

## **Supplementary material**

### **Subjects**

Nineteen healthy subjects (10 women, ages 24-50), participated in one or more of the experiments (18 in the conventional mapping, 5 in free viewing of an audio-visual feature film, 9 in free viewing of object-selective movie clips, and five in the control darkness experiment). All subjects had normal or corrected to normal vision and provided written informed consent. The Tel-Aviv Sourasky Medical center approved the experimental protocol.

### **MRI Setup**

All experimental protocols have been published elsewhere (*1*). Briefly, subjects were scanned in a 1.5T Signa Horizon LX 8.25 GE scanner. Both standard head coil (in the free viewing experiment) and quadrature surface coil (in the movie clips, darkness and standard localizer experiments) were used. Blood oxygenation level dependent (BOLD) contrast was obtained with gradient-echo echo-planar imaging (EPI) sequence (TR = 3000, TE = 55, flip angle = 90°, field of view 24 × 24 cm<sup>2</sup>, matrix size 80 × 80). The scanned volume included 17 nearly axial slices of 4mm thickness and 1mm gap.

### *Experiments*

The audio-visual feature film experiment was an uninterrupted 30-minute segment (from minute 16.48 to minute 46.48) of the classical western “The Good the Bad and the Ugly” directed by Sergio Leone. The experiment started with a 30-second blank followed by 9 seconds patterned stimuli, which were excluded from all analysis.

The edited category-specific movie-clips experiment was composed of 32 epochs (15-second long), of movie clips divided into four distinct categories: medium shots of faces under various natural situations (e.g. walking in the street), navigation of the camera through a building area, navigation of the camera through open fields, and movie-clips of miscellaneous images from various object categories (machines, falling waters, clouds etc). The experiment started with 51-second blank, followed by 9-seconds of pattern stimuli, and ended with 1 minute of blank screen.

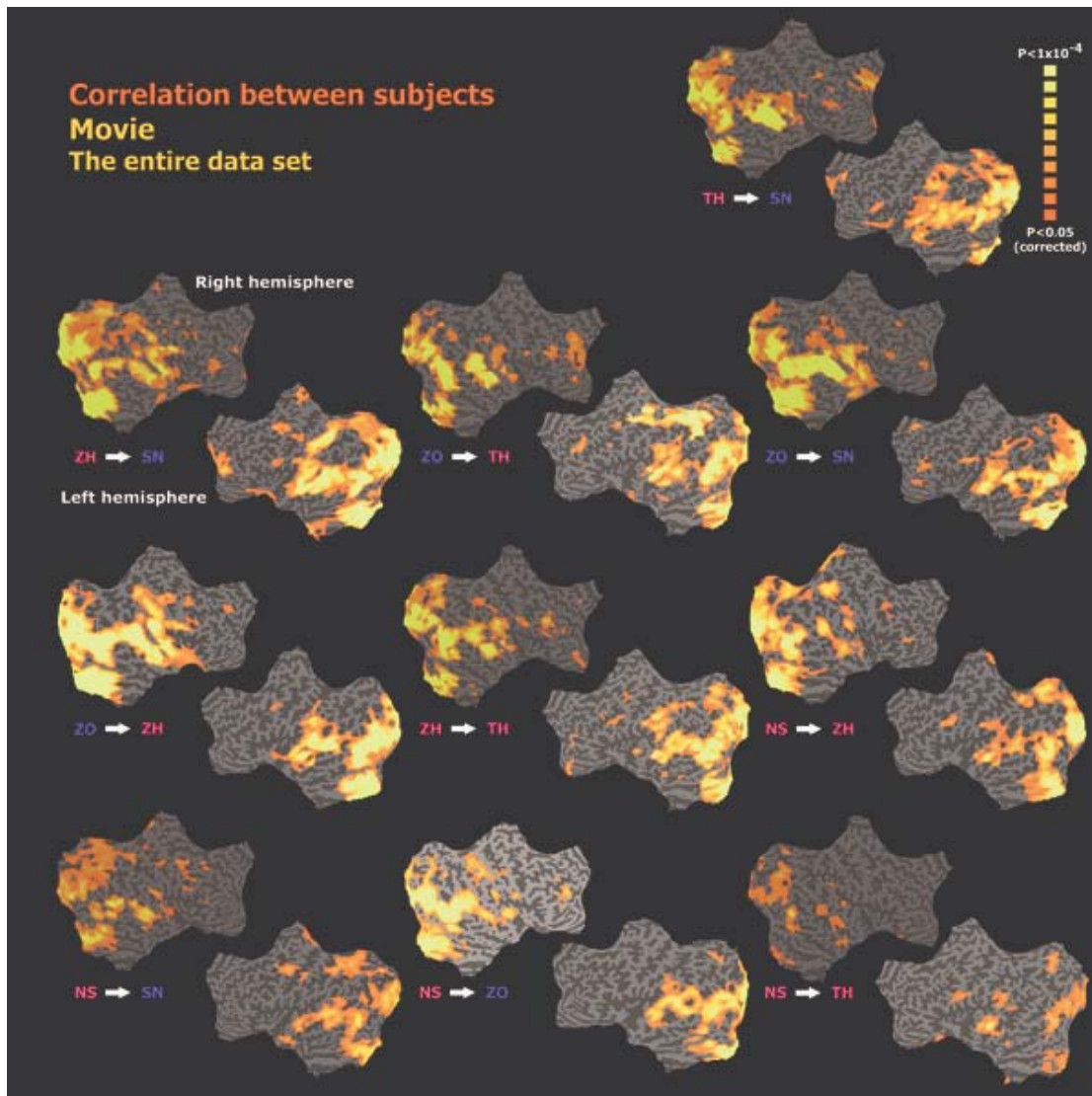
In the control darkness experiment 5 subjects (4 of whom participated in the audio-visual movie experiment), were scanned while lying passively in the dark, with their eyes closed for 10 minutes. For detailed description of the conventional static object-localizer experiment see (1).

