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Are Blondes Really Dumb?

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Abstract

Discrimination based on appearance has serious economic consequences. Women with blonde hair are often considered beautiful, but dumb, which is a potentially harmful stereotype since many employers seek intelligent workers. Using the NLSY79, a large nationally representative survey tracking young baby boomers, this research analyzes the IQ of white women and men according to hair color. Blonde women have a higher mean IQ than women with brown, red and black hair. Blondes are more likely classified as geniuses and less likely to have extremely low IQ than women with other hair colors, suggesting the dumb blonde stereotype is a myth.

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1. Introduction

Discrimination based on a person's appearance is a reality in today's world. Daniel Hamermesh and co-authors starting in the 1990s took the discrimination literature in a new direction by focusing not on skin tone or ethnicity, but on beauty (Biddle and Hamermesh, 1998, Hamermesh, 2011, 2006, Hamermesh and Biddle, 1994, Hamermesh and Parker, 2005). Hamermesh found that beauty pays, with more attractive people receiving larger economic benefits such as higher wages and easier access to loans. Subsequent research found that beauty impacted political chances (Berggren et al., 2010, Lutz, 2010), teaching evaluations (Ponzo and Scoppa, 2013, Sussmuth, 2006), earnings as a prostitute (Arunachalam and Shah, 2012), professional golfing success (Ahn and Lee, 2014), the chance of being a criminal (Mocan and Tekin, 2010), being a celebrity (Gergaud et al., 2012) and wages of real estate agents (Salter et al., 2012).

One reason why people focus on external features is that often humans use a person's looks as a signal for the person's personality or productivity (Robins et al., 2011). For example, blonde women are often stereotyped as dumb or incompetent while redheads are seen as people with fiery tempers (Takeda et al., 2006, Weir and Fine-Davis, 1989). These stereotypes are reinforced in popular culture with the dumb blonde female being a staple of Hollywood movies such as Renee Witherspoon in the "Legally Blonde" series or even Marilyn Monroe in "Gentlemen Prefer Blondes." Dumb blondes are even the focus of many jokes. The international book seller Amazon.com currently lists about 25 joke books that include blondes in the title, but just two for brunettes and one that includes red heads (Buffington, 2010, Young, 2012).

Stereotypes often have an impact on real world hiring, promotion and social experiences (Belot et al., 2012, Borland and Leigh, 2014, Mobius and Rosenblat, 2006). While not considered smart, blonde-haired blue-eyed women have for many years been considered the standard for beauty in the US (Jones, 2008). Research using women dressed in various colored wigs found blonde waitresses got more tips from males than when other hair colors were worn (Gueguen, 2012). Research that did not use wigs found blonde door-to-door fundraisers earned more than brunettes (Price, 2008).

This research asks and answers "Are blondes really dumb?" The question is important because intelligence is a trait many firms seek when hiring. If blonde women are incorrectly perceived as less intelligent than women with other hair colors, then blonde women might be sorted into lower paying and less mentally taxing jobs than they have the ability to handle (Dechter, 2015, Fletcher, 2009). This research's surprising answer is that among white women who belong to the young baby boomer generation those reporting having blonde hair are actually slightly smarter than women with brown, black and red hair colors.

2. Methods

The National Longitudinal Survey of Youth 1979 (NLSY79) cohort is a long running very large randomly selected nationally representative government survey, primarily funded by the U.S. Bureau of Labor Statistics. This survey has repeatedly interviewed the same group of people since 1979, when group members were between 14 to 21 years old, until the present. This age group is popularly called "young baby boomers." To date the NLS79 has publically released 25

rounds of survey information. The 26th survey round was being fielded while this research was written.

NLSY79 data have been used extensively for understanding the impact of schooling, training and life experiences on labor market outcomes (Zagorsky and Gardecki, 1998). but was originally designed to understand the impact of a massive government training program called the Comprehensive Employment and Training Act or CETA. All NLSY79 data used in this research are publically available at http://www.bls.gov/nls.

2.1 Hair Color

Because the NLSY79 is a longitudinal survey it is extremely important that survey staff re-interview the correct respondent. Many respondents are provided with a stipend to provide an incentive to answer the survey for the tenth or twentieth time. To prevent brothers or sisters from participating instead of the correct respondent in 1985 the survey included a question asking all respondents "what is your natural hair color?" Slightly more than ten-thousand (10,878) respondents out of 12,686 potential respondents (85.7%) picked an answer from the following seven different colors; light blond, blond, light brown, brown, black, red and grey. Two respondents refused to answer the question, fourteen respondents were accidently not asked the question by survey staff and 1,792 respondents were not interviewed. The majority of respondents (60.2%) not interviewed were part of a special military oversample that was permanently dropped for funding reasons.[1]

This research took the seven hair colors and combined "light blond" and "blond" into a single category. It also combined light brown and brown into a single brown category. Grey was not analyzed because only 3 respondents reported this color.

