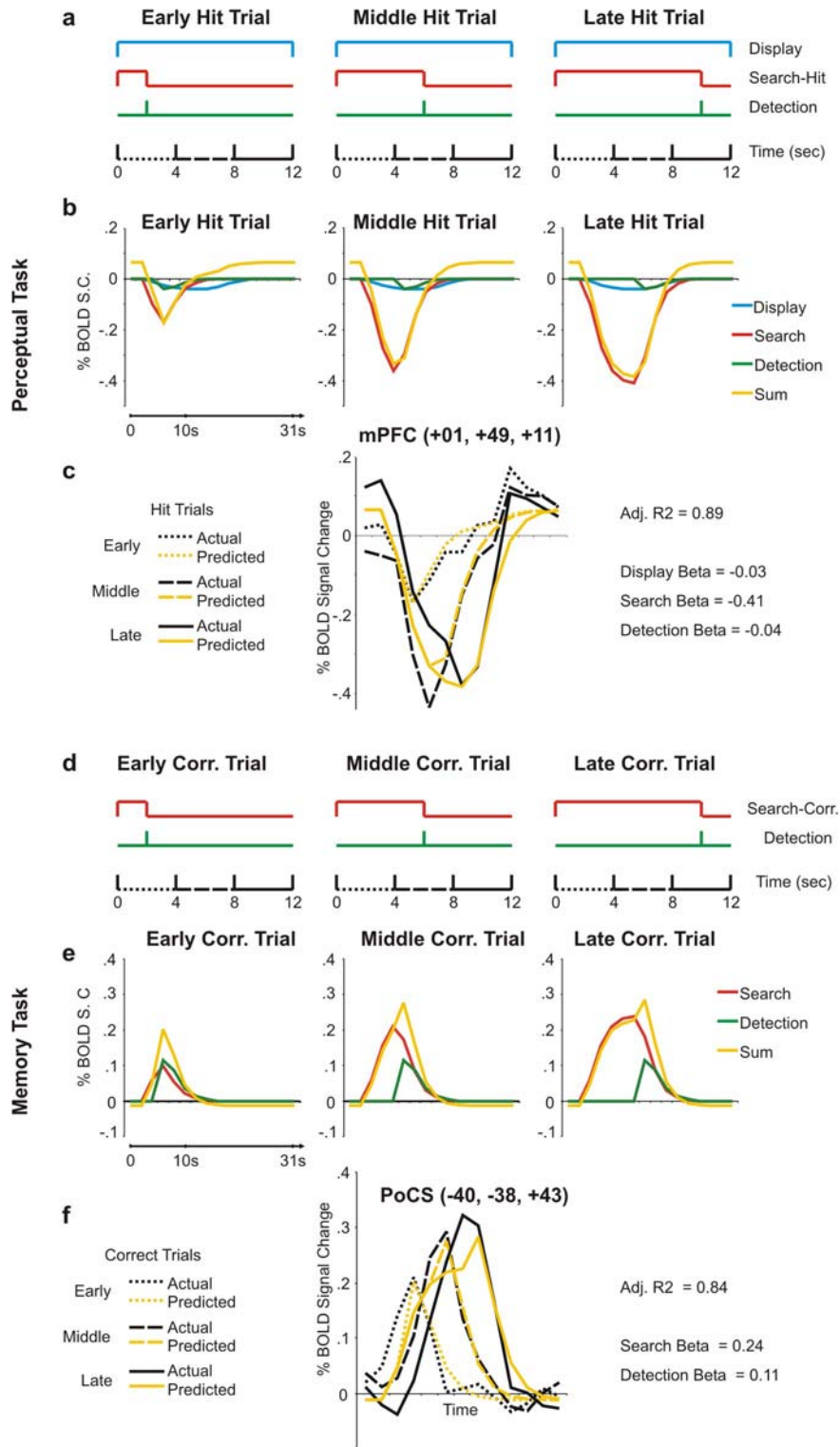


**Supplemental Material for ‘Episodic memory retrieval, parietal cortex,  
and the Default Mode Network: functional and topographic analyses’**

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**Content of the supplemental material:** 5 Figures and captions

# Supplemental Figure 1. BOLD Regression Models.



**a)** Illustration of the regressors for display (response for the duration of the movie clip), search (response that varies with the search time) and detection (transient response to target onset) used to estimate the response to each process during target Hit trials of different duration (early, middle, late) in the perceptual task (process GLM).

