Project Title: Life Course Process of Alzheimer's Disease: Sex Difference and Biosocial Mechanisms

Integrated Dataset Creation and Public Code Documentation

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Table of Contents

Introduction

The project addresses major gaps in existing research on cognitive aging by 1) characterizing age-related cognitive change over the full life span, 2) assessing social disparities in cognitive aging by sex/gender, race/ethnicity, and socioeconomic status as well as other social stressors, and 3) exploring biological mechanisms by which social factors are linked to cognitive health and dementia risk. The foundation for this project is the construction of longitudinal cohort data that spans the adult life course. We address challenges in previous research using single panel data with an extensive longitudinal life course research design and a novel application of integrative data analysis (IDA) to determine for the first time the trajectory of cognitive aging throughout life in Americans aged 12 and older, and main demographic and socioeconomic differentials therein.

We integrated four U.S. population-based panel studies of over 50,000 individuals from most 20th century birth cohorts followed for up to 25 years, including the National Longitudinal Study of Adolescent to Adult Health (1994–2018), the National Survey of Midlife Development in the U.S. (2004–2017), Health and Retirement Study (1996–2018), and Americans' Changing Lives study (1986–2011). The methodology is applicable to a wide variety of outcomes for life course and aging research.

We provide here open-source Stata code for users to create the dataset that combines data from these four individual population-based longitudinal surveys. This resource enables new analytic and modeling approaches for longitudinal IDA (Curran & Hussong, 2009) across a variety of outcomes, and is meant to support data sharing and help build a more cumulative science. Key publications utilizing this dataset include Yang et al. (2021) and Yang et al. (2023).

References:

- Curran, P. J., & Hussong, A. M. (2009). Integrative data analysis: the simultaneous analysis of multiple data sets. *Psychological methods*, 14(2), 81.

- Yang, Y. C., Walsh, C. E., Johnson, M. P., Belsky, D. W., Reason, M., Curran, P., Aiello, A.E., Chanti-Ketterl, M. & Harris, K. M. (2021). Life-course trajectories of body mass index from adolescence to old age: Racial and educational disparities. *Proceedings of the National Academy of Sciences*, 118(17), e2020167118.

- Yang, Y.C., Walsh, C. E., Shartle, K., Stebbins, R. C., Aiello, A. E., Belsky, D. W., Harris, K. M., Chanti-Ketterl, M., & Plassman, B. L. (2023). An early and unequal decline: life course trajectories of cognitive aging in the United States." *Journal of Aging and Health*: DOI: 10.1177/08982643231184593/ ID: JAH-23-279.R2

Source Datasets

Data for the integrative dataset come from four U.S. population-based longitudinal cohort studies: the National Longitudinal Study of Adolescent to Adult Health (Add Health), the National Survey of Midlife Development in the United States (MIDUS), the Health and Retirement Study (HRS), and the American' Changing Lives (ACL) study.

All source datasets used from these four studies are listed in Appendix I.

Add Health

Add Health is a nationally representative sample of 20,745 adolescents in grades 7–12 in the US in 1994–95 who have been followed into mid-adulthood.[1,2] The Add Health cohort was followed up in 1996 (Wave II), 2001–2002 (Wave III), 2008–2009 (Wave IV), and most recently in 2016-2018 (Wave V).

We use the restricted-use Add Health data in this project. Those data can be obtained by applying for a restricted-use contract at the Add Health website at the University of North Carolina at Chapel Hill.[3]

We utilize all five waves of Add Health survey data and the in-school survey, biomarker data from Waves IV and V, plus additional variables taken from various additional surveys and contextual datasets.

All datasets that we use in our public use code are in **SAS XPORT5** (.xpt) format, and can be found in a table in Appendix I.

MIDUS

MIDUS is a national longitudinal study of 7,108 English-speaking, non-institutionalized adults aged 25 and older residing in the contiguous U.S. who were first interviewed in 1995-96 (Wave I) and followed in 2004-2006 (Wave II) and in 2013-2017 (Wave III).[4,5]

The MIDUS data used in this project (Waves I-III) are all public use and are available from the study's website at ICPSR at the University of Michigan[6]. All datasets that we use in our public use code are in Stata format, and can be found in a table in Appendix I.

HRS

The Health and Retirement Study (HRS) is the largest ongoing nationally representative longitudinal survey of U.S. adults aged 50 years and older, conducted bi-annually beginning in 1992 with a sample of 37,000 adults.[7] We use the public survey data and the restricted/sensitive biomarker data from HRS in this project from survey years 1996 to 2018. Those data can be obtained from the HRS website at the Institute for Social Research at the University of Michigan[8].

HRS regularly updates their files and removes older versions. The table of source files in Appendix I contains the file names that were used in this project plus the date on which the file was downloaded from the HRS website.

The datasets used are in **Stata** and **SAS** formats.

ACL

Americans' Changing Lives study (ACL) is a nationally representative longitudinal survey that interviewed an initial sample of 3,617 individuals aged 24 and older in 1986 (Wave I) and followed them in 1989 (Wave II), 1994 (Wave III), 2001-2002 (Wave IV), and 2011 (Wave V).[9]

The ACL study releases all five waves of their data in a single dataset. We use the publicly available data, which is titled **Americans' Changing Lives: Waves I, II, III, IV, and V, 1986, 1989, 1994, 2002, and 2011 (ICPSR 4690)** and is available from ACL website at the Institute for Social Research at the University of Michigan.[10]

Our public use code uses the **Stata** version of the dataset **04690-0001-Data.dta**.