Hair color varies by race and ethnicity. To eliminate any bias caused by ethnic and racial differences all Hispanics and African-Americans were dropped before doing the analysis. Asians were not dropped to ease replication of the results since they comprise an insignificant share of the remaining survey respondents.[2] The below tables use the words "White" as a short-hand in describing the population being analyzed. A more accurate description is that this research analyzed all non-black and non-Hispanic young baby boomers, which was overwhelming comprised of whites.

2.2 IQ

An intelligence or IQ measure is available for almost all NLSY79 respondents. The intelligence of each respondent was created because the U.S. military needed to norm, or generate population controls for, the Armed Forces Qualification Test, or AFQT. The AFQT is used by the Pentagon to determine the intelligence of all recruits. The test ensures people of low intelligence are

[1] The hair color question is variable R17741.00 in the NLSY79 online database and the reason for not being interviewed in 1985 is R18903.00.

[2] The first NLSY79 asked respondents to self-identify their origin or descent (R00096.00). When the sample was drawn in 1977 relatively few Asians resided in the US. Out of the 12,686 people interviewed just 0.7% selected Asian with 25 defining themselves as Chinese, 53 as Filipino, 10 as Japanese and 7 of Korean descent.

neither handling, nor around dangerous weapons. This test is given to all recruits because Congress requires the Pentagon to reject all military recruits whose IQ is in the bottom 10% of the population and only accept a few whose scores are above 10%, but below 30% (Code of Federal Regulations, 2015) of the population.

NLSY79 respondents took the tests needed to generate an AFQT score during the summer and fall of 1980. Approximately 94% of the NLSY79 respondents took the tests. The high completion rate was achieved by providing a $50 (~$145 in 2015 dollars) honorarium for completing the test and by arranging over 400 testing sites across the U.S.

Each respondent took ten different tests; general science, arithmetic reasoning, word knowledge, paragraph comprehension, numerical operations, coding speed, auto and shop information, math knowledge, mechanical comprehension, and electronics knowledge. While all tests are related to intelligence, the Department of Defense (DOD) uses only four tests to calculate an individual's overall intelligence. The overall AFQT score is based on word knowledge, paragraph comprehension, math knowledge, and arithmetic reasoning. The DOD uses AFQT scores to rank the trainability of each enlistment candidate. Since AFQT scores are highly correlated with general intelligence, g, the research community (Herrnstein and Murray, 1994) has used AFQT as a proxy for intelligence even though the DOD states the tests only measure trainability (Center for Human Resource Research, 1992, pg.42).

While the AFQT is a good indicator of general intelligence, some of its subtests measure the amount of learned knowledge, not just natural intellectual ability. Because older respondents had more time to acquire knowledge, there is a positive correlation (0.20, $p<0.01$) between AFQT scores and age. Since respondents spanned an 8 year age range when they took the exam, AFQT scores were adjusted so that younger respondents are not considered less intelligent than older.

This paper follows Zagorsky (2007) and uses a regression framework with a set of age dummy variables to make the adjustments. The specific steps used to calculate an IQ score were to start with NLSY79 variable R06183.00 and subtract points based on the respondent's age when they took the test (13.7 points for ages 20 or 21; 10.5 points age 19; 9.2 points age 18; 8.0 points age 17; 5.2 points age 16; and 3.0 points age 15). The results were then standardized so that the series' mean was 100 and the standard deviation was 15 points for all NLSY79 respondents with a valid AFQT test score, not just blonde women. All results presented in the tables are weighted to adjust the respondents to national totals using the round 1 sampling weight (R02161.00).

3. Results

Combining the NLSY79's IQ information with hair color shows the intelligence of white women and men with blond, brunette, red and black hair. Table 1's top section shows IQ and hair color for women, while the bottom shows men's values. The surprising answer is that among white women, those reporting having blonde hair are actually slightly *smarter* than those with other hair colors.

The first column tracks mean, or average IQ. This column shows that blonde women have the highest IQ at 103.2 points, which is 3.2 points or one-fifth of a standard deviation, above the

average intelligence of all young baby boomers in the NLSY79 sample. Brown hair women have the next highest mean IQ at 102.7 points, red haired women are third with a mean IQ of 101.2 and black haired women have the least IQ with a mean of 100.5. While the IQ of blonde and brown hair women is not statistically distinguishable, blonde women's IQ is statistically distinct from white women with red and black hair.

