the attractiveness premium in 1975 and 1992, but the estimates remain significant at the usual levels of confidence. Thus, a portion of the attractiveness premium arises from out-of-

classroom experiences that attractive children receive while in high school, but these experiences do not fully explain the attractiveness premium in earnings.

### C. The Attractiveness Premium: Confidence and Personality

As Mobius and Rosenblat (2006) suggested, confidence may be related to attractiveness and earnings. The WLS does not include a self-confidence scale, but rather assesses self-esteem (or self-acceptance), which is a bidimensional construct comprising self-confidence and self-deprecation. The self-esteem scale consists of questions such as, “To what extent do you agree that, in general, you feel confident and positive about yourself?” which seems to provide a reasonable proxy for the trait that Mobius and Rosenblat (2006) focus on. In addition to self-esteem, we also examine a “purpose-in-life” proxy, which asks items such as, “To what extent do you agree that you are an active person in carrying out the plans you set for yourself?” We think this also reflects a sense of confidence in oneself. Facial attractiveness is positively correlated with both self-acceptance and purpose in life with a raw correlation of 0.05 and 0.04, respectively. Conditioning on IQ and family background characteristics does not have a meaningful impact on those correlations. The two confidence proxies themselves have a correlation of 0.68.

When we include the two confidence proxies (self-acceptance and purpose in life) in a specification analogous to table 1, we find they are positively, significantly correlated with earnings (table 6). Relative to the results in table 1, however, they have a relatively small effect on the size and significance of the attractiveness coefficient. If confidence or our proxies are personality traits, then it is not clear that we want to condition on the extensive set of covariates included in columns 3 and 4, since these factors may be influenced by these traits. Nevertheless, the results in columns 3 and 4 suggest that the greater confidence or self-acceptance or purposefulness of attractive men does not fully explain the attractiveness premium in earnings.

**The big five personality traits**—Borghans et al. (2008) and Duckworth and Weir (2010) explore the relationship between personality and economic outcomes. The WLS contains a 29-question abbreviated version of the 44-question big five personality inventory. Four dimensions—extroversion, agreeableness, conscientiousness, and openness—are assessed with six questions. Neuroticism is assessed with five questions. Typical questions are exemplified by the items used to assess extroversion, such as, “To what extent do you agree that you see yourself as someone who is full of energy?” or “To what extent do you agree that you see yourself as someone who tends to be quiet?” Respondents are asked to rate themselves on a 1 (agree strongly) to 6 (disagree strongly) scale for each of the various underlying questions. The single-item responses are then coded into average scores.<sup>15</sup>

Table 7 shows the correlations between the WLS personality measures and attractiveness, conditioning on a set of family background characteristics. Attractiveness is significantly correlated positively with extroversion, which reflects talkativeness, absence of reserve, energy, noisiness, absence of shyness, and enthusiasm. It is significantly correlated

<sup>15</sup>Mueller and Plug (2006) describe the WLS personality measures and examine the links between personality and WLS earnings in 1992 for men and women.

negatively with neuroticism, so attractive men are less likely to be tense, emotionally volatile, prone to worry, or nervous and are more likely to be calm in tense situations. Attractiveness is also positively correlated with conscientiousness and openness to experience, though only at the 10% level of significance. We also find IQ is strongly positively correlated with openness to experience and strongly negatively correlated with extroversion, agreeableness, and conscientiousness. It seems likely that extroversion and emotional stability are valuable characteristics in the labor market. Hence, these correlations may help explain the attractiveness premium.

In table 8 we repeat the specification in table 1, but include the big five personality traits. As expected, extroversion is positively correlated with earnings, as is emotional stability (the absence of neuroticism). The big five personality traits, however, have relatively small effects on the estimated attractiveness premium. Compared to specifications that include only IQ, the magnitude of the coefficient is reduced by about one-third—from a 2% premium to 1.3%, in 1975 and from 3.3% to 2.5% in 1992. The precision of the estimates falls as well, from estimates that are significant at 1% to estimates that are significant, respectively, at 10% and 5%. Again, table 8 includes variables that we have shown to be influenced by attractiveness, so the estimates reflect direct and indirect effects of attractiveness on earnings. When the lengthy set of characteristics, including family background, educational attainment, household characteristics, and occupational choices, is included, the magnitude and significance of the attractiveness coefficient are essentially unchanged by including proxy measures for the big five personality traits. Consequently, while prior work has established a relationship between personality traits and earnings, attractiveness appears to be a distinct factor positively correlated with labor market earnings.

