

SUPPLEMENTARY MATERIAL

METHOD

Examples of an emotional neutral and traumatic script

“You are about to leave for shopping. You exit the apartment and light a cigarette outside the building while browsing Facebook and waiting for your wife. When your wife arrives, you stroll together slowly toward the grocery store. The sky is grey, but it is not cold. You look at people passing by and hear them chatter. You buy fruits, bread and milk. There are other people in the store, but you hardly notice them. As you leave you light another cigarette.”

“It is the middle of the night and you are waiting on the beach about to cross the Mediterranean Sea. Shortly after, you are sitting in a small inflatable boat with 34 other refugees. It is cold, you feel afraid and have no space to move about. The engine fails several times and around 5 am the boat punctures. Panic spreads as it quickly sinks. Everyone is yelling and screaming. You tighten your grip around your mother and cousin as you try to calm them. You can feel the fear in your throat.”

Verbatim instructions given to participants during the presentation of the scripts in the scanner

Verbatim instructions during the script-driven imagery task procedure: “We will now play the neutral (traumatic) story. Please pay attention to the story. The story lasts 30 sec.” Then: “Please try to recall the story as vividly as possible for 30 sec while paying attention to the sights, sensations, sounds, smells and feelings you experienced.”. Then: “We will now present pictures for about 5 minutes. Please pay attention to them as best you can”.

Phase Scrambled Images (control picture condition)

The phase scrambled images had been manipulated in the spatial frequency domain following procedures similar to what has been described in detail elsewhere¹⁻³. To create the visual noise images, we transformed each picture into amplitude and phase components using the Fourier transform, for each RGB colour channel independently. A value of α was estimated for the power law dependence of the amplitude of the Fourier transform $f^{-\alpha}$ and the scrambled noise patterns were generated by inverse Fourier transform of the natural amplitude spectrum with random phase spectra (each phase value was chosen at random from the interval $[-\pi, \pi]$). These random phase spectra resulted in images that had a cloud-like appearance, lacking specific edges or sharp features, and can therefore be regarded as a form of visual noise with identical amplitude spectra across all noise images and matched to the original pictures¹.

Data acquisition

All scans were recorded using a 3T Phillips Achieva MRI scanner (Phillips Healthcare, Best, The Netherlands) with a 32-channel head coil at the Danish Research Center for Magnetic Resonance, Hvidovre Hospital. Four whole-brain T2*-weighted echo-planar imaging (EPI) data sets were acquired. Each data set contained 133 volumes recorded using sensitivity encoding (SENSE) with an acceleration factor of two in the phase encoding direction. Field of view was 210 mm (RL), 222 mm (AD) and 126 mm (FH), isotropic voxels of 3 mm and a total of 42 slices per volume were acquired in interleaved order. Volumes were acquired in axial orientation coplanar with the anterior commissure - posterior commissure line. Repetition time (TR) was 2.205 seconds, echo time (TE) 30 milliseconds and flip angle (FA) 72 degrees. A T1-weighted (TR/TE = 6.0 ms/2.7 ms, isotropic 0.85 mm voxels) were recorded for registration of the functional data to a high-resolution structural

image. A T2-weighted (TR/TE = 2500 ms/250 ms, isotropic 0.85 mm voxels), T2 weighted 2D (TR/TE = 3381 ms/80 ms, anisotropic voxels (AP 0.575 mm, RL 0.72 mm, slice thickness 3 mm), Fluid-attenuated inversion recovery (FLAIR) (TR/TE = 4800 ms/327 ms, isotropic 1 mm voxels) and a susceptibility weighted image (TR/TE = 27/20 ms, anisotropic voxels (FH 1.5 AP 0.85 RL 0.85) were acquired for radiological evaluation.