**b)** Decomposition of a hypothetical BOLD response during early, middle and late hit trials of the different component processes based on the model in a). The overall timecourse (yellow line) is the linear sum of the individual components [display (light blue line), search (red) and detection (green)]. This region has a mild constant negative response to display and detection processes, but a robust negative response to search that depends on search duration. The components were obtained by fitting a simplified 4-parameter model to the group-averaged timecourse that was estimated using the frame-by-frame model (see methods). This approach has been extensively validated in previous work (Courtney et al., 1997; D'Esposito et al., 1999; Shulman et al., 2003; Todd and Marois, 2004; Shulman et al., 2007).

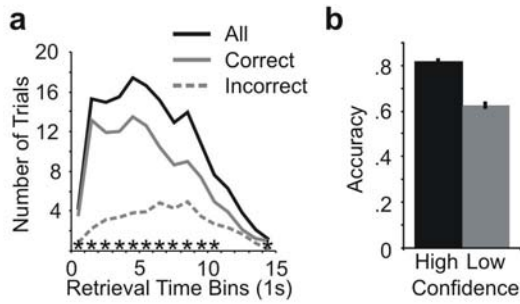
**c)** Actual (black line) and predicted (yellow line) group-averaged timecourses in mPFC during early (dotted), middle (broken) and late (solid) hit trials (perceptual task). The picture shows also the adjusted  $R^2$  representing the fit between the actual and the predicted timecourses as well as the selective contribution of each component to the overall BOLD response (Betas).

**d)** Illustration of the regressors for search and detection used to estimate the response to each process during correct trials of different duration (early, middle, late) in the memory task (process GLM).

e) Decomposition of a hypothetical BOLD response during early, middle and late correct trials of the different component processes based on the model in d). The overall timecourse (yellow line) is the linear sum of the individual components [search (red) and detection (green)]. The components were obtained by fitting a simplified 2-parameter model to the group-averaged timecourse that was estimated using the frame-by-frame model (see methods). This region has a response to the search process that depends on search duration and also a constant transient response to the detection process.

f) Actual (black line) and predicted (yellow line) group-averaged timecourses for early, middle and late correct memory trials in a region of the Postcentral Sulcus (PoCS) showing memory search-related response. The picture shows also the adjusted  $R^2$  representing the fit between the actual and the predicted timecourses as well as the selective contribution of each component to the overall BOLD response (Betas).

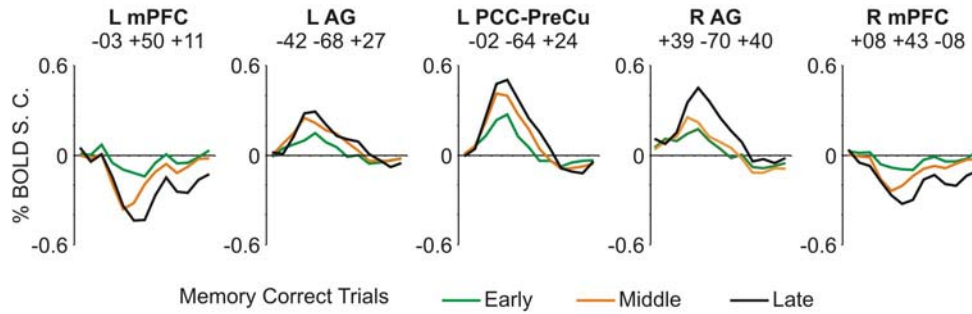
**Supplemental Figure 2. Behavioral results for the episodic memory search task.**



**a.** The distribution of trials (mean across subjects) for each time bin (1 s) of the allowed response time (15 s). The graph shows the distribution of all (solid black), correct (solid grey), and incorrect (broken grey) trials. The asterisks indicate time bins in which performance was significantly different than chance (one sample *t*-test against the chance level of 0.5).