### **Data analysis**

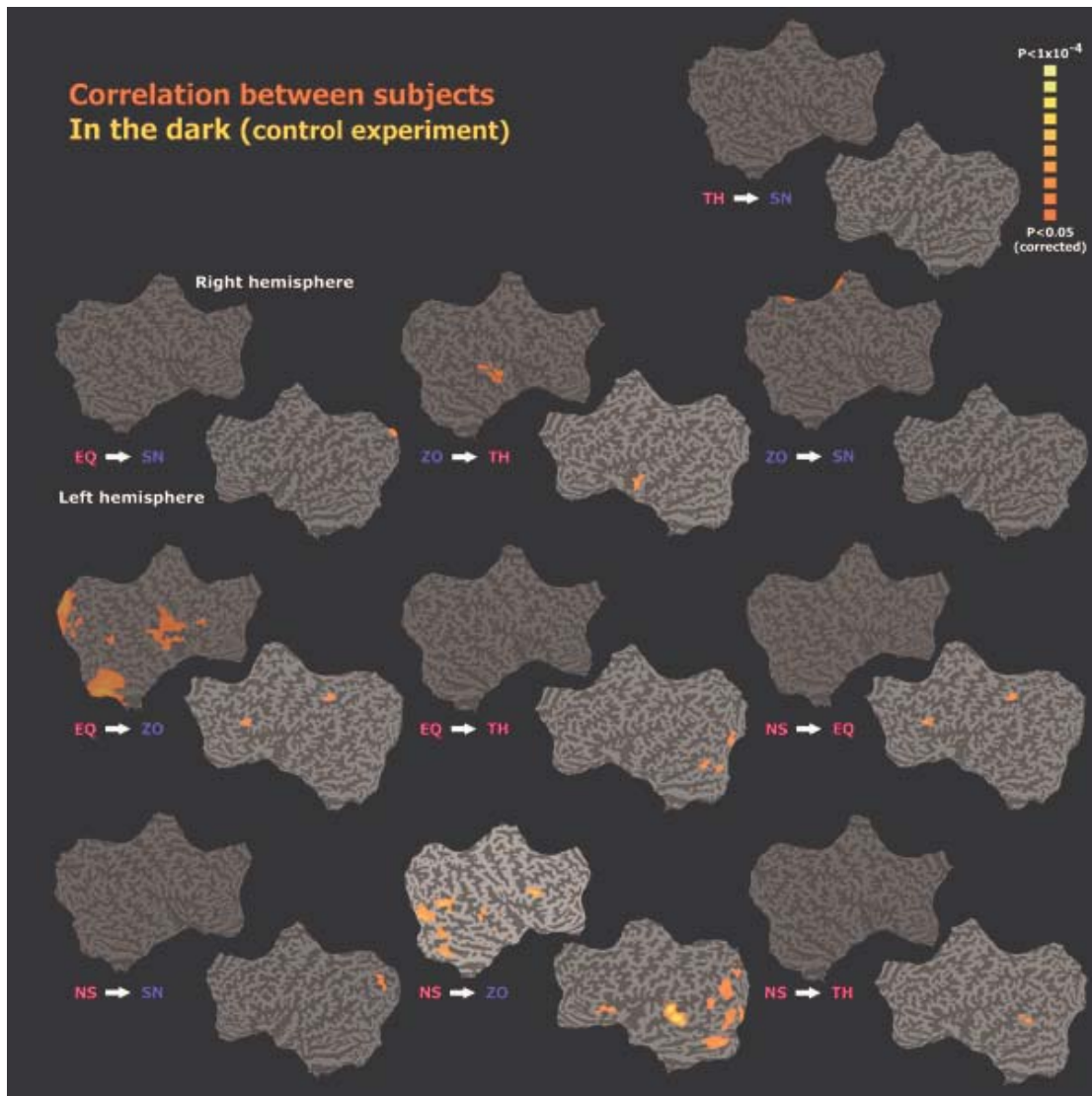
fMRI data were analyzed with the “BrainVoyager” software package (Brain Innovation, Maastricht, Netherlands) and in-house software. All details of brain reconstruction and conventional statistical (GLM) analysis have been published elsewhere (1). Briefly, statistical mapping in figure 5 was based on the General Linear Model (GLM), using a random effect procedure (2).