Radiological assessment

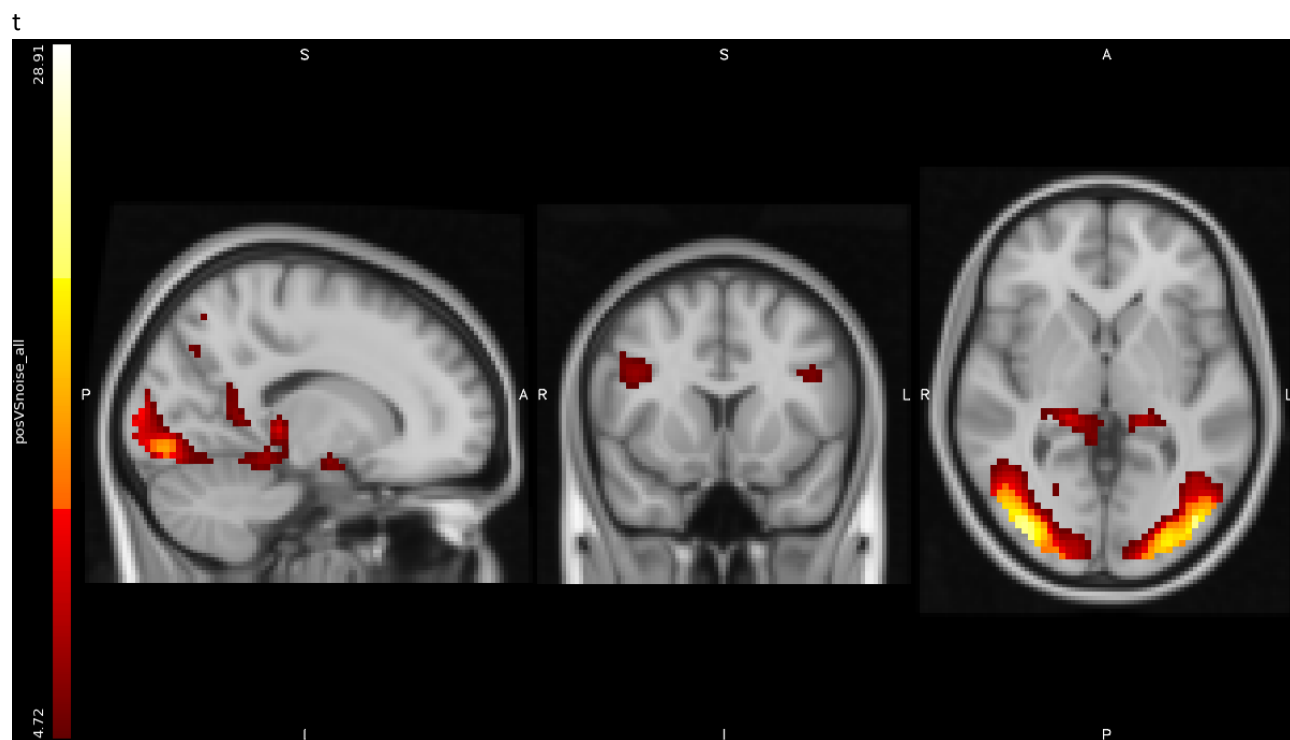
All structural clinical scans were evaluated for clinical abnormalities by two senior radiologists (Madsen CG and Leffers A), and participants were informed of the results of the evaluation. Sixteen participants (9 PTSD participants) had minor pathological findings such as unspecific gliosis, partial empty sella turcica and small ischemic changes and in five cases this led to further examinations. No participants were excluded based on the radiological evaluation as the locations were not deemed relevant to our brain networks of interest. Extra attention was paid to the T1 normalisation quality in these subjects.

Pre-processing

Each participant's functional images were rigid-body registered to the mean functional image and co-registered to his high-resolution structural image. The structural image was normalised to MNI template using the CAT12 toolbox (<http://www.neuro.uni-jena.de/cat/>) for SPM 12 and the subsequent native space to MNI deformation field was used to spatially normalise the fMRI to standard stereotactic MNI space and finally images were smoothed (5 mm full width at half maximum isotropic Gaussian kernel).

