Early-life correlates of later-life well-being: Evidence from the Wisconsin Longitudinal Study

Andrew Clark (PSE-CNRS)
Tom Lee (University of Chicago)

13\textsuperscript{th} December 2016
We like to analyse birth-cohort datasets

These provide measures of child/adolescent outcomes and of family background at the time at which they occurred, rather than as they are recalled many years later.

We here consider the determinants of adult later-life subjective well-being in the Wisconsin Longitudinal Survey: a random sample of 10,317 men and women who were born in 1938/1939.
This is actually NOT birth-cohort data, but rather starts when the respondents were in the last year of High School.

But its venerable age does mean that we can look at later-life well-being.

And in addition, it includes multiple measures of well-being, which is unusual.
DATA

• Initial data collection before high-school graduation in Wisconsin in 1957: respondents mostly born in 1938/1939.

• Periodically re-surveyed. The last three waves (1993, 2004 and 2011) contain multiple well-being measures.

• We thus consider adult outcomes at ages of roughly 54, 65 and 72.
WELL-BEING MEASURES

Self-reported Health

• “How would you rate your health at the present time?” Answers between 1 (very poor) and 5 (excellent).

Depression

• CES-D depression scale from 20 questions about how many days over the past week the individual has felt certain emotions (16 negative, 4 positive). E.g. lonely, sad, happy, hopeful.
WELL-BEING MEASURES

Eudaimonia

• A scale from questions about autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance

Health Utilities Index (Mark 3)

• A scale from questions about vision, hearing, speech, ambulation, dexterity, emotion, cognition and pain.
WELL-BEING MEASURES

Happiness

- From the emotion component of HUI. The final variable is measured on a 1 to 5 scale ranging from "So unhappy that life is not worthwhile" to "Happy and interested in life".
WELL-BEING MEASURES

These all appear in 2011, so we can compare them then.

Table 1: 2011 Well-being Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Self-reported Health</th>
<th>Depression</th>
<th>Eudaimonia</th>
<th>Health Utilities Index</th>
<th>Happiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-reported Health</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>-.29</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eudaimonia</td>
<td>.27</td>
<td>-.28</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Utilities Index</td>
<td>.48</td>
<td>-.36</td>
<td>.31</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Happiness</td>
<td>.27</td>
<td>-.42</td>
<td>.25</td>
<td>.49</td>
<td>1.00</td>
</tr>
</tbody>
</table>

The correlations are fairly small: the measures are far from being identical.
## DISTAL CONTROL VARIABLES

<table>
<thead>
<tr>
<th></th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Every-question Respondent</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IQ Score</td>
<td>2189</td>
<td>104.8</td>
<td>14.3</td>
<td>61</td>
<td>145</td>
</tr>
<tr>
<td>Log Parental Income</td>
<td>2189</td>
<td>10.6</td>
<td>0.68</td>
<td>7.3</td>
<td>13.6</td>
</tr>
<tr>
<td>Parental Education</td>
<td>2189</td>
<td>10.3</td>
<td>2.7</td>
<td>2.5</td>
<td>21</td>
</tr>
<tr>
<td>Single Parent Household</td>
<td>2189</td>
<td>0.10</td>
<td>0.24</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Siblings</td>
<td>2189</td>
<td>3.1</td>
<td>2.4</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>Female</td>
<td>2189</td>
<td>0.54</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
PROXIMAL CONTROL VARIABLES

In 1975:
• Years of schooling

In all of 1993, 2004 and 2011:
• Log income
• Social participation
• Marital Status
• Labour-force status
METHOD

- All regressions are OLS
- All variables are standardised
- We use Inverse Probability Weighting to address attrition
- We check that the results are not affected if we replace missing values via multiple imputation
# RESULTS

