Table S1: ADNI subject and image identifiers for all TF-fMRI studies used in this study.
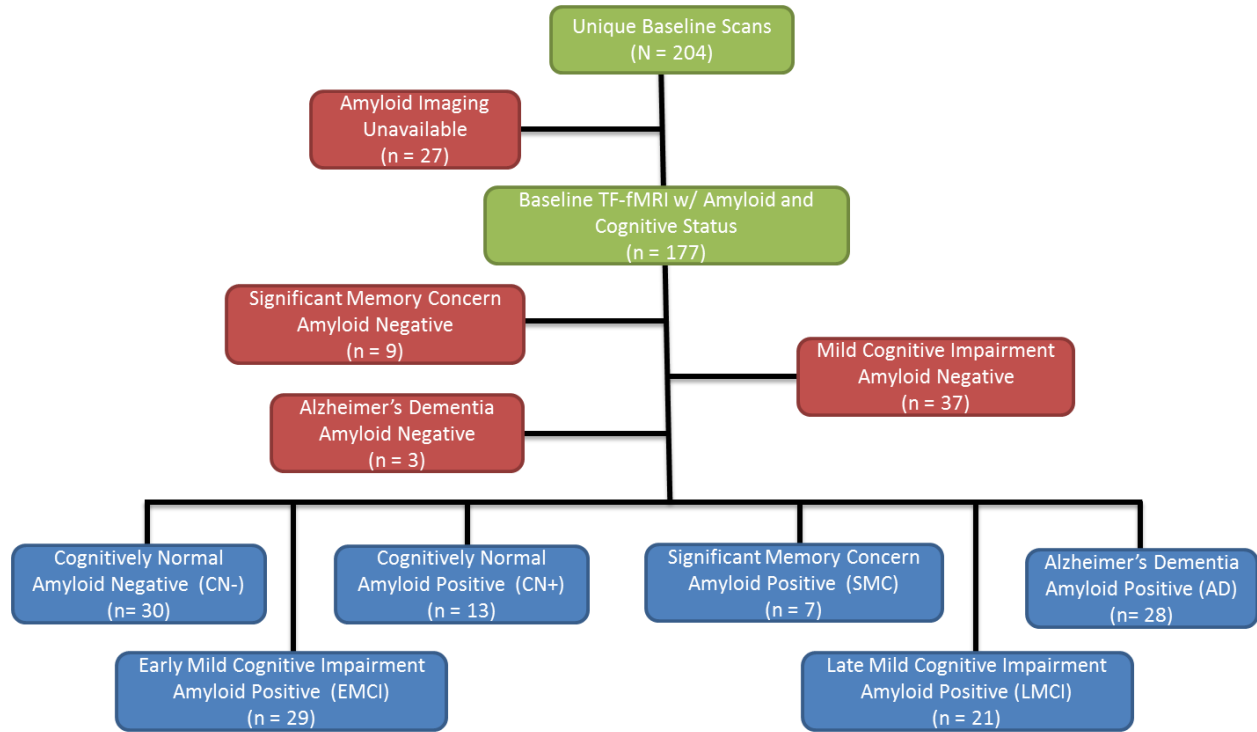

Figure S1: Subject inclusion based on amyloid-PET and cognitive status. Starting from all available high-quality baseline scans (N = 204), we excluded subjects with unavailable amyloid imaging (n = 27) leaving 177 subjects to be stratified based on cognitive status and amyloid status. All subjects with abnormal cognitive status and negative amyloid PET were excluded, as they have a high probability of not being on the typical Alzheimer's disease pathway. The remaining 128 subjects were then used for this study. The ADNI subject and scan identifiers used are listed in Table S1.
