# Supporting Information

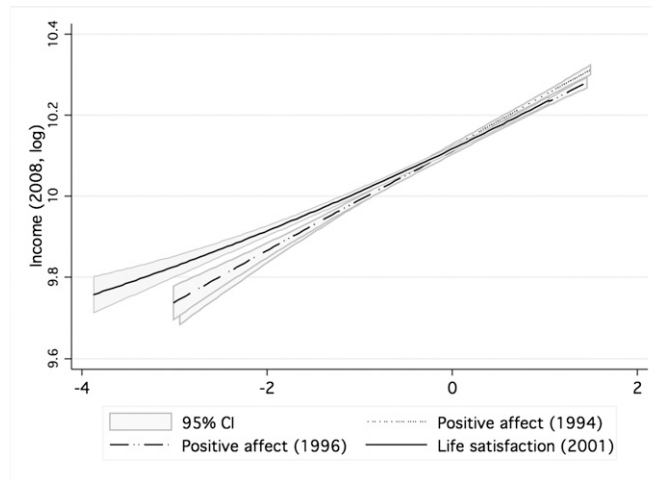## De Neve and Oswald 10.1073/pnas.1211437109



**Fig. S1.** Sibling fixed-effects model (Table 2) predicted values. Quadratic fits with 95% confidence intervals.
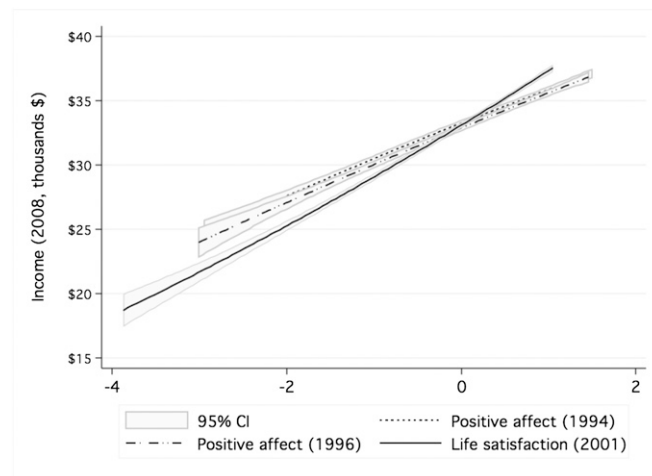


**Fig. S2.** Sibling fixed-effects model predicted values using identical specification as in Table 2 except taking absolute income values instead of natural log. Quadratic fits are presented with 95% confidence intervals.

**Table S1. Correlations table for income and subjective well-being in Add Health data**

|  | Income | PA1994 | PA1996 | LS2001 | PA2008 |
|---|---|---|---|---|---|
| Income (2008) | 1.0000 |  |  |  |  |
| Positive affect (1994) | 0.0777 | 1.0000 |  |  |  |
|  | 0.0000 |  |  |  |  |
| Positive affect (1996) | 0.0905 | 0.4892 | 1.0000 |  |  |
|  | 0.0000 | 0.0000 |  |  |  |
| Life satisfaction (2001) | 0.0856 | 0.1357 | 0.1730 | 1.0000 |  |
|  | 0.0000 | 0.0000 | 0.0000 |  |  |
| Positive affect (2008) | 0.0950 | 0.2529 | 0.2887 | 0.2505 | 1.0000 |
|  | 0.0000 | 0.0000 | 0.0000 | 0.0000 |  |

Significance levels ($P$ value) are given below correlation coefficients.