<table>
<thead>
<tr>
<th>Distal Variables</th>
<th>(1) Self-reported Health</th>
<th>(2) Depression</th>
<th>(3) Eudaimonia</th>
<th>(4) Health Utilities Index</th>
<th>(5) Happiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ Score</td>
<td>0.00655</td>
<td>-0.0760***</td>
<td>0.00956</td>
<td>-0.0110</td>
<td>-0.0170</td>
</tr>
<tr>
<td></td>
<td>(0.0249)</td>
<td>(0.0266)</td>
<td>(0.0241)</td>
<td>(0.0240)</td>
<td>(0.0252)</td>
</tr>
<tr>
<td>Log Parental Income</td>
<td>0.0542**</td>
<td>-0.0295</td>
<td>0.0259</td>
<td>0.0548**</td>
<td>0.0428*</td>
</tr>
<tr>
<td></td>
<td>(0.0220)</td>
<td>(0.0265)</td>
<td>(0.0222)</td>
<td>(0.0227)</td>
<td>(0.0230)</td>
</tr>
<tr>
<td>Parental Education</td>
<td>0.0460**</td>
<td>-0.00340</td>
<td>0.000143</td>
<td>0.0310</td>
<td>0.0330</td>
</tr>
<tr>
<td></td>
<td>(0.0225)</td>
<td>(0.0240)</td>
<td>(0.0226)</td>
<td>(0.0229)</td>
<td>(0.0221)</td>
</tr>
<tr>
<td>Single-Parent Household</td>
<td>0.0205</td>
<td>-0.0226</td>
<td>0.0238</td>
<td>0.0532**</td>
<td>0.0324</td>
</tr>
<tr>
<td></td>
<td>(0.0271)</td>
<td>(0.0302)</td>
<td>(0.0179)</td>
<td>(0.0227)</td>
<td>(0.0242)</td>
</tr>
<tr>
<td>Siblings</td>
<td>0.0206</td>
<td>-0.00468</td>
<td>-0.0213</td>
<td>0.00251</td>
<td>-0.00775</td>
</tr>
<tr>
<td></td>
<td>(0.0226)</td>
<td>(0.0298)</td>
<td>(0.0188)</td>
<td>(0.0258)</td>
<td>(0.0278)</td>
</tr>
</tbody>
</table>

1957 variables continue to play a role in 2011, even controlling for proximal outcomes

- IQ associated with lower depression
- Family income with better health (both measures) and higher happiness
## RESULTS

<table>
<thead>
<tr>
<th></th>
<th>(1) Self-reported Health</th>
<th>(2) Depression</th>
<th>(3) Eudaimonia</th>
<th>(4) Health Utilities Index</th>
<th>(5) Happiness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proximal Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of Schooling</td>
<td>0.119***</td>
<td>-0.0503**</td>
<td>0.0849***</td>
<td>0.0616***</td>
<td>0.0228</td>
</tr>
<tr>
<td></td>
<td>(0.0216)</td>
<td>(0.0210)</td>
<td>(0.0205)</td>
<td>(0.0211)</td>
<td>(0.0200)</td>
</tr>
<tr>
<td>Log Household Income</td>
<td>0.0376</td>
<td>-0.0582**</td>
<td>0.0448**</td>
<td>0.0540**</td>
<td>0.0297</td>
</tr>
<tr>
<td></td>
<td>(0.0235)</td>
<td>(0.0268)</td>
<td>(0.0222)</td>
<td>(0.0242)</td>
<td>(0.0245)</td>
</tr>
<tr>
<td>Social Participation</td>
<td>0.0843***</td>
<td>-0.0251</td>
<td>0.178***</td>
<td>0.0750***</td>
<td>0.0851***</td>
</tr>
<tr>
<td></td>
<td>(0.0224)</td>
<td>(0.0255)</td>
<td>(0.0273)</td>
<td>(0.0233)</td>
<td>(0.0236)</td>
</tr>
<tr>
<td>Separated</td>
<td>-0.0524**</td>
<td>0.0268</td>
<td>-0.00589</td>
<td>-0.0628**</td>
<td>-0.0535**</td>
</tr>
<tr>
<td></td>
<td>(0.0224)</td>
<td>(0.0243)</td>
<td>(0.0194)</td>
<td>(0.0249)</td>
<td>(0.0252)</td>
</tr>
<tr>
<td>Widowed</td>
<td>-0.0202</td>
<td>0.0407</td>
<td>-0.0294</td>
<td>-0.0100</td>
<td>-0.0468*</td>
</tr>
<tr>
<td></td>
<td>(0.0220)</td>
<td>(0.0287)</td>
<td>(0.0228)</td>
<td>(0.0228)</td>
<td>(0.0264)</td>
</tr>
<tr>
<td>Never Married</td>
<td>-0.0289*</td>
<td>0.0360</td>
<td>-0.0609***</td>
<td>-0.0390*</td>
<td>-0.0393*</td>
</tr>
<tr>
<td></td>
<td>(0.0168)</td>
<td>(0.0238)</td>
<td>(0.0225)</td>
<td>(0.0229)</td>
<td>(0.0236)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>-0.0685***</td>
<td>0.0511**</td>
<td>-0.0298*</td>
<td>-0.116***</td>
<td>-0.0528***</td>
</tr>
<tr>
<td></td>
<td>(0.0198)</td>
<td>(0.0212)</td>
<td>(0.0174)</td>
<td>(0.0216)</td>
<td>(0.0204)</td>
</tr>
<tr>
<td>Retired</td>
<td>-0.0767***</td>
<td>0.0105</td>
<td>-0.0267</td>
<td>-0.0660***</td>
<td>-0.0273</td>
</tr>
<tr>
<td></td>
<td>(0.0216)</td>
<td>(0.0231)</td>
<td>(0.0201)</td>
<td>(0.0207)</td>
<td>(0.0229)</td>
</tr>
<tr>
<td>Female</td>
<td>0.195***</td>
<td>0.0667</td>
<td>0.156***</td>
<td>0.0468</td>
<td>-0.0123</td>
</tr>
<tr>
<td></td>
<td>(0.0443)</td>
<td>(0.0468)</td>
<td>(0.0421)</td>
<td>(0.0452)</td>
<td>(0.0458)</td>
</tr>
</tbody>
</table>
RESULTS