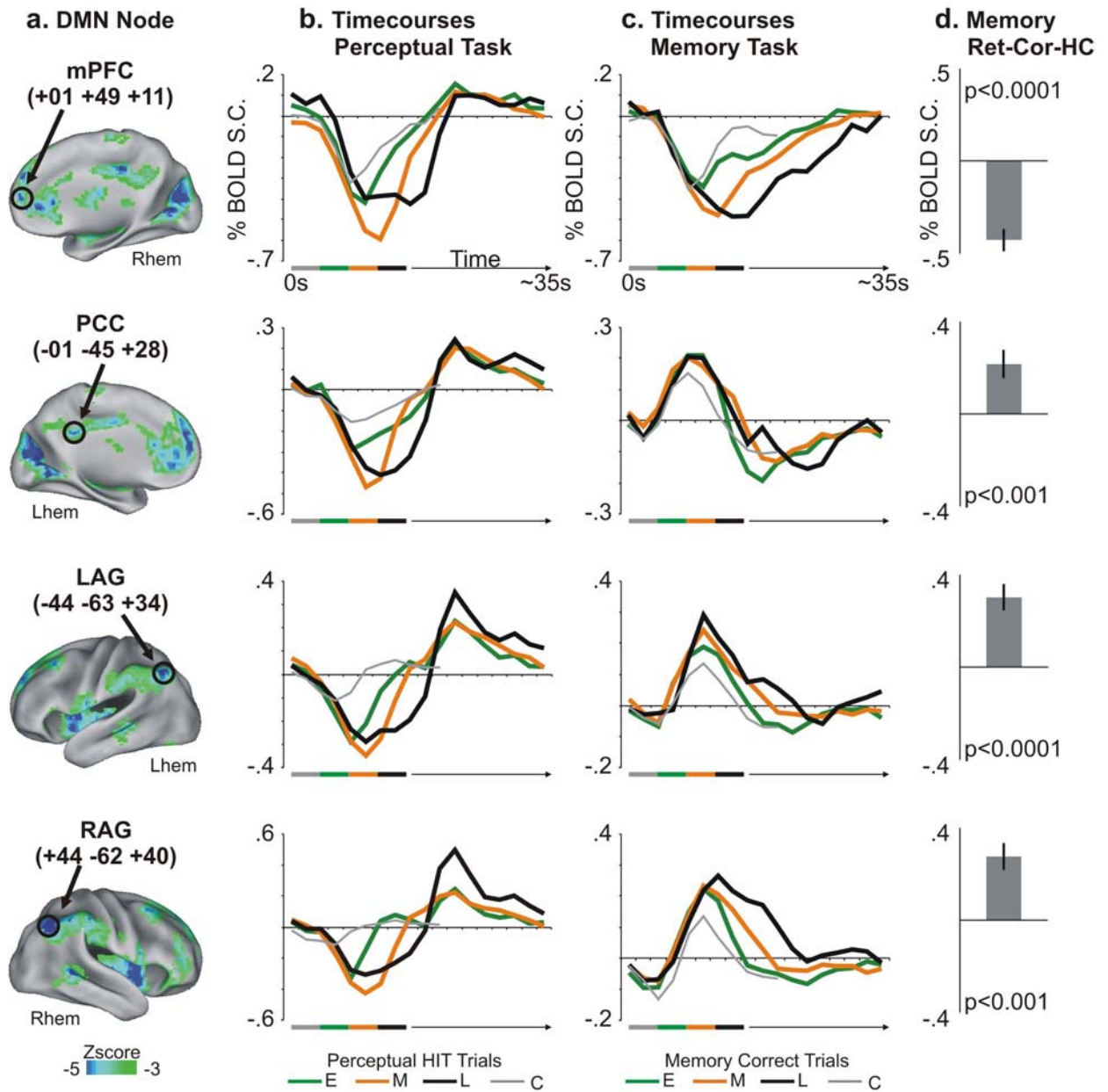
**b.** The significant effect of response confidence [high (HC) versus low (LC)] on behavioral performance (mean accuracy across subjects) in the memory task. Error bars indicate SEM.