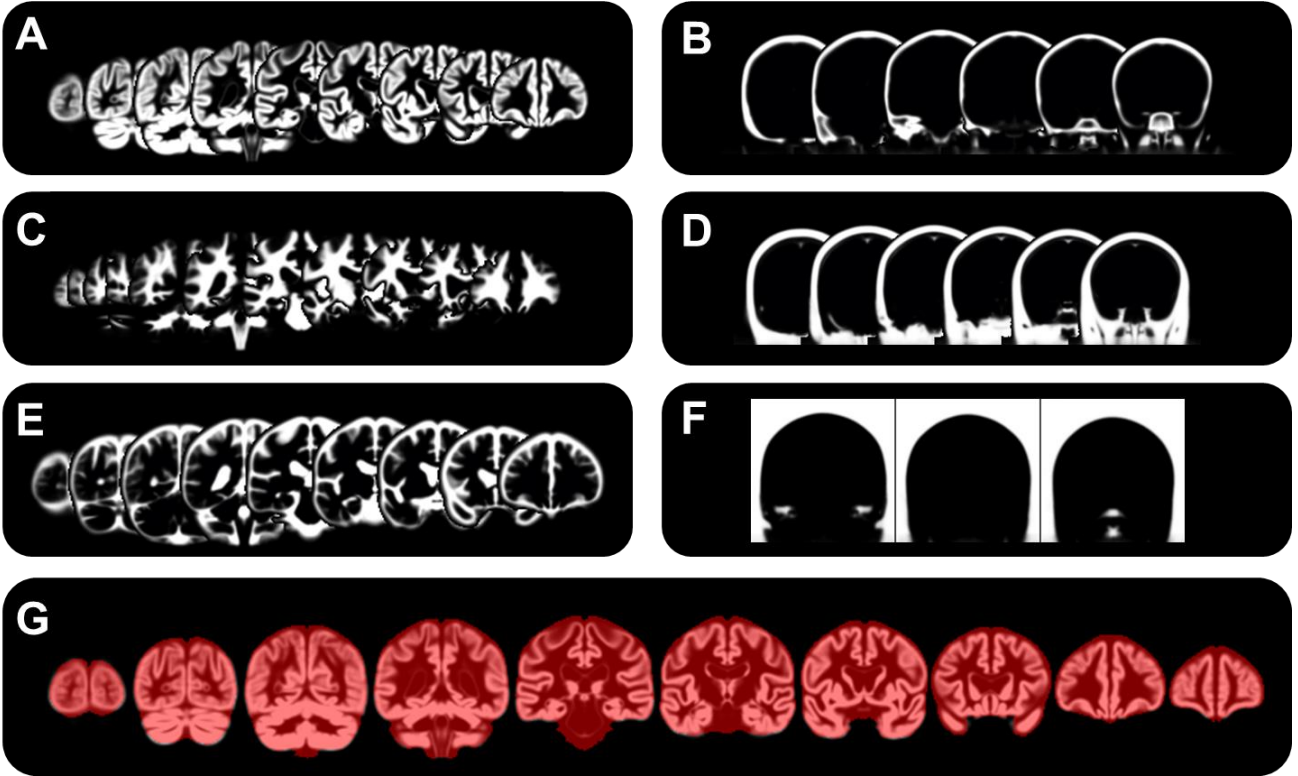
Figure S2: ADNI Template for TF-fMRI processing. Coronal sections of the template space priors for gray matter (**A**), bone (**B**), white matter (**C**), lipid (**D**), cerebral spinal fluid (**E**), air (**F**), and total intracranial volume (**G**). The ADNI TF-fMRI template space is made freely available here: http://mayoresearch.mayo.edu/mayo/research/jack_lab/supplement.cfm.

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┌─────────────────────────────────────┐
│ Remove first 10 volumes (130 remain) │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│     Despiking (AFNI 3dDespike)       │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│  Slice-timing correction (SPM12b)    │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│  Realignment to mean EPI (SPM12b)    │
└─────────────────────────────────────┘
                 │
        ┌──────────────────────────────────────┐
        │ Co-register T1 to mean EPI (SPM12b)   │
        └──────────────────────────────────────┘
                          │
                 ┌──────────────────────────────────┐
                 │  Unified Segmentation and          │
