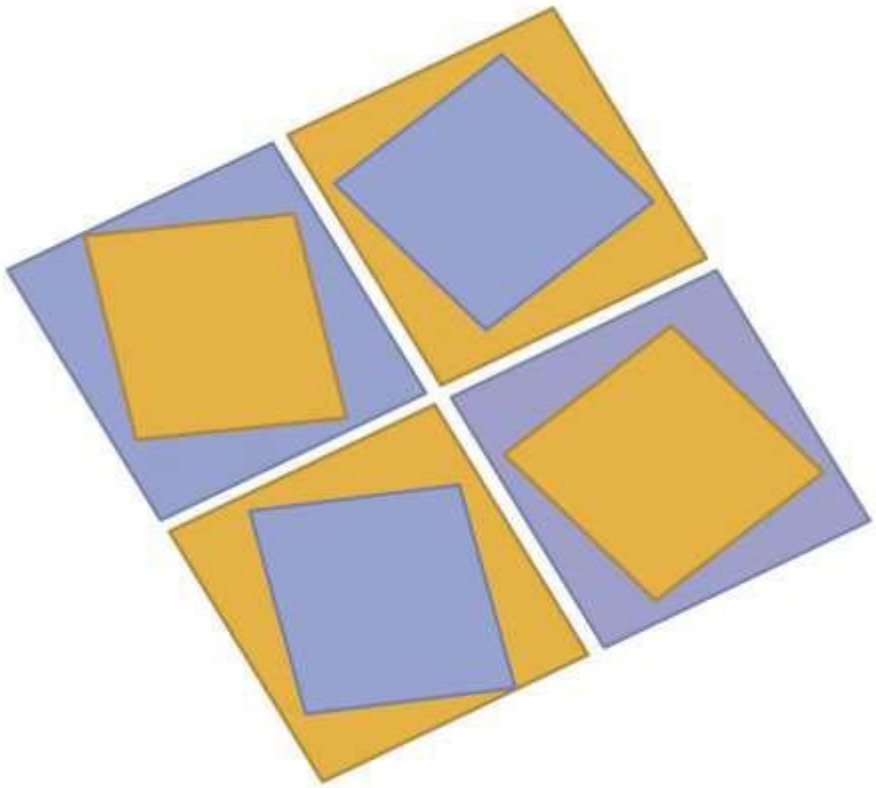

The BIOCARD Study

Biomarkers of Cognitive Decline
Among Normal Individuals

MRI Data – FreeSurfer:
Longitudinal Cortical Volume
Limited Dataset
May 2020

Glossary of Terms

Term	Description
Allowable Codes	codes (and their meanings) allowed to be values for that variable
Audit Findings	error rates based on BIOCARD or NIH phase audits error rates are calculated as number of errors / total number of variables examined
Baseline visit	date admitted to NIH phase of BIOCARD study *[Note: some data may have been collected prior to this date]*
Collection	when the variable information was collected (i.e., Baseline, Follow-up)
Comments	further information about the variable not covered in the above fields
Data Type	numeric or character *[Note: Dates are numeric data]* numeric or character classifications are strictly related to how the data are stored and not how the data should be analyzed
JHU phase	the study phase at JHU from 2009 - present
Missing OK If	instances (such as skips) or reasons why a blank or missing value is acceptable
NA	not applicable for this variable
NIH / NIH phase	the study phase that was performed at the NIH from 1995-2005
Question Text	the question as it appears on the NACC or BIOCARD data collection forms
Short Description	a short explanation of what the variable means
Source	the name of the NACC form, BIOCARD form, or NIH dataset containing the variable information (or "DERIVED" if the variable was derived) and the variable question number located on the form or in the dataset, if applicable
Unknown Code	the codes for the "unknown", "don't know", or missing values for the variable
Variable Name	the name of the variable in the provided dataset *[Note: Variables will follow the NACC naming scheme as closely as possible]*