#### **D. Can All Measures Together Account for the Attractiveness Premium?**

In table 9 we combine the main high school experience measures, the confidence scores, and the big five personality traits, along with IQ and other background characteristics (in columns 3 and 4). The combined effect of these covariates reduces but does not eliminate the attractiveness premium in 1975 and 1992 earnings. Thus, a portion of the attractiveness premium can be accounted for by its effects on high school experiences, greater confidence that attractive men have, and the ways that attractiveness and personality may interact. What is striking about the table 9 results, however, is that even accounting for a large set of factors that affect earnings, attractiveness is significantly correlated positively with earnings in 1975 (at the 5% level) and in 1992 (at the 10% level). Moreover, the size of the estimated correlation is only slightly smaller than the estimates in table 1 when we do not account for these channels.

Gelbach (2010) criticizes the sequential inclusion of covariates in empirical models like those described above and offers a straightforward, easy-to-implement decomposition that yields consistent estimates of population parameters. Depending on the empirical model for which the decomposition is performed, variation in high school experiences accounts for anywhere from 44% to 74% of the reduction in the beauty premium resulting from the inclusion of table 9 covariates. The contributions of the remaining two channels are not precisely estimated, but the confidence, self-acceptance, and purpose-in-life proxies appear

to be second in importance, accounting for about 25% of the reduction in the beauty premium resulting from the inclusion of table 9 covariates. The remainder appears to be accounted for by personality measures.

## V. Discussion and Measurement Error

We interpret the evidence as showing that attractiveness is directly rewarded in the labor market when workers are in their mid-30s and early 50s, but we do not have the ability to distinguish the possibility that attractiveness is truly productive or that employers simply choose to pay attractive workers a premium. There is additional evidence that attractiveness is rewarded in the data on job changes. The facial attractiveness of men is significantly correlated positively with the number of employers men have between 1975 and 1992. A household in the top 20% of the facial attractiveness distribution has 0.16 more employers (off a mean of 1.89) than men in the middle three quintiles of the attractiveness distribution. While facial attractiveness is unrelated to job tenure in 1975, by 1992, facial attractiveness is significantly associated negatively, with job tenure. Attractive men change jobs more frequently than observationally equivalent less attractive men. It appears that either attractive men are more productive than observationally equivalent peers and are moving across jobs to capitalize on their productivity, or they move across jobs to find employers willing to pay them for their attractiveness.<sup>16</sup>

### A. Measurement Error

A natural concern when interpreting our results is that attractiveness is measured in the WLS using photos taken 18 and 35 years earlier than our observations on earnings. While longitudinal studies on the topic are scarce, the literature offers some insight into how attractiveness evolves over time. The general finding is that while facial attractiveness declines with age from puberty onward, the relative ranking in relation to peers is more stable.

Nevertheless, the correlation between adolescent and middle-age beauty is clearly not perfect. To explore how measurement error in attractiveness might affect our analysis, we turn to simulation methods. We benchmark the analysis by altering the data to generate a correlation between beauty and log earnings that (roughly) matches central results in Hamermesh and Biddle (1994) and Biddle and Hamermesh (1998): that the correlation is 0.067 and the  $t$ -statistic is 4.5. We do this by calculating a counterfactual earnings variable equal to the logarithm of observed earnings in 1992 plus  $0.04 \times$  attractiveness plus random noise. The addition of noise is necessary to prevent unrealistically high  $t$ -statistics on attractiveness in our regressions. The noise is drawn independently in every iteration in the simulation from a normal distribution with a variance equal to the variance of residuals from the empirical model in column 4 of table 1. The question the simulation is designed to address is whether the results we get in table 1 are plausible, given a true link between log

<sup>16</sup>We investigated the “empty suit” hypothesis: the idea that employers erroneously attribute positive characteristics to attractive men. If true productivity is initially unobservable but is revealed over time for a given employer, we expect the interaction of attractiveness and tenure (within a job) to be negative and the interaction of IQ (a measure of ability) and tenure to be positive. This is the case in 1992, but both interaction terms are economically and statistically insignificant. The analysis is complicated by the results on job changes, which indicate tenure is affected directly by attractiveness.

earnings and attractiveness of 0.067 and a correlation between high school and adult attractiveness in the range found in the (admittedly sparse) literature.<sup>17</sup>

