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# Looks and longevity: Do prettier people live longer?

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ABSTRACT

Social scientists have given relatively scant attention to the association between attractiveness and longevity. But attractiveness may convey underlying health, and it systematically structures critical social stratification processes. We evaluated these issues using the Wisconsin Longitudinal Study (WLS, N = 8386), a survey of Wisconsin high school graduates from 1957 which provided large samples of women and men observed until their death (or through their early 80s). In doing so, we utilized a meticulously constructed measure of facial attractiveness based on the independent ratings of high-school yearbook photographs. We used linked death information from the National Death Index-plus through 2022 and Cox proportional hazard models as well as standard life-table techniques. We found that the least attractive rated sextile of the sample had significantly higher hazards of mortality (HR: 1.168, $p < 0.01$) compared to the middle rated four sextiles of attractiveness. This finding remained robust to the inclusion of covariates describing high-school achievement, intelligence, family background, earnings as adults, as well as mental and physical health in middle adulthood. We also found that different specifications of the attractiveness measure consistently indicated no significant differences in the mortality hazard between highly attractive and average-looking people. Using life-table techniques, we next illustrated that among women in the least attractive sextile, at age 20 their life expectancy was nearly 2 years less than others'; among men in the least attractive sextile, it was nearly 1 year less at age 20.

## 1. Introduction

Social scientists have extensively documented the importance of social conditions for health and longevity. This work has consistently concluded that those who are socially advantaged live longer and healthier lives than those who are disadvantaged and that social conditions are a fundamental cause of disease (Link and Phelan, 1995; Phelan and Link, 2015). For instance, past research has stressed the critical importance of income, marital status, discrimination, educational attainment, and gender for health and longevity (Chetty et al., 2016; Cobb et al., 2022; Crimmins and Saito, 2001; Hummer and Hernandez, 2013; Read and Gorman, 2010; Umberson et al., 2006). Social scientists have, however, paid almost no attention to how physical or facial attractiveness may be associated with longevity. This oversight is important not only because attractiveness may convey underlying health (Nedelec and Beaver, 2014) but because it also structures many critical social stratification processes that influence health (Monk et al., 2021). Accordingly, social scientists should strive to understand if and why attractiveness may influence longevity, especially throughout middle and older adulthood when most deaths occur (Arias et al., 2021).

The small amount of previous research that has analyzed this relationship has found discrepant results. Still, even with these sparse and discrepant findings it is unclear if there is a longevity advantage for greater attractiveness or a penalty for lesser attractiveness and how best to specify the relationship between attractiveness and longevity. Whether the relationship between attractiveness and longevity differs by gender is also not well understood. It also remains unclear how characteristics such as educational attainment, income, marital status, and health at different stages of life alter any relationship between looks and longevity. We shed light on these issues using the Wisconsin Longitudinal Study (WLS), a survey of Wisconsin high school graduates from 1957 (Herd et al., 2014) which provides large samples of women and men observed until their death (or through their early 80s) and a meticulously constructed measure of facial attractiveness. We study facial attractiveness, as is standard in studies of beauty (Hamermesh and Biddle, 1994).

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## 2. Literature review

There are both direct and indirect pathways through which facial attractiveness may influence longevity. One direct pathway might arise if facial attractiveness is a “phenotype” of health, as some have argued (Nedelec and Beaver, 2014), and as suggested by evidence of a relationship between attractiveness and specific genes (Hu et al., 2019; Mitchem et al., 2014; White and Puts, 2019). Past research utilizing the National Longitudinal Study of Adolescent and Adult Health (Add Health) found that those rated as more attractive had fewer self-reported chronic health issues (Nedelec and Beaver, 2014). More recent research utilizing those data has concluded that interviewers’ appraisals of participants’ attractiveness were associated with more favorable objective measures of cardiometabolic health, even after adjusting for potential indirect pathways (sociodemographic) and direct pathways (i.e., initial health—Bulczak and Gugushvili, 2023). Similarly, other research has indicated that women whose facial attractiveness was more highly rated had greater reproductive longevity than others (Żelaźniewicz et al., 2021). Notably, not all research has found that attractiveness in adolescence was related to subsequent health (Kalick et al., 1998), which stresses the importance of further investigating this issue.

Importantly, past research that has examined the potential direct relationship between attractiveness and health usually compares the most to the least attractive, obfuscating who is at higher *or* lower risk of better or worse health. We contribute to this research by analyzing multiple specifications of attractiveness to identify if there is a longevity benefit of attractiveness and/or a penalty for unattractiveness and to document the optimal specification of the relationship. Doing so can help to elucidate if the level of attractiveness is a phenotype of health. Further, we analyze a long follow-up period with high-quality mortality information, which should reduce any concerns regarding reverse causality (i.e., that the very ill are rated least attractive). Finally, we adjust for self-reported measures of physical and mental health to examine if any relationship still remains, which helps to evaluate whether good health or any longevity benefits derive from direct or more indirect and social pathways (Bulczak and Gugushvili, 2023).

Indeed, there are also more indirect pathways through which attractiveness may influence longevity. From early childhood until adolescence better-looking children show greater improvements in scores on standardized tests (Hamermesh et al., 2023). Previous research has documented the importance of physical attractiveness for educational outcomes (French et al., 2009; Krawczyk, 2018). After schooling, attractive people also earn more and are more likely to be employed (Borland and Leigh, 2014; Hamermesh and Biddle, 1994; Monk et al., 2021; Stinebrickner et al., 2019). They are somewhat more likely to be married (Epstein and Guttman, 1984), and, especially among women, they are more likely to have spouses with greater earning power (Buss, 1989; Hamermesh and Biddle, 1994). Accordingly, as previous research has strongly connected social processes (e.g., involvement with the criminal justice system; Mocan and Tekin, 2010) and socioeconomic status (specifically educational attainment and income) to health and longevity (Chetty et al., 2016; Hummer and Hernandez, 2013; Link and Phelan, 1995), the benefits that attractiveness provide in education, earnings, and employment may thus subsequently indirectly increase longevity.

The least attractive are not only disadvantaged in their socioeconomic status; they may also face other inchoate forms of discriminatory treatment (Lemay et al., 2010). They are likely exposed to unique and consistent sources of stressors and discrimination that more attractive other people do not endure, which might increase their mortality risk (Cobb et al., 2022). This makes it especially important to evaluate if there are longevity benefits or penalties for various levels of facial attractiveness. Given these potential indirect pathways, we adjust for educational attainment, income, marital status, as well as behavioral health variables (e.g., smoking and drinking).