Acronyms and Definitions

AD	Alzheimer's Disease
CDR	Clinical Dementia Rating
CERAD	Consortium to Establish a Registry for Alzheimer's Disease
CNS	Central Nervous System
CSF	Cerebrospinal Fluid
CVD	Cardiovascular Disease
CVLT	California Verbal Learning Test
FAQ	Functional Assessment Questionnaire
FTD	Frontotemporal Degenerations
GDS	Geriatric Depression Scale
JHU	The Johns Hopkins University
MCI	Mild Cognitive Impairment
MMSE	Mini-Mental State Examination
NACC	National Alzheimer's Coordinating Center
NIA	National Institute on Aging
NINDS	National Institute of Neurological Disorders and Stroke
NPI-Q	Neuropsychiatric Inventory Questionnaire
UPDRS	Unified Parkinson's Disease Rating Scale
WAIS	Wechsler Adult Intelligence Scale
WMS	Wechsler Memory Scale

FREE SURFER MRI Data Limited DatasetCharacteristics

Number of variables: 72

Order of variables:

1)	JHUANONID	*Participant ID Anonymized byJHU*
2)	VISITNO	*MRI visit number*
3)	MRIMOBL	*Months from baseline*
4)	MISSINGNESS	*Indicator variable; 1 if scan includes at least one missing region due to unreliable FreeSurfer labeling (e.g., regions of overestimation or underestimation; inconsistency with structural boundaries) or poor scan quality (e.g., poor contrast; movement artifact; global failure of FreeSurfer pipeline)*
5)	LH_BANKSSTS_VOLUME	*Left hemisphere banks of the superior temporal sulcus volume*
6)	LH_CAUDALANTERIORCINGULATE_VOLUME	*Left hemisphere caudal anterior cingulate volume*
7)	LH_CAUDALMIDDLEFRONTAL_VOLUME	*Left hemisphere caudal middle frontal volume*
8)	LH_CUNEUS_VOLUME	*Left hemisphere cuneus volume*
9)	LH_ENTORHINAL_VOLUME	*Left hemisphere entorhinal volume*
10)	LH_FUSIFORM_VOLUME	*Left hemisphere fusiform volume*
11)	LH_INFERIORPARIETAL_VOLUME	*Left hemisphere inferior parietal volume*
12)	LH_INFERIORTEMPORAL_VOLUME	*Left hemisphere inferior temporal volume*
13)	LH_ISTHMUSCINGULATE_VOLUME	*Left hemisphere isthmus cingulate volume*
14)	LH_LATERALOCCIPITAL_VOLUME	*Left hemisphere lateral occipital volume*
15)	LH_LATERALORBITOFRONTAL_VOLUME	*Left hemisphere lateral orbitofrontal volume*
16)	LH_LINGUAL_VOLUME	*Left hemisphere lingual* volume
17)	LH_MEDIALORBITOFRONTAL_VOLUME	*Left hemisphere medial orbitofrontal volume*
18)	LH_MIDDLETEMPORAL_VOLUME	*Left hemisphere middle temporal volume*
19)	LH_PARAHIPPOCAMPAL_VOLUME	*Left hemisphere parahippocampal volume*
20)	LH_PARACENTRAL_VOLUME	*Left hemisphere paracentral volume*
21)	LH_PARSOPERCULARIS_VOLUME	*Left hemisphere pars opercularis volume*
22)	LH_PARSORBITALIS_VOLUME	*Left hemisphere pars orbitalis volume*
23)	LH_PARSTRIANGULARIS_VOLUME	*Left hemisphere pars triangularis volume*
24)	LH_PERICALCARINE_VOLUME	*Left hemisphere pericalcarine volume*
25)	LH_POSTCENTRAL_VOLUME	*Left hemisphere postcentral volume*
26)	LH_POSTERIORCINGULATE_VOLUME	*Left hemisphere posterior cingulate volume*
27)	LH_PRECENTRAL_VOLUME	*Left hemisphere precentral volume*

