Intelligence 39 (2011) 7–14

Contents lists available at ScienceDirect

Intelligence

Intelligence and physical attractiveness ☆

Satoshi Kanazawa *

Department of Management, London School of Economics and Political Science, United Kingdom

ARTICLE INFO

Article history:
Received 5 June 2010
Received in revised form 11 November 2010
Accepted 14 November 2010
Available online 24 December 2010

Keywords:
General intelligence
Physical attractiveness
Cross-trait assortative mating
General fitness (*f*-factor) model

ABSTRACT

This brief research note aims to estimate the magnitude of the association between general intelligence and physical attractiveness with large nationally representative samples from two nations. In the United Kingdom, attractive children are more intelligent by 12.4 IQ points ($r = .381$), whereas in the United States, the correlation between intelligence and physical attractiveness is somewhat smaller ($r = .126$). The association between intelligence and physical attractiveness is stronger among men than among women in both nations. The association remains significant net of a large number of control variables for social class, body size, and health.

1. Introduction

Scientists have long suspected that intelligence and physical attractiveness may be positively correlated across individuals (Berscheid & Walster, 1974, p. 195; Vandenberg, 1972, p. 153). For example, Buss (1985, p. 49) speculates, "If females generally prefer intelligent males because they typically have higher incomes and status, and if most males prefer physically attractive females, then over time these two characteristics will tend to covary." Consistent with such views, meta-analyses (Jackson, Hunter & Hodge, 1995; Langlois et al., 2000) show that there is a small but significantly positive correlation between intelligence and physical attractiveness. Zebrowitz et al.'s (2002) analysis of the Intergenerational Studies of Development and Aging data shows that the correlation between intelligence and physical attractiveness throughout life course ranges from $r = .11$ to $r = .26$. In an earlier analysis of the National Child Development Study, Denny (2008, p. 618) concludes that "the relationship between intelligence and being attractive is generally positive." However, to the best of my knowledge, the correlation between intelligence and physical attractiveness has never been quantitatively established in a large, nationally representative sample.

More recently, evolutionary psychologists have suggested possible explanations for why physically more attractive individuals should on average be more intelligent. Miller (2000a, 2000b, Prokosch, Yeo & Miller (2005)), and propose that both general intelligence and physical attractiveness may be indicators of underlying genetic fitness. His general fitness factor (*f*-factor) model suggests that intelligence and physical attractiveness are positively correlated across individuals because both reflect the quality of their genes and developmental stability. In this view, the correlation between intelligence and physical attractiveness should disappear once measures of the quality of genes and developmental stability are statistically controlled.

In contrast, Kanazawa and Kovar (2004) follow Buss's speculation above and posit that physically more attractive individuals may on average be more intelligent because of the cross-trait assortative mating of intelligent men of high status and beautiful women. If more intelligent men are more likely to attain higher status, and if men of higher status are more likely to marry beautiful women, then, given that both intelligence and physical attractiveness are highly heritable, there should be a positive correlation between intelligence

☆ I thank Geoffrey F. Miller and anonymous reviewers for their comments on earlier drafts. Direct all correspondence to: Satoshi Kanazawa, Managerial Economics and Strategy Group, Department of Management, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, United Kingdom.
* Tel.: +44 20 7955 7297; fax: +44 20 7955 6887.
E-mail address: S.Kanazawa@lse.ac.uk.

0160-2896/$ – see front matter
doi:10.1016/j.intell.2010.11.003

and physical attractiveness in the children's generation. In their view, the correlation is "extrinsic," not "intrinsic" (Jensen, 1998), and it should persist even when measures of genetic quality and developmental stability are held constant.

The purpose of this brief research note is firmly to establish the empirical association between intelligence and physical attractiveness in population-based samples. It seeks to estimate the magnitude of the correlation with two large, nationally representative samples from the United Kingdom and the United States. The two samples have complementary strengths. The British sample has one of the best measures of general intelligence in all survey data, but a comparatively weak measure of physical attractiveness. In contrast, the American sample has a stronger measure of physical attractiveness, but a comparatively weak measure of general intelligence.