A few previous studies have analyzed the relationship between facial attractiveness and longevity. The earliest we are aware of found a positive zero-order correlation between perceptions of the facial attractiveness of 50 high school yearbook photographs from the 1920s and longevity in Canada (Henderson and Anglin, 2003). Two studies also utilized the Wisconsin Longitudinal Study, analyzed here, to relate measures of facial attractiveness to mortality risk. Kim (2014) examined mortality risks from age 54 through 72 and found that the risk of death during this interval decreased among more attractive respondents net of demographic characteristics, personality traits, income, and health behaviors. Kim (2014) also found similar results in the American Changing Lives Survey. As a side issue in their study, Scholz and Sicinski (2015) found no relationship between a continuous rating of attractiveness and mortality risk from age 18 through age 72. The discordant findings using the WLS could be due to different methods used or different specifications of attractiveness.

We advance the analysis of this issue in several noteworthy ways. First, by using the National Death Index-plus (NDI) updated in 2022 instead of 2011 we allow for more deaths to have occurred. Indeed, in 2011, the majority of the WLS cohort was still alive. Adding an additional 11 years of follow-up roughly doubles the number of dead sample members. Second, instead of testing only whether the respondent died during some time interval, we fit survival models, estimating Cox proportional hazards, measuring the determinants of the risk of death longitudinally. This expanded specification allows discovering how attractiveness may influence the risk of death at different ages, not merely whether there is any association. Third, we explore the influence of different covariates (e.g., income and health) at different ages. Fourth, we consider survival separately by gender, following up on the many studies that demonstrate different effects of looks by gender throughout life. Fifth, and especially important, rather than exclusively analyzing a continuous measure of attractiveness or a relative categorical measure, we explore multiple different specifications of perceived attractiveness. This allows us to discover where in the distribution of attractiveness the mortality risk is greater, and how that risk varies over the life cycle (i.e., whether there is a longevity premium for being more attractive, or a longevity penalty for being less attractive, or both). This also enables us to construct life tables and calculate expected Social Security benefits based on facial attractiveness.

## 3. Materials and methods

### 3.1. Data

The data came from the Wisconsin Longitudinal Study (WLS). The WLS was initially designed to measure intentions about further education of high school graduates in Wisconsin in 1957. It has evolved to study changes across the life course in economic prospects, health, well-being, and more. Extensive details about the WLS can be found elsewhere (Herd et al., 2014). Suffice it to note that in 1957 a random 1/3 sample of all graduates in Wisconsin was selected for inclusion in the WLS and provided more detailed information about themselves. We used waves through 1993; while later waves are available, we did not investigate them due to concerns about selection resulting from mortality and other sources of additional sample attrition.

The WLS has major strengths for this analysis. It is linked to the National Death Index through 2022. Most of the surviving participants in the WLS were 83 by the end of the 2022 follow-up period with the NDI. It has validated evaluations of facial attractiveness measures for most respondents, based on later assessments of high-school graduation pictures. Of course, the WLS is not generalizable to the entire population, as it samples only high school graduates from Wisconsin, disproportionately non-Hispanic White people.

The original sample included 10,317 Wisconsin high school graduates; however, our analytical sample consisted of those with valid measures of attractiveness and year of death, or right censoring, (N = 8386). We also analyzed samples of respondents included in follow-up waves, including those interviewed in 1975 about their characteristics in early adulthood (N = 7517), and those interviewed in 1992–93 regarding their health and well-being (N = 5466). These samples were smaller due to attrition (resulting in small part from mortality). In ancillary analyses we found that males, people with lower high school rank, lower cognitive scores, and people from urban areas were less likely to be in the later samples. Attractiveness was not systematically related to sample attrition, except for mortality. We handled non-attrition related missing data with Stata's Multiple Imputation Suite; but we obtained similar results implementing listwise deletion, and imputing values for the entire sample regardless of attrition status.

### 3.2. Measures

#### 3.2.1. Mortality status

Mortality status was collected by matching the WLS data to the National Death Index-plus (NDI-plus), containing information on all deaths in the U.S. The linkage was based on birth dates, names, and Social Security numbers to identify dead respondents (Herd et al., 2014). Mortality information, including year of death, was available from 1957 to 2022. We coded death status as "1" dead, "0" alive. Respondents not identified as deceased were right censored in 2022. For the few respondents who died in 1957 the year of death was coded as 1957.5. We removed deaths from the first five years of follow-up to examine any concerns about reverse causality (i.e., yearbook pictures of the sickest graduates being rated the least attractive). We found substantively similar overall results.

#### 3.2.2. Attractiveness

Data on attractiveness in the WLS were based on independent ratings of high-school yearbook photographs. Respondents were rated as not at all attractive or extremely attractive on an eleven-point scale by varying sets of six men and six women. The raters, of roughly the same birth years as the high-school graduates, were trained to anchor attractiveness ratings with five photographs. They then rated groups of respondents on the level of attractiveness. Out of the 8623 respondents in the WLS who had valid photographs from yearbooks, our sample consisted of the 8386 respondents with valid information on date of death or survival. Respondents from smaller schools were more likely to be missing the rating of attractiveness. However, standardized measures of cognition and high school graduation rank were remarkably close to the standardized middle values, suggesting that our sub-sample was similar to the overall sample, at least along those dimensions. Detailed information regarding the collection, validity, and the reliability, of the attractiveness measure is in Meland (2002). In the main analyses we standardized the normed attractiveness measure and coded it in equal sextiles, with the middle 66.7% (the middle four sextiles) as the reference group, but we also analyzed additional specifications which we discuss further below. Additionally, in ancillary analyses (not shown), we also conducted analyses separately by the rater gender, which provided similar overall results to the main analyses.

We follow the respondent's mortality status from entry to the WLS through age 83 based on attractiveness assessed when the respondents were high-school seniors. Basing the results on assessments of attractiveness at entry to the WLS can be justified in two ways. First, attractiveness in adolescence may be especially important to success in later life, as it will have an effect on success in school, initial job placement, success in the dating/marriage market, and other aspects that affect trajectories over one's life. Second, evidence on the stability of perceived looks over much of an adult lifetime suggests that assessing them at roughly age 18 is sensible. As Supplemental Table S1 shows, in face-to-face interviews in Waves 2 and 4 of the Add Health study interviewers rated the same respondents' looks on a five-to-one scale, with respondents in Wave 4, 12 years after Wave 2, ranging in age from 26 to 32. A chi-square test based on the relevant 5 × 5 contingency table yielded $\chi^2 (16) = 581.4$, highly significantly nonzero ($\chi^2_{.01} (16) = 27.4$). We discuss this issue further in the supplemental materials.

