

Contact Information

Dr. Damaris Aschwanden, Department of Geriatrics, College of Medicine, Florida State University, 1115 West Call Street, Tallahassee, FL 32306, USA. E-mail address: damaris.aschwanden@med.fsu.edu

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Abstract: The discrepancy between subjective memory rating and objective memory performance is the tendency to misestimate one's memory. For example, better self-rated memory compared to performance on memory tasks reflects an overestimation of one's memory. This discrepancy may shape how individuals cognitively age: Overestimating one's memory could mask incident cognitive decline and underestimation could act as a negative self-fulfilling prophecy. This study sought to examine the association between personality traits and depressive symptoms and memory discrepancy in five large samples of middle-aged and older adults ($N > 23,000$). We preregistered three hypotheses: neuroticism would be related to underestimation, extraversion to overestimation, and conscientiousness to higher accuracy. Controlling for sociodemographic covariates (age, gender, race, ethnicity, and education), results from regression models were pooled using random-effect meta-analyses. Openness was associated with underestimation of memory performance. Contrary to our hypothesis, neuroticism was related to overestimation. Surprisingly, depressive symptoms were also associated with overestimation. Cognitive status (impaired vs. unimpaired) did not moderate the association between personality and memory discrepancy, but it did with depressive symptoms, with a null or opposite effect among individuals with impaired cognition. In conclusion, although previous studies demonstrate consistent associations between personality traits and subjective memory ratings and memory performance, the current findings suggest null or unexpected links between personality and memory discrepancy. The findings suggest that clinicians should not dismiss cognitive complaints in the presence of depressive symptoms or high neuroticism because objective memory performance could be even worse than self-rated memory.

Keywords: Five-Factor Personality Traits, Depressive Symptoms, Subjective Memory, Memory Performance, Discrepancy, Cognitive Impairment

List of HRS public files used

HRS 2016 Final Release:

- Section LB: Leave-Behind Questionnaires (Respondent)

HRS 2018 Final Release:

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

Tracker File:

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

Step-by-step documentation

We first extracted our items of interest from each public data file listed above. From each data file, we also extracted the variables *HHID* (*Household identification number*) and *PN* (*Respondent person identification number*) in order to create a unique participant ID.

1. From the HRS 2016 Final Release Leave-Behind Questionnaire, we extracted the following items from the Midlife Development Inventory to assess personality:
 - PLB031A - PLB031Z_6
 - Note that HRS employed a half-sample strategy for personality measures (i.e., half of the sample completed the questionnaire in 2016, whereas the other half completed it in 2018), and that we used the combined 2016/2018 personality data for the analyses.
2. From the HRS 2018 Cognition file, we extracted the following items:
 - QD101 (Rate memory to assess subjective memory)
 - QD110-117 (Items to assess depressive symptoms)
 - QD174 (Number good-immediate) and QD184 (Number good-delayed) to assess memory performance
 - QD142 - QD146 (Series minus items to assess serial 7 subtraction)
 - QD124 and QD129 (items to assess backwards counting)
3. From the HRS 2018 Final Release Leave-Behind Questionnaire, we extracted the following items from the Midlife Development Inventory to assess personality (for the other half of participants that completed it in 2018):
 - QLB031A - QLB031Z_6
4. From the tracker file, we extracted the following variables:
 - GENDER (Gender)
 - HISPANIC (Hispanic type)

