

OASIS FACT SHEET (rev. 2007-8-20)

CROSS-SECTIONAL DATA ACROSS THE ADULT LIFESPAN

Marcus et al., 2007

Summary

OASIS provides brain imaging data that are freely available for distribution and data analysis. This data set consists of a cross-sectional collection of 416 subjects covering the adult life span aged 18 to 96 including individuals with early-stage Alzheimer's Disease (AD). For each subject, 3 or 4 individual T1-weighted MRI scans obtained within a single imaging session are included. The subjects are all right-handed and include both men and women. 100 of the included subjects over the age of 60 have been diagnosed with very mild to mild AD. Additionally, for 20 of the nondemented subjects, images from a subsequent scan session after a short delay (less than 90 days) are also included as a means of assessing acquisition reliability. All data have been anonymized to accommodate public distribution. Facial features were removed at the fMRIDC (<http://www.fmridc.org>) using the Brain Extraction Tool. The full set is 15.8 GB compressed and 50 GB uncompressed. The data are available at <http://www.oasis-brains.org>.

Image data

For each subject, a number of images are provided, including: 1) 3-4 images corresponding to multiple repetitions of the same structural protocol within a single session to increase signal-to-noise, 2) an average image that is a motion-corrected coregistered average of all available data, 3) a gain-field corrected atlas-registered image to the 1988 atlas space of Talairach and Tournoux (Buckner et al., 2004), 4) a masked version of the atlas-registered image in which all non-brain voxels have been assigned an intensity value of 0, and 5) a grey/white/CSF segmented image (Zhang et al., 2001). All images are in 16-bit big-endian Analyze 7.5 format.

Directory structure and file names

The contents of the DVD and downloadable archive file are organized by imaging session. Data from each MRI session exists in its own directory labeled by the subject ID. The random subject ID uses the format OAS1_xxxx, where 'xxxx' represents a number from 00001 to 9999 (e.g., OAS1_0012). For each of a subject's imaging sessions, an ID has been assigned of the format OAS1_xxxx_MRy, where y represents an incrementing number to reflect the imaging visit number for the subject (e.g., OAS1_0012_MR1).

For each session, a zip-compressed archive file is included and named with the session ID. When uncompressed, each session directory includes an XML file, a text (TXT) file, and three subdirectories: RAW, PROCESSED, and FSL_SEG.

The XML file includes acquisition details and anatomic measures derived from the scan images. A full description of the OASIS XML format can be found at <http://www.oasis-brains.org/schemas/>.

The TXT file includes the same information as the XML but is converted to text format for viewing.

The RAW directory includes the individual scan images.

The PROCESSED directory includes two additional subdirectories: SUBJ_111 and T88_111. SUBJ_111 includes the averaged, co-registered image of the individual scan images in the native acquisition space in resampled to 1mm isotropic voxels. T88_111 includes the atlas-registered gain field-corrected image and a brain-masked version of that image resampled to 1mm isotropic voxels. It also includes a subdirectory called t4_files that includes the matrices describing the transformation into atlas space.

The FSL_SEG directory includes the grey/white/CSF segmentation image generated from the masked atlas image. A summary of the image files can be found in Table 1.

Additional data

Demographic, clinical, and derived anatomic measures are located in the spreadsheets files (oasis_cross-sectional.xls and oasis_cross-sectional.csv) included on the DVD distribution and on the OASIS website. Table 2 summarizes demographic and dementia status.

Demographics

Gender (**M/F**), Handedness (**Hand**), Age, Education (**Educ**), socioeconomic status (**SES**) (Rubin et al., 1998). Education codes correspond to the following levels of education: 1: less than high school grad., 2: high school grad., 3: some college, 4: college grad., 5: beyond college.

Clinical

Mini-Mental State Examination (**MMSE**) (Rubin et al., 1998), Clinical Dementia Rating (**CDR**; 0 = nondemented; 0.5 – very mild dementia; 1 = mild dementia; 2 = moderate dementia) (Morris, 1993). All participants with dementia (CDR > 0) were diagnosed with probable AD.

Derived anatomic volumes

Estimated total intracranial volume (**eTIV**) (mm³) (Buckner et al., 2004), Atlas scaling factor (**ASF**) (Buckner et al., 2004), Normalized whole brain volume (**nWBV**) (Fotenos et al., 2004).

Name	Description	Dimensions	Vox. size	Orient
OAS1_xxxx_MRy_mpr-z_anon	Individual scan (z=repetition)	256x256x128	1x1x1.25	Sag
OAS1_xxxx_MRy_mpr_ni_anon_sbj_111	Image averaged across scans (i=# of scans)	256x256x160	1x1x1	Sag
OAS1_xxxx_MRy_mpr_ni_anon_111_t88_gfc	Gain-field corrected atlas registered average	176x208x176	1x1x1	Trans
OAS1_xxxx_MRy_mpr_ni_anon_111_t88_masked_gfc	Brain-masked version of atlas registered image	176x208x176	1x1x1	Trans
OAS1_xxxx_MRy_mpr_ni_anon_111_t88_masked_gfc_fseg	Brain tissue segmentation	176x208x176	1x1x1	Trans

Table 1. Images included in the data set. All images are in Analyze 7.5 format and include separate image (.img) and header (.hdr) files. ‘z’ in the above files names indicates the scan repetition. Most sessions include 3-4 repetitions. ‘i’ represents the number of images included in the averaged image.

Age Group	N	Non-Demented				Demented				CDR 0.5/1/2
		n	mean	male	female	n	mean	male	female	
<20	19	19	18.53	10	9	0		0	0	0/0/0
20s	119	119	22.82	51	68	0		0	0	0/0/0
30s	16	16	33.38	11	5	0		0	0	0/0/0
40s	31	31	45.58	10	21	0		0	0	0/0/0
50s	33	33	54.36	11	22	0		0	0	0/0/0
60s	40	25	64.88	7	18	15	66.13	6	9	12/3/0
70	83	35	73.37	10	25	48	74.42	20	28	32/15/1
80s	62	30	84.07	8	22	32	82.88	13	19	22/9/1
≥90	13	8	91.00	1	7	5	92.00	2	3	4/1/0
Total	416	316		119	197	100		41	59	70/28/2

Table 2. Summary of subject demographics and dementia status.

References

- Buckner, RL, Head, D, Parker, J, Fotenos, AF, Marcus, D, Morris, JC, Snyder, AZ, 2004. A unified approach for morphometric and functional data analysis in young, old, and demented adults using automated atlas-based head size normalization: reliability and validation against manual measurement of total intracranial volume. *Neuroimage* 23, 724-38.
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