Beauty, Brains, and Bulges: Life Course Consequences

Of Adolescent Attractiveness, Ability, and Obesity

Robert M. Hauser

University of Wisconsin-Madison

September 19, 2008

ABSTRACT

Across half a century, the Wisconsin Longitudinal Study (WLS) has obtained a rich record of educational attainment, family life, careers, and health among 10,317 female and male high school graduates. Using high school yearbook photographs, we have added measures of facial attractiveness and facial mass. Facial mass in late adolescence is associated with early morbidity and mortality. This paper compares women and men across a wider set of outcomes – educational attainment, occupational standing, earnings, and marital choice. It compares effects of obesity in combination with those of two other key measures obtained from WLS participants in adolescence – academic ability and facial attractiveness. Biases in household interviewers' ratings may have led to over-estimates of the advantages of facial attractiveness, but these are not a problem in our ratings of high school yearbook photos.

Across half a century, the Wisconsin Longitudinal Study (WLS) has obtained a rich record of educational attainment, family life, careers, and health among 10,317 female and male high school graduates (Sewell, Hauser, Springer, and Hauser 2004). Previous work with the WLS has analyzed and compared a wide-array of post-high school outcomes among women and men: college attendance (Sewell 1971), military service (MacLean 2004), occupational careers (Hauser, Warren, Huang, and Carter 2000; Portes, Haller, and Sewell 1968; Sewell, Haller, and Portes 1969; Sewell, Hauser, and Wolf 1980), earnings (Hauser and Daymont 1977; Sewell and Hauser 1975), health (Marks and Shinberg 1998; Marks and Shinberg 1997; Shinberg 1998; Shinberg 1995), retirement (Raymo, Ho, Sweeney, and Hauser 2006; Raymo and Sweeney 2006), and end-of-life planning (Carr 2006; Carr and Khodyakov 2007; Carr, Nesse, and Wortman 2006; Moorman, Hauser, and Carr 2007).

Most of this work has drawn at least in part on the social psychological model of adolescent academic performance, ambition, and later social and economic attainment that was developed by Sewell and his colleagues almost 40 years ago (Haller and Portes 1973; Sewell, Haller, and Ohlendorf 1970; Sewell, Haller, and Portes 1969). The model is displayed in Figure 1. The essential ideas of the model are as follows: Social background affects school performance. These two sets of variables affect social influences – the expectations and modeling behaviors of significant others. Social influences largely determine educational and occupational aspirations, thus carrying much of the influence of social background and school performance. Aspirations, in turn, have large effects on post-secondary schooling and occupational careers, and they carry much of the influence of social influences, school performance, and social background.

The key theoretical idea of the model is the importance of social psychological processes in mediating the connections between positions in the social structure across generations. This idea now seems simple because it is widely accepted among social scientists. The model is also simple in a second, more important sense, that it is a modified causal chain. Not every earlier variable affects every later variable in the scheme. Of fifteen possible paths from antecedent variables in Figure 1, only the seven paths marked with an asterisk (*) carry large effects.

This paper also compares women and men across a wide set of outcomes – educational attainment, occupational standing, earnings, and marital choice. We expand the content of the model of adolescent ambition to include measures of facial mass and facial attractiveness that have been coded from recently collected high school yearbook photographs. Facial mass in late adolescence is associated with early morbidity and mortality (Reither, Hauser, and Swallen forthcoming), but its implications for education and labor market success are less clear. A widely accepted economic finding holds that facial attractiveness carries a large premium in the labor market (Biddle and Hamermesh 1998; Hamermesh and Biddle 1994). However, this conclusion is questionable in Hamermesh and Biddle's (1994) analyses of three household surveys because the attractiveness ratings were made by interviewers in the participants' own homes. That is, they were very likely biased by situational factors, e.g., the dress, grooming, and manner of the respondent, the physical surroundings, and the performance of and rapport with the respondent in the interview.

DATA

Our measures of facial mass and of facial attractiveness were obtained independently – in two completely separate coding operations by different sets of raters with different sets of

supervisors. Each set of ratings was carried out by several, independent coders using computer-guided, photo-anchored scales of the same stimulus – a scanned, black-and-white headshot taken from the participant's high school yearbook. The photos provided minimal clues about the origins of the participant, and the coders were given no information about any participant other than the photograph. Thus, there is far less reason to think that contextual clues may have prejudiced judgments of the coders. Further, in the WLS data, it is possible to control some biases using measures of the social background and academic performance of the participants.

High school yearbooks from 1957 were collected over the past several years, at first mainly from public sources – high schools and public libraries – beginning with larger schools in larger places. This effort yielded approximately 7500 photos, from which a well-designed sample of 3000 was drawn and coded. A second round of collection and scanning was carried out during the first half of 2007 in conjunction with the distribution of respondent reports from the 2004-05 round of the WLS. Thus, the WLS collection of scanned yearbooks now covers almost all members of the sample. The full set of photos was coded during 2008, and these data will be used in the final version of this paper.

