

## Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

### Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- The exact sample size ( $n$ ) for each experimental group/condition, given as a discrete number and unit of measurement
- A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- The statistical test(s) used AND whether they are one- or two-sided  
*Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
- A description of all covariates tested
- A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
- A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
- For null hypothesis testing, the test statistic (e.g.  $F$ ,  $t$ ,  $r$ ) with confidence intervals, effect sizes, degrees of freedom and  $P$  value noted  
*Give  $P$  values as exact values whenever suitable.*
- For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
- For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
- Estimates of effect sizes (e.g. Cohen's  $d$ , Pearson's  $r$ ), indicating how they were calculated

*Our web collection on [statistics for biologists](#) contains articles on many of the points above.*

### Software and code

Policy information about [availability of computer code](#)

Data collection EAR (Electronically Activated Recorder) was installed to an Android device that participants carried during the intensive data collection, to unobtrusively collect sound recordings every 7 minutes for 30 seconds.

Data analysis The code used for analysis is available on Open Science Framework (<https://osf.io/7az8b/files/osfstorage>). This study used Stata 17 and R for data analysis and visualization.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

### Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

Data and information about the study are available at the National Archive of Computerized Data on Aging (<https://www.icpsr.umich.edu/web/NACDA/studies/38570>).

## Human research participants

Policy information about [studies involving human research participants](#) and [Sex and Gender in Research](#).

### Reporting on sex and gender

Participants self-reported their gender as male or female. In the current sample composed of 266 participants, 54% of them were female. Gender was considered as a covariate in all models reported, yet gender was not a key variable of interest in the current study (i.e., not considered as a main predictor or moderator).

### Population characteristics

See below (Behavioural & social sciences study design, Research sample).

### Recruitment

Community-dwelling older adults in the greater Austin area were recruited via listed landline numbers and random digital dialing using city area codes. Please see the section above for details (Behavioural & social sciences study design, Sample strategy).

### Ethics oversight

The University of Texas at Austin

Note that full information on the approval of the study protocol must also be provided in the manuscript.

## Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

Life sciences  Behavioural & social sciences  Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://nature.com/documents/nr-reporting-summary-flat.pdf)

## Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

### Study description

Quantitative study

### Research sample

The study used data from The Daily Experiences and Well-being Study (DEWS). Data was collected in 2016-2017 in the greater Austin area, USA. The initial sample included 333 community-dwelling older adults aged 65 and older. For the current study, on average, participants (n=266) aged 74.08 (ranged between 65 to 90). They self-reported physical health on a 5-point scale and the average scores was 3.63. Among the sample, 59% were married, 24% self identified as racial or ethnic minority groups, and 59% had a college degree or more. Descriptive information of population characteristics can be found in the manuscript, Table 1.

### Sampling strategy

Participants were recruited via listed landline numbers and random digital dialing using city area codes. The study oversampled in areas that had a high density of racial/ethnic minorities and lower SES populations such that the overall sample was racially and ethnically diverse and representative of the wide range of SES.

### Data collection

A screening interview was first completed by phone to identify an age-eligible respondent. A local interviewer then contacted the respondent to schedule a time to conduct the in-person interview (around 2 hours) as well as provide the devices for the intensive data collection to the respondent. After the initial interview, participants participated in the intensive data collection that lasted 5 to 6 days, during which they (a) reported social contact and well-being every 3 hours throughout the day in the ecological momentary assessments (EMA) and (b) wore Android device with Electronically Activated Recorder (EAR) that captured ambient sound for 30 seconds every 7 minutes. Researchers were not aware of the study hypotheses during data collection. The respondent was provided with a \$50 token of appreciation after completing the main interview and an additional \$100 upon completion of the device data collection. Interviewers transmitted data to the University of Michigan on a daily basis including the interview data, sample management data, recorded interview, actigraph data, EAR sound files, room photos and mEMA data which was uploaded to a website. Ann Arbor conducted quality control checks with each type of file and transmitted the data to the University of Texas at Austin every two weeks.

### Timing

Data collection was conducted from November 1, 2016 until May 3, 2017.

### Data exclusions

No participant with complete data of key variables of interest was excluded. Out of the total sample of 333 participants, 67 were excluded due to incomplete data (22 participants did not participate in EMA or did not complete more than five EMA assessments, 27 participants did not have valid EAR data and were excluded from the current study, 18 participants with sound files in Spanish that resulted in different linguistic feature analysis). As such, the current analytic sample included 266 participants.

### Non-participation

A total of 333 participants completed the initial in-person interview. 326 participants (97.9%) agreed to participant in the additional components (i.e., intensive data collection) including physical acitcal, Electronically Activated Recorder (EAR), ecological momentary assessments (EMA) , and room photos. As mentioned above, 266 participants were included in the current analytic sample.

### Randomization

No experiment procedures and randomization is involved in this study.

# Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

## Materials & experimental systems

n/a	Involved in the study
<input checked="" type="checkbox"/>	Antibodies
<input checked="" type="checkbox"/>	Eukaryotic cell lines
<input checked="" type="checkbox"/>	Palaeontology and archaeology
<input checked="" type="checkbox"/>	Animals and other organisms
<input checked="" type="checkbox"/>	Clinical data
<input checked="" type="checkbox"/>	Dual use research of concern

## Methods

n/a	Involved in the study
<input checked="" type="checkbox"/>	ChIP-seq
<input checked="" type="checkbox"/>	Flow cytometry
<input checked="" type="checkbox"/>	MRI-based neuroimaging