Supplementary Online Material

Supplementary Figure 1. Automated selection of the executive-control component in a single subject. Each subject's executive-control component was selected from among their several independent components (shown here with only 3 of this subject's 21 components) based on a three-step algorithm. Each component consists of a spatial map (colored axial images) with its corresponding timeseries shown beneath it. The color scale indicates the degree to which a given voxel's timeseries is correlated with the overall timeseries of that component (with yellow-red colors indicating a positive correlation and blue colors indicating a negative correlation). First, because intrinsic connectivity networks are driven by low-frequency oscillations, all high-frequency components (Component 1 in this example) are removed using a frequency filter. Second, the remaining low-frequency components are scored based on their spatial goodness-of-fit to a standard template of the executive-control network derived from a separate dataset (template not shown). Third, the component with the highest goodness-of-fit score (Component 3 here) is entered into the group analyses. Note that all voxels of the selected component have z-scores, not just those voxels that fall within the regions defined by the standard template. An identical technique is used to select the salience network (Component 2 in this example) except that the standard template is changed from the executive-control network to the salience network.

Supplementary Figure 2. Comparison of convergent ICN mapping techniques and functional correlations. Region-of-interest (ROI) correlation maps (top row) were

generated for timeseries from the right frontoinsula (FI, red-orange colorbar) and right dorsolateral prefrontal cortex (DLPFC, blue-green colorbar). For display purposes, t-score colorbars for the ROI maps are adjusted so that the top of the bar reflects the maximum t-score seen outside the seed ROI for each network. FI and DLPFC correlation maps were used as spatial templates to select best-fit components from an independent component analysis (ICA) of a separate group of subjects, as detailed in Supplementary Figure 1. One-sample t-tests combining best-fit components across subjects revealed a "salience network" (red-orange colorbar) derived from the right FI network template and an "executive-control network" (blue-green colorbar) derived from the right DLPFC network template (middle row). Functional correlation analyses (bottom row), performed using behavioral measures obtained outside the scanner, showed a double dissociation of network function, with salience network components correlating with pre-scan anxiety (red-orange colorbar) and executive-control network components correlating with executive functioning (Trails B – Trails A, blue-green colorbar). Further anatomical details are provided in Figures 1-3 and Supplementary Tables 1 and 2. Images are displayed as in Figures 1-3, with each row here showing the same six axial slices.

Supplementary Figure 3. Individual variance in goodness-of-fit to the two network templates. Goodness-of-fit metric scores, defined as the mean z-score of voxels within the template minus the mean z-score of voxels outside the template, are shown for each subject's best-fit salience and executive-control network components. Bars indicates mean and standard deviation.

Supplementary Figure 4. Functional activity in the left frontoinsula is shared by the salience and executive-control networks. Timeseries from the right FI and right DLPFC (seed ROIs for the correlation analysis displayed in Figure 1) are shown with the timeseries from the left FI, the largest cluster to appear in both networks in the ROI and ICA analyses. These timeseries, derived from two representative subjects, suggest that left FI is most strongly correlated with right FI, but that left FI and right DLPFC are also intermittently correlated with each other. Timeseries shown were demeaned and normalized to unit standard deviation.

Supplementary Table 1. Region-of-interest intrinsic functional connectivity analyses.

Region	**R/L**	**BA**	**x**	**y**	**z**	**Z-score**
Regions with intrinsic functional connectivity to R FI						
Paralimbic						
Orbital frontoinsula*	R	47/12	36	26	-8	7.32
	L	47/12	-32	26	-14	5.87
Temporal pole	R	38	50	2	-10	4.89
	L	38	-44	4	-22	4.12
Frontal operculum	R	44	58	14	8	4.33
Paracingulate	R	32	8	38	32	3.54
	L	32	-6	12	44	4.12
Dorsal ACC	R	24	8	18	34	4.52
	L	24	0	26	20	4.21

SMA/Pre-SMA	R	6	10	16	50	5.13
	L	6	-6	14	54	3.88
Neocortical						
Superior temporal	R	22	50	-10	-8	3.59
	L	22	-52	-14	-8	4.39
Dorsolateral PFC*	R	44/45/**46**	40	44	18	4.60
	L	46	-30	44	22	4.83
Frontal pole	R	10/**11**	28	58	-2	4.24
	L	10/**11**	-30	54	4	5.04
Ventrolateral PFC	R	47	40	42	0	4.17
	L	47	-36	46	-14	3.78
Subcortical/Limbic						
Ventral striato-pallidum	R	--	12	0	-2	4.06
	L	--	-10	4	4	4.54
Thalamus, dorsomedial	R	--	10	-16	6	3.49
	L	--	-8	-12	8	3.31
Hypothalamus	R	--	6	-10	-2	4.53
	L	--	-10	-4	-8	4.07
SLEA/paraolfactory	R	--	28	4	-10	3.78
	L	--	-26	0	-16	3.49
PAG	R	--	6	-24	-12	4.85
	L	--	-2	-24	-12	3.88
SN/VTA	R	--	12	-12	-8	3.69

	L	--	-6	-12	-12	3.88
Regions with intrinsic functional connectivity to R DLPFC						
Paralimbic						
Dorsal anterior insula*	L	48	-28	30	4	4.36
Neocortical						
Dorsolateral PFC*	R	44/**45**/46	46	36	18	6.81
	L	44/**45**/46	-42	34	20	4.88
DM PFC	R	8	8	28	46	4.67
Lateral parietal	R	39/**40**/7	46	-54	42	4.52
	L	39/**40**/7	-42	50	48	4.40
Frontal operculum	L	44	-58	14	12	3.87
Subcortical						
None						

Group-level correlation maps were superimposed on the MNI template brain in MRIcro for anatomic localization. If multiple Brodmann areas (BAs) were identified, the primary focus is listed in bold. * = regions found in both correlation maps. All foci listed were significant at height and extent statistical thresholds of $P<0.001$, whole-brain corrected. ACC = anterior cingulate cortex, PAG = periaqueductal grey, PFC = prefrontal cortex, SMA = supplementary motor area, SLEA = sublenticular extended amygdala, SN = substantia nigra, VTA = ventral tegmental area.