With the range of correlations in the (dated) literature, the average empirical estimates in table 10 (ranging from 0.15 to 0.40) perfectly bracket the table 1 estimate of 0.28. In this sense, the results we find in this analysis are consistent with past work that argues there is a substantial, durable return to facial attractiveness in the labor market. Yet the fact that we find a statistically significant result, given our assumed strength of the underlying empirical relationship (a  $t$ -statistic of 4.5), is somewhat surprising. Unlike prior studies, we use a photo-labeled scale with carefully constructed anchor points, which presumably increases consistency across judges. The simulation above would generate higher significance levels, consistent with the table 1 results, if the strength of the baseline relationship was stronger. The underlying relationship could be stronger if the procedures for assessing attractiveness in the WLS had been adopted in other studies.

## VI. Conclusion

There is a durable, persistent, and economically large correlation between the facial attractiveness of men, as measured by their high school yearbook photos and their earnings in their mid-30s and their early 50s. The magnitude and significance of the correlation are similar whether we condition only on IQ or on an extensive set of characteristics, including family background, educational attainment, household characteristics, and occupational choices. We are the first to document a long-run correlation between facial attractiveness and earnings.

The attractiveness premium does not appear to result from greater cognitive ability, high school class rank, or greater educational attainment of attractive men. There is no indication that attractive men live longer than their otherwise identical but less attractive counterparts. High school extracurricular activities and personality traits cannot account for the attractiveness premium found for male WLS respondents in their mid-30s and early 50s. It appears then that attractiveness is a characteristic that is directly rewarded in the labor market.

We cannot fully resolve the precise mechanism that accounts for the correlations we document. After ruling out the effects of attractiveness on confidence, personality, and a host of additional variables, the major remaining hypotheses are that the premium is driven by employer/customer discrimination (this is the explanation offered by Hamermesh and Biddle) or that attractiveness is an intrinsically productive characteristic in the labor market.

Some papers in the psychology literature suggest attractive people might possess stronger verbal and interpersonal skills or be perceived as more intelligent. If the beauty premium indeed operates through these channels, we would expect it to be larger in occupations where such skills are productive. We investigate this idea with one final piece of analysis making use of the 1970 *Dictionary of Occupational Titles (DOT)*. We find a robust premium

<sup>17</sup>Zebrowitz et al. (1993) and Adams (1977) report correlations of beauty across time ranging from .26 to .63 for men.

across all occupations coupled with additional rewards to working in a basic job.<sup>18</sup> While still speculative, these results are consistent with the idea that the beauty premium is not solely driven by greater productivity, leaving a role for taste-based discrimination to at least partially account for the attractiveness premium.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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<sup>18</sup>This result is also found in Robins, Homer, and French (2011), who find that for men, “the beauty premium appears to span all occupations and is somewhat larger in occupations where beauty is less important.”



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## APPENDIX A. Descriptive Statistics of Important Variables

Collection Wave	Variable	Mean	SD	Minimum	Maximum	Number
1957	Attractiveness (SD)	0.001	1	–2.936	3.108	3,999
1957	Family income '57 (log, in 100s of nominal dollars)	3.928	0.688	0	6.906	3,794
1957	Farm background	0.209	0.407	0	1	3,999