Each set of facial appearance codes was assigned independently by multiple coders using a detailed, computer-assisted protocol. The yearbook photograph is the only information about the target individual presented to the coder. In both cases, the target picture was presented in combination with a visual scale that is anchored by gender-specific photographs of high school seniors who were not in the WLS sample. For example, Figure 2 shows a display similar to that used to code men's facial mass.

In the case of facial mass, six graduate students independently coded facial mass following

these instructions.

1. Click on this internet site: (Suppressed)

You will be prompted for a name and password. This is highly confidential information, and you are responsible for safeguarding it. Do not share this information with anyone for any reason!

Username: *******

Password: **********

2. In each session, you will code approximately 300 photos, 150 for boys and 150 for girls. At this time, choose whether you want to code girls or boys first. In subsequent coding sessions, please alternate which gender you choose first.

3. You will be asked for your name, sex and birthday. Please respond to these questions consistently at each coding session. Follow the format in this illustration:

Name: Jane Doe

Sex: female

Birthday: October 22, 1970

4. Next, you will see a series of photos aligned at the top of the page with several triangle markers placed beneath them. These photos are a guide to coding the yearbook photos that appear at the bottom of the page. Also at the bottom of the page is a question: How heavy is this person? To answer this question, follow these instructions:

A. In 10 seconds or less, form an initial reaction about where you think this person fits on the scale. Click once on that point.

B. After you choose a particular point, the following question will appear: Does the red symbol indicate your choice? Do not answer this question immediately, but rather proceed to

step C.

C. Examine the person's neck. How wide is this person's neck relative to the other photos? Do you see evidence of a "double-chin" or other fat deposits around the neck?

D. Examine the person's cheeks. Are this person's cheeks "puffy," full or sunken? How does this compare to other photos in the scale?

E. After you examine the person's neck and cheeks, decide whether your initial reaction still seems appropriate. If so, click "yes."

F. If not, then (1) answer "no," (2) click on the new point that seems most appropriate and (3) immediately answer "yes."

G. Repeat steps A-F for all photos.

H. Once finished, choose the other gender and code those photos following these instructions (Reither 2005).

Very high reliability (Cronbach's alpha = 0.91) can be obtained in the ratings of facial mass with six independent codings of each photograph (Reither 2005). In the new round of rating, we each rater also recoded several hundred previously coded photos in order to calibrate the two rounds of coding.

A similar protocol was used to code facial attractiveness. In the initial round of coding, we obtained 12 independent ratings of each photo. Six ratings were obtained from college students, and six ratings were obtained from contemporaries of the graduates—seniors who were on campus during the summer for Elder Hostel. We used both older and younger coders because we were concerned that there might be changing standards of facial attractiveness. However, the only substantial difference in the ratings by older and younger coders was that the older coders

were more reliable, and older coders have been used consistently in all production coding. Again, we have obtained repeated ratings of several hundred previously coded photos in order to calibrate the two rounds of coding.

For the present analysis, each individual coder's ratings were standardized – that is, deviated from the coder's mean and divided by the standard deviation of that coder's ratings. Then, the mean of the standardized ratings of each student photo was calculated. However, in the case of the attractiveness ratings, the highest and lowest ratings of each photo were eliminated to reduce the occurrence of outliers.

PRELIMINARY ANALYSIS

Regardless of gender, there is little evidence that either the ratings of facial mass or those of facial attractiveness are affected by social or economic background or by academic ability. As shown in Tables 1 and 2, regressions of the two average ratings on an array of social background variables yield negligible and inconsistent estimates. The background variables include father's educational attainment, mother's educational attainment, father's occupational status (Duncan SEI), a 4-year average of family income from tax records, number of siblings, and intact family, while the measures of academic ability are the Henmon-Nelson Test of Mental Ability (Froehlich 1941; Henmon and Holt 1931; Henmon and Nelson 1946; Henmon and Nelson 1954) and the student's rank in their high school graduating class.

Table 3 shows effects of social background, academic ability, facial attractiveness, and facial mass on educational attainment by gender. As one would expect, there are positive effects of social standing and negative effects of number of siblings on educational attainments of women and of men. Similarly, there are highly significant positive effects of test scores and of high

school rank on educational attainment for women and for men. While facial attractiveness and facial mass have no significant effects on the educational attainment of men, both variables have significant effects among women. Greater facial attractiveness increases women's educational attainments, while greater facial mass decreases them. However, the effects of facial attractiveness are not significantly different between women and men; this may well change when the full sample ratings are analyzed.

[Analyses of occupational status, earnings, and spouse characteristics to be added]

References

Biddle, Jeff E. and Daniel S. Hamermesh. 1998. "Beauty, Productivity, and Discrimination: Lawyers' Looks and Lucre." *Journal of Labor Economics* 16:172-201.

Carr, Deborah. 2006. "Methodological Issues in Studying Bereavement." Pp. 19-47 in *Spousal Bereavement in Late Life*, edited by D. Carr, R. M. Nesse, and C. B. Wortman. New York, NY: Springer Publishing Company, Inc.