2. British sample

2.1. Data

The National Child Development Study (NCDS) is a large-scale prospectively longitudinal study which has followed a *population* of British respondents since birth for more than half a century. The study includes *all* babies ($n = 17{,}419$) born in Great Britain (England, Wales, and Scotland) during one week (March 03–09, 1958). The respondents are subsequently reinterviewed in 1965 (Sweep 1 at age 7; $n = 15{,}496$), in 1969 (Sweep 2 at age 11; $n = 18{,}285$), in 1974 (Sweep 3 at age 16; $n = 14{,}469$), in 1981 (Sweep 4 at age 23; $n = 12{,}537$), in 1991 (Sweep 5 at age 33; $n = 11{,}469$), in 1999–2000 (Sweep 6 at age 41–42; $n = 11{,}419$), and in 2004–2005 (Sweep 7 at age 46–47; $n = 9534$). In each Sweep, personal interviews and questionnaires are administered to the respondents, to their mothers, teachers, and doctors during childhood, and to their partners and children in adulthood.

97.8% of the NCDS respondents are Caucasian. There are so few respondents in other racial categories that, if I control for race with a series of dummies in multiple regression analyses, it often results in too few cell cases to arrive at stable estimates for coefficients. I therefore do not control for respondents' race in my analysis of the NCDS data.

2.2. Dependent variable: general intelligence

The NCDS respondents take multiple intelligence tests at ages 7, 11, and 16. At age 7, the respondents take four cognitive tests (Copying Designs Test, Draw-a-Man Test, Southgate Group Reading Test, and Problem Arithmetic Test). At age 11, they take five cognitive tests (Verbal General Ability Test, Nonverbal General Ability Test, Reading Comprehension Test, Mathematical Test, and Copying Designs Test). At age 16, they take two cognitive tests (Reading Comprehension Test, and Mathematics Comprehension Test). I first perform a factor analysis at each age to compute their general intelligence score for each age. All cognitive test scores at each age load only on one latent factor, with reasonably high factor loadings (Age 7: Copying Designs Test = .671, Draw-a-Man Test = .696, Southgate Group Reading Test = .780, and Problem Arithmetic Test = .762; Age 11: Verbal General Ability Test = .920, Nonverbal General Ability Test = .885, Reading Comprehension Test = .864, Mathematical Test = .903, and Copying Designs Test = .486; Age 16: Reading Comprehension Test = .909, and Mathematics Comprehension Test = .909).

The latent general intelligence factors at each age are converted into the standard IQ metric, with a mean of 100 and a standard deviation of 15. I then perform a second-order factor analysis with the IQ scores at three different ages to compute the overall childhood general intelligence score. The three IQ scores load only on one latest factor with very high factor loadings (Age 7 = .867; Age 11 = .947; Age 16 = .919). I use the childhood general intelligence score in the standard IQ metric as the dependent variable. All of the following analyses would have produced identical results had I used the arithmetic mean of all 11 IQ test scores, as the correlation between the mean and the general intelligence factor (extracted from the factor analysis) is .991.

2.3. Independent variable: physical attractiveness

At ages 7 and 11, the teacher of each NCDS respondent is asked to describe the child's physical appearance, by choosing up to three adjectives from a highly eclectic list of five: "attractive," "unattractive or not attractive," "looks underfed or undernourished," "abnormal feature," and "scruffy or slovenly & dirty." A respondent is coded as attractive = 1 if he or she is described as "attractive" at *both* age 7 *and* age 11 by two different teachers, 0 otherwise. I use this binary measure of physical attractiveness as the independent variable. 62.0% of all NCDS respondents are coded as attractive.

Zebrowitz, Olson and Hoffman (1993) analysis of the longitudinal data from the Intergenerational Studies of Development and Aging shows that individuals' relative physical attractiveness remains very stable across the life course. Their structural equation model suggests that physical attractiveness in childhood (measured between the ages of 9 and 10) is significantly positively correlated with physical attractiveness in puberty (measured between the ages of 12 and 13 for girls and 14 and 15 for boys) ($r = .70$ for boys, $r = .79$ for girls), and physical attractiveness in puberty is significantly positively correlated with physical attractiveness in adolescence (measured between the ages of 17 and 18) ($r = .72$ for boys, $r = .70$ for girls). This suggests that physical attractiveness in childhood is correlated with physical attractiveness in adolescence at $r = .504$ for boys and $r = .553$ for girls.