**Table S2. Variable descriptions**

| Variable | Source | Range | N | Mean | SD |
|---|---|---|---|---|---|
| Income (2008) | Now think about your personal earnings. In {2006/2007/2008}, how much income did you receive from personal earnings before taxes, that is, wages or salaries, including tips, bonuses, and overtime pay, and income from self-employment? | $0 – $920,000 | 14,914 | 34,632 | 38,284 |
| Positive affect (1994) | CES-D subindex additively composed of: How often was each of the following true during the last week? You felt that you were just as good as other people You felt hopeful about the future You were happy You enjoyed life | 0. Never or rarely 1. Sometimes 2. A lot of the time 3. Most of the time or all of the time Additive index 0–12 | 20,648 | 7.96 | 2.70 |
| Positive affect (1996) | Idem | Idem | 14,698 | 8.08 | 2.69 |
| Life satisfaction (2001) | How satisfied are you with your life as a whole? | 1. Very satisfied 2. Satisfied 3. Neither satisfied n or dissatisfied 4. Dissatisfied 5. Very dissatisfied | 15,157 | 4.15 | 0.81 |
| Positive affect (2008) | CES-D subindex additively composed of: How often was each of the following true during the last week? You felt that you were just as good as other people You were happy You enjoyed life ["You felt hopeful about the future" is not available] | 0. Never or rarely 1. Sometimes 2. A lot of the time 3. Most of the time or all of the time additive index 0–9 | 15,687 | 6.67 | 2.06 |
| Male | | Dummy | 20,743 | 0.49 | 0.50 |
| Age (2001) | | 18–27 | 15,170 | 22.0 | 1.77 |
| White | | Dummy | 20,704 | 0.62 | 0.49 |
| Black | | Dummy | 20,704 | 0.23 | 0.42 |
| Hispanic | | Dummy | 20,745 | 0.17 | 0.38 |
| Asian | | Dummy | 20,704 | 0.08 | 0.27 |
| Job (2008) | Are you currently working for pay at least 10 h a week? | Dummy | 13,016 | 0.78 | 0.41 |
| Supervision (2008) | Thinking about your official job duties, which of the following statements best describes your supervisory responsibilities at your (current/ most recent) primary job? | 0. I (do/did) not supervise anyone 1. I (supervise/supervised) other employees 2. I (supervise/supervised) other employees, some of whom (supervise/supervised) others | 15,447 | 0.46 | 0.67 |
| Married (2008) | What is the current status of your marriage to {initials}? 1. Living together 2. Living apart because of legal separation 3. Living apart because of other reason such as career, military service, family illness, etc. 4. Legitimate skip | Dummy (loading respondents of categories 1 and 3) | 15,216 | 0.42 | 0.49 |
| College (2008) | College degree or higher | Dummy | 15,697 | 0.32 | 0.46 |
| Medication (2001) | In the past 12 mo, have you taken any prescription medication—that is, a medicine that must be prescribed by a doctor or nurse? | Dummy | 15,150 | 0.61 | 0.49 |
| Optimism (2008) | LOT-R Optimism index additively composed of: 1. I'm always optimistic about my future* 2. I hardly ever expect things to go my way 3. Overall, I expect more good things to happen to me than bad* 4. I rarely count on good things happening to me | 1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree Additive index 4–20 | 15,672 | 14.88 | 2.45 |

| Variable | Source | Range | N | Mean | SD |
|---|---|---|---|---|---|
| Self-esteem (1994) | Compared with other people your age, how intelligent are you? | 1. Moderately below average<br>2. Slightly below average<br>3. About average<br>4. Slightly above average<br>5. Moderately above average<br>6. Extremely above average | 20,644 | 3.85 | 1.10 |
| Self-esteem (1996) | Idem | Idem | 14,704 | 3.94 | 1.10 |
| Self-esteem (2001) | Idem | Idem | 15,121 | 3.96 | 1.07 |
| Openness (2008) | Openness to experience index additively composed of:<br>I have a vivid imagination*<br>I am not interested in abstract ideas<br>I have difficulty understanding abstract ideas<br>I do not have a good imagination | 1. Strongly agree<br>2. Agree<br>3. Neither agree nor disagree<br>4. Disagree<br>5. Strongly disagree<br>Additive index 4–20 | 15,509 | 14.50 | 2.45 |
| Conscientiousness (2008) | Conscientiousness index additively composed of:<br>I get chores done right away*<br>I often forget to put things back in their proper place<br>I like order*<br>I make a mess of things | Idem | 15,657 | 14.64 | 2.70 |
| Extraversion (2008) | Extraversion index additively composed of:<br>I am the life of the party*<br>I don't talk a lot<br>I talk to a lot of different people at parties*<br>I keep in the background | Idem | 15,634 | 13.22 | 3.06 |
| Agreeableness (2008) | I sympathize with others' feelings*<br>I am not interested in other people's problems<br>I feel others' emotions*<br>I keep in the background | Idem | 15,644 | 15.24 | 2.41 |
| Neuroticism (2008) | I have frequent mood swings*<br>I am relaxed most of the time<br>I get upset easily*<br>I seldom feel blue | Idem | 15,652 | 10.45 | 2.74 |