Collection Wave	Variable	Mean	SD	Minimum	Maximum	Number
1957	Female	0	0	0	0	3,999
1957	High school class size	180.181	134.794	6	482	3,999
1957	High school rank	97.31	14.635	61	139	3,777
1957	In student government	0.183	0.387	0	1	3,999
1957	In varsity sports	0.518	0.5	0	1	3,999
1957	IQ	0.025	1.028	−2.661	2.984	3,999
1957	Large hometown population	0.125	0.331	0	1	3,999
1957	Medium hometown population	0.368	0.482	0	1	3,999
1957	Total number of activities	3.868	3.224	0	19	3,999
1975	Education—B.A. degree	0.147	0.354	0	1	2,703
1975	Education—M.A. and beyond	0.165	0.371	0	1	2,703
1975	Education—some college	0.142	0.349	0	1	2,703
1975	Experience	12.47	4.954	0	18	2,703
1975	Father executive	0.107	0.309	0	1	2,703
1975	Father's education	9.785	3.207	4	17	2,647
1975	Lived with both parents	0.912	0.283	0	1	2,702
1975	Marital status	0.886	0.318	0	1	2,700
1975	Military service	0.583	0.493	0	1	2,703
1975	Mother employed	0.372	0.483	0	1	2,697
1975	Mother's education	10.619	2.678	5	16	2,678
1975	Number of siblings	3.152	2.499	0	26	2,702
1975	Population at place of residence	1.214	3.825	0.001	78.949	2,589
1975	Resides outside Wisconsin	0.305	0.46	0	1	2,703
1975	Tenure	7.348	5.062	0	18.25	2,701
1975	Union membership	0.39	0.488	0	1	2,703
1975	Vocational training	0.197	0.398	0	1	2,703
1975	Wages (log, in 1992 dollars)	10.626	0.323	9.584	11.566	2,703
1975	Years of education	13.873	2.44	12	20	2,703
1992	Education—B.A. degree	0.155	0.362	0	1	2,219
1992	Education—MA and beyond	0.19	0.393	0	1	2,219
1992	Education—Some college	0.16	0.367	0	1	2,219
1992	Experience	30.263	5.794	0	37	2,193
1992	Health excellent (self-rating)	0.275	0.447	0	1	1,865
1992	Health fair or worse (self-rating)	0.109	0.312	0	1	1,865
1992	Health good (self-rating)	0.616	0.487	0	1	1,865
1992	Height (SD)	−0.009	1.016	−5.479	4.829	1,857
1992	Marital status	0.857	0.35	0	1	2,220
1992	Measure of agreeableness	27.628	4.435	8	36	1,788
1992	Measure of conscientiousness	29.316	4.062	14	36	1,780
1992	Measure of extroversion	22.452	5.255	6	36	1,756
1992	Measure of neuroticism	15.276	4.682	5	29	1,785
1992	Measure of openness	21.878	4.483	8	35	1,752

Collection Wave	Variable	Mean	SD	Minimum	Maximum	Number
1992	Number of employers 1975–1992	1.834	1.073	1	5	2,217
1992	Popul. place residence	4.574	10.095	0.046	88.632	2,211
1992	Purpose-in-life score	33.96	5.272	11	42	1,840
1992	Resides outside Wisconsin	0.331	0.471	0	1	2,220
1992	Self-acceptance score	33.103	5.654	7	42	1,840
1992	Tenure	17.371	10.975	0.5	40	2,208
1992	Union membership	0.137	0.344	0	1	2,220
1992	Wages (log, in 1992 dollars)	10.654	0.522	8.987	12.206	2,220
1992	Years of education	14.11	2.507	12	20	2,219
2011	Mortality status	0.239	0.427	0	1	3,999

All statistics are for men only. For the 1975 and 1992 collection waves, the sample was further restricted to respondents who were not self-employed and for whom earnings were not missing.

**Table 1**

## Attractiveness and Log Earnings of Men

Variables	(1)	(2)	(3)	(4)
	1975 Earnings	1992 Earnings	1975 Earnings	1992 Earnings
Beauty (standardized)	0.020*** (0.006)	0.033*** (0.011)	0.020*** (0.006)	0.028*** (0.010)
IQ score (SD)	0.106*** (0.006)	0.172*** (0.010)	0.049*** (0.006)	0.070*** (0.011)
Education				
Some college			0.076*** (0.020)	0.201*** (0.031)
B.A. degree			0.256*** (0.023)	0.476*** (0.037)
M.A. and beyond			0.306*** (0.028)	0.596*** (0.044)
Vocational training '75			0.049*** (0.014)	0.096*** (0.025)
Experience			0.018*** (0.005)	−0.016 (0.012)
Experience <sup>2</sup>			−0.000* (0.000)	0.001** (0.000)
Tenure			0.006*** (0.001)	0.009*** (0.001)
Marital status			0.130*** (0.017)	0.176*** (0.028)
Resides outside Wisconsin			0.154*** (0.014)	0.197*** (0.024)
Father's education			−0.003 (0.002)	0.002 (0.004)
Mother's education			0.003 (0.002)	0.007* (0.004)
Father executive			0.030 (0.020)	0.017 (0.035)
Family income '57			0.022** (0.010)	0.047*** (0.017)
Farm background			−0.001 (0.016)	0.028 (0.028)
Medium hometown population			0.020 (0.015)	0.064** (0.027)
Large hometown population			0.089*** (0.022)	0.047 (0.038)
Number of siblings			0.006** (0.002)	0.008* (0.004)
Lived with both parents			−0.010 (0.023)	−0.014 (0.040)
Mother employed			0.011 (0.012)	−0.000 (0.021)
High school class size			0.000* (0.000)	−0.000 (0.000)
Military service			0.037*** (0.013)	0.063*** (0.022)