#### 3.2.3. Covariates

We adjusted for covariates from across three waves of data collection from the WLS that correspond to different stages of life. First, we used demographic and early life characteristics collected during the initial collection period in 1957. We accounted for gender, males coded "1," females coded "0," and for parental education, with both father's and mother's educational attainment, coded "1" if the parent at least graduated from high school, "0" if not. We also included the respondent's percentile high-school class rank (0–100). We further adjusted for the cognitive test score (the Henmon-Nelson test) taken as a high-school junior. We then included a vector of indicators of the size of the community including the graduate's high school.

We next accounted for graduates' total income from the 1975 wave, when they were in their mid-30s. Also included were dichotomous measures of never having been married (1 = never married, 0 = ref); having attained college or more education (=1, 0 if not), and having served in the military (=1, 0 if not). We next added information from middle adulthood, generally collected in 1992–93, including measures of health. These were the calculated Body Mass Index, based on self-reported height and weight; having ever been a regular cigarette smoker (=1, 0 if not), the number of illnesses reported, their Center for Epidemiological Studies Depression Scale score, and a dichotomous measure of self-reported ill-health (1 = Fair/Poor/Very Poor, 0 = Good/Very Good).

## 4. Methods

We first calculated descriptive statistics for the sample. Then using the STATA command *stcox* we fit a series of Cox proportional hazard models (Cox models) measuring the risk of mortality over the 65-years post high-school graduation (1957–2022). We present the results in the form of Hazard Ratios. We specified age to be the measure of time in the Cox model, with the entrance age to be that when the respondents entered the WLS, and the exit age to be age of death or age at right-censoring. There was little variation in age of entrance, with 77 percent of respondents born in 1939 and another 16 percent born in 1938. Cox models were ideal for this analysis, as they handle censored data, do not assume constant hazard ratios, allow for covariates, are easily interpretable, and are optimal for large datasets. The Cox model assumes proportional hazards; however, in ancillary analyses we found (using the STATA routine *stcoxkm*) no evidence that this assumption was violated. We first calculated unadjusted models with nine different specifications of attractiveness to determine the consistency of results across specifications and determine the most optimal model fit based on Bayesian Information Criterion (Luo et al., 2015).

Next, we present figures showing the mortality hazard at each age of the sextile specification (which fit best based on BIC), beginning at ages 20, 40, and 65. Then we fit a series of models adjusting for covariates. Model 1 was a Cox model with no covariates to identify the zero-order relationship between attractiveness and the mortality hazard. Next, we fit Model 2, which adjusted for early life covariates. Model 3 was estimated on the sample contacted for the 1975 follow-up that included covariates through age 35. In Model 4, we estimated a model predicting the mortality hazard focusing on the sample contacted in 1992/93. We then implemented an identical strategy in models that were stratified by gender and tested for differences in hazard rates by attractiveness across genders. Using these results, we calculated differences in life expectancy (Preston, 2000) and expected Social Security benefits across levels of attractiveness. We also estimated a series of Cox models to test for the sensitivity of the results to alternative specifications of the covariates and sample selection criterion.

## 5. Results

### 5.1. Descriptive statistics

Table 1 presents descriptive statistics. Almost 43% of the sample had died by the end of the follow-up period. This was somewhat below the mortality rate implied by recent national life tables for White adults (Arias et al., 2021). A slight majority of the sample was female (52.3%). Percentile rank in high school and cognitive test scores were near the standardized midpoints, suggesting that the sample-selection criteria and availability of yearbook pictures to be rated for attractiveness and valid death measures did not differ from the overall sample of those measures. About 6% of the sample was never married, while almost 12% graduated college, and nearly a quarter (and around half of all men) served in the military. These results are consistent with previous research that has suggested the WLS cohort is broadly representative of the non-Hispanic White adults in that cohort.

### 5.2. Different specifications of attractiveness and mortality

An important question was how longevity differs at various points of the distribution of facial attractiveness. While the WLS provides the average of the ratings of each respondent's facial attractiveness (mean = 5.43, s.d. = 1.27), there was no reason to anticipate that a linear measure best describes the impact of looks on longevity. Accordingly, we evaluated nine different specifications of attractiveness.

We show the results of this specification analyses in Table 2, evaluating the results by the BIC (with lowers values indicating better fits). The first two rows show the results of specifying attractiveness continuously. The rest detail quantile specifications, going from ventiles to quartiles, with the reference groups being all but the lowest quantile, then the middle quantiles. The Table made several things abundantly clear: 1) Simply using the average attractiveness rating, as is common, yields a worse fit than using normalized ratings; 2) The fitted models that used attractiveness specified in sextiles—when those in the lowest 1/6 of attractiveness are compared to others, and when they are compared to those in the middle 4/6 and those in the top 1/6, generally fit best; and 3) No matter what specification of quantiles was used, however, there were no significant differences between those in the top quantile and those in whatever middle set of quantiles was specified. We also analyzed gender differences in the best-fitting specification. The specification based on sextiles fit best among men; among women a definition based on deciles achieved a slightly better model fit. Regardless of the definition, however, for both women and men the least-attractive category had a higher (significantly so for women) mortality risk, while the most-attractive category differed little from that of the reference group.

**Table 1**
Descriptive statistics from the Wisconsin longitudinal study (WLS).

| | Mean or % |
|---|---|
| **Died (N=8386)** | 42.9% |
| **Demographics and Early Life Conditions (1957, N=8386)** | |
| Female (Ref = Male) | 52.3% |
| Father HS Education + (Ref = Less than HS education) | 43.0% |
| Mother HS Education + (Ref = Less than HS education) | 50.2% |
| High School Percentile Rank | 50.72 |
| Cognitive Test Score | 100.69 |
| **Midlife Characteristics (1975, N= 7517)** | |
| Never Married (Ref = Married | 6.1% |
| College or More education (Ref = Less than College Education) | 11.5% |
| Served in Military (Ref = Did not) | 24.3% |
| Income in 1974 in $100 units. | 90.21 |
| **Later Life Characteristics (1992–93, N=5466)** | |
| Body Mass Index | 26.78 |
| Smoker (Ref = Not a Smoker) | 54.4% |
| Number of Illnesses | 1.05 |
| Center for Epidemiological Studies Depression Scale | 16.51 |
| Fair/Poor/Very Poor Self-Rated Health (Ref = Good/Very Good Health) | 11.5% |

Notes: Attractiveness coded in sextiles.