Significance levels were calculated taking into account the minimum cluster size and the probability threshold of a false detection of any given cluster (3). This was accomplished by a Monte Carlo simulation (AlphaSim by B. Douglas Ward, Cox R. W. 1996), using the combination of individual voxel probability thresholding, FWHM of 12mm, and minimum cluster size of 23 voxels, the probability of a false positive detection per image was determined from the frequency count of cluster sizes within the entire cortical surface (not including white matter and sub nuclei). The minimum significance level, corrected for any given cluster was  $p < 0.05$ . Color scales indicate the statistical level ranging from  $p < 0.05$  (darker colors) up to at least  $p < 10^{-5}$  (brighter colors) Additional information regarding the inter-subject correlation and reverse correlation methods appears within the paper notes.

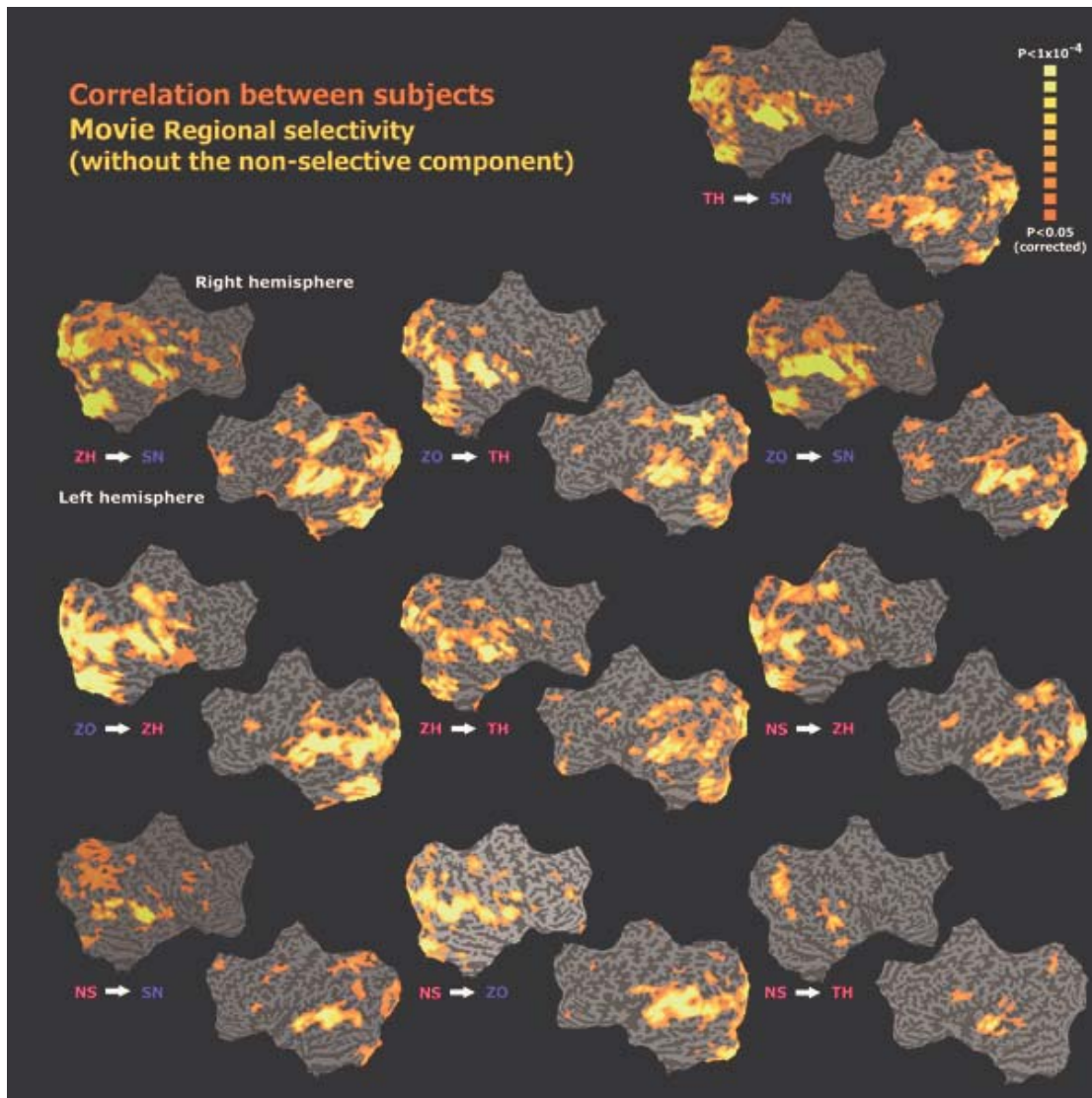
Supporting figures:



S1. Inter-subject, spatio-temporal correlation of all 10 subject pairs watching the audio-visual feature film. The analysis was performed on the entire data set of each subject. Correlation maps are shown on unfolded left and right hemispheres. Color indicates the significance level of the inter-subject correlation in each voxel. Colored letters indicate the gender of the subject (red for females). Note the striking level of voxel by voxel synchronization in individuals watching the same movie.



S2. Inter-subject, regional specific spatio-temporal correlation of all 10 subject pairs during the control darkness experiment. In the experiment subjects were scanned while lying passively in the dark, with their eyes closed. Abbreviations as in figure 1 in the supplementary materials. Note, that the inter subject correlation breaks down in the absence of external stimuli.



S3. Inter-subject, regionally- specific spatio-temporal correlation of all 10 subject pairs watching the audio-visual feature film. The analysis was performed on the data set after the removal of the non-selective component in each subject. Abbreviations as in figure 1 in the supplementary materials. Note, that the strong inter-subject correlation was preserved after the removal of the non-selective component.