Carr, Deborah and Dmitry Khodyakov. 2007. "Health Care Proxies in Later Life: Whom Do We Choose and Why?" *Journal of Health and Social Behavior* 48:180-184.

Carr, Deborah, Randolph M. Nesse, and Camille B. Wortman. 2006. *Spousal Bereavement in Late Life*. New York, NY: Springer Publishing Company, Inc.

Froehlich, Gustav J. 1941. *The prediction of academic success at the University of Wisconsin, 1909-1941*. Madison, Wisconsin: Bureaus of Guidance and Records of the University of Wisconsin.

Haller, Archibald O. and Alejandro Portes. 1973. "Status Attainment Processes." *Sociology of Education* 46:51-91.

Hamermesh, Daniel S. and Jeff E. Biddle. 1994. "Beauty and the Labor Market." *The American Economic Review* 84:1174-1194.

Hauser, Robert M. and Thomas N. Daymont. 1977. "Schooling, Ability, and Earnings: Cross-sectional Evidence 8 to 14 Years After High School Graduation." *Sociology of Education* 50:182-206.

Hauser, Robert M., John Robert Warren, Min-Hsiung Huang, and Wendy Y. Carter. 2000. "Occupational Status, Education, and Social Mobility in the Meritocracy." Pp. 179-229 in *Meritocracy and Economic Inequality,* edited by K. Arrow, S. Bowles, and S. Durlauf. Princeton: Princeton University Press.

Henmon, V. A. C. and Frank Oscar Holt. 1931. *A report on the administration of scholastic aptitude tests to 34,000 high school seniors in Wisconsin in 1929 and 1930 prepared for the committee on cooperation, Wisconsin secondary schools and colleges*. Madison: Bureau of Guidance and Records of the University of Wisconsin.

Henmon, V. A. C. and M. J. Nelson. 1946. *Henmon-Nelson Tests of Mental Ability, High School Examination - Grades 7 to 12 - Forms A, B, and C. Teacher's Manual*. Boston: Houghton-Mifflin Company.

—. 1954. *The Henmon-Nelson Tests of Mental Ability. Manual for Administration*. Boston: Houghton-Mifflin Company.

MacLean, Alair. 2004. "The Varieties of Veteran Experience: Cold War Military Service and the Life Course." Department of Sociology, University of Wisconsin.

Marks, N. F. and D. S. Shinberg. 1998. "Socioeconomic status differences in hormone therapy." *Am J Epidemiol* 148:581-93.

Marks, Nadine F. and Diane S. Shinberg. 1997. "Socioeconomic Differences in Hysterectomy: Evidence from the Wisconsin Longitudinal Study." *American Journal of Public Health* 87:1507-1514.

Moorman, Sara M., Robert M. Hauser, and Deborah Carr. 2007. "Do Older Adults Know Their Spouses' End-of-Life Treatment Preferences? Evidence from the Wisconsin Longitudinal

Study." Center for Demography and Ecology, University of Wisconsin-Madison, Madison, WI.

Portes, Alejandro, Archibald O. Haller, and William H. Sewell. 1968. "Professional-Executive vs. Farming as Unique Occupational Choices." *Rural Sociology* 33:153-59.

Raymo, James M., J. H. Ho, Megan M. Sweeney, and Robert M. Hauser. 2006. "Retirement Preferences: Who Realizes Them? Who Doesn't?": CDHA Weekly Methodology Seminar.

Raymo, James M. and Megan M. Sweeney. 2006. "Work-Family Conflict and Retirement Preferences." *The Journals of Gerontology* 61B:S161.

Reither, Eric. 2005. "Why Are Our Waistlines Expanding? Age-Period-Cohort Analyses of the Obesity Epidemic and a Critical Examination of Mass Preparation Theory." Department of Sociology, University of Wisconsin-Madison.

Reither, Eric N., Robert M. Hauser, and Karen E. Swallen. forthcoming. "Predicting Adult Health and Mortality from Adolescent Facial Characteristics in Yearbook Photographs." *Demography*.

Sewell, William H. 1971. "Inequality of Opportunity for Higher Education." *American Sociological Review* 36:793-809.

Sewell, William H., Archibald O. Haller, and George W. Ohlendorf. 1970. "The Educational and Early Occupational Status Attainment Process: Replication and Revision." *American Sociological Review* 35:1014-27.

Sewell, William H., Archibald O. Haller, and Alejandro Portes. 1969. "The Educational and Early Occupational Attainment Process." *American Sociological Review* 34:82-92.

Sewell, William H. and Robert M. Hauser. 1975. *Education, Occupation, and Earnings: Achievement in the Early Career*. New York: Academic Press.

Sewell, William H., Robert M. Hauser, Kristen W. Springer, and Taissa S. Hauser. 2004. "As We Age: The Wisconsin Longitudinal Study, 1957-2001." Pp. 3-111 in *Research in Social Stratification and Mobility*, vol. 20, edited by K. Leicht. London: Elsevier.

Sewell, William H., Robert M. Hauser, and Wendy C. Wolf. 1980. "Sex, Schooling and Occupational Status." *American Journal of Sociology* 86:551-83.