                 │  Normalization using ADNI Template │
                 │  (SPM12b)                          │
                 └──────────────────────────────────┘
                          │
   ┌──────────────────────────────────────┐
   │  Template ICV and MCSA fROIs to        │
   │  Subject Space (SPM12b)                │
   └──────────────────────────────────────┘
                          │
   ┌──────────────────────────────────────┐
   │        Create aCompCor ROI            │
   └──────────────────────────────────────┘

┌──────────────────────────────────┐   ┌──────────────────────────────────────┐
│ Simultaneous bandpass and nuisance│◄──│ 18 total regressors: 6 motion and 1st │
│ regression (AFNI 3dBandpass)      │   │ derivative, and first 6 PCs           │
└──────────────────────────────────┘   └──────────────────────────────────────┘
                 │
┌──────────────────────────────────┐
│ Voxel time series variance, brain  │
│ mask (ICV), and smooth 6mm FWHM    │
└──────────────────────────────────┘
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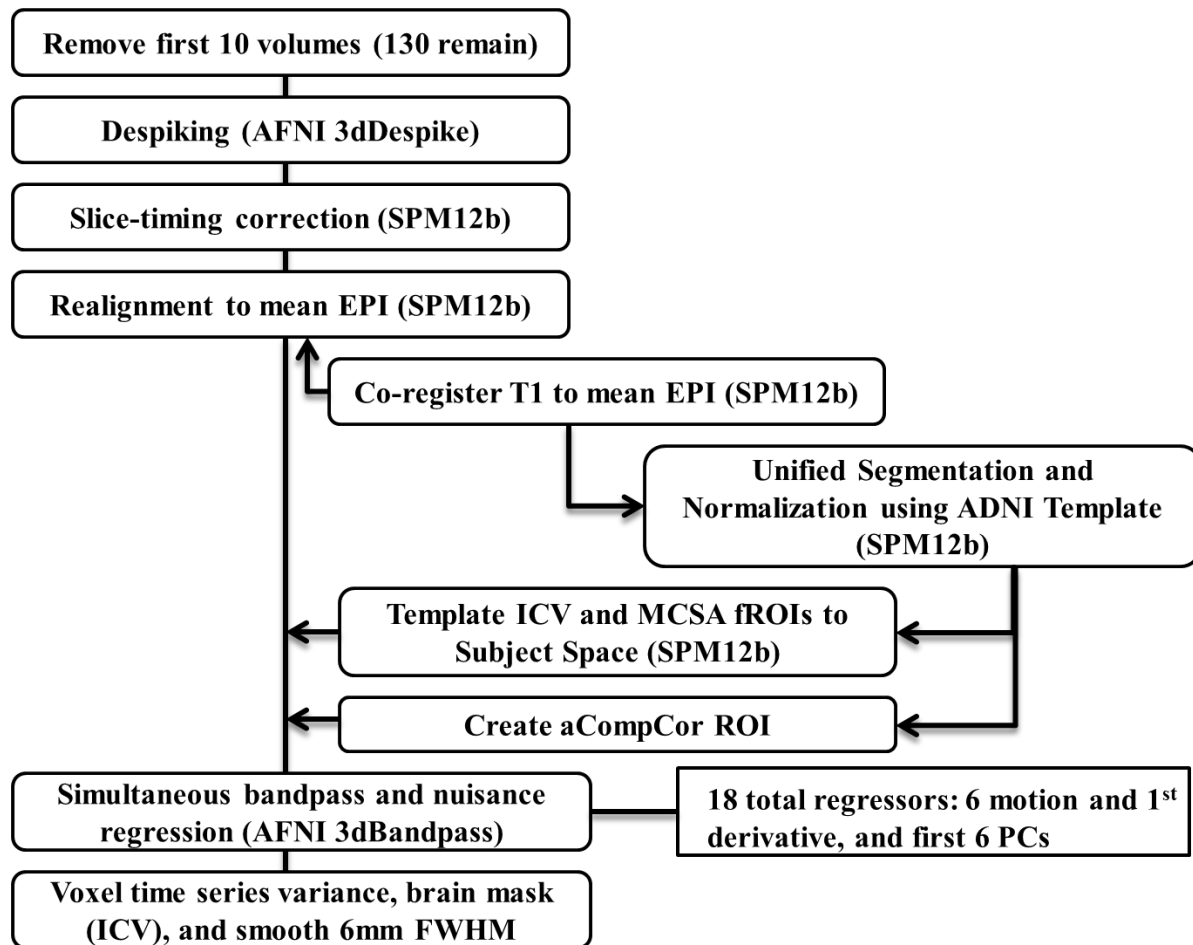
Figure S3: Subject space pre-processing pipeline utilizing ADNI TF-fMRI template. See main text for details.
