HRS Replication Package

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Abstract
Subjective age is associated with health-related outcomes across adulthood. The present study examined the cross-sectional and longitudinal associations between personality traits and subjective age. Participants (N > 31,000) were from the Midlife in the United States Study (MIDUS), the Health and Retirement Study (HRS), the National Health and Aging Study (NHATS), the Wisconsin Longitudinal Study Graduate (WLSG) and Siblings (WLSS) samples, and the English Longitudinal Study of Ageing (ELSA). Demographic factors, personality traits, and subjective age were assessed at baseline. Subjective age was assessed again in the MIDUS, the HRS, and the NHATS, 4 to almost 20 years later. Across the samples and a meta-analysis, higher neuroticism was related to an older subjective age, whereas higher extraversion, openness, agreeableness, and conscientiousness were associated with a younger subjective age. Self-rated health, physical activity, chronic conditions, and depressive symptoms partially mediated these relationships. There was little evidence that chronological age moderated these associations. Multilevel longitudinal analyses found similar associations with the intercept and weak evidence for an association with the slope in the opposite of the expected direction: Lower neuroticism and higher extraversion, agreeableness, and conscientiousness were related to feeling relatively older over time. The present study provides replicable and robust evidence that personality is related to subjective age. It extends existing conceptualization of subjective age as a biopsychosocial marker of aging by showing that how old or young individuals feel partly reflects personality traits.
Key-words: subjective age, personality traits, adulthood

List of HRS public files used:

- **HRS 2008 :**
- Section PR (Respondent)
- Section C : Physical Health (Respondent)
- Section D : Cognition (Respondent)
- Section I : Physical Measures (Respondent)
- Section LB : Leave-Behind Questionnaires (Respondent)
- **HRS 2010:**
- Section PR (Respondent)
- Section C : Physical Health (Respondent)

- Section D : Cognition (Respondent)
- Section I : Physical Measures (Respondent)
- Section LB : Leave-Behind Questionnaires (Respondent)

- **HRS 2012**
- Section LB : Leave-Behind Questionnaires (Respondent)

- **HRS 2014**
- Section LB : Leave-Behind Questionnaires (Respondent)

- **HRS 2016**
- Section LB : Leave-Behind Questionnaires (Respondent)

- **HRS 2018**
- Section LB : Leave-Behind Questionnaires (Respondent)

- **Tracker File**
- Section TR : HRS 2018 Early Release Tracker File Version 2 (Respondent)

Step-by-step documentation

In each data file, we extracted the variables HHID (Household identification number) and PN (Respondent person identification number).

The following items were extracted from the public data file listed above :

- From the HRS 2008 Leave Behind Questionnaire, we extracted :
  - The items from the Midlife Development Inventory to assess personality : LLB033A to LLB033Z
  - The item LLB029A to assess felt age :

  Given that the HRS used a half-sample strategy, we extracted the corresponding items assessing personality (MLB033A, MLB033B, MLB033D, MLB330E, MLB033F, MLB033G, MLB033H, MLB033I, MLB033J, MLB033K, MLB033L, MLB033M, MLB033N, MLB033O, MLB033P, MLB033Q, MLB033S, MLB033T, MLB033U, MLB033V, MLB033W, MLB033Y, MLB033Z_2, MLB033Z_3, MLB033Z_4, MLB033Z_5) and felt age (MLB029A) in the 2010 Leave-Behind Questionnaire for the other half of the sample. Accordingly, demographic factors, disease burden, physical activity, BMI, and depressive symptoms were assessed either in 2008 or in 2010. Both waves were combined.

- From the HRS 2008 and 2010 Physical Health files, we extracted:
  - Chronic conditions: LC005 (MC005), LC010 (MC010), LC018(MC018), LC030(MC030), LC036(MC036), LC053(MC053), LC070(MC070)
  - Physical activity : LC223(MC223), LC224(MC224)
- From the HRS 2008 and 2010 Cognition files, we extracted :
  - The items from the CESD to assess depressive symptoms : LD110 to LD117(MD110 to MD117)
- From the HRS 2008 and 2010 Physical Measures files, we extracted :
  - Height (2008: LI834; 2010: MI834)
  - Weight (2008: LI841; 2010: MI841)
- From the HRS 2008 and 2010 Pre-load files, we extracted :

- Sex (2008: LX060R ; 2010: MX060R)
- Education (2008: LZ216 ; 2010: MZ216)

- From the Tracker File, we extracted the following variables:
  - LAGE (age at 2008 interview) and MAGE (age at 2010 interview)
  - RACE (Race/ethnicity)
- We extracted follow-up measures of felt age from the Leave Behind Questionnaire:
  - In 2012 (NLB029A) and 2016 (PLB028A) for the 2008 sample
  - In 2014 (OLB028A) and 2018 (QLB028A) for the 2010 sample
- We extracted follow-up assessments of chronological age from the tracker file :
  - In 2012 (NAGE) and 2016 (PAGE) for the2008 sample
  - In 2014 (OAGE) and 2016 (QAGE) for the 2010 sample.