The standard deviation column shows that among all eight groups analyzed, blonde women are the most homogeneous, since the standard deviation (12.8) is the smallest. The median column shows the IQ value where half of the group is smarter and half is dumber. Among white women those with brown hair are the smartest (median IQ 102.9) but blondes with a median IQ of 102.7 are not far behind. Like the results in the mean column, the median column shows blondes' IQ is higher than those with red hair (100.5) or black (101.4).

Table 1: IQ Categorized by Hair Color.

Type of Individual	**Mean IQ**	**Standard Deviation**	**Median IQ**	**Percent of Group**	**Number Respondents**
Blonde Hair White Women	103.2	12.8	102.7	20.7%	597
Brown Hair White Women	102.7	13.8	102.9	73.0%	2,205
Red Hair White Women	101.2*	13.2	100.5	3.8%	118
Black Hair White Women	100.5**	13.4	101.4	2.5%	77
Blond Hair White Men	103.9	14.6	104.3	17.1%	475
Brown Hair White Men	104.4	14.5	105.4	73.4%	2,074
Red Hair White Men	100.5**	15.1	100.6**	3.5%	94
Black Hair White Men	100.1***	15.2	98.7***	6.0%	187
All Respondents (Hispanic, Black and White) With IQ and Hair Color Values	100	14.95	99.7	78.9%	10,355

Notes: * means IQ is significantly different from value in Blond's IQ line at $p<0.10$, ** at $p<0.05$ and *** at $p<0.01$. Statistical tests were run using one-sided t-tests. All columns except the number of respondents are adjusted by the round 1 sampling weights. Percent of Group column shows the percent of white women and men having each hair color, except for the bottom row which shows the percent white men and women comprise of the entire NLSY79 sample.

The table's bottom section shows that among men, the order of intelligence is reversed. Brown haired men have the highest IQ (mean 104.4; median105.4) while blond haired men are ranked second (mean 103.9; median 104.3). Red haired men (mean 100.5; median 100.6) and black haired men (mean 100.1; median 98.7) both trail brown and blond men's IQ.

Genetic information suggests the percent of young baby boomers of each hair color should be very similar for males and females since genomes for having blond hair are not dependent on gender (Guenther et al., 2014). The percent of men and women reporting brown and red hair are very similar and support the idea that hair color is gender independent. However, the data suggest too many women are blonde and not enough have black hair. Table 1 shows 20.7% of women reported being blonde compared to only 17.1% of men. Moreover, just 2.5% of the women reported having black hair compared to 6% of men. This suggests about 3.5% of women did not follow directions and reported their current hair color instead of their natural color.

The last row shows descriptive statistics for all respondents, including Hispanics and blacks who are dropped from the rest of the analysis. The row shows whites comprise slightly more than three-quarters of young baby boomers (78.9%) and the excluded groups had IQs below the mean.

3.1 Distribution of IQ

Table 2 shows details on the distribution of intelligence by breaking IQ into ten-point ranges. The left two columns, "<= 75" and "75-85" show the percentage of individuals with low intelligence. These individuals are one standard deviation or more below the average person's IQ. Blonde women have the smallest percentage of low IQ individuals among the four hair colors. Just 7.2% of blondes had an IQ of 85 points or less, compared to 11.4% of brown haired white women, 10.8% of red heads and 19.6% of black haired women.

Table 2: Distribution of IQ of White Women and Men Categorized by Hair Color.

Hair Color	**% IQ <= 75**	**% IQ 75-85**	**% IQ 85-95**	**% IQ 95-105**	**% IQ 105-115**	**% IQ 115-125**	**% IQ 125 >=**	**Total**
Female Blonde	0.1%	7.1%	23.6%	25.1%	21.8%	18.1%	4.3%	100%
Female Brown	0.8%	10.6%	22.0%	22.1%	21.2%	19.4%	4.0%	100%
Female Red	0.0%	10.8%	25.4%	23.2%	23.8%	15.8%	1.1%	100%
Female Black	0.4%	19.2%	17.1%	19.7%	27.1%	16.3%	0.2%	100%
Male Blond	0.8%	11.5%	18.3%	20.1%	22.5%	21.4%	5.4%	100%
Male Brown	0.7%	11.7%	16.2%	20.5%	20.5%	25.4%	4.9%	100%
Male Red	0.5%	22.9%	18.1%	21.7%	14.9%	16.7%	5.3%	100%
Male Black	0.2%	21.8%	16.0%	23.0%	17.9%	16.5%	4.6%	100%

Notes: Ranges such as 75-85 include the lower bound, but not the upper bound. The mathematically correct title, which does not fit in the space, is "75 >= to < 85."