28)	LH_PRECUNEUS_VOLUME	*Left hemisphere precuneus volume*
29)	LH_ROSTRALANTERIORCINGULATE_VOLUME	*Left hemisphere rostral anterior cingulate volume*
30)	LH_ROSTRALMIDDLEFRONTAL_VOLUME	*Left hemisphere rostral middle frontal volume*
31)	LH_SUPERIORFRONTAL_VOLUME	*Left hemisphere superior frontal volume*
32)	LH_SUPERIORPARIETAL_VOLUME	*Left hemisphere superior parietal volume*
33)	LH_SUPERIORTEMPORAL_VOLUME	*Left hemisphere superior temporal volume*
34)	LH_SUPRAMARGINAL_VOLUME	*Left hemisphere supramarginal volume*
35)	LH_FRONTALPOLE_VOLUME	*Left hemisphere frontal pole volume*
36)	LH_TEMPORALPOLE_VOLUME	*Left hemisphere temporal pole volume*
37)	LH_TRANSVERSETEMPORAL_VOLUME	*Left hemisphere transverse temporal volume*
38)	LH_INSULA_VOLUME	*Left hemisphere insula volume*
39)	RH_BANKSSTS_VOLUME	*Right hemisphere banks of the superior temporal sulcus volume*
40)	RH_CAUDALANTERIORCINGULATE_VOLUME	*Right hemisphere caudal anterior cingulate volume*
41)	RH_CAUDALMIDDLEFRONTAL_VOLUME	*Right hemisphere caudal middle frontal volume*
42)	RH_CUNEUS_VOLUME	*Right hemisphere cuneus volume*
43)	RH_ENTORHINAL_VOLUME	*Right hemisphere entorhinal volume*
44)	RH_FUSIFORM_VOLUME	*Right hemisphere fusiform volume*
45)	RH_INFERIORPARIETAL_VOLUME	*Right hemisphere inferior parietal volume*
46)	RH_INFERIORTEMPORAL_VOLUME	*Right hemisphere inferior temporal volume*
47)	RH_ISTHMUSCINGULATE_VOLUME	*Right hemisphere isthmus cingulate volume*
48)	RH_LATERALOCCIPITAL_VOLUME	*Right hemisphere lateral occipital volume*
49)	RH_LATERALORBITOFRONTAL_VOLUME	*Right hemisphere lateral orbitofrontal volume*
50)	RH_LINGUAL_VOLUME	*Right hemisphere lingual volume*
51)	RH_MEDIALORBITOFRONTAL_VOLUME	*Right hemisphere medial orbitofrontal volume*
52)	RH_MIDDLETEMPORAL_VOLUME	*Right hemisphere middle temporal volume*
53)	RH_PARAHIPPOCAMPAL_VOLUME	*Right hemisphere parahippocampal volume*
54)	RH_PARACENTRAL_VOLUME	*Right hemisphere paracentral volume*
55)	RH_PARSOPERCULARIS_VOLUME	*Right hemisphere pars opercularis volume*
56)	RH_PARSORBITALIS_VOLUME	*Right hemisphere pars orbitalis volume*
57)	RH_PARSTRIANGULARIS_VOLUME	*Right hemisphere pars triangularis volume*
58)	RH_PERICALCARINE_VOLUME	*Right hemisphere pericalcarine volume*
59)	RH_POSTCENTRAL_VOLUME	*Right hemisphere postcentral volume*
60)	RH_POSTERIORCINGULATE_VOLUME	*Right hemisphere posterior cingulate volume*
61)	RH_PRECENTRAL_VOLUME	*Right hemisphere precentral volume*
62)	RH_PRECUNEUS_VOLUME	*Right hemisphere precuneus volume*

63) RH_ROSTRALANTERIORCINGULATE_VOLUME *Right hemisphere rostral anterior cingulate volume*

64) RH_ROSTRALMIDDLEFRONTAL_VOLUME *Right hemisphere rostral middle frontal volume*