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[1]Harris, K. M., Halpern, C. T., Whitsel, E. A., Hussey, J. M., Killeya-Jones, L. A., Tabor, J., & Dean, S. C. (2019). Cohort profile: The national longitudinal study of adolescent to adult health (add health). International Journal of Epidemiology, 48(5), 1415-1415k. https://doi.org/10.1093/ije/dyz115.

[2]Harris, K.M & Udry J. R. (2022). National Longitudinal Study of Adolescent to Adult Health (Add Health), 1994-2018 [Public Use]. https://doi.org/10.3886/ICPSR21600.v25.

[3]https://addhealth.cpc.unc.edu/data/#restricted-use

[4]Ryff C.D. & Lachman, M.E. (2017). Midlife in the United States (MIDUS 2): Cognitive Project, 2004-2006. https://doi.org/10.3886/ICPSR25281.v6.

[5]Ryff C.D. & Lachman, M.E. (2019). Midlife in the United States (MIDUS 3): Cognitive Project, 2013-2017. https://doi.org/10.3886/ICPSR37095.v2.

[6]https://www.icpsr.umich.edu/web/ICPSR/series/203

[7]Sonnega, A., Faul, J. D., Ofstedal, M. B., Langa, K. M., Phillips, J. W., & Weir, D. R. (2014). Cohort profile: the health and retirement study (HRS). International Journal of Epidemiology, 43(2), 576-585.

[8]https://hrs.isr.umich.edu/data-products

[9]House, J.S. (2018). Americans' Changing Lives: Waves I, II, III, IV, and V, 1986, 1989, 1994, 2002, and 2011. https://doi.org/10.3886/ICPSR04690.v9.

[10] https://acl.isr.umich.edu/for-researchers/data/publicly-accessible-data/

Integrated Dataset

The integrated dataset contains **749,359** records and **468** harmonized variables across the four studies. Some variables are identical to the source data, others are constructed from a combination of variables. A full list of variables can be found in Appendix II.

Records per Study Wave

The table below gives the number of respondents in each study by wave that are in the final dataset.

Wave	ACL	Add Health	HRS	MIDUS
School		15,355		
1	3,617	20,745	42,680	7,108
2	3,617	20,745	42,235	7,521
3	3,617	20,745	42,236	7,521
4	3,617	19,962	42,237	
5	3,617	19,828	42,236	
6			42,236	
7			42,236	
8			42,236	
9			42,236	
10			42,236	
11			42,236	
12			42,236	
13			42,235	
14			42,233	

Public Use Code

Overview

The public use code consists of five Stata Do files. One Do file is provided for each of the four studies, written specifically to create the harmonized variables from that study's datasets. The fifth Do file is the primary control script that will call the study-specific scripts. The primary control script is the only one that users will need to modify and run.

Primary Do File

- IDA_Primary_Control_Script.do

Secondary Study-Specific Do Files

- IDA_Secondary_Study_Variables_ACL.do
- IDA_Secondary_Study_Variables_AddHealth.do
- IDA_Secondary_Study_Variables_HRS.do
- IDA_Secondary_Study_Variables_MIDUS.do

How to Use the Do Files

As mentioned above, the only file that users will need to edit and use is the Primary Do File (IDA_Primary_Control_Script.do). There are four steps that users need to take to make the code functional. The code is heavily commented and also contains the following instructions.

Step 1: Set Up the Log File

Line 82 in the code sets the log file name. The default is a generic path and text file name. Users should set this to save the log file in their preferred computer directory with a meaningful file name. If a user prefers the log file to be saved in SMCL format, simply change the file extension from `.txt` to `.smcl` and change the optional `text` parameter to `smcl`.

Step 2: Set the Study Inclusion Flags

The code includes four study inclusion flags which are stored as global variables on lines 89-94. The default value of each of these flags is 1, which directs the code to run the Do file associated with those studies. If a user does not have access to the data from a study, or prefers to exclude that study's data from the final dataset, change the flag value for that study's inclusion flag to 0.

Step 3: Set the Directory Paths

The code includes twenty global variables for directory paths on lines 101-126. The default directory structure specified in the Primary Do File, listed below, assumes a hierarchical directory structure.

Path	Description
C:\Work	top-level working directory
C:\Work\Code	code stored here
C:\Work\Data	
C:\Work\Data\Final	final IDA dataset saved here
C:\Work\Data\Interim	study-specific interim datasets saved here
C:\Work\Data\Source	
C:\Work\Data\Source\ACL	ACL source files
C:\Work\Data\Source\AddHealth	
C:\Work\Data\Source\AddHealth\Wave1	Add Health Wave I source files
C:\Work\Data\Source\AddHealth\Wave2	Add Health Wave II source files
C:\Work\Data\Source\AddHealth\Wave3	Add Health Wave III source files
C:\Work\Data\Source\AddHealth\Wave4	Add Health Wave IV source files
C:\Work\Data\Source\AddHealth\Wave5	Add Health Wave V source files
C:\Work\Data\Source\AddHealth\Inschool	Add Health In-School source files
C:\Work\Data\Source\AddHealth\Parents2	Add Health Parents Study source files
C:\Work\Data\Source\AddHealth\Constructed	Add Health Constructed source files
C:\Work\Data\Source\HRS	
C:\Work\Data\Source\HRS\Biomarkers	HRS biomarker source files
C:\Work\Data\Source\HRS\Childhood	HRS childhood source files
C:\Work\Data\Source\HRS\FatFiles	HRS fat files source files
C:\Work\Data\Source\HRS\RAND	RAND HRS source files
C:\Work\Data\Source\MIDUS	
C:\Work\Data\Source\MIDUS\MIDUS1	MIDUS 1 source files
C:\Work\Data\Source\MIDUS\MIDUS2	MIDUS 2 source files
C:\Work\Data\Source\MIDUS\MIDUS3	MIDUS 3 source files
C:\Work\Data\Source\MIDUS\MIDUS_Mortality	MIDUS mortality source files
C:\Work\Logs	Log files saved here

We realize that every user organizes files differently, so we have provided plenty of detail to allow for such flexibility. The descriptions of these globals match the directory structure above and are also provided in the comments at the beginning of the code file in lines 40-59.