Shinberg, D. S. 1998. "An event history analysis of age at last menstrual period: correlates of natural and surgical menopause among midlife Wisconsin women." *Social Science and Medicine* 46:1381-96.

Shinberg, Diane S. 1995. "An Event History Analysis of Age at Last Menstrual Period: Correlates of Natural and Surgical Menopause Among Mid-Life Wisconsin Women."

Table 1. Regressions of Facial Mass Ratings on Social Background and Academic Ability
by Gender: Wisconsin Longitudinal Study.

```
------------------------------------------------------------------------------
------------------
. regress FACIAL MASS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr
        if sexrsp==1 (MALE)

      Source |       SS       df       MS              Number of obs =    1175
-------------+------------------------------           F(  6,  1168) =    0.63
       Model |  2.66482343     6  .444137238           Prob > F      =  0.7090
    Residual |  827.648419  1168  .708603098           R-squared     =  0.0032
-------------+------------------------------           Adj R-squared = -0.0019
       Total |  830.313242  1174  .707251484           Root MSE      =  .84179

------------------------------------------------------------------------------
 FACIAL MASS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |    .003114   .0088526     0.35   0.725    -.0142547    .0204826
     bmmaedu |  -.0182793   .0099771    -1.83   0.067    -.0378544    .0012959
     bmfoc1u |  -1.80e-06   .0001305    -0.01   0.989    -.0002578    .0002542
      bmpin1 |  -.0000424   .0004096    -0.10   0.918    -.0008461    .0007613
      sibstt |  -.0041567   .0098749    -0.42   0.674    -.0235313    .0152179
      bklvpr |  -.0385039   .1095774    -0.35   0.725    -.2534944    .1764866
        cons |   .2379095   .1603267     1.48   0.138    -.0766509      .55247
------------------------------------------------------------------------------

. regress FACIAL MASS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr
        if sexrsp==2 (FEMALE)

      Source |       SS       df       MS              Number of obs =    1375
-------------+------------------------------           F(  6,  1368) =    5.88
       Model |  23.7958494     6   3.9659749           Prob > F      =  0.0000
    Residual |  922.450518  1368  .674305934           R-squared     =  0.0251
-------------+------------------------------           Adj R-squared =  0.0209
       Total |  946.246367  1374  .688680034           Root MSE      =  .82116

------------------------------------------------------------------------------
 FACIAL MASS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |  -.0149625   .0087078    -1.72   0.086    -.0320445    .0021195
     bmmaedu |  -.0098238   .0091785    -1.07   0.285    -.0278292    .0081816
     bmfoc1u |  -.0003011     .00012    -2.51   0.012    -.0005364   -.0000658
      bmpin1 |  -.0002921    .000459    -0.64   0.525    -.0011926    .0006084
      sibstt |   .0051223   .0091461     0.56   0.576    -.0128197    .0230643
      bklvpr |   .0422833   .0852675     0.50   0.620     -.124986    .2095527
        cons |   .3107038    .131815     2.36   0.019     .0521222    .5692853
------------------------------------------------------------------------------

. regress FACIAL MASS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm
hsrscorq
        if sexrsp==1 (MALE)

      Source |       SS       df       MS              Number of obs =    1083
-------------+------------------------------           F(  8,  1074) =    0.52
       Model |  2.97559742     8  .371949677           Prob > F      =  0.8437
    Residual |  771.384307  1074  .718234923           R-squared     =  0.0038
-------------+------------------------------           Adj R-squared = -0.0036
       Total |  774.359904  1082  .715674588           Root MSE      =  .84749

------------------------------------------------------------------------------
 FACIAL MASS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |   .0011152   .0093012     0.12   0.905    -.0171355    .0193658
     bmmaedu |  -.0159132   .0104244    -1.53   0.127    -.0363677    .0045412
```

```
     bmfoc1u |    .000016   .0001366     0.12   0.907     -.000252    .0002841
      bmpin1 |  -.0000725   .0004158    -0.17   0.862    -.0008884    .0007434
      sibstt |  -.0065192   .0102788    -0.63   0.526    -.0266879    .0136496
      bklvpr |  -.0384333   .1132952    -0.34   0.735    -.2607382    .1838717
    gwiiq bm |  -.0018448    .002182    -0.85   0.398    -.0061263    .0024366
    hsrscorq |   .0003171   .0022389     0.14   0.887    -.0040761    .0047103
        cons |   .3933119   .2551429     1.54   0.123    -.1073231    .8939469
------------------------------------------------------------------------------

. regress FACIAL MASS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm
hsrscorq
        if sexrsp==2 (FEMALE)

      Source |       SS       df       MS              Number of obs =    1240
-------------+------------------------------           F(  8,  1231) =    4.67
       Model |  25.0206626     8  3.12758283           Prob > F      =  0.0000
    Residual |  823.694484  1231  .669126307           R-squared     =  0.0295
-------------+------------------------------           Adj R-squared =  0.0232
       Total |  848.715147  1239  .685000118           Root MSE      =    .818

------------------------------------------------------------------------------
 FACIAL MASS |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |  -.0081581    .009294    -0.88   0.380     -.026392    .0100758
     bmmaedu |  -.0110167   .0098814    -1.11   0.265     -.030403    .0083695
     bmfoc1u |  -.0002635   .0001264    -2.08   0.037    -.0005116   -.0000155
      bmpin1 |  -.0002745   .0004732    -0.58   0.562    -.0012028    .0006539
      sibstt |   .0025635   .0095555     0.27   0.789    -.0161833    .0213102
      bklvpr |   .0924301   .0886195     1.04   0.297    -.0814318     .266292
    gwiiq bm |  -.0028583   .0021634    -1.32   0.187    -.0071027     .001386
    hsrscorq |  -.0021156    .002166    -0.98   0.329    -.0063652    .0021339
        cons |   .6939869   .2210251     3.14   0.002     .2603594    1.127614
------------------------------------------------------------------------------
```