2.4. Control variables

Because social class is positively associated with both general intelligence (Herrnstein & Murray, 1994) and physical attractiveness (Elder, 1969), I control for the respondent's social class at birth measured by: father's occupation (0 = unemployed, dead, retired, no father present, 1 = unskilled, 2 = semiskilled, 3 = skilled, 4 = white-collar, 5 = professional); mother's education (age at which the mother left full-time education); and father's education (age at which the father left full-time education). Controlling for such measures of social class likely removes much

Table 1
Correlation matrix National Child Development Study (UK): full sample.

	IQ	Physical attractiveness	Sex	Social class at birth	Mother's education	Father's education	Birth weight	Height	Age at puberty
IQ		.381***	−.001	.310***	.291***	.313***	.137***	.063***	−.049***
Physical attractiveness			−.088***	.164***	.129***	.140***	.073***	.032**	−.055***
Sex				.005	−.025**	−.013	.118***	.030***	.390***
Social class at birth					.272***	.359***	.067***	.046***	.000
Mother's education						.566***	.035***	.028**	−.007
Father's education							.036***	.032**	−.008
Birth weight								.087***	.053***
Height									−.043***
Mean	100.00	.62	.52	2.81	3.92	3.90	116.23	47.42	4.30
Standard deviation	15.00	.49	.50	1.03	1.38	1.62	20.45	6.40	1.40

Note: *$p<.05$, **$p<.01$, ***$p<.001$.

variance in general intelligence. Thus the partial association between general intelligence and physical attractiveness controlling for social class will be a conservative estimate.

In addition, because general intelligence is also associated with body size (Jensen & Sinha, 1993) and health (Gottfredson & Deary, 2004), I also control for birth weight (in oz), height at age 7 (in cm), and the age of puberty (menarche for girls, voice change for boys), measured on the scale: 1 = 10 years old or younger; 2 = 11 years old; 3 = 12 years old; 4 = 13 years old; 5 = 14 years old; 6 = 15 years old; 7 = 16 years old or older.

2.5. Results

Table 1 presents the descriptive statistics (mean and standard deviation) for all variables included in the analysis of the NCDS data, as well as the full correlation matrix. It shows that the dependent variable (IQ) is significantly correlated with all the variables included in the analysis, except for sex, and physical attractiveness is more strongly associated with general intelligence than any other variable. Table 2 presents the descriptive statistics and the correlation matrix separately for men and women. Once again, for both sexes, physical attractiveness is more strongly associated with general intelligence than any other variable.

Table 3, Column 1, shows that NCDS respondents who are described by two different teachers as "attractive" at age 7 and age 11 are significantly more intelligent than those who are not so described. Attractive NCDS respondents have the mean IQ of 104.2 while others have the mean IQ of 91.8. The mean IQ difference of 12.4 between the two groups implies a correlation coefficient $r = .381$ ($p<.001$), as Table 1 also shows.

Table 3, Column 2, shows that, even controlling for sex (0 = female, 1 = male), social class, body size, and health, attractive NCDS respondents are still significantly more intelligent than others, by 9.5 IQ points. All other variables included in the equation, except for height at age 7, are statistically significantly associated with general intelligence. However, the comparison of standardized coefficients shows that physical attractiveness has a stronger association with general intelligence than any other variable in the model. Physical attractiveness and general intelligence are still statistically significantly associated with each other even net of all the control variables.

Results presented in Table 4 replicate the analysis of NCDS data separately for each sex. Column 1 shows that attractive women in the NCDS sample are significantly more intelligent than other women by 11.4 IQ points, and Column 3 shows

Table 2
Correlation matrix National Child Development Study (UK): by sex women (above the diagonal) and men (below the diagonal).