For users who prefer to store all of their files in a single location, just set all globals to the same directory path. These globals are hard-coded into the study-specific Do files so do not comment out or delete any of them or it will cause errors when the code is run. Each global variable must be used, even if some or all have the same paths.

Similar to the log file path, these global variables are set to generic directory paths.

Step 4: Set the Source File Name

The final section of the code that needs user input is the global variables for the source data file names, contained on lines 133-212. These globals are set to the source file names as provided by the studies, and match the file names listed in Appendix I.

If a user has renamed source data files, make sure to replace the file names in this section so they match the renamed files.

File formats should remain the same as used in the code. However, if a user wants to use a different format (e.g., SAS instead of Stata), then the corresponding lines of code in the study-specific Do files will need to be edited. This option is only recommended for experienced Stata users who have enough patience to scroll through hundreds of lines of code and make those changes.

Appendix I: Source Files

ACL Source File

There is only one ACL source file: **04690-0001-Data.dta**

This file is referenced as **Americans' Changing Lives: Waves I, II, III, IV, and V, 1986, 1989, 1994, 2002, and 2011 (ICPSR 4690)** on the ACL study website.

Add Health Source Files

	Dataset Title	File Name
Core Files	Wave I In-Home Interview Data	allwave1.xpt
	Wave II In-Home Interview Data	wave2.xpt
	Wave III In-Home Interview Data	wave3.xpt
	Wave III Section 17 Dataset	sect17.xpt
	Wave III Section 19 Dataset	sect19.xpt
	Wave IV In-Home Interview Data	wave4.xpt
	Wave V Mixed-Mode Survey Data	wave5.xpt
Biomarker Files	Wave IV Inflammation and Immune Function	crp_ebv.xpt
	Wave IV Glucose Homeostasis	glu_a1c.xpt
	Wave IV Lipids	lipids.xpt
	Wave V Anthropometrics	banthro5.xpt
	Wave V Cardiovascular Measures	bcardio5.xpt
	Wave V Inflammation and Immune Function	bcrp5.xpt
	Wave V Glucose Homeostasis	bglua1c5.xpt
	Wave V Lipids	blipids5.xpt
	Wave V Renal Function	brenal5.xpt
Disposi-tion Files	Waves I and II Disposition File	w1w2dsp.xpt
	Wave III Disposition File	dsp3.xpt
	Wave IV Disposition File	dsp4.xpt
	Wave V Disposition File	dsp5.xpt
Weights	Wave I In-Home Weight Components	Homewt1.xpt
	Wave II In-Home Weight Components	Homewt2.xpt
	Wave III In-Home Weight Components	weights3.xpt
	Wave IV Weight Components	weights4.xpt
	Wave V Mixed-Mode Weights	weights5.xpt
Other	Wave I In-School Questionnaire	Inschool.xpt
	Wave I School Network Data	network.xpt
	Constructed SES Variables	conses.xpt
	Parents (2015-2017)	parent2.xpt
	Wave III Census Region	w3region.xpt
	Wave IV Census Region	w4region.xpt
	Wave IV Constructed Current Relationship Status	currel.xpt

HRS Source Files

Dataset Title		File Name	Date Obtained
RAND HRS Longitudinal File 2018 Version 2		randhrs1992_2018v2.dta	Feb 2023
RAND HRS Family Data 2014 Version 1		randhrsfamr1992_2014v1.dta	Jan 2022
1996 RAND HRS Fat File 1996	*	h96f4a.dta	Dec 2020
1998 RAND HRS Fat File	*	hd98f2c.dta	Jul 2019
2000 RAND HRS Fat File	*	h00f1d.dta	Jun 2020
2002 RAND HRS Fat File	*	h02f2c.dta	Jun 2020
2004 RAND HRS Fat File	*	h04f1c.dta	Aug 2019
2006 RAND HRS Fat File	*	h06f4a.dta	Aug 2019
2008 RAND HRS Fat File	*	h08f3a.dta	Aug 2019
2010 RAND HRS Fat File	*	hd10f6a.dta	Aug 2019
2012 RAND HRS Fat File	*	h12f3a.dta	Aug 2019
2014 RAND HRS Fat File	*	h14f2b.dta	Aug 2019
2016 RAND HRS Fat File	*	h16f2b.dta	Apr 2021
2018 RAND HRS Fat File	*	h18f2a.dta	Feb 2023
2006 HRS Biomarker Data		biomk06bl_r.sas7bdat	Nov 2019
2008 HRS Biomarker Data		biomk08bl_r.sas7bdat	Nov 2019
2010 HRS Biomarker Data		biomk10bl_r.sas7bdat	Nov 2019
2012 HRS Biomarker Data		biomk12bl_r.sas7bdat	Nov 2019
2014 HRS Biomarker Data		biomk14bl.sas7bdat	Nov 2019
2016 HRS Biomarker Data		biomk16bl_r.sas7bdat	Jan 2021
2016 HRS Venous Blood Study (VBS)		hrs2016vbs.sas7bdat	Jan 2021
HRS Childhood Socio-Economic Status		cses_measures.dta	Apr 2021

The RAND HRS Fat Files were renamed early in the project for ease of use and the original file names were not recorded. So for these files in the table above (marked with an asterisk), we give the file name available as of March 2023 but we provide the date on which we downloaded the file version that we used.