key to variables: bmfaed = father's years of schooling; bmmaed = mother's years of schooling; bmfoc1 = father's occupational status; bmpin1 = parents' income; sibstt = number of siblings; bklvpr = intact family; gwiiq bm = Henmon-Nelson IQ; hsrscorq = rank in high school class; srbmi = facial mass.

Table 2. Regressions of Attractiveness Ratings on Social Background and Academic Ability
by Gender: Wisconsin Longitudinal Study.

```
. regress ATTRACTIVENESS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr
        if sexrsp==1 (MALE)

      Source |       SS       df       MS              Number of obs =    1156
-------------+------------------------------           F(  6,  1149) =    1.15
       Model |  .051902635     6  .008650439           Prob > F      =  0.3288
    Residual |   8.6128889  1149  .007495987           R-squared     =  0.0060
-------------+------------------------------           Adj R-squared =  0.0008
       Total |  8.66479153  1155  .007501984           Root MSE      =  .08658

------------------------------------------------------------------------------
ATTRACTIVENESS|      Coef.   Std. Err.      t    P>|t|     [95% Conf.
Interval]
-------------+----------------------------------------------------------------
     bmfaedu |   .0003812   .0009194     0.41   0.679    -.0014228    .0021852
     bmmaedu |   .0005624   .0010406     0.54   0.589    -.0014793    .0026041
     bmfoc1u |  -.0000223   .0000135    -1.65   0.100    -.0000488    4.25e-06
      bmpin1 |  -9.80e-06   .0000422    -0.23   0.816    -.0000926     .000073
      sibstt |  -.0000342   .0010199    -0.03   0.973    -.0020353    .0019668
      bklvpr |   .0211812   .0114474     1.85   0.065    -.0012789    .0436412
        cons |  -.0228257   .0167518    -1.36   0.173    -.0556933    .0100419
------------------------------------------------------------------------------

.
. regress ATTRACTIVENESS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr
        if sexrsp==2 (FEMALE)

      Source |       SS       df       MS              Number of obs =    1337
-------------+------------------------------           F(  6,  1330) =    1.90
       Model |  .047954784     6  .007992464           Prob > F      =  0.0774
    Residual |  5.59056592  1330  .004203433           R-squared     =  0.0085
-------------+------------------------------           Adj R-squared =  0.0040
       Total |   5.6385207  1336   .00422045           Root MSE      =  .06483

------------------------------------------------------------------------------
ATTRACTIVENESS|      Coef.   Std. Err.      t    P>|t|     [95% Conf.
Interval]
-------------+----------------------------------------------------------------
     bmfaedu |  -.0002934   .0006998    -0.42   0.675    -.0016663    .0010795
     bmmaedu |    .000908   .0007375     1.23   0.218    -.0005387    .0023547
     bmfoc1u |  -6.92e-06   9.62e-06    -0.72   0.472    -.0000258    .0000119
      bmpin1 |  -9.35e-07   .0000365    -0.03   0.980    -.0000725    .0000706
      sibstt |   .0003689   .0007339     0.50   0.615    -.0010709    .0018087
      bklvpr |  -.0210822   .0068009    -3.10   0.002    -.0344238   -.0077406
        cons |   .0136758   .0105615     1.29   0.196    -.0070433    .0343948
------------------------------------------------------------------------------

.
. regress ATTRACTIVENESS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm
hsrscorq
        if sexrsp==1 (MALE)

      Source |       SS       df       MS              Number of obs =    1064
-------------+------------------------------           F(  8,  1055) =    1.29
       Model |  .081289248     8  .010161156           Prob > F      =  0.2436
    Residual |   8.2972445  1055  .007864687           R-squared     =  0.0097
-------------+------------------------------           Adj R-squared =  0.0022
       Total |  8.37853375  1063   .00788197           Root MSE      =  .08868

------------------------------------------------------------------------------
ATTRACTIVENESS|      Coef.   Std. Err.      t    P>|t|     [95% Conf.
Interval]
```

bmfaedu	.0005125	.0009832	0.52	0.602	-.0014167	.0024418
bmmaedu	.0008599	.0011076	0.78	0.438	-.0013135	.0030332
bmfoc1u	-.00002	.0000144	-1.39	0.164	-.0000483	8.23e-06
bmpin1	-5.59e-06	.0000436	-0.13	0.898	-.0000912	.00008
sibstt	-.0001155	.0010799	-0.11	0.915	-.0022344	.0020035
bklvpr	.0244011	.0120483	2.03	0.043	.0007598	.0480425
gwiiq bm	-.0001988	.0002293	-0.87	0.386	-.0006487	.0002512
hsrscorq	-.0001862	.0002373	-0.78	0.433	-.0006518	.0002793
cons	.0072776	.0268965	0.27	0.787	-.0454992	.0600544