	IQ	Physical attractiveness	Social class at birth	Mother's education	Father's education	Birth weight	Height	Age at puberty
IQ		.351***	.322***	.290***	.311***	.140***	.058***	−.072***
Physical attractiveness	.414***		.144***	.116***	.138***	.082***	.019	−.046*
Social class at birth	.300***	.183***		.264***	.356***	.073***	.038**	.006
Mother's education	.292***	.139***	.281***		.565***	.026	.028	−.008
Father's education	.315***	.144***	.363***	.566***		.030*	.018	−.009
Birth weight	.136***	.090***	.061***	.050***	.043**		.073***	.001
Height	.067***	.055**	.055***	.029*	.047***	.094***		−.064***
Age at puberty	−.045*	−.002	−.010	.008	−.003	−.004	−.051***	
Women								
Mean	100.02	.66	2.80	3.95	3.93	113.76	47.22	3.79
Standard deviation	14.59	.47	1.03	1.40	1.63	19.99	6.50	1.34
Men								
Mean	99.98	.58	2.81	3.88	3.88	118.57	47.61	4.88
Standard deviation	15.39	.49	1.02	1.35	1.62	20.59	6.29	1.23

Note: *$p<.05$, **$p<.01$, ***$p<.001$.

Table 3
Association between physical attractiveness and general intelligence National Child Development Study (UK).

	(1)	(2)
Physical attractiveness	12.426***	9.514***
	(.407)	(.480)
	.381	*.297*
Sex		1.310**
		(.478)
		.044
Social class at birth		2.402***
		(.243)
		.159
Mother's education		1.317***
		(.187)
		.125
Father's education		1.405***
		(.168)
		.154
Birth weight		.077***
		(.012)
		.095
Height at 7		.055
		(.035)
		.023
Age at puberty		−.544**
		(.167)
		−.052
Constant	91.806	67.242
	(.334)	(2.283)
R^2	.146	.258
Number of cases	5,470	3,464

Note: *$p<.05$, **$p<.01$, ***$p<.001$.
Main entries are unstandardized coefficients.
Numbers in parentheses are standard errors.
Numbers in italics are standardized coefficients (beta coefficients).

that attractive men are significantly more intelligent than other men by 13.6 IQ points.

Among both women (Column 2) and men (Column 4), the association between physical attractiveness and general intelligence remains statistically significant, even net of all the control variables. Comparisons of standardized coefficients within each equation show that general intelligence is more strongly associated with physical attractiveness than with any other variable in the equation. Contrary to previous research (Jensen & Sinha, 1993), height at age 7 is not significantly associated with general intelligence among women, and neither height at age 7 nor age at puberty is associated with general intelligence among men (possibly because the age of puberty is less accurately measured among boys than among girls).

The association between general intelligence and physical attractiveness is statistically significantly stronger among men than among women without the controls ($b=2.221$, $p<.01$). However, with the controls, it is only marginally statistically significantly stronger among men than among women ($b=1.627$, $p=.086$).

3. American sample

3.1. Data

The National Longitudinal Study of Adolescent Health (Add Health) is a large, nationally representative and prospectively longitudinal study of young Americans. A sample of 80 high schools and 52 middle schools from the US was selected with an unequal probability of selection. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensures this sample is representative of US schools with respect to region of country, urbanicity, school size, school type, and ethnicity. A sample of 20,745 adolescents was personally interviewed in their homes in 1994–1995 (Wave I) and again in 1996 (Wave II; $n=14{,}738$). In 2001–2002, 15,197 of the original Wave I respondents, now age 18–28, were interviewed in their homes (Wave III).

3.2. Dependent variable: general intelligence

Add Health measures respondents' intelligence with the Peabody Picture Vocabulary Test (PPVT) at Wave I and Wave

Table 4
Association between physical attractiveness and general intelligence by sex National Child Development Study (UK).