**Table 2**
Alternative specifications of attractiveness in relation to mortality risk, WLS, 1957–2022 (N = 8386).

| | Lowest | quantile | Highest quantile | | |
|---|---|---|---|---|---|
| | HR | SE | HR | SE | Bayes Information Criterion |
| **Average rating** | 0.964 | 0.013 | – | – | 63,069.0 |
| **Z(average rating)** | 0.959 | 0.013 | – | – | 63,067.1 |
| **Quantiles: (Reference group)** | | | | | |
| **Ventiles** | | | | | |
| (Top 19) | 1.252 | 0.090 | – | – | 63,067.4 |
| (Middle 18) | 1.257 | 0.090 | 1.077 | 0.080 | 63,075.5 |
| **Deciles** | | | | | |
| (Top 9) | 1.187 | 0.063 | – | – | 63,066.6 |
| (Middle 8) | 1.194 | 0.064 | 1.053 | 0.058 | 63,074.8 |
| **Octiles** | | | | | |
| (Top 7) | 1.168 | 0.056 | – | – | 63,066.7 |
| (Middle 6) | 1.178 | 0.058 | 1.060 | 0.053 | 63,074.4 |
| **Sextiles** | | | | | |
| **(Top 5)** | **1.162** | **0.050** | **——** | **——** | **63,064.9** |
| **(Middle 4)** | **1.168** | **0.051** | **1.024** | **0.047** | **63,073.6** |
| **Quintiles** | | | | | |
| (Top 4) | 1.132 | 0.046 | – | – | 63,067.6 |
| (Middle 3) | 1.125 | 0.047 | 0.977 | 0.043 | 63,076.3 |
| **Quartiles** | | | | | |
| (Top 3) | 1.123 | 0.042 | – | – | 63,067.3 |
| (Middle 2) | 1.114 | 0.045 | 0.975 | 0.040 | 63,075.9 |

Note: The best-fitting specification based on the BIC is in **bold**. See supplemental materials for details.

Fig. 1 presents Kaplan-Meier estimates of mortality hazards by gender at each of several ages: 20, 40, and 65, standard ages included in life tables. Following up on the results in Tables 2, it compared the mortality risk of members of the least attractive sextile of respondents to that of the remaining 5/6. It demonstrated that the least attractive members of the panel face a higher risk of death at each stage of life, with the hazard rates becoming only slightly closer as the sample reached old age.

### 5.3. The impact of covariates on the relationship

Table 3 provides Cox proportional hazard ratios estimating mortality risk. The first model included no covariates, reproducing the estimates for sextiles in Table 2. It indicated that those in the least attractive sextile had a significantly ($p < 0.01$) 16.8% higher hazard of mortality than those in the middle four sextiles. Crucially, there was little difference in hazards between people in the most attractive sextile and the middle four sextiles. Model 2 added demographic and early-life covariates: gender, parental education, rank in high-school graduating class, cognitive test score and rural-urban location in high school. Including these, the substantive results remained similar: members of the least attractive sextile had a significantly ($p < 0.01$) 18.5% higher hazard than people in the middle four sextiles, with the most attractive sextile's mortality risk differing little from that of the large middle group. In sensitivity analyses, information regarding parental incomes was included for 1957 and 1966, although many observations were missing. Adding these measures altered the hazard rates by less than 0.01.

Model 3 included covariates measured in 1975: never-married status, college education, military service, and income. Despite the added controls and differing samples, the results remained quite similar to those of Models 1 and 2, with the least attractive sextile having a statistically significantly ($p < 0.01$) 17.5% higher hazard of mortality relative to the middle four sextiles.