	(1)	(2)	(3)	(4)
Variables	1975 Earnings	1992 Earnings	1975 Earnings	1992 Earnings
Population at place of residence			−0.001 (0.001)	0.002** (0.001)
Union			−0.040*** (0.013)	−0.036 (0.030)
Constant	10.619*** (0.006)	10.636*** (0.010)	9.975*** (0.089)	9.635*** (0.201)
Observations	2,703	2,220	2,445	1,978
$R^2$	0.120	0.113	0.308	0.358

Cell entries are OLS coefficient estimates (standard errors in parentheses). Significant at \*10%, \*\*5%, \*\*\*1%. The regressions exclude observations in the top and bottom 2% of the earnings distribution, minorities, cases missing multiple attractiveness scores, and the self-employed (included in this category are individuals who reported a wage but derived a majority of their income from their business and were self-employed in the other wave of the survey). Regressions in columns 3 and 4 also include industry dummies.

**Table 2**

Facial Attractiveness, Height, and Earnings

Variables	(1)	(2)	(3)	(4)
	1975 Earnings	1992 Earnings	1975 Earnings (many covariates)	1992 Earnings (many covariates)
Beauty (standardized)	0.016** (0.007)	0.029** (0.012)	0.020*** (0.007)	0.029*** (0.011)
Height (standardized)	0.033*** (0.007)	0.047*** (0.011)	0.023*** (0.007)	0.030*** (0.010)
IQ score (SD)	0.098*** (0.007)	0.166*** (0.011)	0.044*** (0.008)	0.066*** (0.012)
Constant	10.626*** (0.007)	10.648*** (0.011)	10.012*** (0.106)	9.666*** (0.223)
Observations	1,948	1,857	1,769	1,666
$R^2$	0.117	0.121	0.299	0.353

See the notes to table 1.



**Table 3**

## Attractiveness and Health

	(1)	(2)	(3)	(4)
Variables	Mortality (1957–2011) (probit)	Mortality (1975–2011) (probit)	Health in 1992 (ordered probit)	Health in 1992 (ordered probit)
Beauty (standardized)	−0.009 (0.007)	−0.010 (0.007)	0.039 (0.026)	0.050* (0.029)
IQ score (SD)	−0.016** (0.007)	−0.001 (0.008)	0.088*** (0.025)	−0.053 (0.032)
Education				
Some college		−0.072*** (0.022)		0.185** (0.088)
B.A. degree		−0.109*** (0.023)		0.419*** (0.107)
M.A. and beyond		−0.146*** (0.025)		0.593*** (0.127)
Vocational training '75		−0.002 (0.019)		0.172** (0.070)
Experience		0.002 (0.006)		0.059* (0.034)
Experience <sup>2</sup>		−0.000 (0.000)		−0.001 (0.001)
Tenure		−0.003* (0.002)		0.000 (0.003)
Marital status		−0.089*** (0.026)		0.183** (0.081)
Resides outside Wisconsin		0.032* (0.019)		0.132* (0.068)
Father's education		0.004 (0.003)		0.010 (0.011)
Mother's education		0.005 (0.003)		0.009 (0.012)
Father executive		−0.024 (0.025)		0.120 (0.100)
Family income '57		−0.015 (0.013)		0.006 (0.049)
Farm background		−0.041** (0.021)		0.201** (0.080)
Medium hometown population		−0.020 (0.020)		−0.003 (0.079)
Large hometown population		−0.031 (0.027)		0.089 (0.108)
Number of siblings		0.002 (0.003)		0.003 (0.012)
Lived with both parents		0.013 (0.030)		0.203* (0.116)
Mother employed		0.032* (0.016)		−0.035 (0.059)
High school class size		0.000 (0.000)		0.000 (0.000)

	(1)	(2)	(3)	(4)
Variables	Mortality (1957–2011) (probit)	Mortality (1975–2011) (probit)	Health in 1992 (ordered probit)	Health in 1992 (ordered probit)
Military service		−0.056*** (0.018)		0.096 (0.063)
Population at place of residence		−0.002 (0.002)		0.004 (0.003)
Union		−0.018 (0.017)		−0.216** (0.088)
Observations	3,999	3,137	2,015	1,802
Pseudo- $R^2$	0.0018	0.0306	0.0039	0.0380

Reported numbers are marginal effects (standard errors in parentheses). Significant at \*10%, \*\*5%, \*\*\*1%. In columns 3 and 4, the dependent variable is self-rated health status on a four-point scale. Sample exclusions are same as in table 1.