	Women		Men	
	(1)	(2)	(3)	(4)
Physical attractiveness	11.391***	8.828***	13.612***	10.330***
	(.560)	(.627)	(.597)	(.745)
	.351	*.277*	*.414*	*.318*
Social class at birth		2.527***		2.232***
		(.309)		(.391)
		.173		*.141*
Mother's education		1.466***		1.045***
		(.233)		(.311)
		.146		*.093*
Father's education		1.043***		1.932***
		(.213)		(.271)
		.118		*.205*
Weight at birth		.085***		.068***
		(.016)		(.019)
		.105		*.082*
Height at 7		.029		.095
		(.043)		(.061)
		.013		*.036*
Age at puberty		−.634**		−.413
		(.209)		(.275)
		−.059		*−.034*
Constant	92.248	68.862	91.392	66.039
	(.471)	(2.879)	(.476)	(3.907)
R^2	.123	.240	.171	.286
Number of cases	2,948	2,027	2,522	1,437

Note: *$p<.05$, **$p<.01$, ***$p<.001$.
Main entries are unstandardized coefficients.
Numbers in parentheses are standard errors.
Numbers in italics are standardized coefficients (beta coefficients).

III. At each Wave, the raw scores (0–87) are age-standardized and converted to the IQ metric, with a mean of 100 and a standard deviation of 15. I then perform a factor analysis of the two IQ scores for each respondent to compute a measure of general intelligence for Add Health respondents. The two IQ scores load very heavily on the latent factor (Wave I = .890, Wave III = .890). I use the general intelligence score in the standard IQ metric as the dependent variable. All of the following analyses would have produced identical results had I used the arithmetic mean of the two IQ test scores, as the correlation between the mean and the general intelligence factor (extracted from factor analysis) is .999.

3.3. Physical attractiveness

At the conclusion of the in-home interview at each wave, the Add Health interviewer rates the respondent's physical attractiveness on a five-point ordinal scale (1 = very unattractive, 2 = unattractive, 3 = about average, 4 = attractive, 5 = very attractive). I perform a factor analysis of the attractiveness ratings from the three waves to compute a measure of physical attractiveness. The three attractiveness ratings load heavily on the latent factor (Wave I = .729, Wave II = .756, Wave III = .600). I use the latent physical attractiveness factor (measured in the standard unit with a mean of 0 and a standard deviation of 1) as the independent variable. All of the following analyses would have produced identical results had I used the arithmetic mean of the three physical attractiveness ratings, as the correlation between the mean and the latent physical attractiveness factor (extracted from factor analysis) is .997.

3.4. Control variables

I control for the social class of the Add Health respondents' family of orientation with three measures: Gross family income in $1K at Wave I; mother's education; and father's education (both measured with the ordinal scale: 0 = no education, 1 = less than high school, 2 = some high school, 3 = secondary trade school, 4 = high school/GED, 5 = postsecondary trade school, 6 = some college, 7 = college degree, 8 = postgraduate). In addition, I control for birth weight (in oz), height at Wave I (in inches), and a general health index at Wave I.

The general health index is computed from a series of 20 questions about the Add Health respondents' health. These questions ask how frequently the respondents have experienced the following conditions in the last 12 months: headache; feeling hot all over suddenly for no reason; stomach ache or upset stomach; cold sweats; feeling physically weak for no reason; sore throat or cough; feeling very tired for no reason; painful or very frequent urination; feeling really sick; waking up feeling tired; skin problems such as itching or pimples; dizziness; chest pains; aches, pains, or soreness in muscles or joints; poor appetite; trouble falling asleep or staying asleep; trouble relaxing; moodiness; frequent crying; and fearfulness.

For each of the 20 questions, the respondents indicate the frequency of their experience on a five-point ordinal scale (0 = never, 1 = just a few times, 2 = about once a week, 3 = almost every day, 4 = every day). I perform a factor analysis with these 20 responses. All 20 indicators load on a latent factor

Table 5
Correlation matrix National Longitudinal Study of Adolescent Health (US): full sample.