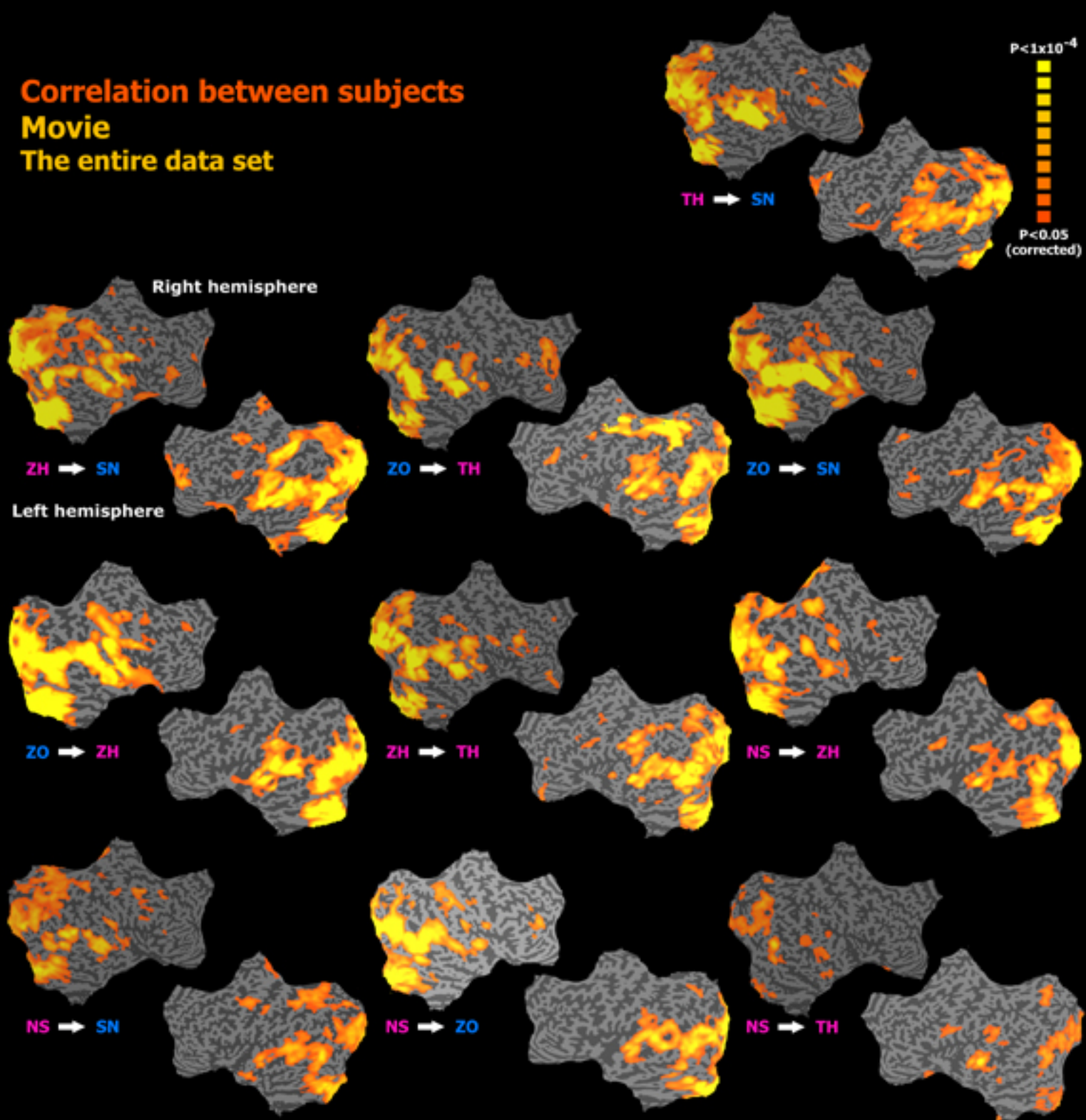
Table 1. Time codes list								
<b>Non-selective</b>	<b>Peak 1</b>	<b>Peak 2</b>	<b>Peak 3</b>	<b>Peak 4</b>	<b>Peak 5</b>	<b>Peak 6</b>	<b>Peak 7</b>	<b>Peak 8</b>
<b>Start</b>	00:16:55	00:19:16	00:23:46	00:25:55	00:31:52	00:35:13	00:40:16	00:40:49
<b>End</b>	00:17:13	00:19:25	00:23:58	00:26:19	00:31:58	00:35:16	00:40:19	00:41:04
<b>Duration</b>	18	9	12	24	6	6	6	15
	<b>Peak 9</b>	<b>Peak 10</b>	<b>Peak 11</b>	<b>Peak 12</b>	<b>Peak 13</b>	<b>Peak 14</b>	<b>Peak 15</b>	<b>Peak 16</b>
<b>Start</b>	00:41:25	00:43:46	00:46:19					
<b>End</b>	00:41:31	00:43:55	00:46:25					
<b>Duration</b>	6	9	6					
<b>pFs</b>	<b>Peak 1</b>	<b>Peak 2</b>	<b>Peak 3</b>	<b>Peak 4</b>	<b>Peak 5</b>	<b>Peak 6</b>	<b>Peak 7</b>	<b>Peak 8</b>
<b>Start</b>	00:18:03	00:20:18	00:21:24	00:23:03	00:27:12	00:28:51	00:30:24	00:31:39
<b>End</b>	00:18:12	00:20:21	00:21:39	00:23:06	00:27:27	00:29:03	00:30:42	00:31:45
<b>Duration</b>	9	3	15	3	15	12	18	6
	<b>Peak 9</b>	<b>Peak 10</b>	<b>Peak 11</b>	<b>Peak 12</b>	<b>Peak 13</b>	<b>Peak 14</b>	<b>Peak 15</b>	<b>Peak 16</b>
<b>Start</b>	00:32:21	00:38:21	00:39:12	00:41:06	00:43:03	00:44:45	00:46:00	00:46:48
<b>End</b>	00:32:27	00:38:24	00:39:21	00:41:15	00:43:06	00:44:57	00:46:03	00:46:51
<b>Duration</b>	6	3	9	9	3	12	3	3