• Regarding the proximal variables, happiness in our 72 year-olds is correlated with marital status and social participation.
• But depression is rather correlated with schooling and income.
• Self-assessed health depends on all of schooling, social participation and marital status.
RESULTS

How similar are the estimated coefficients across the five well-being measures?
• The estimated coefficients for self-assessed health and HUI are (unsurprisingly) similar; but they are both also similar to those for eudaimonia.
• The estimated coefficients for happiness and depression are not that strongly correlated for this sample.
CHANNELS

• Adult years of schooling and income all depend on child IQ, parental income and parental education

• We find little effect of single-parent households or of number of siblings on adult outcomes
Figure 1: Self-Reported Health: Distal Correlates

- IQ Score
- Log Parental Income
- Parental Education
- Single Parent Household
- Siblings

Legend:
- 1993
- 2004
- 2011
DIFFERENT ADULT AGES

Figure 2: Self-Reported Health: Proximal Correlates

- Years of Schooling
- Log Household Income
- Social Participation
- Separated
- Widowed
- Never Married
- Unemployed
- Not in Labour Force
- Retired

1993 2004 2011
DIFFERENT ADULT AGES

Figure 3: Depression: Distal Correlates
Figure 4: Depression: Proximal Correlates

- Years of Schooling
- Personal Income
- Unemployed
- Not in Labour Force
- Separated
- Widowed
- Never Married
- Social Participation
- Retired

DIFFERENT ADULT AGES

Figure 5: Eudaimonia: Distal Correlates

- IQ score (1957)
- Parental Income (1957)
- Single Parent Household
- Siblings (1957)
- Parental Education

1993 vs. 2011
DIFFERENT ADULT AGES

Figure 6: Eudaimonia: Proximal Correlates

- Years of Schooling
- Log Household Income
- Social Participation
- Separated
- Widowed
- Never Married
- Unemployed
- Not in Labour Force
- Retired

1993 vs 2011
CONCLUSIONS

- Distal variables affect well-being 50+ years later, even controlling for proximal outcomes
- They do not fade away between ages 54 and 72
- Especially true for IQ, family income and parental education
- Happiness is most strongly related to social participation and marital status: to relations with others
- The determinants of happiness and depression differ
- But health and eudaimonia look surprisingly similar to each other
APPENDIX

Distal Variables

IQ Score (1957)
Log Parental Income (1957-60)
Parental Education (1957)
Single Parent Household (1975)
Number of Siblings (1975)

IQ score mapped from raw Henmon-Nelson test score
Average Parental Income (1957-1960) - from tax data
(Corrected for inflation using the CPI index from the Bureau of Labor Statistics)
Average number of years of schooling of parents
Did you live with both parents most of time up until 1957?
Total number of siblings
APPENDIX

Proximal Variables

**Years of Schooling (1975)**
Total years of schooling

Household income per OECD adult equivalent (extra adults 0.7; children 0.5)
For respondent and spouse: Reported income from wages, farm, interest, social security, pensions, public assistance, other government programs, child support, alimony, and other sources of income - child support and alimony expenditure
For other household members: Total reported income
(Corrected for inflation using the CPI index from the Bureau of Labor Statistics)

Sum of replies to participation question across 17 types of groups*

*What is your level of involvement with...?*
Great Deal = 4
Quite a Bit = 3
Some = 2
Very little = 1
Not involved = 0

*What is your current marital status?*
Married (omitted dummy variable category)
Separated
Divorced (Included under separated dummy variable)
Widowed
Never married

Constructed from variables:
1993: *Current employment status*
1993: *Ever work in paid labor force from 1975 to 1992/93*
2004/2011: *Flag for current employment and retirement status*