The final model contained health-related variables measured in

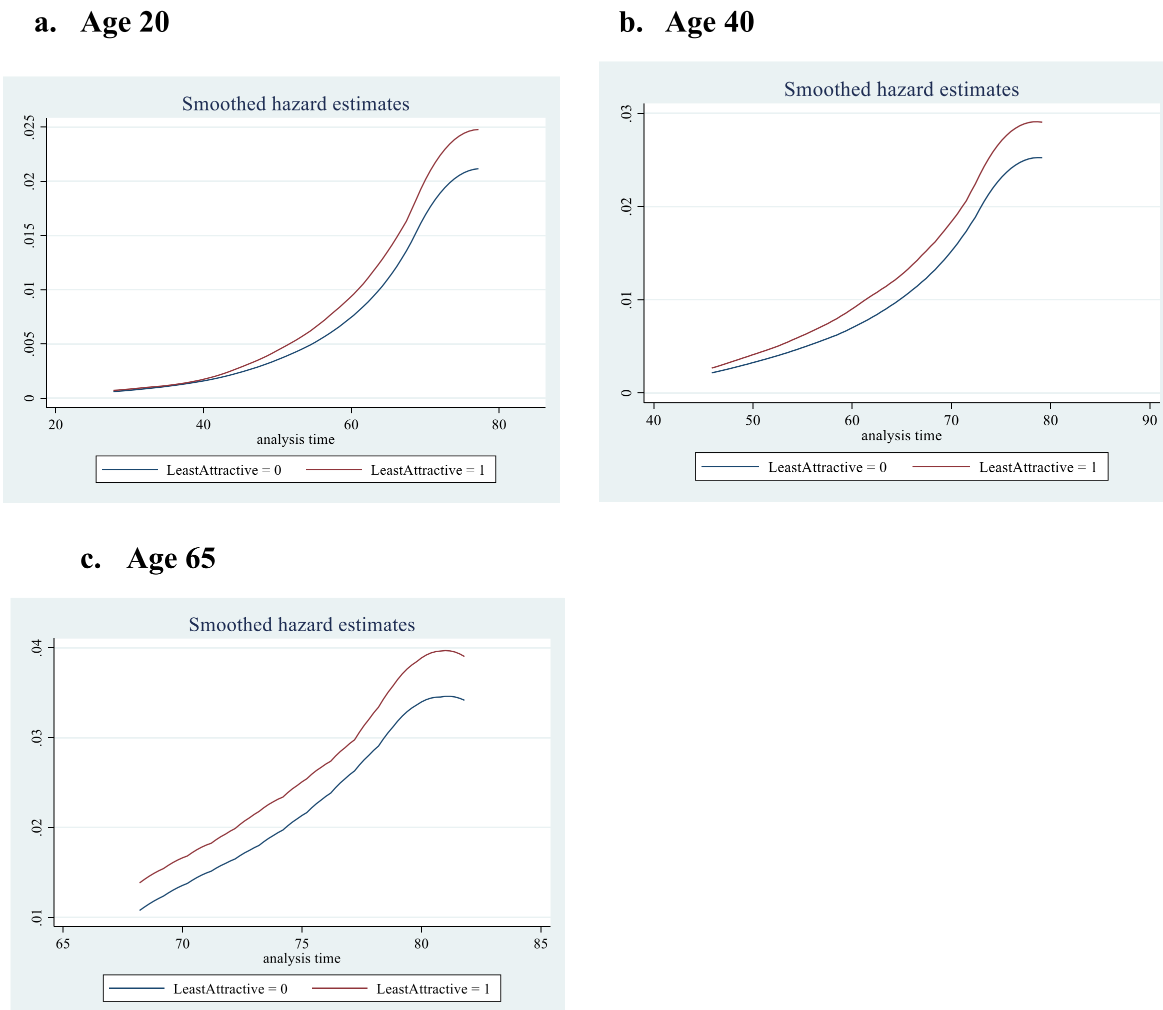


**Fig. 1.** Hazard Rates, Bottom Sextile of Attractiveness vs. Others, From Ages 20, 40, and 65.

1992–93: BMI, smoking status, number of illnesses, the CESD scale, and self-reported health. Once again, the results were similar: The least attractive one-sixth of respondents had a significantly ($p = 0.02$) higher hazard (HR: 1.144) than those in the middle four sextiles. The decrease in the hazard ratio was largely due to the addition of the number of illnesses, suggesting that a correlation between attractiveness and health in middle age modifies the attractiveness-longevity relationship somewhat.

### 5.4. *Gender differences*

Next we began gender-stratified analyses. Fig. 2 illustrates Kaplan-Meier estimates of mortality hazards by gender at ages 20, 40, and 65. They demonstrated that among women the difference in mortality risk was substantial and remained proportionate throughout life. Among men the difference in longevity by attractiveness was less; and the proportionate difference was greatest earlier in life (so that even their smaller effects of looks on longevity are concentrated in youth and middle-age).

In Table 4, we implemented an identical hierarchical strategy on gender-stratified models, so that Model 1 essentially reproduced the results of Fig. 2a and b. The mortality hazard was significantly ($p < 0.01$) higher for women in the least attractive sextile compared to the middle four sextiles (Model 1). There were, however, no significant patterns for men. We found similar patterns in Model 2, when early life and demographic patterns were adjusted for. Among women there was an elevated and statistically significantly higher hazard of mortality among the least attractive women compared to those in the two-thirds; among men the hazard was also higher, although only marginally statistically different. These patterns were similar in Model 3 when midlife covariates were included; the difference between the least attractive sextile and the middle four sextiles remained significant among women ($p < 0.01$) but not among men. When health measures in later life were included (Model 4), there were no longer significant differences among women or men. While the results indicated that women's longevity seemed more sensitive to attractiveness the formal test indicated that the gender differences in hazard of mortality were not statistically significant.

## 6. Supplemental analyses

### 6.1. *Life expectancy calculations*

We used these results to infer the difference in life expectancy between the 1/6 worst-rated sample members and others, constructing life tables based on facial attractiveness. The upper panel of Table 5 shows these measures, $e_x^o$—expected remaining years of life—at ages 20, 40, and 65. Among women, the difference in life expectancy at age 20 was 1.89 years on a base (among the other 5/6 of respondents) of 64.71 years; among men at that age, it was 0.86 years on a base of 59.96 years. By age 65 the difference among women had only fallen to 1.30 years, among men, however, it had nearly disappeared, being only 0.18 years.

**Table 3**
Hazard Ratios, their Standard Errors, and Tests that HR = 1. Cox Proportional Hazard Models Predicting Mortality, WLS, 1957–2022.

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HR | SE | p | HR | SE | p | HR | SE | p | HR | SE | p |
| **Attractiveness** | | | | | | | | | | | | |
| Least Attractive Sextile | 1.168 | 0.051 | <0.01 | 1.185 | 0.053 | <0.01 | 1.175 | 0.055 | <0.01 | 1.144 | 0.068 | 0.02 |
| Middle Four Sextiles of Attractiveness (Ref) | | | | | | | | | | | | |
| Most Attractive Sextile | 1.024 | 0.047 | 0.60 | 1.011 | 0.047 | 0.82 | 1.003 | 0.049 | 0.95 | 0.953 | 0.058 | 0.43 |
| **Demographics and Early Life Conditions (Collected: 1957)** | | | | | | | | | | | | |
| Female (Ref = Male) | | | | 0.705 | 0.025 | <0.01 | 0.647 | 0.035 | <0.01 | 0.670 | 0.045 | <0.01 |
| Father HS Education + (Ref = Less than HS education) | | | | 0.956 | 0.038 | 0.26 | 0.954 | 0.040 | 0.26 | 0.969 | 0.050 | 0.54 |
| Mother HS Education + (Ref = Less than HS education) | | | | 1.060 | 0.041 | 0.13 | 1.070 | 0.043 | 0.09 | 1.072 | 0.052 | 0.16 |
| High School Percentile Rank | | | | 0.994 | 0.001 | <0.01 | 0.995 | 0.001 | <0.01 | 0.998 | 0.001 | 0.06 |
| Cognitive Test Score | | | | 1.002 | 0.001 | 0.31 | 1.002 | 0.002 | 0.24 | 1.001 | 0.002 | 0.60 |
| **Midlife Characteristics (Collected: 1975)** | | | | | | | | | | | | |
| Never Married (Ref = Married) | | | | | | | 1.386 | 0.095 | <0.01 | 1.270 | 0.115 | 0.01 |
| College or More education (Ref = Less than College Education) | | | | | | | 0.812 | 0.051 | <0.01 | 0.828 | 0.063 | 0.01 |
| Served in Military (Ref = Did not) | | | | | | | 0.906 | 0.044 | 0.04 | 0.973 | 0.057 | 0.64 |
| Income in 1974 in $100 units. | | | | | | | 0.996 | 0.002 | 0.04 | 0.993 | 0.003 | 0.08 |
| **Later Life Characteristics (Collected, 1992–93)** | | | | | | | | | | | | |
| Body Mass Index | | | | | | | | | | 1.026 | 0.005 | <0.01 |
| Smoker (Ref = Not a Smoker) | | | | | | | | | | 1.496 | 0.070 | <0.01 |
| Number of Illnesses | | | | | | | | | | 1.075 | 0.017 | <0.01 |
| Center for Epidemiological Studies Depression Scale | | | | | | | | | | 1.002 | 0.001 | 0.15 |
| Fair/Poor/Very Poor Self-Rated Health (Ref = Good/Very Good Health) | | | | | | | | | | 1.767 | 0.112 | 0.00 |
| N | 8386 | | | 8386 | | | 7517 | | | 5466 | | |