Supplementary Table 2. Two distinct intrinsic connectivity networks identified with ICA.

Region	**R/L**	**BA**	**x**	**y**	**z**	**Z-score**
Salience Network						
Paralimbic						
Orbital frontoinsula*	R	47/12	42	10	-12	5.99
	L	47/12	-40	18	-12	6.15
Temporal pole	R	38	52	20	-18	4.28
	L	38	-52	16	-14	4.02
Paracingulate	--	32	0	44	28	5.20
Dorsal ACC	R	24	6	22	30	4.53
	L	24	-6	18	30	4.92
SMA/Pre-SMA	R	6	6	8	58	4.38
	L	6	-4	14	48	3.35
Neocortical						
Superior temporal	R	22	64	-38	6	3.94
	L	22	-62	-16	8	4.20
Parietal operculum	R	40	58	-40	30	4.66
	L	48	-60	-40	40	4.49
Frontal pole	L	10	-24	56	10	4.27
Ventrolateral PFC*	R	47	42	46	0	4.83
Dorsolateral PFC*	R	44/45/**46**	30	48	22	4.33
	L	45/**46**	-38	52	10	4.47

Subcortical/Limbic						
Ventral striato-pallidum	R	--	22	6	-2	4.12
	L	--	-22	12	-6	4.33
Thalamus, dorsomedial	R	--	12	-18	6	4.48
Hypothalamus	R	--	6	-16	-6	3.96
	L	--	-10	-14	-8	4.85
SLEA/paraolfactory	R	--	26	4	-20	4.13
	L	--	-28	4	-18	4.08
PAG	L	--	-4	-24	-2	3.57
SN/VTA	R	--	8	-8	-14	3.58
	L	--	-10	-14	-10	4.79
Executive-control Network						
Paralimbic						
Orbital frontoinsula*	L	47/12	-36	24	-10	4.39
Neocortical						
Dorsolateral PFC*	R	44/**45**/46	46	46	14	5.60
	L	44/**45**/46	-34	46	6	5.01
Ventrolateral PFC*	R	47/11	34	56	-6	4.45
	L	47/11	-32	54	-4	4.57
Frontal operculum	R	44	56	14	14	4.2
DLPFC/FEF	R	8/9	30	12	60	7.41
	L	8/9	-32	18	50	4.22
DM PFC	--	8	0	36	46	4.78

Lateral parietal	R	39/**40**/7	38	-56	44	5.09
	L	39/**40**/7	-48	-48	48	4.60
Inferior temporal	R	37	58	-54	-16	3.56
Subcortical						
Caudate, dorsal	R	--	12	14	4	4.39
	L	--	-16	-14	20	4.13
Caudate, ventromedial	R	--	10	12	2	3.42
Thalamus, anterior	R	--	10	2	8	4.26
	L	--	-8	-2	8	4.01

Data were assessed anatomically and presented as in Table S1. If multiple Brodmann areas (BAs) were identified, the primary focus is listed in bold. * = regions found in both ICA networks. All foci listed were significant at height and extent statistical thresholds of $P<0.001$, whole-brain corrected. FEF = frontal eye field. Abbreviations otherwise as in Supplementary Table 1.

Supplementary Table 3. Regional timeseries correlations within subjects.

	Regions correlated		
Subject	**R FI vs. R DLPFC**	**R FI vs. L FI**	**R DLPFC vs. L FI**
1	-0.43	0.39	0.22
2	-0.26	0.28	0.27
3	0.54	0.85	0.46
4	0.27	0.75	0.28

5	0.2	0.32	0.41
6	0.31	0.38	0.42
7	0.04	0.33	0.21
8	0.23	0.38	0.24
9	-0.01	0.49	0.18
10	0.33	0.62	0.02
11	0.39	0.44	0.59
12	0.38	0.46	0.36
13	0.19	0.71	0.28
14	0.15	0.49	0.47
Total (mean +/- s.d.)	0.17 +/- 0.26	0.49 +/- 0.18	0.32 +/- 0.15

Supplementary Table 4. Salience and Executive-control component timeseries correlations within subjects.

Subject	**Salience Network component vs. Executive-control component timeseries**
1	0.42
2	0.2
3	0.13
4	0.05
5	1.0*
6	0.04
7	1.0

8	0.03
9	-0.05
10	0.09
11	0.06
12	0.1*
13	-0.2
14	0.07
15	0.15
16	-0.15
17	-0.05
18	0.29
19	-0.15
20	1.0*
21	-0.23
Total (mean +/- s.d.)	0.18 +/- 0.38

* Template matching procedure chose same component for salience and executive-control network templates.