**Table 4**

## Attractiveness and Early Human Capital Formation

Variables	(1)	(2)	(3)	(4)
	Varsity Sports	Student Government	Service Organizations	Total Number of Activities
Beauty (standardized)	0.058*** (0.009)	0.033*** (0.007)	−0.008 (0.006)	0.266*** (0.049)
IQ score (SD)	0.014 (0.009)	0.080*** (0.007)	0.034*** (0.006)	0.687*** (0.050)
Father's education	0.007** (0.003)	0.007*** (0.002)	0.005** (0.002)	0.105*** (0.019)
Mother's education	0.008** (0.004)	−0.000 (0.003)	−0.000 (0.003)	0.046** (0.021)
Father executive	0.025 (0.031)	−0.006 (0.022)	0.036* (0.021)	0.414** (0.175)
Family income '57	0.000 (0.015)	0.016 (0.011)	0.018* (0.010)	0.253*** (0.084)
Farm background	−0.101*** (0.025)	−0.018 (0.018)	−0.053*** (0.015)	−0.276** (0.139)
Medium hometown population	−0.188*** (0.024)	−0.050*** (0.018)	0.024 (0.017)	−1.537*** (0.139)
Large hometown population	−0.176*** (0.032)	−0.009 (0.024)	0.166*** (0.030)	−1.531*** (0.186)
Number of siblings	−0.004 (0.004)	−0.005 (0.003)	−0.005* (0.003)	−0.050** (0.021)
Lived with both parents	0.004 (0.037)	−0.022 (0.028)	−0.017 (0.025)	−0.042 (0.204)
Mother employed	0.019 (0.019)	0.017 (0.014)	−0.022* (0.012)	0.133 (0.106)
High school class size	−0.001*** (0.000)	−0.001*** (0.000)	−0.000*** (0.000)	−0.006*** (0.000)
Observations	3,431	3,431	3,431	3,431
$R^2$	0.0839	0.1021	0.0758	0.238

Reported numbers are coefficients (standard errors in parentheses). Significant at \*10%, \*\*5%, \*\*\*1%. Marginal effects and pseudo  $R^2$  are reported in probit regressions (columns 1–3). Sample exclusions are the same as in table 1.

**Table 5**

## Earnings and High School Activities

Variables	(1)	(2)	(3)	(4)
	1975 Earnings	1992 Earnings	1975 Earnings (many covariates)	1992 Earnings (many covariates)
Beauty (standardized)	0.016*** (0.006)	0.027** (0.011)	0.016*** (0.006)	0.022** (0.010)
In varsity sports	0.031** (0.015)	0.007 (0.027)	0.024* (0.014)	0.017 (0.024)
In student government	0.069*** (0.017)	0.074** (0.031)	0.056*** (0.016)	0.064** (0.029)
Total number of activities	0.001 (0.002)	0.013*** (0.004)	0.002 (0.003)	0.007 (0.004)
IQ score (SD)	0.100*** (0.006)	0.155*** (0.011)	0.046*** (0.006)	0.065*** (0.011)
Constant	10.589*** (0.010)	10.576*** (0.018)	9.939*** (0.089)	9.394*** (0.201)
Observations	2,703	2,220	2,445	1,978
$R^2$	0.131	0.128	0.316	0.364

Cell entries are OLS coefficient estimates (standard errors in parentheses). Significant at \*10%, \*\*5%, \*\*\*1%. Regressions in columns 3 and 4 also include industry dummies. Sample exclusions are the same as in table 1. For some (predominantly small) schools, varsity sports appear to be the only choice available to students, making them undistinguishable from club or intramural sports. We assigned a dummy variable to such schools and interacted it with participation in varsity sports in all regressions.

**Table 6**

## Earnings and Confidence

	(1)	(2)	(3)	(4)
Variables	1975 Earnings	1992 Earnings	1975 Earnings (many covariates)	1992 Earnings (many covariates)
Beauty (standardized)	0.014** (0.007)	0.024** (0.012)	0.019*** (0.007)	0.024** (0.011)
Self-acceptance score	0.003* (0.002)	0.006** (0.003)	0.003* (0.002)	0.005* (0.003)
Purpose-in-life score	0.007*** (0.002)	0.011*** (0.003)	0.003* (0.002)	0.008*** (0.003)
IQ score (SD)	0.103*** (0.007)	0.173*** (0.011)	0.050*** (0.008)	0.076*** (0.012)
Constant	10.314*** (0.046)	10.051*** (0.077)	9.817*** (0.112)	9.281*** (0.229)
Observations	1,932	1,839	1,751	1,649
$R^2$	0.137	0.146	0.305	0.370

See the notes to table 1.