	IQ	Physical attractiveness	Sex	Black	Asian	Native American	Family income	Mother's education	Father's education	Birth weight	Height	Health
IQ		.126***	.049***	−.278***	−.044***	−.077***	.220***	.356***	.364***	.102***	.111***	−.023**
Physical attractiveness			−.177***	−.049***	.002	−.015	.095***	.106***	.120***	−.005	−.085***	.000
Sex				−.037***	.027***	.020*	.000	.012	.004	.099***	.524***	.178***
Black					−.148***	−.067***	−.126***	.018*	−.023*	−.127***	.003	.067***
Asian						−.053***	.037***	.056***	.084***	−.047***	−.099***	.007
Native American							−.051***	−.092***	−.090***	−.001	−.002	−.006
Family income								.280***	.344***	.034***	.041***	.008
Mother's education									.591***	.050***	.064***	.010
Father's education										.044***	.039***	.007
Birth weight											.195***	.006
Height												.099***
Mean	100.00	0.00	.50	.23	.08	.05	45.73	4.85	4.95	115.40	66.22	.00
Standard deviation	15.00	1.00	.50	.42	.28	.23	51.62	1.97	2.04	22.56	4.13	1.00

Note: *$p<.05$, **$p<.01$, ***$p<.001$.

Table 6
Correlation matrix National Longitudinal Study of Adolescent Health (US): by sex women (above the diagonal) and men (below the diagonal).

	IQ	Physical attractiveness	Black	Asian	Native American	Family income	Mother's education	Father's education	Birth weight	Height	Health
IQ		.134***	−.266***	−.057***	−.072***	.225***	.360***	.364***	.106***	.113***	−.030**
Physical attractiveness	.144***		−.097***	.010	−.008	.088***	.094***	.110***	−.005	−.027*	.028*
Black	−.289***	−.004		−.145***	−.066***	−.131***	.000	−.024	−.123***	.045***	.078***
Asian	−.033**	.001	−.150***		−.047***	.053***	.052***	.095***	−.038**	−.138***	.007
Native American	−.085***	−.018	−.066***	−.060***		−.050***	−.080***	−.097***	.001	−.020	−.016
Family income	.218***	.107***	−.121***	.018	−.053***		.281***	.351***	.031**	.037**	.026*
Mother's education	.349***	.137***	.040**	.060***	−.105***	.279***		.592***	.048***	.066***	.020
Father's education	.363***	.146***	−.022	.072***	−.084***	.337***	.590***		.026*	.061***	.019
Birth weight	.090***	.031*	−.126***	−.060***	−.009	.037**	.050***	.060***		.194***	−.014
Height	.095***	.038**	.010	−.129***	−.009	.060***	.072***	.033**	.155***		−.032**
Health	−.038**	.044**	.070***	−.003	−.003	−.012	−.007	−.011	−.012	.015	
Women											
Mean	99.31	.17	.24	.08	.05	45.77	4.83	4.94	113.18	64.08	−.177
Standard deviation	15.13	1.03	.43	.27	.22	51.83	1.99	2.05	21.96	2.96	1.05
Men											
Mean	100.79	−.19	.21	.09	.06	45.69	4.87	4.96	117.67	68.41	.18
Standard deviation	14.81	.93	.41	.29	.24	51.41	1.97	2.03	22.95	4.00	.91

Note: **p*<.05, ***p*<.01, ****p*<.001.

Table 7
Association between physical attractiveness and general intelligence National Longitudinal Study of Adolescent Health (US).

	(1)	(2)
Physical attractiveness	1.869***	.793***
	(.143)	(.162)
	.126	*.059*
Sex		.401
		(.381)
		.015
Race		
Black		−9.199***
		(.451)
		−.242
Asian		−5.402***
		(.662)
		−.097
Native American		−3.325***
		(.742)
		−.052
Family income		.019***
		(.003)
		.071
Mother's education		1.490***
		(.104)
		.207
Father's education		1.237***
		(.100)
		.183
Weight at birth		.016*
		(.007)
		.027
Height		.210
		(.045)
		.064
Health		.055
		(.193)
		.003
Constant	100.032	73.602
	(.143)	(2.907)
R^2	.016	.235
Number of cases	10,681	5,694

Note: **p*<.05, ***p*<.01, ****p*<.001.
Main entries are unstandardized coefficients.
Numbers in parentheses are standard errors.
Numbers in italics are standardized coefficients (beta coefficients).

with reasonably high factor loadings (headache = .530; feeling hot = .568; stomach ache = .564; cold sweats = .500; feeling physically weak = .644; sore throat = .459; feeling tired = .632; painful urination = .507; feeling sick = .598; waking up tired = .536; skin problems = .375; dizziness = .627; chest pains = .575; aches = .495; poor appetite = .535; trouble sleeping = .559; trouble relaxing = .592; moodiness = .586; crying = .601; and fearfulness = .573). I multiply the extracted latent factor by −1, so that it reflects good health rather than illnesses to compute the latent health index for Wave I. I use the latent health index as another measure of general fitness. The

Table 8
Association between physical attractiveness and general intelligence by sex National Longitudinal Study of Adolescent Health (US).