It is possible that any files obtained by other users may differ from the versions used in this project.

MIDUS Source Files

Dataset Title	File Name
Midlife in the United States (MIDUS 1), 1995-1996 (ICPSR 2760)	02760-0001-Data.dta
Midlife in the United States (MIDUS 2), 2004-2006 (ICPSR 4652)	04652-0001-Data.dta
Midlife in the United States (MIDUS 3), 2013-2014 (ICPSR 36346)	36346-0001-Data.dta
MIDUS 2: Biomarker Project, 2004-2009 (ICPSR 29282)	29282-0001-Data.dta
MIDUS 2: Cognitive Project, 2004-2006 (ICPSR 25281)	25281-0001-Data.dta
MIDUS 3: Cognitive Project, 2013-2017 (ICPSR 37095)	37095-0001-Data.dta
MIDUS 2 Disposition Codes [†]	04652-0002-Data.dta
MIDUS 3 Disposition Codes [§]	36346-0002-Data.dta
MIDUS Core Sample Mortality Data, 1995-2020 (ICPSR 37237)	37237-0001-Data.dta

[†] This file is contained in the MIDUS 2 download.
[§] This file is contained in the MIDUS 3 download.

Appendix II: Integrated Dataset Variables

The table in this Appendix lists all of the variables in the master dataset along with their inclusion by study. For more information about each variable, including a detailed description, source dataset, and construction algorithm (where applicable), see the companion Excel file **IDA Master Variable Inventory.xlsx**.

Variable	Label	ACL	AH	HRS	MIDUS
year_died	Year of death	X		X	X
attrition	participant attrition status	X	X		X
died	participant mortality status				X
month_died	Month of death			X	
date_died	Date of death			X	
death_source	Death date source			X	
death2intvw_months	Number of months from last Core interview to death date			X	
f_sei	Father/Male head-of-house SEI				X
m_sei	Mother/female head-of-house SEI				X
fempl	Father works outside the home				X
mempl	Mother works outside the home				X
pempl	Parent works outside the home		X		
p_empl_ft	Parent currently employed fulltime		X	X	
p1_educ	Parent 1's education	X	X	X	X
p2_educ	Parent 2's education	X	X	X	X
childses	Childhood SES score	X	X	X	
phhincome	Childhood household income (annual)		X		
pincome	Parent income during childhood (annual)		X		
pwelfare	Parent received welfare during childhood		X		
rassets_10k	Respondent assets above $10k	X			
rassets_20k	Respondent assets above $20k	X			
rassets_50k	Respondent assets above $50k	X			
rassets_100k	Respondent assets above $100k	X			
rassets_200k	Respondent assets above $200k	X			
rassets_500k	Respondent assets above $500k	X			
rassets_total	Respondent - total assets	X		X	X
rassets_status	Respondent - debts, even, or assets if liquefied		X		X
rassets_owe	Respondent - total you would owe		X		X

Variable	Label	ACL	AH	HRS	MIDUS
reduc_year	Respondent: Highest year of education	X	X	X	X
reduc_8yr	Respondent Education - 8 years or less	X			
reduc_cat	Respondent: Educational attainment category	X	X	X	X
reduc_GED	Respondent Education - GED	X	X		X
reduc_HS	Respondent Education - HS / equivalent	X	X		
reduc_AA	Respondent Education - Associate's	X	X		
reduc_BA	Respondent education - Bachelor's	X	X		
reduc_MA	Respondent education - Master's		X		
reduc_PhD	Respondent Education - Doctorate		X		
reduc_prof	Respondent Education - professional degree		X		
reduc_current	Respondent currently attending school		X		
rincome_cat	Total personal income, categories		X		
rincome_hh	Respondent & Spouse/Partner Income together	X	X	X	
rincome_period	Respondent income - period of earning	X			
rincome_total	Respondent income - total (wages + other)	X	X		X
rincome_wagefreq	R income - frequency	X			
rincome_wages	Respondent earnings	X	X	X	X
rincome_wagescat	Respondent income - earnings, categorized		X		
rses_4cat	4-category SES	X	X		X
meeting_all	Frequency attend any group meetings	X		X	
religious_attend	Frequency attend religious services	X	X	X	X
volunteer_religion	Volunteer for religious organizations	X			
volunteer_edu	Volunteer for an educational organization	X			
volunteer_politics	Volunteer for political organizations	X			
volunteer_seniors	Volunteer for senior citizen group	X			
volunteer_other	Volunteer for other organizations	X			
volunteerhrs	Volunteer hours	X	X		

Variable	Label	ACL	AH	HRS	MIDUS
close_other_talk	Talk on the phone with friends, family, or neighbors	X			
close_other_inperson	Get together with friends, family, or neighbors	X			
close_other_loved	Friends and relatives make you feel loved	X			
close_other_demand	Friends and relatives makes too many demands	X			
close_other_listen	Friends and relatives willing to listen about worries	X			
close_other_critical	Friends and relatives critical of you	X			
child_contact	Contact with children	X			
child_listen	Your children listen to your worries	X			
child_feel_loved	Your children make you feel loved	X			
child_demand	Your children make too many demands	X		X	
child_critic	Your children are critical of you	X		X	
mom_contact	Contact with mother	X		X	
dad_contact	Contact with father	X		X	
biomom_alive	Biological mother still living	X	X		
biodad_alive	Biological father still living	X	X		
marital_status	Current marital status	X	X	X	X
sppn_listen	Spouse/partner listens when you need to talk	X	X		
sppn_loved	Spouse make you feel loved	X			
sppn_demand	Spouse/partner make too many demands	X		X	X
sppn_critic	Spouse/partner criticize you	X		X	X
child_num	Number of children	X		X	X
child_contact1	Contact with one child who lives elsewhere	X			
child_contact2	Contact with two or more children who live elsewhere	X			
biomom_died	Mother died since last interview	X			
biodad_died	Father died since last interview	X			
child_nonhh	Number of children not living with the respondent	X			
child_hh	Number of children living with the respondent	X			
par_died1	Parent or step-parent died since last interview - 1st mention	X			
par_died2	Parent or step-parent died since last interview - 2st mention	X			