**Supplemental Figure 3. Timecourses of BOLD activity, aligned to the offset of cue sentences.**



The timecourses were extracted from the same regions shown in Figure 6, using the frame-by-frame within-trial GLM in which timecourses were aligned to the onset of memory search (see methods). Timecourses represent only the estimated search and response task processes on early, middle and late correct trials. The same dissociation between anterior and posterior DMN nodes was observed.

**Supplemental Figure 4.**



**a.** Inflated representation of the left and right hemispheres showing the location of the peaks of *perceptual* search-related deactivations (process GLM) used for the definition of the DMN.

**b.** Timecourses of BOLD activity in the *perceptual* task, aligned to the onset of the cue sentence (frame-by-frame, between-trial GLM), extracted from ROIs formed on the

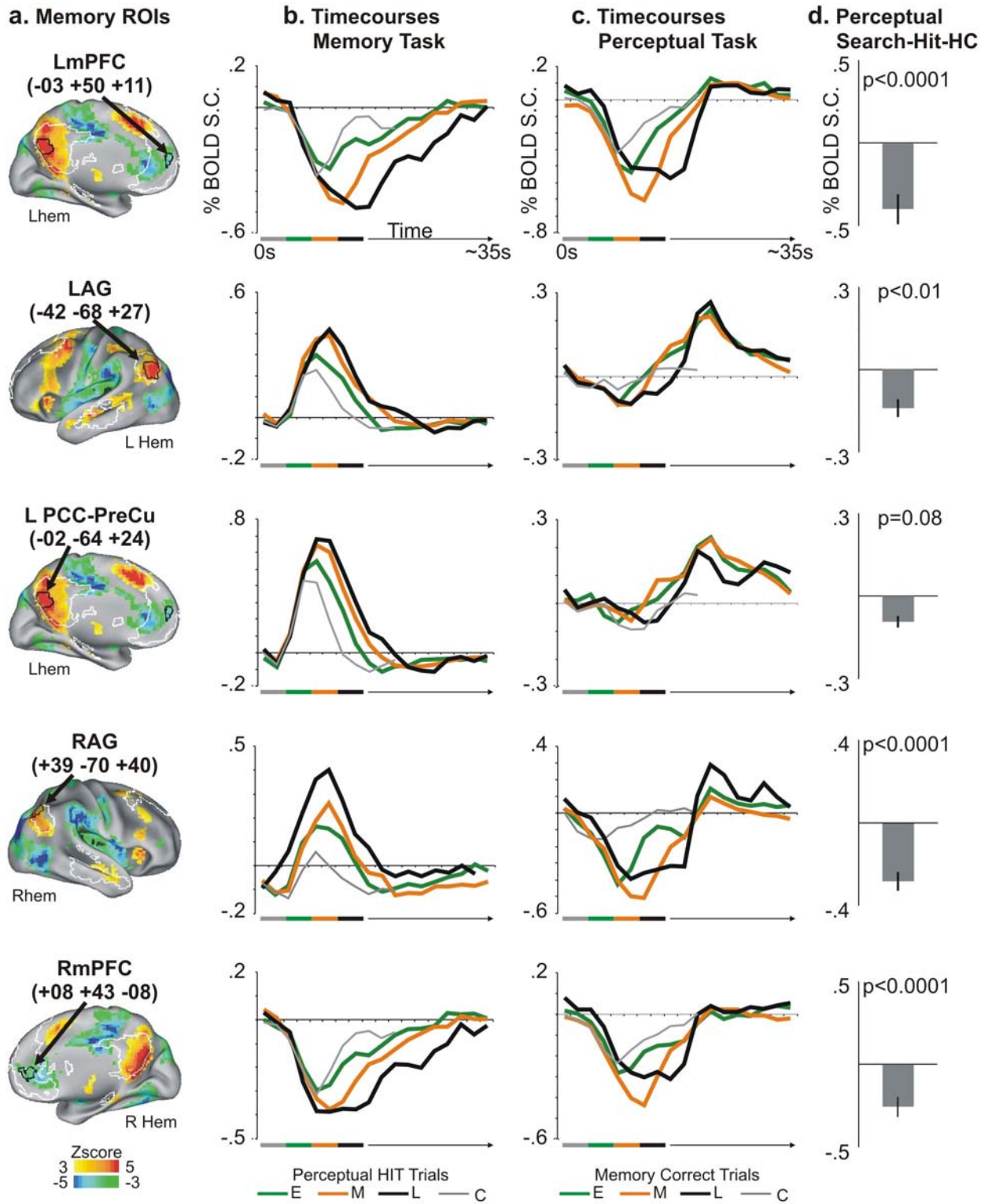
peaks of perceptual search related deactivations. Timecourses were grouped according to the *perceptual* search time interval and refer to catch trials (grey), and early (1-4 s, green), middle (4-8 s, orange) and late (8-12 s, black) Hit trials. By definition, all these regions should show deactivation that scale with the duration of the search process. The horizontal line under the graphs illustrates the temporal duration of the corresponding *perceptual* search intervals.