	Women		Men	
	(1)	(2)	(3)	(4)
Physical attractiveness	1.957***	.576**	2.278***	1.232***
	(.191)	(.219)	(.223)	(.241)
	.134	*.043*	*.144*	*.086*
Race				
Black		−7.498***		−11.464***
		(.624)		(.651)
		−.199		*−.297*
Asian		−5.558***		−5.234***
		(.962)		(.904)
		−.096		*−.098*
Native American		−3.130**		−3.492***
		(1.097)		(.999)
		−.046		*−.058*
Family income		.021***		.015**
		(.004)		(.005)
		.086		*.052*
Mother's education		1.265***		1.763***
		(.146)		(.149)
		.176		*.245*
Father's education		1.387***		1.024***
		(.140)		(.141)
		.203		*.153*
Weight at birth		.024*		.006
		(.011)		(.010)
		.038		*.011*
Height		.330***		.131*
		(.077)		(.056)
		.073		*.040*
Health		.222		−.220
		(.251)		(.305)
		.014		*−.012*
Constant	98.895	65.080	101.400	80.914
	(.199)	(4.789)	(.211)	(3.877)
R^2	.018	.217	.021	.262
Number of cases	5717	2988	4964	2706

Note: *$p<.05$, **$p<.01$, ***$p<.001$.
Main entries are unstandardized coefficients.
Numbers in parentheses are standard errors.
Numbers in italics are standardized coefficients (beta coefficients).

general health index correlates significantly and moderately with self-perceived general health (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent) ($r = .284$, $p < .001$, $n = 20{,}719$).

3.5. Results

Table 5 presents the descriptive statistics and correlation matrix for all the variables included in the analysis of the Add Health data. It shows that physical attractiveness is significantly correlated with general intelligence ($r = .126$), but not as strongly as some other variables included in the analysis, such as family income, mother's education and father's education. Table 6 presents the descriptive statistics and correlation matrix separately for men and women.

Table 7, Column 2, shows that the significant positive association between general intelligence and physical attractiveness remains even after I control for sex (0 = female, 1 = male), race (with three dummies for black, Asian, and Native American, with white as the reference category), social class, body size, and health. While birth weight is significantly positively associated with intelligence ($b = .016$, $p < .05$), neither height at Wave I nor general health index is associated with intelligence.

Results presented in Table 8 replicate the analysis of Add Health data separately by sex. The bivariate correlation between general intelligence and physical attractiveness is slightly larger within each sex than in the full sample ($r = .134$, $p < .001$, for women; $r = .144$, $p < .001$, for men), as Table 6 also shows. The unstandardized coefficients for physical attractiveness suggest that one standard deviation increase in physical attractiveness increases intelligence by 2.0 IQ points among women and 2.3 IQ points among men.

Columns 2 and 4 show that the partial association between general intelligence and physical attractiveness within each sex remains highly significant even after I control for race, social class, body size, and health. Birth weight is significantly associated with intelligence only among men ($b = .024$, $p < .05$), not among women ($b = .006$, *ns*). Height is significantly associated with intelligence within sexes ($b = .330$, $p < .001$, for women; $b = .131$, $p < .05$, for men). However, the measure of general health is not associated with general intelligence at all for either sex ($b = .222$, *ns*, for women; $b = -.220$, *ns*, for men).

The sex difference in the association between general intelligence and physical attractiveness is not statistically significant without the controls ($b = .321$, *ns*), but is statistically significant with the controls ($b = .645$, $p < .05$).