.
. regress ATTRACTIVENESS bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm hsrscorq
if sexrsp==2 (FEMALE)

Source	SS	df	MS		
Model	.055466834	8	.006933354	Number of obs	= 1202
Residual	4.88384793	1193	.004093754	F(8, 1193)	= 1.69
Total	4.93931476	1201	.004112668	Prob > F	= 0.0956
				R-squared	= 0.0112
				Adj R-squared	= 0.0046
				Root MSE	= .06398

ATTRACTIVENESS	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bmfaedu	-.0003426	.0007418	-0.46	0.644	-.0017981	.0011128
bmmaedu	.0007413	.0007864	0.94	0.346	-.0008015	.0022842
bmfoc1u	-6.61e-06	.0000101	-0.66	0.511	-.0000263	.0000131
bmpin1	-2.72e-06	.0000373	-0.07	0.942	-.0000758	.0000704
sibstt	.000373	.0007607	0.49	0.624	-.0011195	.0018655
bklvpr	-.0211613	.0070076	-3.02	0.003	-.0349098	-.0074127
gwiiq bm	.0000172	.0001714	0.10	0.920	-.0003191	.0003534
hsrscorq	.0002158	.0001726	1.25	0.212	-.0001229	.0005544
cons	-.008527	.0176448	-0.48	0.629	-.0431454	.0260913

key to variables: bmfaed = father's years of schooling; bmmaed = mother's years of schooling; bmfoc1 = father's occupational status; bmpin1 = parents' income; sibstt = number of siblings; bklvpr = intact family; gwiiq bm = Henmon-Nelson IQ; hsrscorq = rank in high school class; std_pa_rate_trunc = facial attractiveness.

