Supplementary Figure 1. *FIR Model*. As evidence that the FIR model successfully fit the evoked response, we plot the signal averaged residuals of our FIR model (bottom panel) and another canonical HRF model (middle panel). The upper panel shows a sample subject’s FG response to the face-only condition. While the signal averages of the original timecourse (upper right) and the HRF residual (middle right) show an evoked response, the signal average of the FIR residual is flat (bottom right).
Supplementary Figure 2. Behavioral Data. (A) Mean accuracy and (B) mean response time for detecting target repetitions during the five main task runs. From left to right: face-only (F), scene-only (S), face-attended (Fs), scene-attended (Sf), and conjunction (C).
Supplementary Figure 3. **FG-PHC Background Connectivity for Left Hemisphere ROIs.** Mean background connectivity between the Left FG and PHC for each condition. From left to right: rest (R), face-only (F), scene-only (S), face-attended (Fs), scene-attended (Sf), and conjunction (C). Error bars reflect one within-subject standard error of the mean.
Supplementary Figure 4. FG-PHC Background Connectivity without Global Mean Regressor. As evidence that our results do not depend on mean normalization, we present FG-PHC background connectivity for models without the global mean regressor. From left to right: rest (R), face-only (F), scene-only (S), face-attended (Fs), scene-attended (Sf), and conjunction (C). Error bars reflect one within-subject standard error of the mean.
Supplementary Figure 5. Mean Evoked Responses. Mean evoked responses to each condition in the (A) FG and (B) PHC. From left to right: face-only (F), scene-only (S), face-attended (Fs), scene-attended (Sf), and conjunction (C). Error bars reflect one within-subject standard error of the mean.
Supplementary Figure 6. Correlations of Behavior with FG-PHC Background Connectivity. As further evidence that task differences in FG-PHC background connectivity do not reflect task difficulty, we correlated behavioral performance and FG-PHC background connectivity in each condition across subjects. Since there was no task at rest, we correlated average behavioral performance in all tasks with resting connectivity. (A) Correlations with accuracy. (B) Correlations with inverted response times. From left to right: rest (R), face-only (F), scene-only (S), face-attended (Fs), scene-attended (Sf), and conjunction (C). Error bars reflect one standard error of Fisher’s z statistic.
Supplementary Figure 7. Frequency Analysis with Other Bin Width. As evidence that the pattern of results did not depend on our specific choice of bin width, here we used a wider 0.05 Hz bin. Mean baseline background connectivity with respect to rest in the frequency bands that exhibited a main effect of face tasks (F/Fs) vs. scene tasks (S/Sf). Error bars reflect one standard error of the mean within-subject difference from rest.
Supplementary Figure 8. Whole-Brain Background Connectivity. During face-attended (Fs) and scene-attended (Sf) conditions, clusters in the right middle frontal gyrus (upper row) showed increased connectivity to the FG and clusters in the left supramarginal gyrus (lower row) showed increased connectivity to PHC. All maps reflect a contrast with rest.
Supplementary Table 1. *Whole-Brain Background Connectivity*. Relative to rest (p < 0.05 corrected), peak MNI coordinates (mm) from clusters with: (A) increased FG connectivity, (B) decreased FG connectivity, (C) increased PHC connectivity, or (D) decreased PHC connectivity.

### A) Increased FG Connectivity

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### Background connectivity

Supplementary Material

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### C) Increased PHC Connectivity

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