<b>CoS</b>	<b>Peak 1</b>	<b>Peak 2</b>	<b>Peak 3</b>	<b>Peak 4</b>	<b>Peak 5</b>	<b>Peak 6</b>	<b>Peak 7</b>	<b>Peak 8</b>
<b>Start</b>	00:19:30	00:22:18	00:24:09	00:25:15	00:26:33	00:27:21	00:30:54	00:19:30
<b>End</b>	00:19:36	00:22:30	00:24:12	00:25:21	00:26:48	00:27:27	00:30:57	00:19:36
<b>Duration</b>	6	6	12	3	6	15	9	3
	<b>Peak 9</b>	<b>Peak 10</b>	<b>Peak 11</b>	<b>Peak 12</b>	<b>Peak 13</b>	<b>Peak 14</b>	<b>Peak 15</b>	<b>Peak 16</b>
<b>Start</b>	00:31:21	00:32:03	00:33:00	00:34:33	00:37:03	00:37:33	00:38:57	00:44:12
<b>End</b>	00:31:36	00:32:06	00:33:12	00:34:36	00:37:09	00:37:39	00:39:03	00:44:18
<b>Duration</b>	15	3	9	3	6	6	6	6
<b>PSC</b>	<b>Peak 1</b>	<b>Peak 2</b>	<b>Peak 3</b>	<b>Peak 4</b>	<b>Peak 5</b>	<b>Peak 6</b>	<b>Peak 7</b>	<b>Peak 8</b>
<b>Start</b>	00:19:35	00:22:35	00:24:44	00:24:56	00:27:29	00:30:41	00:32:50	00:33:32
<b>End</b>	00:19:44	00:22:38	00:24:47	00:25:02	00:27:32	00:30:47	00:32:56	00:34:02
<b>Duration</b>	9	3	3	6	3	6	6	21
	<b>Peak 9</b>	<b>Peak 10</b>	<b>Peak 11</b>	<b>Peak 12</b>	<b>Peak 13</b>	<b>Peak 14</b>	<b>Peak 15</b>	<b>Peak 16</b>
<b>Start</b>	00:35:29	00:35:41	00:38:35	00:39:26	00:39:44	00:42:38	00:43:05	00:44:47
<b>End</b>	00:35:35	00:35:53	00:38:44	00:39:32	00:39:56	00:42:47	00:43:08	00:44:59
<b>Duration</b>	6	12	9	6	12	9	3	12