Table 3. Regressions of Educational Attainment on Social Background, Academic Ability,
Facial Attractiveness, and Facial Mass by Gender: Wisconsin Longitudinal Study.

```
.
. regress edeqyr bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr if sexrsp==1 (MALE)

      Source |       SS       df       MS              Number of obs =    1155
-------------+------------------------------           F(  6,  1148) =   27.57
       Model |  826.345149     6  137.724192            Prob > F      =  0.0000
    Residual |  5734.39424  1148  4.99511694            R-squared     =  0.1260
-------------+------------------------------           Adj R-squared =  0.1214
       Total |  6560.73939  1154  5.68521611            Root MSE      =   2.235

------------------------------------------------------------------------------
      edeqyr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |    .152475   .0237363     6.42   0.000     .1059037    .1990463
     bmmaedu |   .0517487   .0269086     1.92   0.055    -.0010469    .1045442
     bmfoc1u |   .0012207   .0003493     3.50   0.000     .0005355     .001906
      bmpin1 |   .0022388     .00109     2.05   0.040     .0001002    .0043773
      sibstt |    -.05544   .0263288    -2.11   0.035    -.1070979    -.003782
      bklvpr |  -.2125225   .2955211    -0.72   0.472    -.7923445    .3672994
        cons |   11.63139   .4325198    26.89   0.000     10.78277    12.48001
------------------------------------------------------------------------------

.
. regress edeqyr bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr if sexrsp==2
(FEMALE)

      Source |       SS       df       MS              Number of obs =    1337
-------------+------------------------------           F(  6,  1330) =   54.88
       Model |  858.874735     6  143.145789            Prob > F      =  0.0000
    Residual |  3469.34366  1330  2.60852907            R-squared     =  0.1984
-------------+------------------------------           Adj R-squared =  0.1948
       Total |   4328.2184  1336  3.23968443            Root MSE      =  1.6151

------------------------------------------------------------------------------
      edeqyr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |   .0748851   .0174334     4.30   0.000     .0406851     .109085
     bmmaedu |   .1038563   .0183709     5.65   0.000     .0678173    .1398953
     bmfoc1u |   .0012108   .0002395     5.05   0.000     .0007409    .0016808
      bmpin1 |   .0030824   .0009082     3.39   0.001     .0013007     .004864
      sibstt |  -.0704071   .0182832    -3.85   0.000    -.1062742   -.0345401
      bklvpr |  -.0738077   .1694183    -0.44   0.663     -.406164    .2585486
        cons |   10.97177   .2631006    41.70   0.000     10.45563    11.48791
------------------------------------------------------------------------------

.
. regress edeqyr bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm hsrscorq
        if sexrsp==1 (MALE)

      Source |       SS       df       MS              Number of obs =    1063
-------------+------------------------------           F(  8,  1054) =   77.54
       Model |  2264.43584     8   283.05448            Prob > F      =  0.0000
    Residual |  3847.44563  1054  3.65032792            R-squared     =  0.3705
-------------+------------------------------           Adj R-squared =  0.3657
       Total |  6111.88147  1062   5.7550673            Root MSE      =  1.9106

------------------------------------------------------------------------------
      edeqyr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |   .1305231   .0211838     6.16   0.000     .0889559    .1720902
     bmmaedu |   .0469793   .0239053     1.97   0.050      .000072    .0938866
     bmfoc1u |   .0008554   .0003106     2.75   0.006      .000246    .0014649
```

```
      bmpin1 |   .0011057   .0009396     1.18   0.240    -.0007379    .0029494
      sibstt |  -.0222694   .0232654    -0.96   0.339    -.0679211    .0233823
      bklvpr |   -.275829   .2595838    -1.06   0.288    -.7851888    .2335308
    gwiiq bm |   .0291555   .0049405     5.90   0.000      .019461    .0388499
    hsrscorq |   .0638467   .0051139    12.48   0.000     .0538121    .0738812
        cons |   2.875094   .5798091     4.96   0.000     1.737382    4.012805
------------------------------------------------------------------------------

.
. regress edeqyr bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm hsrscorq
        if sexrsp==2 (FEMALE)

      Source |       SS       df       MS              Number of obs =    1202
-------------+------------------------------           F(  8,  1193) =   62.25
       Model |  1115.14115     8  139.392644           Prob > F      =  0.0000
    Residual |  2671.23489  1193  2.23909043           R-squared     =  0.2945
-------------+------------------------------           Adj R-squared =  0.2898
       Total |  3786.37604  1201  3.15268613           Root MSE      =  1.4964

------------------------------------------------------------------------------
      edeqyr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |    .056732   .0173492     3.27   0.001     .0226935    .0907704
     bmmaedu |   .0698168    .018391     3.80   0.000     .0337345    .1058991
     bmfoc1u |    .000958   .0002353     4.07   0.000     .0004964    .0014196
      bmpin1 |   .0022236   .0008712     2.55   0.011     .0005143    .0039329
      sibstt |  -.0554735   .0177913    -3.12   0.002    -.0903793   -.0205677
      bklvpr |   .0573044   .1638863     0.35   0.727     -.264233    .3788418
    gwiiq bm |   .0082936   .0040077     2.07   0.039     .0004307    .0161566
    hsrscorq |   .0368569   .0040366     9.13   0.000     .0289371    .0447766
        cons |   6.738918   .4126601    16.33   0.000     5.929298    7.548538
------------------------------------------------------------------------------

.
. regress edeqyr bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm hsrscorq
std_pa_rate trunc srbmi
        if sexrsp==1 (MALE)

      Source |       SS       df       MS              Number of obs =    1063
-------------+------------------------------           F( 10,  1052) =   62.38
       Model |  2275.06407    10  227.506407           Prob > F      =  0.0000
    Residual |   3836.8174  1052  3.64716483           R-squared     =  0.3722
-------------+------------------------------           Adj R-squared =  0.3663
       Total |  6111.88147  1062   5.7550673           Root MSE      =  1.9098

------------------------------------------------------------------------------
      edeqyr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     bmfaedu |   .1299311   .0211774     6.14   0.000     .0883763     .171486
     bmmaedu |   .0460144   .0239262     1.92   0.055    -.0009341    .0929628
     bmfoc1u |   .0008785   .0003108     2.83   0.005     .0002687    .0014883
      bmpin1 |   .0011131   .0009392     1.19   0.236    -.0007298    .0029559
      sibstt |  -.0221086   .0232591    -0.95   0.342    -.0677481    .0235309
      bklvpr |  -.3033512   .2599718    -1.17   0.244    -.8134734     .206771
    gwiiq bm |   .0293899   .0049423     5.95   0.000     .0196919    .0390878
    hsrscorq |   .0640513   .0051131    12.53   0.000     .0540183    .0740843
ATTRACTIVE . |    1.13561   .6669711     1.70   0.089    -.1731353    2.444355
FACIAL MASS  |   .0041245   .0694871     0.06   0.953    -.1322245    .1404736
        cons |   2.865989   .5802364     4.94   0.000     1.727437    4.004542
------------------------------------------------------------------------------

.
. regress edeqyr bmfaed bmmaed bmfoc1 bmpin1 sibstt bklvpr gwiiq_bm hsrscorq
std_pa_rate_trunc srbmi
        if sexrsp==2 (FEMALE)

      Source |       SS       df       MS              Number of obs =    1202
```