## Attractiveness and Personality

Table 7

Variables	(1)	(2)	(3)	(4)	(5)
	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Beauty (standardized)	0.413*** (0.110)	0.153 (0.094)	0.161* (0.087)	-0.276*** (0.099)	0.181* (0.094)
IQ score (SD)	-0.453*** (0.113)	-0.483*** (0.096)	-0.401*** (0.089)	-0.163 (0.102)	0.736*** (0.097)
Father's education	0.115*** (0.042)	-0.047 (0.036)	0.015 (0.033)	-0.052 (0.038)	0.072** (0.036)
Mother's education	0.003 (0.047)	-0.008 (0.040)	-0.048 (0.037)	-0.078* (0.042)	0.069* (0.040)
Father executive	0.682* (0.382)	-0.264 (0.328)	-0.126 (0.302)	0.360 (0.348)	0.606* (0.329)
Family income '57	-0.078 (0.186)	0.126 (0.159)	-0.120 (0.147)	-0.054 (0.169)	0.116 (0.159)
Farm background	-0.050 (0.308)	0.061 (0.263)	-0.188 (0.243)	-0.208 (0.276)	-0.428 (0.263)
Medium hometown population	-0.637*** (0.311)	-0.325 (0.266)	-0.418* (0.245)	0.284 (0.281)	-0.193 (0.267)
Large hometown population	-0.533 (0.419)	0.222 (0.357)	0.252 (0.327)	-0.207 (0.376)	-0.168 (0.355)
Number of siblings	-0.037 (0.046)	0.035 (0.040)	0.015 (0.037)	-0.095** (0.043)	0.032 (0.040)
Lived with both parents	0.265 (0.443)	-0.120 (0.379)	0.344 (0.352)	-0.257 (0.402)	-0.332 (0.382)
Mother employed	0.498** (0.235)	-0.311 (0.201)	-0.019 (0.185)	-0.060 (0.212)	0.161 (0.201)
High school class size	0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)
Constant	21.545*** (0.956)	28.011*** (0.818)	29.893*** (0.755)	17.597*** (0.865)	19.912*** (0.819)
Observations	2,290	2,326	2,317	2,327	2,281
R <sup>2</sup>	0.024	0.022	0.017	0.012	0.061

Reported numbers are OLS coefficients (standard errors in parentheses). Significant at \*10%, \*\*5%, \*\*\*1%. Dependent variables are summary scores. Sample exclusions are the same as in table 1.



**Table 8**

## Earnings, Attractiveness, and Personality

Variables	(1)	(2)	(3)	(4)
	1975 Earnings	1992 Earnings	1975 Earnings (many covariates)	1992 Earnings (many covariates)
Beauty (standardized)	0.013* (0.007)	0.025** (0.012)	0.020*** (0.007)	0.026** (0.012)
Measure of extroversion	0.006*** (0.001)	0.005* (0.003)	0.003** (0.001)	0.005** (0.002)
Measure of agreeableness	-0.004** (0.002)	-0.008*** (0.003)	-0.003* (0.002)	-0.007** (0.003)
Measure of conscientiousness	0.005*** (0.002)	0.004 (0.003)	0.004** (0.002)	0.004 (0.003)
Measure of neuroticism	-0.004** (0.002)	-0.007** (0.003)	-0.003* (0.002)	-0.005** (0.003)
Measure of openness	0.002 (0.002)	0.014*** (0.003)	-0.001 (0.002)	0.008*** (0.003)
IQ score (SD)	0.106*** (0.007)	0.160*** (0.013)	0.054*** (0.008)	0.072*** (0.014)
Constant	10.460*** (0.089)	10.444*** (0.149)	9.938*** (0.147)	9.451*** (0.286)
Observations	1,707	1,618	1,547	1,464
$R^2$	0.139	0.138	0.316	0.373

See the notes to table 1.