Blonde women are also overrepresented among those with high IQs. The right hand column labeled "125>=" shows the percentage of people with exceptionally high intelligence.

Approximately 4.3% of all blondes are in the exceptionally high intelligence column, compared to 4.0% of brown haired women, 1.1% or red haired and 0.2% of black haired women.

The hair color patterns appear similar for males but the differences are not as pronounced. Among those with a low IQ (<85) the smallest group (12.3%) were blond white men but this is statistically and practically the same as the 12.4% of men who were brown haired. The percentage of blond haired men in the highest IQ category (5.4%) is also statistically and practically the same as the 5.3% of men who are red haired.

3.2 Potential Explanation

Both heredity (nature) and environment (nurture) impact intelligence. Factors such as early childhood nutrition, alcohol usage during pregnancy, levels of lead in the environment as well as genes matter in determining a person's IQ (American Psychological and Task Force on the Intelligence, 1995). Unfortunately many of the key variables identified as influencing IQ were not measured in the NLSY79. However, Stanovich (1993) asked a provocative research question "Does reading make you smarter?" His affirmative answer suggests one possibility is that blondes grew up in home environments that provided more intellectual stimulation.

This particular hypothesis can be tested using three survey questions from the NLSY79's first survey which determined if the respondent had access to reading materials. The interviewer first asked "When you were about 14 years old, do/did you or anyone else living with you get any magazines regularly?" The question was then repeated for access to newspapers and library cards.[3]

The results show that white blonde women grew up in homes with more reading material than those with other hair color. The average blonde's home at age fourteen had 2.44 out of the three types of reading materials. This is greater than the 2.39 (different at $p<0.10$) for brown haired women, 2.28 ($p<0.03$) for red haired and 2.38 ($p<0.30$) for black haired women. It is important to note that this does not rule out other factors as the driving reason behind the IQ differences.

4. Conclusions

Popular culture portrays white women with blonde hair as beautiful but dumb. Nevertheless, each year millions of people in the U.S. spend over a billion dollars to change the color of their hair, many to blonde (Deborah and Ellen, 2006). Surprisingly, NLSY79 data show the dumb blonde stereotype is a myth.

Mean values of IQ shown in table 1 show that on average, blondes are smarter than brown, red and black haired women. The distribution of IQ shown in table 2 reveals blondes have the least percentage of low IQ or dumb women and blondes are most likely to appear in the exceptionally high intelligence or genius category. Only data in table 1's median column suggests blonde women are not the smartest, but instead have roughly equal intelligence to brown haired women.

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[3] The three questions are located in the NLSY79 database as R00027.00, R00028.00 and R00029.00.

A persistent myth in the U.S. is that blonde haired women are more beautiful but less intelligent, than women with other hair colors. Employers who believe the beauty part of the myth will choose and pay higher wages for blonde women to work in front-line positions where aesthetics and customer interactions are important. However, employers believing the myth that blondes are dumb will also slow the advancement of qualified blondes for back-room managerial positions where intelligence is more highly valued than looks. Future research is needed to see if this leads to the perverse result that for a given job, such as waitress, blondes earn more than women with other hair colors, but that women with other hair colors are more likely to be promoted to higher paying positions than blondes.

These findings also have implications for research on the economics of beauty. Previous findings showed that more attractive people received larger financial benefits than the less attractive. However, if blondes are both more likely to be considered beautiful *and* they are of higher average intelligence, then not all of the economic return attributed to beauty in the previous research is discrimination. Instead, some of the "beauty premium" might actually be caused by blondes having higher ability because they are smarter. Future research on the economics of beauty needs to include both attractiveness and intelligence indicators to isolate the true effects of attractiveness.

While it is beyond the scope of this research to investigate genetic relationships between hair color and intelligence, results suggested that blondes grew up in homes with more reading material than women of other hair color. If living in a more literate environment is truly the driving reason for higher blonde intelligence, then the solution for people who wish they or their children were smarter is not to dye or bleach their hair. Instead, the prescription is to provide or engage in more intellectual stimulation, such a reading books.

Johnston (2010) and others have posed an interesting follow-up question, "Do blondes really have more fun?" Maybe in the next 50 years of collecting data on some of society's serious problems the NLSY79 will include enough extra information to also answer this question.

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