**c.** Timecourses of BOLD activity in the *memory* task, aligned to the onset of the cue sentence (frame-by-frame, between-trial GLM), extracted from the same ROIs. Timecourses were grouped according to the *memory* retrieval time interval and refer to catch trials (grey), and early (1-4 s, green), middle (4-8 s, orange) and late (8-12 s, black) correct trials. While the anterior node of the DMN (mPFC) was deactivated, a positive activation was observed in all the posterior nodes of the DMN. The horizontal line under the graphs illustrates the temporal duration of the corresponding retrieval intervals.

**d.** Graphs showing the percent signal change for the memory Search-Corr-HC parameter (process GLM). Both the search-related deactivation of the anterior node and the search-related deactivations of the posterior nodes were statistically significant (one sample t-test versus the baseline).



Supplemental Figure 5.



**a.** Inflated representation of the left and right hemispheres showing the map of *memory* search-related BOLD activity and the location of the five regions corresponding to the peaks of significant positive and negative memory search-related responses that were located inside the DMN.

**b.** Timecourses of BOLD activity in the *memory* task, aligned to the onset of the cue sentence (frame-by-frame, between-trial GLM), extracted from the five ROIs. Timecourses were grouped according to the *memory* search time interval and refer to catch trials (grey), and early (1-4 s, green), middle (4-8 s, orange) and late (8-12 s, black) correct trials.

**c.** Timecourses of BOLD activity in the *perceptual* task, aligned to the onset of the cue sentence (frame-by-frame, between-trial GLM), extracted from the same ROIs. Timecourses were grouped according to the *perceptual* search time interval and refer to catch trials (grey), and early (1-4 s, green), middle (4-8 s, orange) and late (8-12 s, black) Hit trials.

**d.** Graphs showing the percent signal change for the *perceptual* search-Hit-HC parameter (process GLM). In all the regions, with the exclusion of left PCC-PreCu in which only a trend was observed, search-related deactivations were statistically significant (one sample t-test versus the baseline).