Variable	Label	ACL	AH	HRS	MIDUS
par_died3	Parent or step-parent died since last interview - 3st mention	X			
sch_close	You feel close to people at your school		X		
sch_feel_part	You feel like a part of your school		X		
sch_happy	You are happy at your school		X		
fam_understand	Family understands you		X	X	X
fam_attention	Family pays attention to you		X		
fam_fun	Have fun with family		X		
resmom_activities_shop	Gone shopping with your mom		X		
resmom_activities_sport	Played a sport with your mom		X		
resmom_activities_religion	Gone to a church-related event with your mom		X		
resmom_activities_dating	Talked to your mom about someone you're dating or a party you went to		X		
resmom_activities_movie	Gone to a movie, play, museum, concert, or sports event with your mom		X		
resmom_activities_problem	Talked with your mom about a person problem		X		
resmom_activities_argument	Have had a serious argument about your behavior with your mom		X		
resmom_activities_grades	Have talked about your school work or grades with your mom		X		
resmom_activities_project	Worked on a project for school with your mom		X		
resmom_activities_sch	Have talked about other things you're doing in school with your mom		X		
resmom_activities_none	Haven't done any of these activities with your mom		X		
resdad_activities_shop	Gone shopping with your dad		X		
resdad_activities_sport	Played a sport with your dad		X		
resdad_activities_religion	Gone to a church-related event with your dad		X		
resdad_activities_dating	Talked to your dad about someone you're dating or a party you went to		X		
resdad_activities_movie	Gone to a movie, play, museum, concert, or sports event with your dad		X		
resdad_activities_problem	Talked with your dad about a person problem		X		

Variable	Label	ACL	AH	HRS	MIDUS
resdad_activities_argument	Have had a serious argument about your behavior with your dad		X		
resdad_activities_grades	Have talked about your school work or grades with your dad		X		
resdad_activities_project	Worked on a project for school with your dad		X		
resdad_activities_sch	Have talked about other things you're doing in school with your dad		X		
resdad_activities_none	Haven't done any of these activities with your dad		X		
mom_warm	Mother is warm and loving		X		
dad_warm	Father is warm and loving		X		
mom_close	How close do you feel to your mother		X		
dad_close	How close do you feel to your father		X		
mom_relationship	Satisfied with relationship with your mother		X		
dad_relationship	Satisfied with relationship with your father		X		
mom_comm	Satisfied with relationship with your communication with your mother		X		
dad_comm	Satisfied with relationship with your communication with your father		X		
par_care	Parents care about you		X		
fri_contact	Frequency of contact with friends		X		X
fri_care	Friends care about you		X		X
volunteer	Volunteer: yes or no		X	X	
relationship_current	Current relationship		X		
dating_3months	Dating for at least three months		X		
rel_start_date	Date relationship started		X		
interview_date	Interview date		X		
child_close	Feel close to children		X		
child_overwhelm	Feel overwhelmed by being a parent		X		
child_stress	Your children are a main source of stress		X		
sppn_rel_sat	Satisfied with relationship with spouse or partner		X		
fri_num	Number of friends		X		
fam_rely	Can rely on your family		X	X	X

Variable	Label	ACL	AH	HRS	MIDUS
fam_open	Open up to your family		X	X	X
fam_demand_critic	Family members make too many demands and criticize you		X		
child_bio_num	Number of living biological children		X		X
child_nonbio_num	Number of non-biological children		X		X
child_open	Open up to children in need to talk		X	X	
child_rely	Can rely on your children		X	X	
child_demand_critic	Your children make too many demands		X		
sppn_open	Open up to your spouse/partner		X	X	X
sppn_rely	Can rely on your spouse/partner		X	X	X
sppn_demand_critic	Spouse/partner make too many demands and criticize you		X		
fri_rely	Can rely on your friends		X	X	X
fri_open	Can open up to your friends		X	X	X
fri_demand_critic	Friends make too many demands and criticize you		X		
sch_activity1	Participating in French club		X		
sch_activity2	Participating in German club		X		
sch_activity3	Participating in Latin club		X		
sch_activity4	Participating in Spanish club		X		
sch_activity5	Participating in Book club		X		
sch_activity6	Participating in Computer club		X		
sch_activity7	Participating in Debate team		X		
sch_activity8	Participating in Drama club		X		
sch_activity9	Participating in Future Farmers of America		X		
sch_activity10	Participating in History club		X		
sch_activity11	Participating in Math club		X		
sch_activity12	Participating in Science club		X		
sch_activity13	Participating in Band		X		
sch_activity14	Participating in Cheerleading/dance team		X		
sch_activity15	Participating in Chorus or choir		X		
sch_activity16	Participating in Orchestra		X		
sch_activity17	Participating in Other club or organization		X		
sch_activity18	Participating in Baseball/softball		X		
sch_activity19	Participating in Basketball		X		
sch_activity20	Participating in Field hockey		X		
sch_activity21	Participating in Football		X		