A file was created including the variables of interest. These variables were further prepared for data analysis :

Personality. When necessary, items were reverse coded and we computed the mean, with higher scores indicating higher level of the personality traits.

Subjective age. A proportional discrepancy score was computed by subtracting chronological age from felt age, and then dividing by chronological age. Positive values indicated an older subjective age, whereas negative values indicated a younger subjective age.

Self-rated health. The item was reverse coded, with higher score indicating better self-rated health

Depressive symptoms. Positive symptoms were reverse coded. Answers were summed across items, with higher scores representing higher depressive symptoms

Chronic conditions. The sum of diagnosed conditions was used as a measure of chronic conditions

Physical activity. The two items were reverse coded, and averaged. Higher mean indicated higher physical activity.

Covariates. Age (in years), sex (coded as 1=male and 0=female), education (in years), and race (coded as 1= white and 0= other) were included as covariates

Participants were included if they had complete data on the five personality traits, subjective age, and demographic factors (age, sex, education, and race) at baseline. For subjective age, individuals with discrepancy scores three standard deviations above the mean were considered outliers and excluded from the analysis. For longitudinal analysis, participants who had at least one assessment of subjective age at follow-up were included. Personality traits were standardized.

Statistical programs used

- Data were prepared using Statistica 7
- Linear regressions were conducted using JAMOVI 1.6.23 to test the relationship between personality and the proportional discrepancy score, controlling for demographic factors.

An example syntax is presented below with neuroticism as a predictor. This syntax was obtained using the « R Syntax Mode » in JAMOVI, which produces equivalent R code for each analysis :

```
jmv::linReg(
    data = data,
    dep = subjective_age,
    covs = vars(age, education, neuroticismz),
    factors = vars(sex, race),
    blocks = list(
        list(
            "age",
            "sex",
            "education",
            "race",
            "neuroticismz")),
    refLevels = list(
        list(
            var="sex",
            ref="0"),
        list(
            var="race",
            ref="0")),
    stdEst = TRUE,
    ciStdEst = TRUE)
```

Example syntax used for additional analyses examining whether the association between personality and subjective age was moderated by age by including an interaction term for each of the five factors and chronological age.

Example syntax used with neuroticism as a predictor :

```
jmv::linReg(
    data = data,
    dep = subjective_age,
    covs = vars(agez, education, neuroticismz, neuroticism_age),
```

```
factors = vars(sex, race),
blocks = list(
    list(
        "sex",
        "race",
        "agez",
        "education",
        "neuroticismz",
        "neuroticism_age")),
refLevels = list(
    list(
        var="sex",
        ref="0"),
    list(
        var="race",
        ref="0")),
stdEst = TRUE,
ciStdEst = TRUE)
```

- Mediation analyses were computed using the PROCESS Macro (3.0) on SPSS 19 to test whether self-rated health, physical activity, depressive symptoms, and chronic conditions mediated the association between personality and subjective age.

The example syntax below is extracted from the macro, with neuroticism as a predictor:

```
PROCESS
y= subjective_age
/x=neuroticismz
/m= self_rated_health chronic_conditions physical_activity depression
/cov=age sex education race
/total=1
/decimals=F10.4
/save=1
```

/boot=5000

/conf=95

/model=4

- Multilevel modeling analyses were conducted to test the association between personality and change in subjective age using the JAMOVI 1.6.23 software (Linear mixed model). The syntax presented below is extracted using the « R Syntax Mode » in JAMOVI, with neuroticism as a predictor:

```
gamlj::gamljMixed(
  formula = subjective_age ~ 1 + age + sex + education + neuroticism + race + time + neuroticism:time+( 1 | ident ),
  data = data)
```

Final data files

- HRS.omv
- HRSmlm.omv

The file HRS.omv contains the following variables :

- age (in years)
- agez (standardized age)
- felt_age
- subjective_age
- sex (coded as 1 for male and 0 for female)
- education (in years)
- self_rated_health
- race (coded as 1 for white and 0 for other)
- chronic_conditions
- physical_activity
- depression
- extraversion
- agreeableness
- conscientiousness
- openness
- neuroticism
- extraversionz (standardized extraversion)
- extraversion_age (interaction between extraversionz and agez)
- agreeablenessz (standardized agreeableness)
- agreeableness_age interaction between agreeablenessz and agez)
- conscientiousnessz (standardized conscientiousness)
- conscientiousness_age (interaction between conscientiousnessz and agez)
- opennessz (standardized openness)

- openness_age (interaction between opennessz and agez)
- neuroticismz (standardized neuroticism)
- neuroticism_age (interaction between neuroticismz and agez)

Linear regression analyses and mediation analyses were conducted using this file. This file was also used for additional analyses examining whether the association between personality and subjective age was moderated by age.

The file HRSmlm.omv contains the following variables :

- age (in years)
- sex (coded as 1 for male and 0 for female)
- education (in years)
- extraversion (standardized)
- agreeableness (standardized)
- conscientiousness (standardized)
- openness (standardized)
- neuroticism (standardized)
- race (coded as 1 for white and 0 for other)
- subjective_age
- time

Multilevel modeling analyses (Linear mixed model) were conducted using this file.