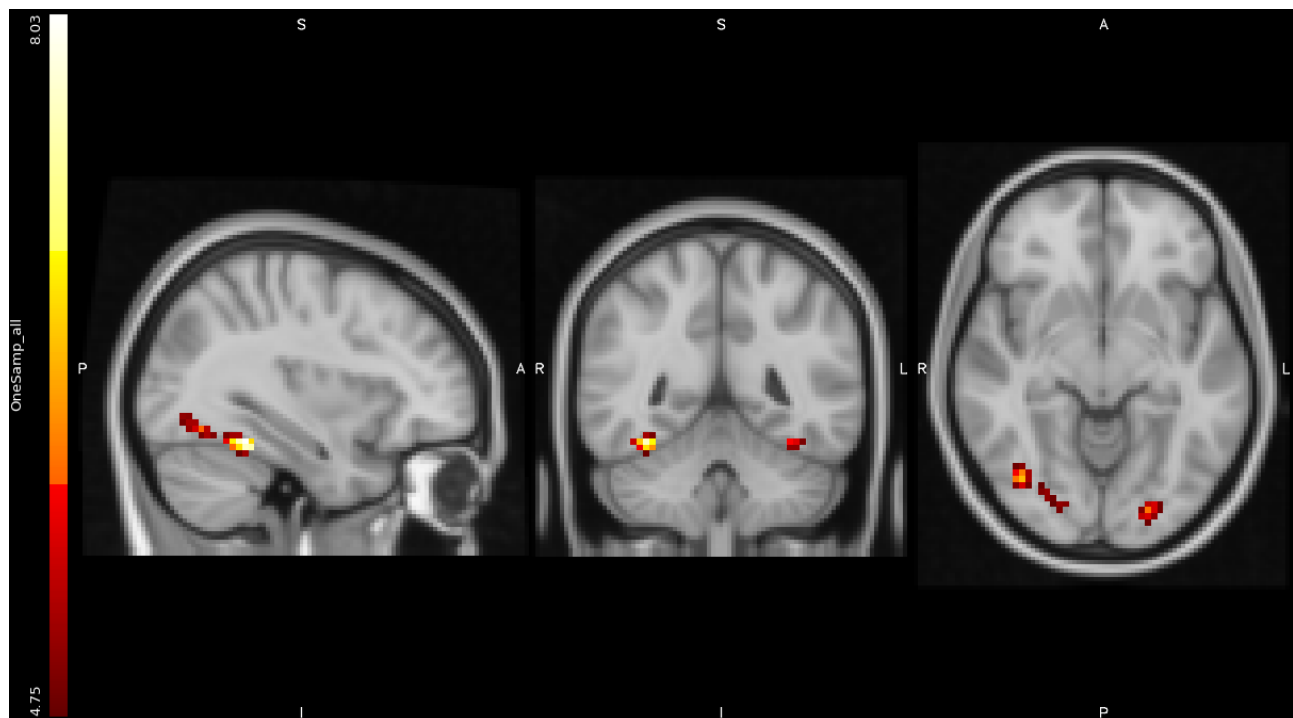
eTable 1. MNI coordinates and statistics of factorial model analysis								
Contrast	Anatomical region	Cluster size (3 mm isovoxels)	X	Y	Z	Peak T	Peak Z	Peak-level P_{fwe}
RHC > PTSD	Right fusiform gyrus	6	36	-45	-18	5.30	5.20	0.004
	left middle occipital gyrus	2	-42	-81	0	5.14	5.05	0.009
	right inferior temporal gyrus	4	48	-66	-3	5.07	4.99	0.011
	Left fusiform gyrus	2	-33	-63	-18	4.77	4.70	0.035
Neutral Script > Trauma Script	right posterior cingulate gyrus	5	12	-45	3	4.90	4.82	0.024
	left calcarine cortex	2	9	-51	9	4.85	4.78	0.029
	right precuneus	2	-9	-78	9	4.75	4.68	0.043

eFigure 1. Activation of the positive pictures>scramble contrast for all participants



T-score map for average activation across all participants for the positive picture > scrambled images contrast. Thresholded at $p < 0.05$ and overlayed an standard MNI 2mm image.

eFigure 2. Activation of the parametric contrast for all participants



T-score map for average activation across participants for the parametric contrast. In this contrast all pictures (except negative rated pictures and scrambled images) have been parametric modulated in the design matrix at subject level according to participants own rating of the picture's valence. Thresholded at $p < 0.05$ and overlaid an standard MNI 2mm image.

References

1. Rainer G, Augath M, Trinath T, Logothetis NK. Nonmonotonic noise tuning of BOLD fMRI signal to natural images in the visual cortex of the anesthetized monkey. *Curr Biol*. 2001. doi:10.1016/S0960-9822(01)00242-1
2. Rainer G, Lee H, Logothetis NK. The effect of learning on the function of monkey extrastriate visual cortex. *PLoS Biol*. 2004. doi:10.1371/journal.pbio.0020044
3. Liebe S, Fischer E, Logothetis NK, Rainer G. Color and shape interactions in the recognition of natural scenes by human and monkey observers. *J Vis*. 2009. doi:10.1167/9.5.14