Variable	Label	ACL	AH	HRS	MIDUS
sch_activity22	Participating in Ice Hockey		X		
sch_activity23	Participating in Soccer		X		
sch_activity24	Participating in Swimming		X		
sch_activity25	Participating in Tennis		X		
sch_activity26	Participating in Track		X		
sch_activity27	Participating in Volleyball		X		
sch_activity28	Participating in Wrestling		X		
sch_activity29	Participating in Other sport		X		
sch_activity30	Participating in Newspaper		X		
sch_activity31	Participating in Honor society		X		
sch_activity32	Participating in Student council		X		
sch_activity33	Participating in Yearbook		X		
sch_activity_none	Do not participate in any activities		X		
fri_indegree	Number of people who nominated the respondent		X		
fri_outdegree	Number of friends the respondent nominated		X		
neigh_contact_per	Frequency of contact per time			X	
child_res	Living with children			X	
mom_res	Who does your mother live with			X	
dad_res	Who does your father live with			X	
par_alive	Number of living parents			X	
fam_demand	Family members make too many demands			X	X
fam_critic	Family members criticize you			X	X
fam_letudown	Family members let you down			X	X
fam_nerves	Family gets on your nerves			X	X
child_contact_inperson	Contact with children in -person			X	
child_contact_phone	Contact with children on the phone			X	
child_contact_write	Contact with children in writing or email			X	
child_understand	Your children understand the way you feel			X	
child_letudown	Your children let you down			X	
child_nerves	Your children get on your nerves			X	
cohabitation	Cohabitating with partner		X		X
cohabitating	Cohabitating with partner	X	X	X	
sppn_rel_close	Closeness of relationship with spouse or partner			X	
sppn_understand	Spouse/partner understands you			X	X
sppn_letudown	Spouse/partner let you down			X	X

Variable	Label	ACL	AH	HRS	MIDUS
sppn_nerves	Spouse/partner get on your nerves			X	X
fri_yesno	Have friends			X	
fri_contact_inperson	Contact with friends in -person			X	
fri_contact_phone	Contact with friends on the phone			X	
fri_contact_write	Contact with friends in writing or email			X	
fri_understand	Friends understands you			X	X
fri_demand	Friends make too many demands			X	X
fri_critic	Friends criticize you			X	X
fri_letudown	Friends let you down			X	X
fri_nerves	Friends get on your nerves			X	X
meeting_soc	Frequency attend sport/social meetings			X	X
meeting_other	Frequency attend other group meetings			X	X
meeting_prof	Frequency attend professional meetings				X
neigh_contact_any	Frequency of contact with neighbors				X
neigh_contact	Frequency of contact with neighbors		X	X	X
volunteerhrs_hos	Volunteer hours for hospitals				X
volunteerhrs_edu	Volunteer hours for an educational organization				X
volunteerhrs_politics	Volunteer hours for political organizations				X
volunteerhrs_other	Volunteer hours for other organizations				X
fam_contact	Contact with family members				X
fam_care	Family members care about you				X
sppn_care	Spouse/partner cares about you				X
sppn_appreciates	Spouse/partner appreciates you				X
sppn_be_yourself	Can you be yourself around them				X
sppn_tense	Spouse/partner makes you feel tense				X
sppn_argue	Spouse/partner argues with you				X
married_cohab	Married or cohabiting				X
height	Height (m)		X	X	X
weight	Weight (kg)		X	X	X
bmi	Body mass index (kg/m2)	X	X	X	X
bmi_class	BMI category	X	X		
wc	Waist circumference (cm)		X	X	X

Variable	Label	ACL	AH	HRS	MIDUS
wc_class	waist circumference risk classification		X		
bp_class	blood pressure risk classification		X		
systolicbp	Systolic BP, mm/Hg		X	X	X
diastolicbp	Diastolic BP, mm/Hg		X	X	X
hypertension	dichotomous measure for evidence of hypertension		X	X	X
meanarterpres	Mean arterial pressure, mm/Hg		X		
totchol	Total Cholesterol, mg/dL		X	X	X
highchol	dichotomous measure for evidence of high cholesterol or triglycerides		X		X
hdlchol	HDL Cholesterol, mg/dL		X	X	X
ldlchol	LDL Cholesterol, mg/dL		X	X	X
ldl_class	LDL-C risk classification		X		X
diabetes	dichotomous measure for evidence of diabetes		X	X	X
fastgluc	Fasting glucose (mg/dL)				X
fastgluc_class	Classification of fasting glucose		X		
nonfastgluc_class	Classification of non-fasting glucose		X		
hba1c	Hemoglobin A1c (%)		X	X	X
hba1c_class	HbA1c diabetes risk classification		X		
pulse	Pulse, beats/minute		X	X	X
pulsepress	Pulse pressure, mm/Hg		X		
crp	C-reactive protein (mg/l)		X	X	X
crp_class	crp risk classification		X		
cystatinc	cystatin c		X	X	
renalfunction	kidney disease risk classification		X		
triglyceride	Triglycerides		X	X	X
triglyceride_class	triglycerides risk classification		X		
inflam_med	anti-inflammatory medication use		X	X	X
lipid_med	anti-hyperlipidemic medication use		X	X	X
diab_med	anti-diabetic medication use		X	X	X
hyperten_med	anti-hypertensive medication use		X	X	X
rmem_datec	Memory: Date correct	X			
rmem_dwkc	Memory: Day of Week correct	X			
rmem_month	Memory: Current Month	X			
rmem_day	Memory: Current Day	X			
rmem_yr	Memory: Current Year	X			
rmem_dwk	Memory: Day of Week	X			