*Reverse coded.

### Table S3.   Distribution table positive affect

| Positive affect | Frequency | Percent | Cumulative frequency |
|---|---|---|---|
| 0 | 84 | 0.41 | 0.41 |
| 1 | 127 | 0.62 | 1.02 |
| 2 | 308 | 1.49 | 2.51 |
| 3 | 661 | 3.20 | 5.71 |
| 4 | 1,268 | 6.14 | 11.86 |
| 5 | 1,563 | 7.57 | 19.43 |
| 6 | 2,167 | 10.49 | 29.92 |
| 7 | 2,405 | 11.65 | 41.57 |
| 8 | 2,810 | 13.61 | 55.18 |
| 9 | 2,659 | 12.88 | 68.06 |
| 10 | 2,270 | 10.99 | 79.05 |
| 11 | 2,103 | 10.19 | 89.23 |
| 12 | 2,223 | 10.77 | 100.00 |
| Total | 20,648 | 100.00 | |

Data are from 1994.

**Table S4. Distribution table positive affect**

| Positive affect | Frequency | Percent | Cumulative frequency |
|---|---|---|---|
| 0 | 34 | 0.23 | 0.23 |
| 1 | 108 | 0.73 | 0.97 |
| 2 | 198 | 1.35 | 2.31 |
| 3 | 421 | 2.86 | 5.18 |
| 4 | 867 | 5.90 | 11.08 |
| 5 | 1,092 | 7.43 | 18.51 |
| 6 | 1,423 | 9.68 | 28.19 |
| 7 | 1,641 | 11.16 | 39.35 |
| 8 | 2,080 | 14.15 | 53.50 |
| 9 | 1,906 | 12.97 | 66.47 |
| 10 | 1,662 | 11.31 | 77.78 |
| 11 | 1,543 | 10.50 | 88.28 |
| 12 | 1,723 | 11.72 | 100.00 |
| Total | 14,698 | 100.00 | |

Data are from 1996.

**Table S5. Distribution table life satisfaction**

| Life satisfaction | Frequency | Percent | Cumulative frequency |
|---|---|---|---|
| 1 | 92 | 0.61 | 0.61 |
| 2 | 534 | 3.52 | 4.13 |
| 3 | 1,908 | 12.59 | 16.72 |
| 4 | 7,097 | 46.82 | 63.54 |
| 5 | 5,526 | 36.46 | 100.00 |
| Total | 15,157 | 100.00 | |

Data are from 2001.

**Table S6. Distribution table positive affect**

| Positive affect | Frequency | Percent | Cumulative frequency |
|---|---|---|---|
| 0 | 48 | 0.31 | 0.31 |
| 1 | 95 | 0.61 | 0.91 |
| 2 | 306 | 1.95 | 2.86 |
| 3 | 1,019 | 6.50 | 9.36 |
| 4 | 1,156 | 7.37 | 16.73 |
| 5 | 1,552 | 9.89 | 26.62 |
| 6 | 2,694 | 17.17 | 43.79 |
| 7 | 2,410 | 15.36 | 59.16 |
| 8 | 2,186 | 13.94 | 73.09 |
| 9 | 4,221 | 26.91 | 100.00 |
| Total | 15,687 | 100.00 | |

Data are from 2008.