- RACE (Race/ethnicity)
 - SCHLYRS (Number of years in school to assess education)
 - QAGE (Age at 2018 Interview)
5. We then created a data file containing all our variables of interest and further prepared them for data analysis.
- Personality: We reverse coded the items when necessary and took the mean, with higher scores representing higher levels of the personality traits.
 - Depressive Symptoms: We calculated the total number of endorsed symptoms (positive symptoms were reverse-coded) to create a sum score of depressive symptoms.
 - Subjective Memory: The item was reverse coded so that higher scores indicated better perceived memory.
 - Memory Performance: Scores from immediate and delayed recall were summed up. Higher scores indicated better memory performance.
 - Memory Discrepancy: We used a three-step approach to operationalize memory discrepancy. First, we created age groups (5-year-segments). Second, for each age group, we regressed memory performance on subjective memory. Third, we then used the residuals as a measure of memory discrepancy to capture the deviation of memory performance from the level predicted by the subjective rating. A value of zero (within +/- .4949) represented agreement between rating and performance. Positive scores (> +.4950) indicated underestimation of memory performance (i.e., objective memory performance is better than perceived memory). Negative scores (< -.4950) indicated overestimation of memory performance (i.e., performance is worse than perceived). For supplementary analyses, three dummy variables were created to contrast (a) overestimation (coded as 1, reflecting values smaller than -.4950) versus accurate (coded as 0, reflecting values ranging from -.4949 to +.4949), (b) underestimation (coded as 1, reflecting values greater than +.4950) versus accurate (coded as 0, reflecting values ranging from -0.4949 to +.4949), and (c) accurate (coded as 1, reflecting values ranging from -0.4949 to +.4949) versus inaccurate (coded as 0, reflecting all other values). Accurate referred to agreement between rating and performance, while inaccurate referred to discrepancy in either direction (overestimation or underestimation).
 - Cognitive Impairment: Cognitive impairment was classified based on the participants' performance on three tasks: immediate and delayed word list recall, serial 7 subtraction, and backward counting. These tasks are part of the modified Telephone Interview for Cognitive Status (TICS_m). Based on the TICS_m sum score (max. 27 points) participants can be classified into "normal cognition" (12-27 points), "cognitively impaired not dementia (CIND)" (7-11 points) and "dementia" (≤6 points). Individuals with ≤11 points were identified as cases of cognitive impairment for the present analyses.
 - Covariates: Age (in years), gender, race, ethnicity, and education (in years) were included as sociodemographic covariates. We dummy-coded gender (0 = male, 1

= female). Race was divided into two dummy variables (0 = White/identified as other race vs. 1 = African American; 0 = White/African American vs. 1 = identified as other race). Ethnicity was divided into 1 = Hispanic vs. 0 = non-Hispanic.

6. All continuous variables were standardized. Missing data were recoded as 999.
7. Statistical analyses were conducted. The scripts are available at <https://osf.io/qzep4/>. The hypotheses and statistical analyses of this study were preregistered at <https://osf.io/cnqus>.

Statistical programs used

- Data were prepared using SPSS (Version 25): IBM Corp. (2017). *IBM SPSS Statistics for Windows*. Armonk, NY: IBM Corp. Retrieved from <https://hadoop.apache.org>
- Analyses were conducted in R (Version 3.5.1): R Development Core Team. (2020). *R: A language and environment for statistical computing*. <https://www.r-project.org/index.html>

Final data files

- Main data file: *Data HRS.sav*
- Supplemental data file (for the supplemental analyses that tested cognitive status as a moderator): *Data HRS_CogImp.sav*

The file *Data HRS.sav* contains the following variables:

- Gender
- Hispanic
- race_AA
- race_other
- Overestimation_new
- Underestimation_new
- Accurate_new
- AGEGROUP
- OM_18
- SM_18
- Age
- Education
- Neuroticism
- Extraversion
- Openness
- Agreeableness
- Conscientiousness

- MemDis_raw_new
- Dep_sum_18
- ZAge
- ZEducation
- ZNeuroticism
- ZExtraversion
- ZOpenness
- ZAgreeableness
- ZConscientiousness
- MemDis_zscore_new
- ZDep_sum_18

The file *Data HRS_CogImp.sav* contains the following variables:

- Gender
- Hispanic
- race_AA
- race_other
- Overestimation_new
- Underestimation_new
- Accurate_new
- cog_impairment
- ZAge
- ZEducation
- ZNeuroticism
- ZExtraversion
- ZOpenness
- ZAgreeableness
- ZConscientiousness
- MemDis_zscore_new
- ZDep_sum_18

For labels and values, see information within each data file.