Table 9

## Earnings and All Channels

Variables	(1)	(2)	(3)	(4)
	1975 Earnings	1992 Earnings	1975 Earnings	1992 Earnings
Beauty (standardized)	0.011 (0.007)	0.022* (0.012)	0.018** (0.007)	0.022* (0.012)
In varsity sports	0.030* (0.018)	0.038 (0.030)	0.031* (0.017)	0.049* (0.028)
Total number of activities	0.005 (0.003)	0.013*** (0.005)	0.004 (0.003)	0.007 (0.005)
Self-acceptance score	0.002 (0.002)	0.007** (0.003)	0.002 (0.002)	0.005* (0.003)
Purpose-in-life score	0.006*** (0.002)	0.012*** (0.003)	0.003 (0.002)	0.009*** (0.003)
Measure of extroversion	0.003** (0.002)	-0.001 (0.003)	0.002 (0.002)	0.001 (0.002)
Measure of agreeableness	-0.005*** (0.002)	-0.011*** (0.003)	-0.004** (0.002)	-0.008*** (0.003)
Measure of conscientiousness	0.003 (0.002)	-0.002 (0.003)	0.002 (0.002)	-0.001 (0.003)
Measure of neuroticism	-0.002 (0.002)	-0.002 (0.003)	-0.002 (0.002)	-0.002 (0.003)
Measure of openness	0.001 (0.002)	0.011*** (0.003)	-0.001 (0.002)	0.007** (0.003)
IQ score (SD)	0.100*** (0.008)	0.147*** (0.013)	0.052*** (0.008)	0.070*** (0.014)
Education				
Some college			0.065*** (0.025)	0.198*** (0.036)
B.A. degree			0.251*** (0.029)	0.501*** (0.043)
M.A. and beyond			0.266*** (0.035)	0.605*** (0.052)
Vocational training '75			0.044** (0.018)	0.082*** (0.029)
Experience			0.012** (0.006)	-0.034** (0.014)
Exp. Squared			-0.000 (0.000)	0.001*** (0.000)
Tenure			0.005*** (0.002)	0.009*** (0.001)
Marital status			0.107*** (0.023)	0.155*** (0.034)
Resides outside Wisconsin			0.136*** (0.017)	0.153*** (0.028)
Father's education			-0.006** (0.003)	-0.002 (0.004)
Mother's education			-0.000 (0.003)	0.006 (0.005)
Father executive			0.057** (0.025)	0.053 (0.040)

	(1)	(2)	(3)	(4)
Variables	1975 Earnings	1992 Earnings	1975 Earnings	1992 Earnings
Family income '57			0.025** (0.012)	0.033 (0.020)
Farm background			0.023 (0.020)	0.019 (0.033)
Medium hometown population			0.037* (0.020)	0.085*** (0.032)
Large hometown population			0.124*** (0.028)	0.062 (0.045)
Number of siblings			0.005 (0.003)	0.007 (0.005)
Lived with both parents			−0.011 (0.029)	−0.026 (0.046)
Mother employed			−0.008 (0.015)	−0.001 (0.024)
High school class size			0.000** (0.000)	0.000 (0.000)
Military service			0.036** (0.017)	0.091*** (0.026)
Population at place of residence			−0.004** (0.002)	0.003** (0.001)
Union			−0.048*** (0.016)	−0.055 (0.036)
Constant	10.343*** (0.096)	10.139*** (0.159)	9.867*** (0.151)	9.242*** (0.290)
Observations	1,692	1,599	1,534	1,446
$R^2$	0.153	0.169	0.326	0.388

See the notes to table 1. All regressions include a dummy for schools that offer only varsity sports and its interaction with participation in varsity sports.

**Table 10**

Reverse Simulation: Effects of Attenuation Bias on the Magnitude and Significance of Attractiveness Coefficients

Correlation in Attractiveness (1957–1992)	Average Coefficient	Coefficient Range	Percentage Significant at 10% Level	Percentage Significant at 5% Level
0.25	0.015	−0.041–0.072	30.09%	19.98%
0.40	0.025	−0.031–0.081	57.41%	44.42%
0.63	0.040	−0.012–0.094	91.85%	85.25%
0.87	0.057	0.012–0.103	99.89%	99.61%
1	0.067	0.025–0.114	100.00%	100.00%

The dependent variable is hypothetical 1992 earnings that on average exhibit a 6.7% attractiveness premium. The first column reports the assumed correlation between high school and adult attractiveness. The empirical models use the long set of covariates. For each row, the statistics are calculated from 100,000 iterations.