Note: Mortality information is from the National Death Index here and in Table 4. Models 2, 3, and 4 also include a vector of indicators of city size/rural location of the graduate's high school.

A useful way to think about these differences is to compare them to differences in longevity at age 40 by income between those in the bottom 1/6 of household income and others, based on unpublished tabulations from Chetty et al. (2016; https://healthinequality.org/data/, Table 1). Among women the difference of 1.71 years can be compared to a difference across income sextiles of 3.97 years of additional life. Among men the comparison of 1.01 years shorter life expectancy across sextiles of looks compares to a difference of 6.17 years across sextiles of household income. While attractiveness clearly affect longevity less than income, these are still non-trivial differences.

### 6.2. Social Security calculations

Based on these estimates of life expectancy, we next measured the monetary "cost" of being in the least attractive sextile on the amount of transfer payments—Social Security benefits— that one might receive in old age. We used the calculated life tables for women and men of different attractiveness, conservatively assumed that mortality risk did not differ by attractiveness after age 83 (since we have no information beyond that age). We further assumed that the stream of benefits began at age 65 (when members of the WLS cohort became eligible for full monthly benefits). We based the calculation on the benefits paid to the average new recipient in 2022 (in 2022 dollars), prorated for men and women by Social Security benefits by gender among recipients ages 67–69 (the earliest ages eligible for full benefits in 2022) in the CPS Annual Social and Economic supplement; and we assume a real discount rate of 3 percent. These calculations suggested that women in the lowest sextile of looks at age 65 can expect a stream of benefits at about $26,000 (6 percent) smaller than other women. Among men the shortfall is only about $4000 (less than 1 percent), since differences in mortality risk among older men by facial attractiveness are much less than among women.

### 6.3. Additional covariates and sample selection

The results were also insensitive to the deletion of various combinations of the covariates. Previous studies show that less attractive looking people earn less per hour, so we added measures of personal income and household income. These did not reduce the estimated association between looks and mortality. We also explored the sensitivity of results to different sample-selection criteria. For instance, we fitted models in which all values were imputed at every wave (even if there had been attrition from the sample). The substantive results were similar, with members of the least attractive sextile still facing a significantly higher mortality hazard.

## 7. Conclusions

Here we analyzed the relationship between attractiveness and mortality using a sample of high school graduates from Wisconsin with a measure of facial attractiveness from yearbook photographs and 65 years of high-quality follow-up information on mortality. Broadly, we found that those whose facial attractiveness was rated in the least attractive sextile had a higher mortality risk throughout life compared to those rated average or high. Importantly, we found little advantage in longevity for those rated with high levels of attractiveness relative to the average. These results were consistent across different life-course stages, specifications of attractiveness, and sample selection protocols; and were robust to the inclusion of a wide array of covariates. Accordingly, the answer to the sub-titular question of this article is No; but the least-attractive individuals do have shorter lives than others.

Our findings were somewhat consistent with research that has investigated the association between attractiveness and physical health (Bulczak and Gugushvili, 2023; Nedelec and Beaver, 2014), although that research used either small samples, only one interviewer's assessment of attractiveness, and/or a short follow-up period. Research that has analyzed the relationship between attractiveness and physical health or longevity has generally found mixed results. Our results indicated that mortality rates fall with rated attractiveness, but that there was a difference in mortality risk only for the least attractive compared to those of average attractiveness, with no advantage for the most attractive. We suggest that subsequent researchers replicate this analytical design with other samples.

Our results could stem from direct pathways, such as the least attractive being endowed with less health and longevity potential than others (Bulczak and Gugushvili, 2023). It persisted, however, even when