65) RH_SUPERIORFRONTAL_VOLUME *Right hemisphere superior frontal volume*

66) RH_SUPERIORPARIETAL_VOLUME *Right hemisphere superior parietal volume*

67) RH_SUPERIORTEMPORAL_VOLUME *Right hemisphere superior temporal volume*

68) RH_SUPRAMARGINAL_VOLUME *Right hemisphere supramarginal volume*

69) RH_FRONTALPOLE_VOLUME *Right hemisphere frontal pole volume*

70) RH_TEMPORALPOLE_VOLUME *Right hemisphere temporal pole volume*

71) RH_TRANSVERSETEMPORAL_VOLUME *Right hemisphere transverse temporal volume*

72) RH_INSULA_VOLUME *Right hemisphere insula volume*

1)	Variable Name	**JHUANONID**
	Short Description	Participant ID Anonymized by JHU
	Source	NA
	Question Text	NA
	Time of Collection	Baseline
	Data Type	Character
	Allowable Codes	JHU + 6 numbers
	Missing OK If	NA
	Audit Findings	NA
	Comments	None
2)	Variable Name	**VISITNO**
	Short Description	MRI visit number
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	NIH visit: Integers and decimals from 0 to 10, where a visit 0 represents a visit that occurred prior to the established baseline date JHU visit: 101, 102, 103, 104, ….. 1XX where XX is from 01 to 99 Visit number 999 used for all participants that have died before a 101 visit for forms: A4, A5, A5a, B1, B2, B3, B3a, B8, B9, and D1. For participants that are alive, an A5 may have a 999 visit number to capture medical data acquired during the NIH phase of the study.
	Missing OK If	NA
	Audit Findings	No NIH or JHU audit
	Comments	Visit when MRI was completed

3) Variable Name **MRIMOBL**

Short Description	Months from baseline
Source	DERIVED
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = 0 Max = 999
Missing OK If	NA
Audit Findings	NA
Comments	Calculated as months between the baseline start date and the recorded MRI date.

4) Variable Name **MISSINGNESS**

73) Short Description	Indicator variable; 1 if scan includes at least one missing region due to unreliable FreeSurfer labeling (e.g., regions of overestimation or underestimation; inconsistency with structural boundaries) or poor scan quality (e.g., poor contrast; movement artifact; global failure of FreeSurfer pipeline)
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	None.

5) Variable Name **LH_BANKSSTS_VOLUME**

Short Description	Left hemisphere banks of the superior temporal sulcus
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

6) Variable Name **LH_CAUDALANTERIORCINGULATE_VOLUME**

Short Description	Left hemisphere caudal anterior cingulate volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

7)	Variable Name	**LH_CAUDALMIDDLEFRONTAL_VOLUME**
	Short Description	Left hemisphere caudal middle frontal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

8)	Variable Name	**LH_CUNEUS_VOLUME**
	Short Description	Left hemisphere cuneus volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

9)	Variable Name	**LH_ENTORHINAL_VOLUME**
	Short Description	Left hemisphere entorhinal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

10)	Variable Name	**LH_ FUSIFORM L_VOLUME**
	Short Description	Left hemisphere fusiform volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

11) Variable Name **LH_INFERIORPARIETAL_VOLUME**

Short Description	Left hemisphere inferior parietal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

12) Variable Name **LH_INFERIORTEMPORAL_VOLUME**

Short Description	Left hemisphere inferior temporal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

13)	Variable Name	**LH_ISTHMUSCINGULATE_VOLUME**
	Short Description	Left hemisphere isthmus cingulate volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

14)	Variable Name	**LH_LATERALOCCIPITAL_VOLUME**
	Short Description	Left hemisphere lateral occipital volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

15) Variable Name **LH_LATERALORBITOFRONTAL_VOLUME**

Short Description	Left hemisphere lateral orbitofrontal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

16) Variable Name **LH_LINGUAL_VOLUME**

Short Description	Left hemisphere lingual volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

17) Variable Name **LH_MEDIALORBITOFRONTAL_VOLUME**

Short Description	Left hemisphere medial orbitofrontal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