**Table S7. Individual fixed-effects models of log income on lagged subjective well-being and covariates**

| | FE | | Prais (Cochrane-Orcutt) | |
|---|---|---|---|---|
| | Coeff. | P value | Coeff. | P value |
| SWB (lagged) | 0.50 | 0.000 | 0.136 | 0.000 |
| Intercept | 7.55 | 0.000 | 9.66 | 0.000 |
| N | 20,436 | | 7,035 | |
| N groups | 13,401 | | | |
| $R^2$ | 0.12 | | 0.12 | |
| Durbin–Watson | 0.82 | | | |

Note that this time series only covers two time periods for which earnings are available (2001 and 2008). Subjective well-being variables are transformed into 5-point scales.

**Table S8. Granger causality tests**

| | Log income (2008) | | Positive affect (2008) | |
|---|---|---|---|---|
| | Coeff. | P value | Coeff. | P value |
| Log income (lagged, 2001) | 0.033 | 0.000 | 0.002 | 0.643 |
| Life satisfaction (lagged, 2001) | 0.113 | 0.000 | 0.262 | 0.000 |
| Intercept | 9.92 | 0.000 | −0.00 | 0.000 |
| N | 9,090 | | 10,024 | |
| $R^2$ | 0.02 | | 0.07 | |
| F-test Life satisfaction (P value) | 0.000 | | | |
| F-test Log income (P value) | | | 0.643 | |

Granger causality tests analyze whether lagged observations of income (2001) and life satisfaction (2001) have incremental forecasting power when added to a univariate autoregressive representation of income (2008) and positive affect (2008).

**Table S9. Multivariate mediation test on log income (2008)**

| | Independent variable | | | | | |
|---|---|---|---|---|---|---|
| | Positive affect (1994) | | Positive affect (1996) | | Life satisfaction (2001) | |
| Mediating variables | Coeff. | P value | Coeff. | P value | Coeff. | P value |
| Job (2008) | 0.013 | 0.000 | 0.020 | 0.000 | 0.017 | 0.000 |
| Supervision (2008) | 0.005 | 0.000 | 0.005 | 0.000 | 0.004 | 0.001 |
| College (2008) | 0.032 | 0.000 | 0.036 | 0.000 | 0.026 | 0.000 |
| Married (2008) | 0.002 | 0.001 | 0.003 | 0.002 | 0.011 | 0.000 |
| Optimism (2008) | 0.010 | 0.000 | 0.009 | 0.006 | 0.008 | 0.001 |
| Self-esteem (2008) | 0.004 | 0.012 | 0.005 | 0.014 | 0.001 | 0.040 |
| Openness (2008) | −0.001 | 0.624 | −0.000 | 0.812 | −0.000 | 0.998 |
| Conscientiousness (2008) | 0.001 | 0.283 | 0.005 | 0.537 | 0.001 | 0.248 |
| Extraversion (2008) | 0.005 | 0.000 | 0.005 | 0.001 | 0.003 | 0.001 |
| Agreeableness (2008) | −0.008 | 0.000 | −0.009 | 0.000 | −0.003 | 0.001 |
| Neuroticism (2008) | 0.013 | 0.002 | 0.015 | 0.000 | 0.014 | 0.000 |
| Proportion of total effect that is mediated, % | 68 | | 77 | | 78 | |

Multivariate mediation tests for multiple potentially mediating variables considered jointly that may partially carry the effect from lagged SWB to Log income. Presented are the mediation test coefficient, P value, and the proportion of the total effect that is mediated (%). All variable coefficients are standardized. Descriptive statistics are provided in Table S2. The mediated (indirect) effect is tabulated using the product of the coefficients method that multiplies the regression coefficients from the IV on MV and MV on DV regressions. These sets of coefficients and their SEs are obtained using "seemingly unrelated regression" (sureg in Stata). The mediated effect is obtained by multiplying the coefficients using the "non-linear combination" command (nlcom in Stata) and these single mediated effects are considered additively when tabulating the total indirect or mediated effect (also using nlcom in Stata). For a detailed description and example, see www.ats.ucla.edu/stat/stata/faq/mulmediation.htm.