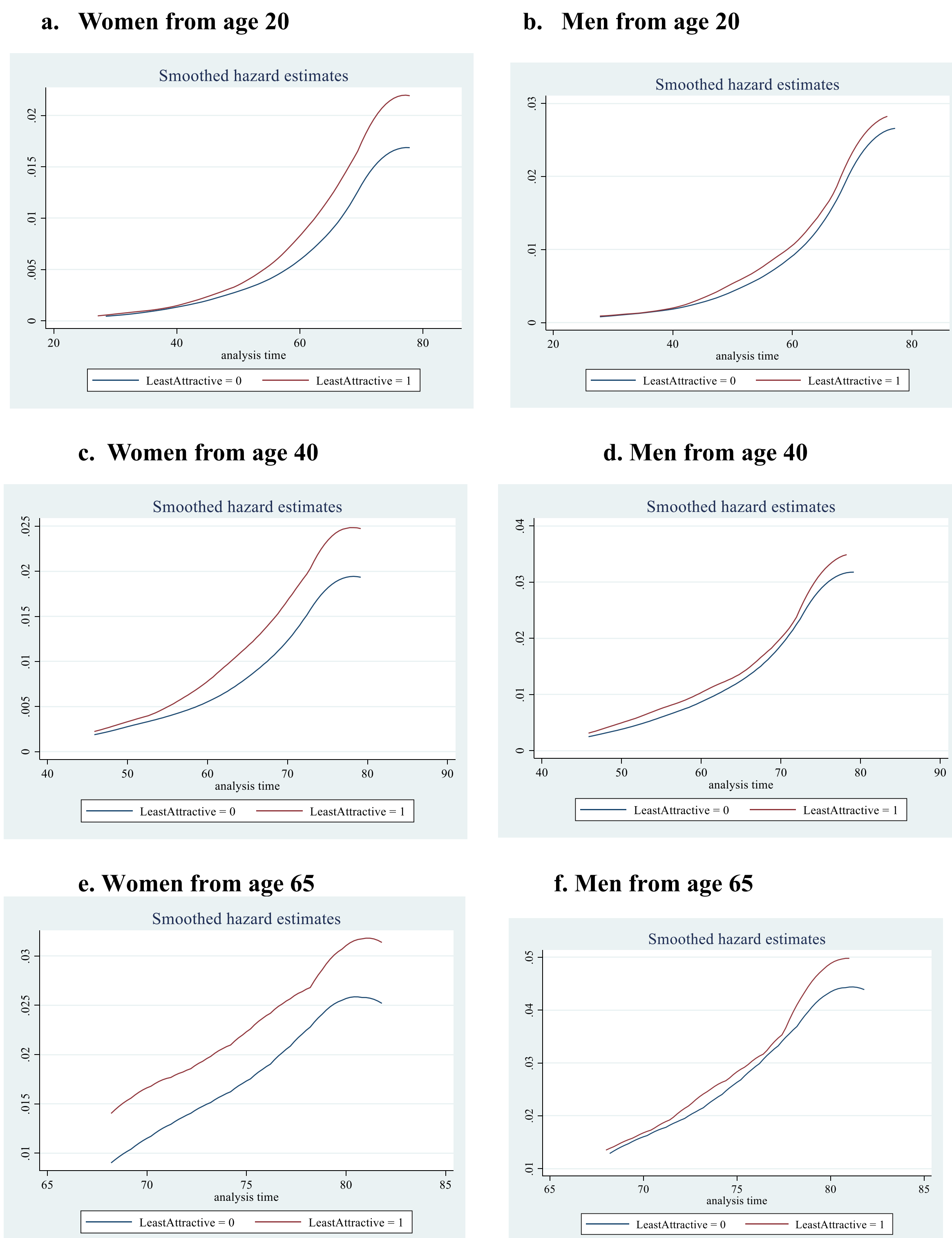


**Fig. 2.** Hazard Rates, Bottom Sextile of Attractiveness vs. Others, From Ages 20, 40, and 65, by Gender.

deaths within the first five-year follow-up period were removed, and was also present in later life. That the longevity disadvantage of the least attractive existed throughout life suggests that, if facial attractiveness is a signal for health, it is long-lasting. The elevated mortality risk facing the least attractive was also not statistically explained when demographic measures, such as educational attainment, marital status, household income, and measures of physical and mental health, were accounted for.

We are left to speculate about what could be driving the mortality disadvantage of the least attractive. We did not account for quotidian discrimination that the least attractive endure (Luo et al., 2019; Maheshwari, 2022), mixed with more major sources of discrimination, social stigma, discrimination within employment, discrimination within the medical system, as well as deleterious behavioral health responses and coping mechanisms to such discrimination (Lee et al., 2015; Maxfield et al., 2019). Future research should explore why those who are less

**Table 4**
Hazard Ratios, their Standard Errors, and Tests that HR = 1. Cox Proportional Hazard Models Predicting Mortality by Gende, WLS, 1957–2022.

| Females | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HR | SE | p | HR | SE | p | HR | SE | p | HR | SE | P |
| **Attractiveness** | | | | | | | | | | | | |
| Least Attractive Sextile | 1.265 | 0.080 | <0.01 | 1.245 | 0.080 | <0.01 | 1.217 | 0.082 | <0.01 | 1.148 | 0.098 | 0.11 |
| Middle Four Sextiles of Attractiveness (Ref) | | | | | | | | | | | | |
| Most Attractive Sextile | 1.014 | 0.071 | 0.85 | 1.001 | 0.071 | 0.99 | 1.022 | 0.075 | 0.76 | 0.969 | 0.089 | 0.73 |
| N | 4389 | | | 4389 | | | 3997 | | | 2910 | | |
| Males | | | | | | | | | | | | |
| **Attractiveness** | | | | | | | | | | | | |
| Least Attractive Sextile | 1.125 | 0.069 | 0.06 | 1.132 | 0.070 | 0.05 | 1.136 | 0.075 | 0.06 | 1.126 | 0.094 | 0.16 |
| Middle Four Sextiles of Attractiveness (Ref) | | | | | | | | | | | | |
| Most Attractive Sextile | 1.032 | 0.062 | 0.60 | 1.019 | 0.062 | 0.76 | 0.994 | 0.065 | 0.93 | 0.932 | 0.076 | 0.39 |
| N | 3997 | | | 3997 | | | 3520 | | | 2556 | | |

Notes: In each of Models 2, 3, and 4 the same controls are included as shown for the corresponding Models in Table 3. Model 1 includes no controls.

**Table 5**
Life expectancy and social security calculations, WLS.

| | **Males** | | | **Females** | | |
|---|---|---|---|---|---|---|
| | Least Attractive Sextile | All Others | Difference | Least Attractive Sextile | All Others | Difference |
| Years of Life Remaining ($e_x^o$): Age 20 | 59.10 | 59.96 | −0.86 | 62.82 | 64.71 | −1.89 |
| Age 40 | 39.93 | 40.94 | −1.01 | 42.51 | 44.22 | −1.71 |
| Age 65 | 19.11 | 19.29 | −0.18 | 20.35 | 21.65 | −1.30 |
| Present Value, Social Security Benefits at Age 65 | **$467,540** | **$471,910** | **-$4370** | **$412,564** | **$438,982** | **-$26,418** |

Notes: Life expectancy calculated using standard methods (Preston, 2000).
Present Value of Social Security based on average benefit paid in 2022, benefit stream beginning at age 65.

attractive have a higher risk of mortality and what might promote resilience within this population. One potential avenue for studying this would be to analyze cause of death information, which could identify the unique contribution of certain external causes of death (e.g., suicide, homicide, and deaths of despair) and potential involvement in anti-social behaviors.