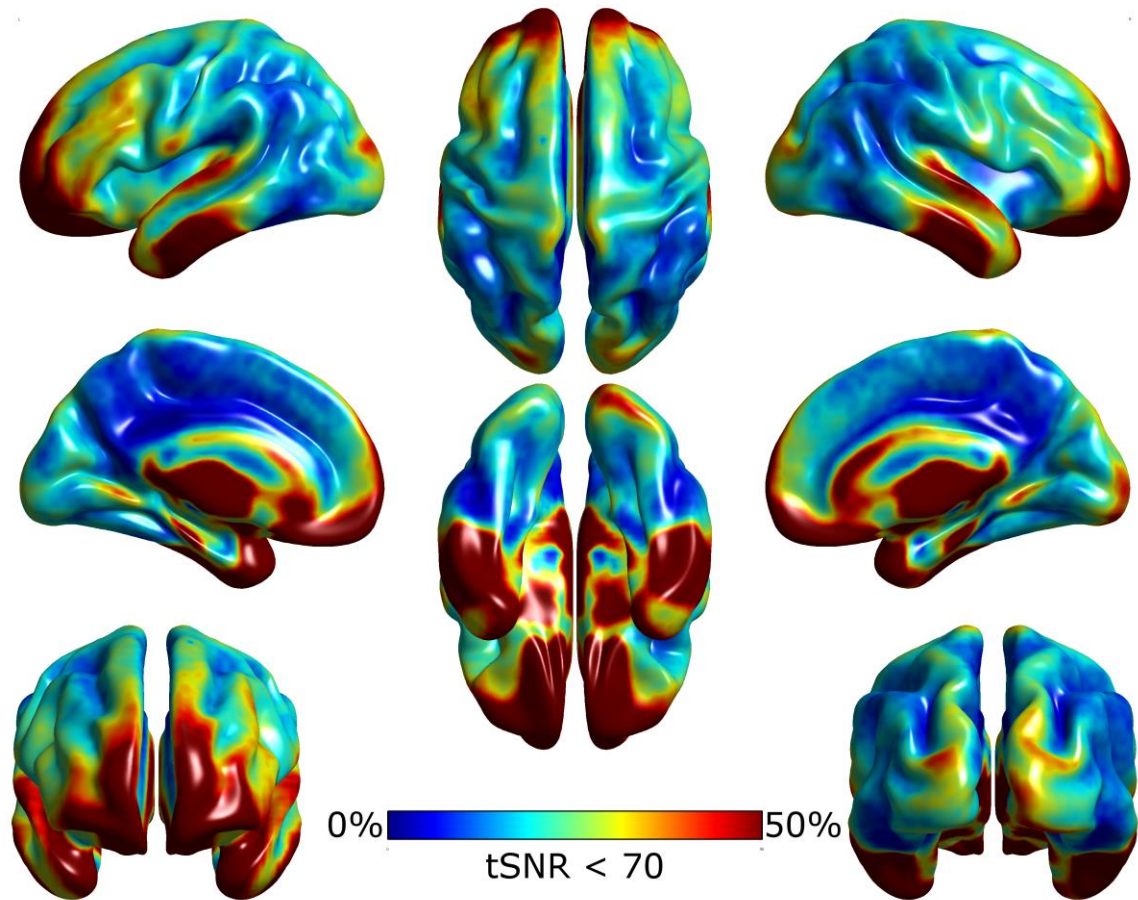
Figure S4: Topography of regions with poor signal-to-noise across ADNI TF-fMRI scans. A brain surface rendering displaying the frequency count of the number of subjects with temporal signal-to-noise ratio (tSNR) bellow 70. Dark blue indicating that no subjects displayed poor tSNR and dark red indicating that 50% or more of the scans displayed poor tSNR in these regions. This map highlights the regions typically affected by susceptibility artifacts, but it also highlights regions in the left lateral frontal lobe that tend to be affected by a penciling artifact in the ADNI data. The regions of the brain used to create our DMN summary metrics (Figures 1 and S5) largely exclude these regions.
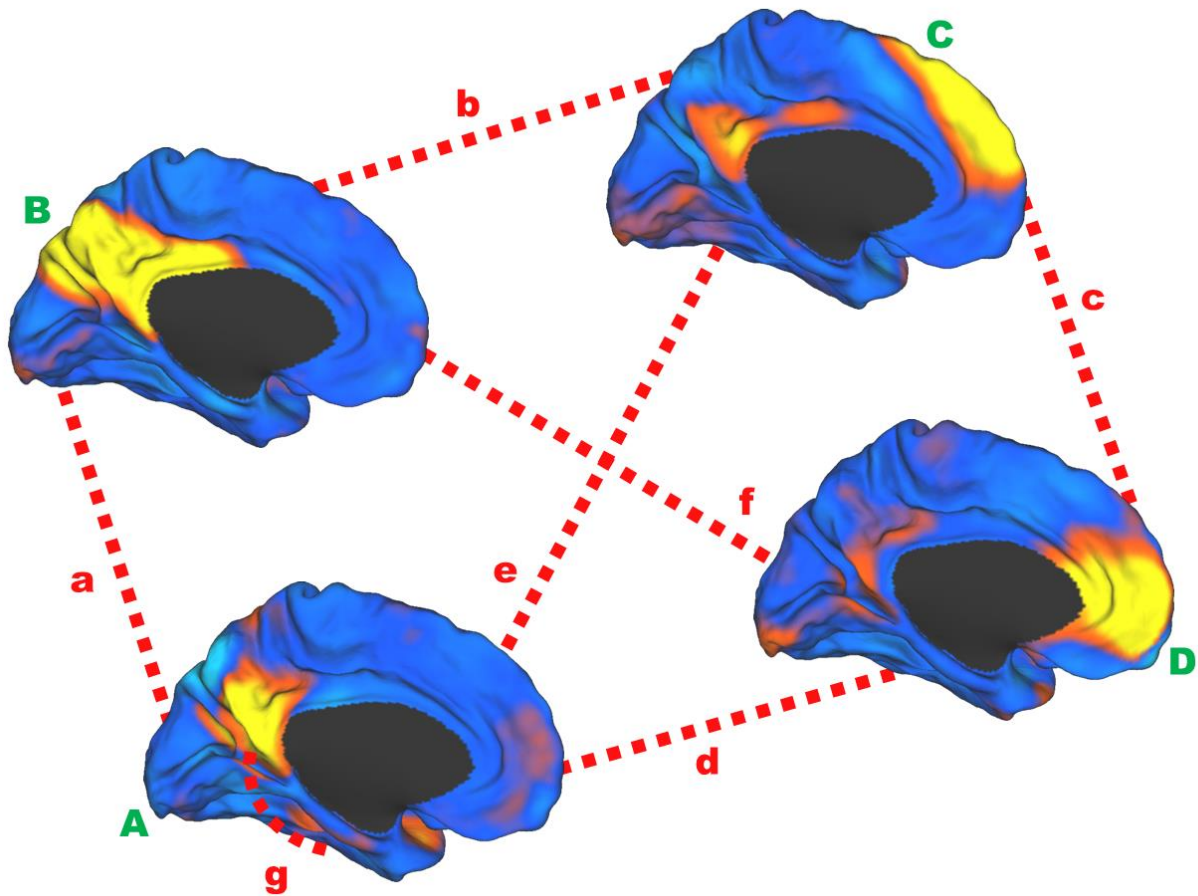
Figure S5: Schematic of within- and between-DMN subsystem connectivity. The within-DMN subsystems connectivity for the ventral DMN (**A**), posterior DMN (**B**), anterior-dorsal DMN (**C**), and