Model	1147.46067	10	114.746067	F(10, 1191)	51.79
Residual	2638.91537	1191	2.21571399	Prob > F	0.0000
				R-squared	0.3030
				Adj R-squared	0.2972
Total	3786.37604	1201	3.15268613	Root MSE	1.4885

edeqyr	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bmfaedu	.05517	.0172702	3.19	0.001	.0212866	.0890535
bmmaedu	.0668829	.0183114	3.65	0.000	.0309566	.1028091
bmfoc1u	.0009214	.0002345	3.93	0.000	.0004613	.0013814
bmpin1	.0021877	.0008667	2.52	0.012	.0004872	.0038882
sibstt	-.0551751	.0177015	-3.12	0.002	-.0899047	-.0204456
bklvpr	.1009063	.1637321	0.62	0.538	-.2203291	.4221417
gwiiq bm	.0077488	.0039898	1.94	0.052	-.0000791	.0155767
hsrscorq	.0363147	.004019	9.04	0.000	.0284296	.0441998
ATTRACTIVE .	1.322106	.6739667	1.96	0.050	-.0001881	2.6444
FACIAL MASS	-.1767291	.0528628	-3.34	0.001	-.2804437	-.0730144
cons	6.865842	.4120122	16.66	0.000	6.057492	7.674193

key to variables: edeqyr = educational attainment; bmfaed = father's years of schooling; bmmaed = mother's years of schooling; bmfoc1 = father's occupational status; bmpin1 = parents' income; sibstt = number of siblings; bklvpr = intact family; gwiiq bm = Henmon-Nelson IQ; hsrscorq = rank in high school class; std_pa_rate_trunc = facial attractiveness; srbmi = facial mass.

Figure 1 The Wisconsin Model

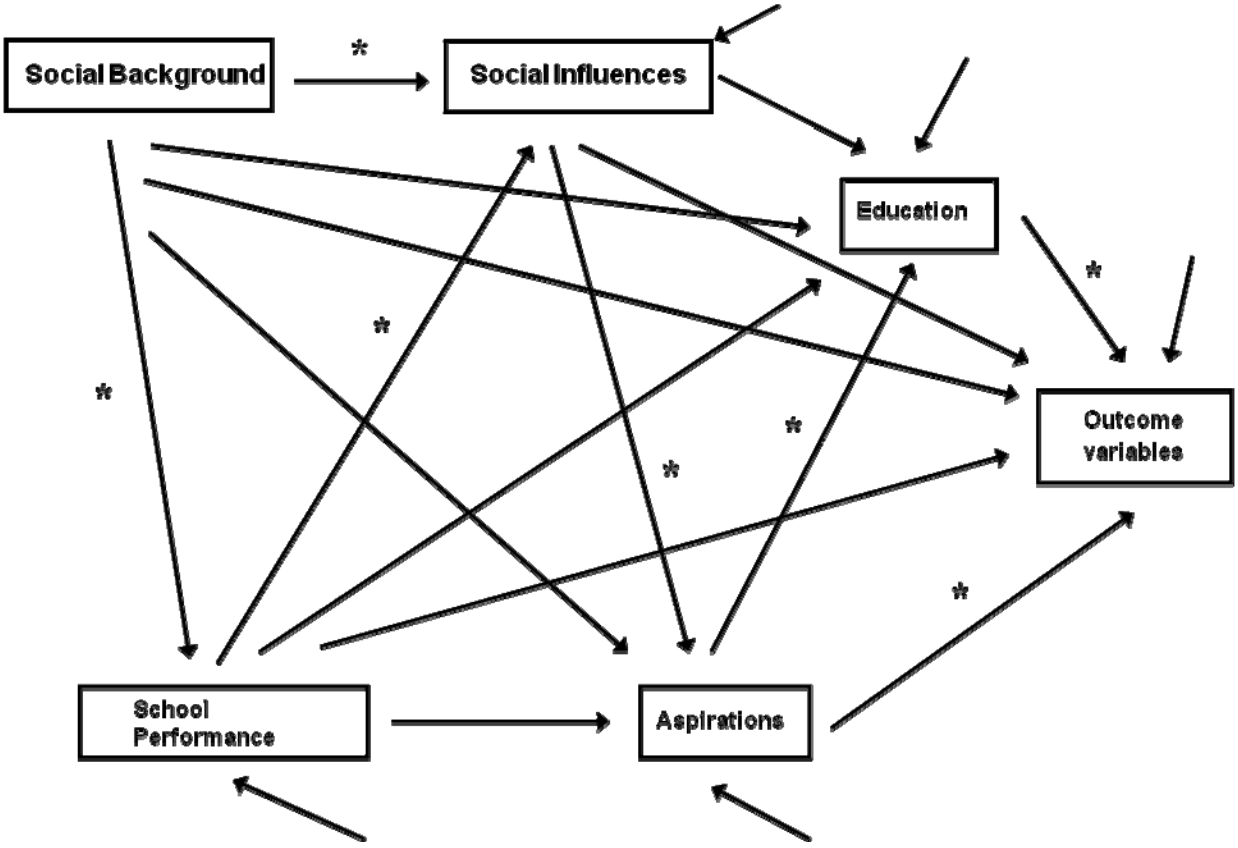

Figure 2. Model of Relative Body Mass (RBM) Scale Used to Code Yearbook Photographs of Male Participants in the Wisconsin Longitudinal Study (WLS)