18) Variable Name **LH_MIDDLETEMPORAL_VOLUME**

Short Description	Left hemisphere middle temporal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

19)	Variable Name	**LH_PARAHIPPOCAMPAL_VOLUME**
	Short Description	Left hemisphere parahippocampal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

20)	Variable Name	**LH_PARACENTRAL_VOLUME**
	Short Description	Left hemisphere paracentral volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

21) Variable Name **LH_PARSOPERCULARIS_VOLUME**

Short Description	Left hemisphere pars opercularis volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

22) Variable Name **LH_PARSORBITALIS_VOLUME**

Short Description	Left hemisphere pars orbitalis volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

23) Variable Name **LH_PARSTRIANGULARIS_VOLUME**

Short Description	Left hemisphere pars triangularis volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

24) Variable Name **LH_PERICALCARINE_VOLUME**

Short Description	Left hemisphere pericalcarine volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

25) Variable Name **LH_POSTCENTRAL_VOLUME**

Short Description	Left hemisphere postcentral volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

26) Variable Name **LH_POSTERIORCINGULATE_VOLUME**

Short Description	Left hemisphere posterior cingulate volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

27) Variable Name **LH_PRECENTRAL_VOLUME**

Short Description	Left hemisphere precentral volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

28) Variable Name **LH_PRECUNEUS_VOLUME**

Short Description	Left hemisphere precuneus volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

29) Variable Name **LH_ROSTRALANTERIORCINGULATE_VOLUME**

Short Description	Left hemisphere rostral anterior cingulate volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

30) Variable Name **LH_ROSTRALMIDDLEFRONTAL_VOLUME**

Short Description	Left hemisphere rostral middle frontal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

31)	Variable Name	**LH_SUPERIORFRONTAL_VOLUME**
	Short Description	Left hemisphere superior frontal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

32)	Variable Name	**LH_SUPERIORPARIETAL_VOLUME**
	Short Description	Left hemisphere superior parietal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

33)	Variable Name	**LH_SUPERIORTEMPORAL_VOLUME**
	Short Description	Left hemisphere superior temporal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

34)	Variable Name	**LH_SUPRAMARGINAL_VOLUME**
	Short Description	Left hemisphere supramarginal volume Source
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

35) Variable Name **LH_FRONTALPOLE_VOLUME**

Short Description	Left hemisphere frontal pole volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

36) Variable Name **LH_TEMPORALPOLE_VOLUME**

Short Description	Left hemisphere temporal pole volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

37) Variable Name **LH_TRANSVERSETEMPORAL_VOLUME**

Short Description	Left hemisphere transverse temporal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

38) Variable Name **LH_INSULA_VOLUME**

Short Description	Left hemisphere insula volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

39) Variable Name **RH_BANKSSTS_VOLUME**

Short Description	Right hemisphere banks of the superior temporal sulcus volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

40) Variable Name **RH_CAUDALANTERIORCINGULATE_VOLUME**

Short Description	Right hemisphere caudal anterior cingulate volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

41) Variable Name **RH_CAUDALMIDDLEFRONTAL_VOLUME**

Short Description	Right hemisphere caudal middle frontal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

42) Variable Name **RH_CUNEUS_VOLUME**

Short Description	Right hemisphere cuneus volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

43) Variable Name **RH_ENTORHINAL_VOLUME**

Short Description	Right hemisphere entorhinal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

44) Variable Name **RH_FUSIFORM_VOLUME**

Short Description	Right hemisphere fusiform volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

45) Variable Name **RH_INFERIORPARIETAL_VOLUME**

Short Description	Right hemisphere inferior parietal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

46) Variable Name **RH_INFERIORTEMPORAL_VOLUME**

Short Description	Right hemisphere inferior temporal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

47) Variable Name **RH_ISTHMUSCINGULATE_VOLUME**

Short Description	Right hemisphere isthmus cingulate volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