**Table 1.** Time codes of all movie frames (13) associated with each signal peak of [A] the non-selective time course, [B] fusiform face-related region (pFs), [C] collateral building-related region (CoS), and [D] post central hand-related region (PSC). Time codes format: hours: minutes: seconds.

## References

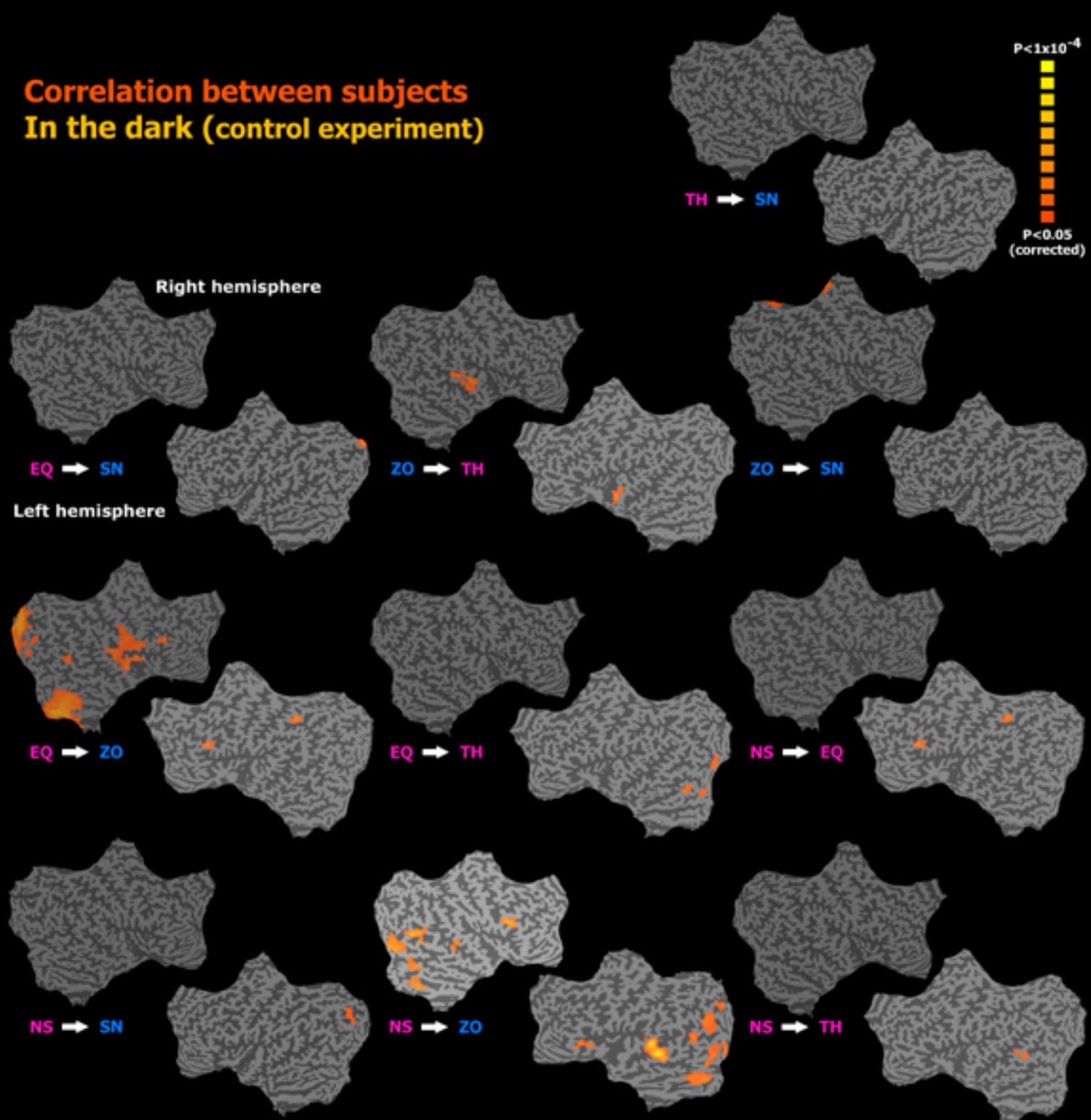
1. U. Hasson, M. Harel, I. Levy, R. Malach, *Neuron* **37**, 1027-1041 (2003).
2. J. Friston *et al.*, *Hum. Brain Mapp.* **2**, 189-210 (1995).
3. S. D. Forman *et al.*, *Magnetic Resonance in Medicine* **33**, 636-647 (1995).

**Correlation between subjects**  
**Movie**  
**The entire data set**





# Correlation between subjects In the dark (control experiment)



**Correlation between subjects**  
**Movie Regional selectivity**  
**(without the non-selective component)**