4. Discussion

Both in the British and American samples, physical attractiveness is significantly positively associated with general intelligence, both with and without controls for social class, body size, and health. Both in the UK and in the US, the association between physical attractiveness and general intelligence is stronger among men than among women. In the UK, physically attractive men have higher IQ by 13.6 points, whereas physically attractive women have higher IQ by 11.4 IQ points. These mean differences imply bivariate correlation coefficients of $r = .351$ among women and $r = .414$ among men. Physical attractiveness is more strongly associated with general intelligence than any other variable included in the equations. However, the relatively weak measure of physical attractiveness in the NCDS data is likely to attenuate the true association between general intelligence and physical attractiveness.

At the same time, given that the attractiveness ratings of the NCDS respondents were given by their two elementary school teachers, who were largely aware of the students' cognitive ability from their academic work, it is also possible that there may be some halo effect, where more intelligent, better students are considered by their teachers to be physically more attractive. However, such a halo effect, if it exists, does not explain where the perception that more intelligent individuals are physically more attractive comes from. The results presented in this paper suggest that the perception is based on empirical reality (Kanazawa & Kovar, 2004).

The association between intelligence and physical attractiveness is much weaker in the US. The bivariate correlations are $r = .134$ among women and $r = .144$ among men. The associations remain significant even controlling for sex, race, social class, body size, and health. The stronger association

between general intelligence and physical attractiveness may possibly be due to the fact that the NCDS data have a much stronger measure of general intelligence than the Add Health data, although the latter has a stronger measure of physical attractiveness than the former. It is not clear why the association is stronger among men than among women both in the UK and in the US, but Miller's (2000a, 2000b, Prokosch, Yeo, & Miller, 2005) general fitness factor (*f*-factor) model can account for the sex difference.

References

Berscheid, E., & Walster, E. (1974). Physical attractiveness. *Advances in Experimental Social Psychology*, *7*, 157–215.

Buss, D. M. (1985). Human mate selection. *American Scientist*, *73*, 47–51.

Denny, K. (2008). Beauty and intelligence may – or may not – be related. *Intelligence*, *36*, 616–618.

Elder, G. H., Jr. (1969). Appearance and education in marriage mobility. *American Sociological Review*, *34*, 519–533.

Gottfredson, L. S., & Deary, I. J. (2004). Intelligence predicts health and longevity, but why? *Current Directions in Psychological Science*, *13*, 1–4.

Herrnstein, R. J., & Murray, C. (1994). *The bell curve: Intelligence and class structure in American life.* New York: Free Press.

Jackson, L. A., Hunter, J. E., & Hodge, C. N. (1995). Physical attractiveness and intellectual competence. A meta-analytic review. *Social Psychology Quarterly*, *58*, 108–122.

Jensen, A. R. (1998). *The g factor: The science of mental ability.* Westport: Praeger.

Jensen, A. R., & Sinha, S. N. (1993). Physical correlated of human intelligence. In P. A. Vernon (Ed.), *Biological approaches to the study of human intelligence* (pp. 139–242). Norwood: Ablex.

Kanazawa, S., & Kovar, J. L. (2004). Why beautiful people are more intelligent. *Intelligence*, *32*, 227–243.

Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin*, *126*, 390–423.

Miller, G. F. (2000a). Sexual selection for indicators of intelligence. In G. R. Bock, J. A. Goode, & K. Webb (Eds.), *The nature of intelligence* (pp. 260–275). New York: Wiley.

Miller, G. F. (2000b). *The mating mind: How sexual choice shaped the evolution of human nature.* New York: Doubleday.

Prokosch, M. D., Yeo, R. A., & Miller, G. F. (2005). Intelligence tests with higher *g*-loadings show higher correlations with body symmetry: Evidence for a general fitness factor mediated by developmental stability. *Intelligence*, *33*, 203–213.

Vandenberg, S. G. (1972). Assortative mating, or who marries whom? *Behavior Genetics*, *2*, 127–158.

Zebrowitz, L. A., Hall, J. A., Murphy, N. A., & Rhodes, G. (2002). Looking smart and looking good: Facial cues to intelligence and their origins. *Personality and Social Psychology Bulletin*, *28*, 238–249.

Zebrowitz, L. A., Olson, K., & Hoffman, K. (1993). Stability of babyfaceness and attractiveness across the life span. *Journal of Personality and Social Psychology*, *64*, 453–466.