48) Variable Name **RH_LATERALOCCIPITAL_VOLUME**

Short Description	Right hemisphere lateral occipital volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

49)	Variable Name	**RH_LATERALORBITOFRONTAL_VOLUME**
	Short Description	Right hemisphere lateral orbitofrontal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

50)	Variable Name	**RH_LINGUAL_VOLUME**
	Short Description	Right hemisphere lingual volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

51) Variable Name **RH_MEDIALORBITOFRONTAL_VOLUME**

Short Description	Right hemisphere medial orbitofrontal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

52) Variable Name **RH_MIDDLETEMPORAL_VOLUME**

Short Description	Right hemisphere middle temporal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

53)	Variable Name	**RH_PARAHIPPOCAMPAL_VOLUME**
	Short Description	Right hemisphere parahippocampal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

54)	Variable Name	**RH_PARACENTRAL_VOLUME**
	Short Description	Right hemisphere paracentral volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

55)	Variable Name	**RH_PARSOPERCULARIS_VOLUME**
	Short Description	Right hemisphere pars opercularis volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

56)	Variable Name	**RH_PARSORBITALIS_VOLUME**
	Short Description	Right hemisphere pars orbitalis volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

57) Variable Name **RH_PARSTRIANGULARIS_VOLUME**

Short Description	Right hemisphere pars triangularis volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

58) Variable Name **RH_PERICALCARINE_VOLUME**

Short Description	Right hemisphere pericalcarine volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

59) Variable Name **RH_POSTCENTRAL_VOLUME**

Short Description	Right hemisphere postcentral volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

60) Variable Name **RH_POSTERIORCINGULATE_VOLUME**

Short Description	Right hemisphere posterior cingulate volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

61) Variable Name **RH_PRECENTRAL_VOLUME**

Short Description	Right hemisphere precentral volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

62) Variable Name **RH_PRECUNEUS_VOLUME**

Short Description	Right hemisphere precuneus volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

63) Variable Name **RH_ROSTRALANTERIORCINGULATE_VOLUME**

Short Description	Right hemisphere rostral anterior cingulate volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

64) Variable Name **RH_ROSTRALMIDDLEFRONTAL_VOLUME**

Short Description	Right hemisphere rostral middle frontal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

65)	Variable Name	**RH_SUPERIORFRONTAL_VOLUME**
	Short Description	Right hemisphere superior frontal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

66)	Variable Name	**RH_SUPERIORPARIETAL_VOLUME**
	Short Description	Right hemisphere superior parietal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

67)	Variable Name	**RH_SUPERIORTEMPORAL_VOLUME**
	Short Description	Right hemisphere superior temporal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

68)	Variable Name	**RH_SUPRAMARGINAL_VOLUME**
	Short Description	Right hemisphere supramarginal volume
	Source	NA
	Question Text	NA
	Time of Collection	Baseline and Follow-up
	Data Type	Numeric
	Allowable Codes	Min = TBD Max = TBD
	Missing OK If	NA
	Audit Findings	NA
	Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

69) Variable Name **RH_FRONTALPOLE_VOLUME**

Short Description	Right hemisphere frontal pole volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

70) Variable Name **RH_TEMPORALPOLE_VOLUME**

Short Description	Right hemisphere temporal pole volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

71) Variable Name **RH_TRANSVERSETEMPORAL_VOLUME**

Short Description	Right hemisphere transverse temporal volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.

72) Variable Name **RH_INSULA_VOLUME**

Short Description	Right hemisphere insula volume
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	Min = TBD Max = TBD
Missing OK If	NA
Audit Findings	NA
Comments	Measure obtained using the longitudinal FreeSurfer pipeline, version 5.3. For more information, see: Pettigrew C, Soldan A, Zhu Y, Cai Q, Wang MC, Moghekar A, Miller MI, Singh B, Martinez O, Fletcher E, DeCarli C, Albert M. Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals. Neurobiology of Aging 2020; in press. doi: 10.1016/j.neurobiolaging.2019.12.003.