anterior-ventral DMN (**D**) are indicated with green colored capital letters near the medial surface rendering of their respective intrinsic connectivity network (ICN). The between-subsystems connectivity is indicated with dashed red lines (**a-f**). The ventral DMN hippocampal connectivity is indicated by the red dashed line extending from the ventral DMN to the medial temporal lobe (**g**). The surface renderings of the ICN from the Mayo Clinic Study of Aging Functional Connectivity Atlas (Jones *et al.*, 2012) were created using the caret software package (Van Essen, 2005).
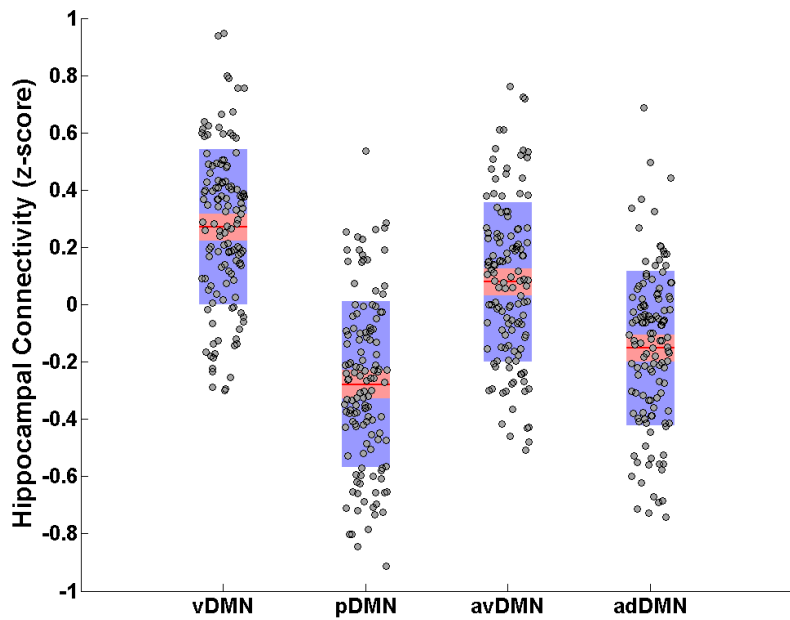
Figure S6: DMN subsystem connectivity with the hippocampus. The connectivity within the hippocampus for each of the default mode network subsystems is displayed in this plot containing individual data points (gray circles), mean (red line), 95% confidence interval of the mean (margins of pink box), and one standard deviation (margins of blue box).