Variable	Label	ACL	AH	HRS	MIDUS
rmem_mmn	Memory: Mother's Maiden Name	X			
rmem_currp	Memory: Current President	X			
rmem_prevp	Memory: Previous President	X			
rmem_1	Memory: # Recall 1	X			
rmem2	Memory: # Recall 2	X			
rmem3	Memory: # Recall 3	X			
rmem4	Memory: # Recall 4	X			
rmem5	Memory: # Recall 5	X			
rmem6	Memory: # Recall 6	X			
r_vf1	Verbal Facility - Rain	X			
r_vf2	VF - Trees	X			
r_vf3	VF - Learn	X			
r_vf4	VF - Escape	X			
r_vf5	VF - Decide	X			
r_vf6	VF - Safe	X			
rmem_date	Memory: Date	X			
rmem_sum	Memory: IWER MARK SUM	X			
rmem_ser3a	Memory: Backward Serial 3s 1	X			
rmem_ser3b	Memory: Backward Serial 3s 2	X			
rmem_ser3c	Memory: Backward Serial 3s 3	X			
rmem_ser3d	Memory: Backward Serial 3s 4	X			
rmem_ser3e	Memory: Backward Serial 3s 5	X			
rmem_ser3f	Memory: Backward Serial 3s 6	X			
rmem_ser3sum	Memory: Sum of Backward Serial 3s (0 to 6)	X			
rmem_proxy1	Memory: Proxy 1	X			
rmem_proxy2	Memory: Proxy 2	X			
rmem_proxy3	Memory: Proxy 3	X			
rmem_proxy4	Memory: Proxy 4	X			
rmem_proxy5a	Memory: Proxy 5a	X			
rmem_proxy5b	Memory: Proxy 5b	X			
rmem_proxy5c	Memory: Proxy 5c	X			
rmem_proxy5d	Memory: Proxy 5d	X			
rmem_proxy5e	Memory: Proxy 5e	X			
rmem_proxy5f	Memory: Proxy 5f	X			
rmem_correct	Memory: # incorrect	X			
rmem_recall1	Memory: Word Recall 1	X			
rmem_recall2	Memory: Word Recall 2	X			
rmem_recall3	Memory: Word Recall 3	X			
rmem_recall4	Memory: Word Recall 4	X			
rmem_recall5	Memory: Word Recall 5	X			

Variable	Label	ACL	AH	HRS	MIDUS
rmem_recall6	Memory: Word Recall 6	X			
rmem_recall7	Memory: Word Recall 7	X			
rmem_recall8	Memory: Word Recall 8	X			
rmem_recall9	Memory: Word Recall 9	X			
rmem_recall10	Memory: Word Recall 10	X			
rmem_recallassist	Memory: Word Recall # of times assisted	X			
rcog_5item	Respondent cog impairment - 5 item	X			
rcog_6item	Respondent cog impairment - 6 item	X			
immedrecall	immediate recall - total # of words		X	X	X
delayrecall	delayed recall - total # of words		X	X	X
digbackwards	digits backwards - total score		X		X
serial7	serial 7s - # correct subtractions			X	
backcount	backwards counting - # counted			X	X
datename_mo	Date naming - month			X	
datename_daymo	Date naming - day of month			X	
datename_year	Date naming - year			X	
datename_daywk	Date naming - day of the week			X	
objname_scis	Object naming - scissors			X	
objname_cact	Object naming - cactus			X	
presname	president naming			X	
vpname	vice-president naming			X	
vocab	vocabulary - sum score			X	
cogtot	total cognition summary score			X	
numseries	number series - # items correct				X
catflu	category fluency - total # unique				X
sgstsingle	stop and go single - # correct				X
sgstswitch	stop and go switch - # correct				X
btact	Z-score BTACT Composite Score				X
physactivity	total physical activity index	X			
physactivity_quartile	ACL physical activity index quartiles	X			
hrsexercise	hours vigorous/active sports or exercise per week	X			
pa_light	frequency of light physical activity			X	
pa_light3xwk	yes/no: engage in light physical activity 3+ times a week			X	
pa_mod	frequency of moderately active sports or activities			X	X

Variable	Label	ACL	AH	HRS	MIDUS
pa_mod_wk	weekly frequency of moderately active sports or activities		X		
pa_vig	frequency of vigorous/active sports or exercise	X		X	X
pa_vig_wk	weekly frequency of vigorous/active sports or exercise		X		
pa_vig3xwk	binary: engage in vigorous/active sports or exercise average 3+ times a week			X	
pa_teamsports_wk	weekly frequency of vigorous team sports		X		
pa_indvsports_wk	weekly frequency of vigorous individual sports		X		
pa_gymtraining_wk	weekly frequency of gymnastics, weight lifting, strength training		X		
pa_walking_wk	weekly frequency of walking for exercise		X		
fitnesscenter	times per week use fitness or recreation center		X		
summerpa_mod	in the summer: frequency of moderately active sports or activities				X
summerpa_vig	in the summer: frequency of vigorous/active sports or exercise				X
winterpa_mod	in the winter: frequency of moderately active sports or activities				X
winterpa_vig	in the winter: frequency of vigorous/active sports or exercise				X
summerleisure_light	in the summer: frequency of light leisure activities				X
summerleisure_mod	in the summer: frequency of moderate leisure activities				X
summerleisure_vig	in the summer: frequency of vigorous leisure activities				X
winterleisure_light	in the winter: frequency of light leisure activities				X
winterleisure_mod	in the winter: frequency of moderate leisure activities				X
winterleisure_vig	in the winter: frequency of vigorous leisure activities				X
summerchore_light	in the summer: frequency of light chore activities				X
summerchore_mod	in the summer: frequency of moderate chore activities				X