Regardless of the potential causes and mechanisms, these results have real implications. The least attractive have shorter lives and can expect to receive a smaller stream of Social Security benefits upon retirement. The disadvantage in Social Security was especially great among women. It is worth noting, however, that we did not find statistically significant differences by gender in the hazards of mortality, although the association with attractiveness was consistently stronger among women than men. Thus, while we do not want to speculate too much regarding gender differences, women do endure elevated social pressure regarding their appearance (Helfert and Warschburger, 2013), as reflected in the greater importance of non-monetary impacts of lower attractiveness in women's life satisfaction (Hamermesh and Abrevaya, 2013) that may compound as they age.

Facial attractiveness is subjective; but people's subjective views of others' attractiveness are highly correlated. Numerous studies in which photographs are rated by panels of observers find high—but not perfect—correlations among the observers' ratings, with Cronbach alpha measures rising well above 0.6 in most (Gordon et al., 2013; Hamermesh and Parker, 2005; Lemay et al., 2010) but not all cases Debruine et al., 2007). Indeed, if there were no commonality in people's perceptions of others' looks, findings of relationships of life outcomes to measures of perceived attractiveness would not be observable, since those measures would have been totally random. Similarly, we only had one measure of facial attractiveness, but it involves ratings of each person's attractiveness by a dozen raters, so that it is less likely simply to be measuring health than other measures of physical attractiveness. Still, this may be improved by including more raters in future research.

The WLS also has limited external validity, as it is only representative of Wisconsin high school graduates, largely non-Hispanic Whites. Future research must consider analyzing heterogeneity in this relationship with more diverse samples. That would allow a greater understanding of intersectional processes, including anti-Black racism, and the racialized and gendered conceptions of beauty that may be occurring (Monk et al., 2021). Of course, while participants in the WLS are homogeneous racially/ethnically, it is the only large-scale study with a follow-up period long enough to track a large fraction of deaths. Further, that the level of attractiveness in high school is associated with longevity across the life course is a noteworthy finding. We also lack important covariates, such as childhood health status. However, excluding deaths from the first five years (when the least healthy are likely to die) provided similar overall results. In addition, we did not analyze information regarding respondent's offspring, due to the unavailability of such the data for over half the sample. The photograph quality may also be variable and could be picking up on other aspects (e.g., socioeconomic status, race/ethnicity), but the results were unchanged when parental income was included.

While our work shows that those with low levels of facial attractiveness are at a higher risk of mortality across the lifespan, there are important future avenues for future research. First, we were unable to explain this association, and thus future research should consider further exploring the casual mechanisms and pathways through which those with low facial attractiveness face higher mortality risks. Second, long-duration longitudinal datasets including measures of attractiveness could also help to assess the stability and how the association may change across the life course. Third, future research should consider exploring how policies can improve the lives and lifespans of the least attractive. Overall, social scientists should explore how attractiveness may influence still other processes that may contribute to its relationship to health and longevity.

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We have no funding to declare.

## Ethics statement

We received IRB approval at Arizona State University and the University of Texas at Austin viewed the project as exempt. We abide by all ethical standards required by the journal, our institutions, our disciplines, and scientific inquiry more broadly.

## CRediT authorship contribution statement

**Connor M. Sheehan:** Writing – review & editing, Writing – original draft, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Daniel S. Hamermesh:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Software, Methodology, Formal analysis.

## Data availability

The authors do not have permission to share data.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2024.117076.

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# Supplemental Materials: Looks and Longevity: Do Prettier People Live Longer?

*Additional Specification Coding*

The additional specifications of attractiveness included the raw continuous coding, z-score, quartiles (with the middle two quartiles as the reference), quintiles (with middle three quintiles as the reference), octiles (with the middle six octiles as the reference), deciles (with the middle eight deciles as the reference), ventiles (with the middle 18 ventiles as the reference). We also explored specifications with the lowest groups as the reference. Regardless of the specification or reference group, the results were similar: there were generally no differences in mortality risk between the most attractive and those in the middle of the distribution of attractiveness; and those who were evaluated to be least attractive had a higher hazard of mortality (see Table 2).

*Justification of One Temporal Measurement of Attractiveness*

In addition to Table S1, further support for this assertion is provided by the 240 mothers in the Study of Early Child Care and Youth Development (SECCYD) who were ages 18-25 at their child's birth had their beauty assessed (by at least 10 raters) on a five-to-one scale) six months after the birth, then 15 years later. The averages of these ratings were positively correlated, $r = 0.36$, across the nearly 15 years, positive and significant ($p < 0.01$). This correlation arises partly from the substantial randomness that exists in assessments of beauty: Among this group of mothers the correlation in assessments of their looks at times just two years apart (at average ages of 31 and 33) is only +0.56. Taking these two new pieces of evidence together, one can conclude that, while assessments of looks vary, there is substantial correlation of ratings of a person's looks over time.

# Supplemental Materials: Looks and Longevity: Do Prettier People Live Longer?

**Supplemental Table S1.**

Concordance of Interviewer-Assessed Attractiveness Ratings in the National Longitudinal Study of Adolescent to Adult Health between Waves 2 (1996) and 4 (2008-09).

| | Frequency / [%] | | | | | |
|---|---|---|---|---|---|---|
| | Wave 4 Attractiveness rating | | | | | Total |
| Wave 2 Attractiveness rating | 1 | 2 | 3 | 4 | 5 | |
| 1 | 4 | 9 | 43 | 37 | 11 | 104 |
| | [3.9] | [8.7] | [41.4] | [35.6] | [10.6] | [100.0] |
| 2 | 7 | 81 | 290 | 101 | 10 | 489 |
| | [1.4] | [16.6] | [59.3] | [20.7] | [2.0] | [100.0] |
| 3 | 112 | 308 | 2,743 | 1,764 | 354 | 5,281 |
| | [2.1] | [5.8] | [51.9] | [33.4] | [6.7] | [100.0] |
| 4 | 141 | 113 | 1,899 | 1,729 | 481 | 4,363 |
| | [3.2] | [2.6] | [43.5] | [39.6] | [11.0] | [100.0] |
| 5 | 63 | 32 | 570 | 654 | 255 | 1,574 |
| | [4.0] | [2.0] | [36.2] | [41.6] | [16.2] | [100.0] |
| Total | 327 | 543 | 5,545 | 4,285 | 1,111 | 11,811 |
| | [2.8] | [4.6] | [47.0] | [36.3] | [9.4] | [100.0] |

Note: This is a two-way tabulation of Wave 2 and Wave 4 interviewer-assessed attractiveness ratings of the same respondent. Cells report frequencies. Row percentages are in square brackets. $\chi^2(16) = 581.4$.