Variable	Label	ACL	AH	HRS	MIDUS
summerchore_vig	in the summer: frequency of vigorous chore activities				X
winterchore_light	in the winter: frequency of light chore activities				X
winterchore_mod	in the winter: frequency of moderate chore activities				X
winterchore_vig	in the winter: frequency of vigorous chore activities				X
fastfood	fast food consumption in past week		X		
ssb	sugar-sweetened beverage consumption in past week		X		
everdrink	Drink alcohol ever in past year - yes or no	X	X	X	X
alc_drinkfreqweek	Number of drinks per week		X	X	
num_drinksday	Number of drinks consumed per occasion/days when drink	X	X		X
bingedrinking	Days drank 5+ drinks in one sitting		X		X
daysdrinkpermonth	Number of days drank alcohol in past month	X	X		X
lownum_drinks	medium - dummy variable for number of drinks/day when drank	X			
highnum_drinks	high - dummy variable for number of drinks/day when drank	X			
mednum_drinks	medium - dummy variable for number of drinks/day when drank	X			
drinksperday	Number of drinks per day when drank			X	
smoker	Current smoker - yes or no	X	X	X	X
eversmoke_reg	Ever smoked regularly - yes or no		X		
dailysmokefreq	Number of cigarettes smoked per day in last 30 days		X		
age	respondent age	X	X	X	X
birthyear	respondent birth year	X	X	X	X
hrscohort	respondent HRS study birth cohort			X	
female	respondent gender	X	X	X	X
race	respondent race/ethnicity	X		X	X
race_onecat	respondent race - best category		X		
race_wh	respondent race - White		X		
race_aa	respondent race - Black/African American		X		
race_as	respondent race - Asian		X		
race_ai	respondent race - American Indian/Native American		X		

Variable	Label	ACL	AH	HRS	MIDUS
race_pi	respondent race - Pacific Islander		X		
race_ot	respondent race - Other		X		
hispanic	respondent Hispanic ethnicity	X	X	X	X
immigrant	immigrant status	X	X	X	X
religion	respondent religion	X	X	X	X
language	respondent primary language		X		X
region	respondent geographic census region	X	X	X	
proxy	whether proxy interview	X		X	
pvt	picture vocabulary test		X		
verbal_iq	verbal IQ index	X			
adult_srh	respondent self-rated health	X	X	X	X
child_srh	childhood self-rated health		X	X	X
healthins	current health insurance status	X	X		X
anxiety	anxiety diagnosis		X		
depressiondx	depression diagnosis		X		
depressed_cesd	self-reported depression; CES-D	X	X	X	X
anxiety_depression	anxiety and/or depression				X
jobstress	self-reported stress due to job			X	
misswork_healthprob	health caused missed work/school in last month		X		X
healthins_medicarepta	has Medicare Part A healthcare coverage	X			
healthins_medicareptb	has Medicare Part B healthcare coverage	X			
healthins_medicareptd	has Medicare Part D healthcare coverage	X			
healthins_medicaid	has Medicaid healthcare coverage	X			
healthins_va	has VA or military healthcare coverage	X			
healthins_employer	has healthcare coverage through self or spouse employer	X			
healthins_self	has self-arranged healthcare coverage	X			
employhealthins	respondent employer health insurance			X	
govhealthins	respondent government health insurance			X	
relaxprobs	self-reported trouble relaxing		X		
pss_1	Perceived stress scale - item 1		X		
pss_2	Perceived stress scale - item 2		X		
pss_3	Perceived stress scale - item 3		X		
pss_4	Perceived stress scale - item 4		X		

Variable	Label	ACL	AH	HRS	MIDUS
adl	Sum of ADLs			X	
iadl	Sum of IADLs			X	
comorbidities	Sum of comorbidities	X		X	X
limit_pen	Difficulty holding a pen		X		
limit_reach	Difficulty reaching		X		
limit_stand	Difficulty standing		X		
limit_grip	Difficulty gripping		X		
limit_steps	Difficulty walking steps		X		
limit_dressing	Help dressing		X		
limit_eating	Help eating		X		
limit_toilet	Help with toilet		X		
limit_shopping	Help shopping		X		
limit_mod_act	Health limits moderate activities		X		X
limit_vig_act	Health limits vigorous activities		X		X
limit_stairs	Health limits climbing stairs	X			
limit_sev_stairs	Health limits climbing several flights of stairs		X		X
limit_flight_stairs	Health limits climbing one flight of stairs		X		X
limit_bending	Health limits bending, kneeling, or stooping		X		X
limit_walking	Difficulty walking a quarter-mile		X		
limit_sev_blocks	Health limits several blocks		X		
limit_one_block	Health limits walking one block		X		
limit_groceries	Health limits carrying groceries		X		X
limit_bath_dress	Health limits bathing and dressing		X		X
limit_walk_one_block	Health limits walking one block				X
limit_walk_block	Health limits walking several blocks	X			X
limit_walk_mile	Health limits walking more than a mile				X
limit_bathing	Heath limits bathing	X	X		
limit_housework	Health limits heavy housework	X			
lbelig	leave behind eligibility			X	
xsectionweight	Study-specific cross-section weights	X	X	X	X
acl_panelweight	ACL panel weight	X			
ah_longweight	Add Health longitudinal weight		X		
ah_longweight34	Add Health longitudinal weight (waves 3 and 4)		X		
ah_longweight345	Add Health longitudinal weight (waves 3, 4 and 5)		X		

Variable	Label	ACL	AH	HRS	MIDUS
ah_longweight45	Add Health longitudinal weight (waves 4 and 5)		X		
ah_psu	Add Health sampling unit/cluster variable		X		
hrs_sampleweight	HRS sampling weight			X	
hrs_strataweight	HRS stratum weight			X	