

Supplemental Information

Methods and Materials

Participants

Six avoidant participants were excluded (one for excessive head motion, two for normalization failures, and three for excessive fMRI signal distortion), and three healthy participants were excluded (one for self-reported inability to hear auditory cues and two for excessive fMRI signal distortion). Additionally, technical problems with fMRI data acquisition prevented analysis of the final functional imaging run (out of four) in 1 avoidant and 1 healthy participant; however, these participants were retained in the analysis given the pseudorandomized and counterbalanced trial order that was presented.

Materials

Themes present in negative images included grief, sadness, abuse, and physical violence. Neutral images depicted individuals at work or at home or attending public events in emotionally neutral contexts, as substantiated by normative rating data from the IAPS set (negative mean valence = 2.4 and neutral mean valence = 5.2, where 1 = most negative and 9 = most positive).

Image Acquisition and Analysis

A gradient-echo echo-planar image (GE-EPI) sequence was performed using the following protocol: 42 axial slices, 2.5 mm thick, skip = .825 mm, repetition time (TR) = 3 sec, echo time (TE) = 27 msec, flip angle = 84°, field of view (FOV) = 210 mm, matrix = 64 × 64. Functional slices were acquired in an interleaved ascending order. For

anatomical localization, a high-resolution T2-weighted anatomical scan was acquired on an axial plane parallel to anterior commissure- posterior commissure (AC-PC) line with a turbo spin-echo pulse sequence.

Image preprocessing was carried out using SPM8 software (Wellcome Department of Cognitive Neurology, London, UK) using standard parameters: slice-timing correction, realignment and coregistration between each participant's functional and anatomical data, normalization to a standard template [Montreal Neurological Institute (MNI)] using 3mm isotropic voxels, and spatial smoothing with a Gaussian kernel (full- width at half maximum = 7 mm).

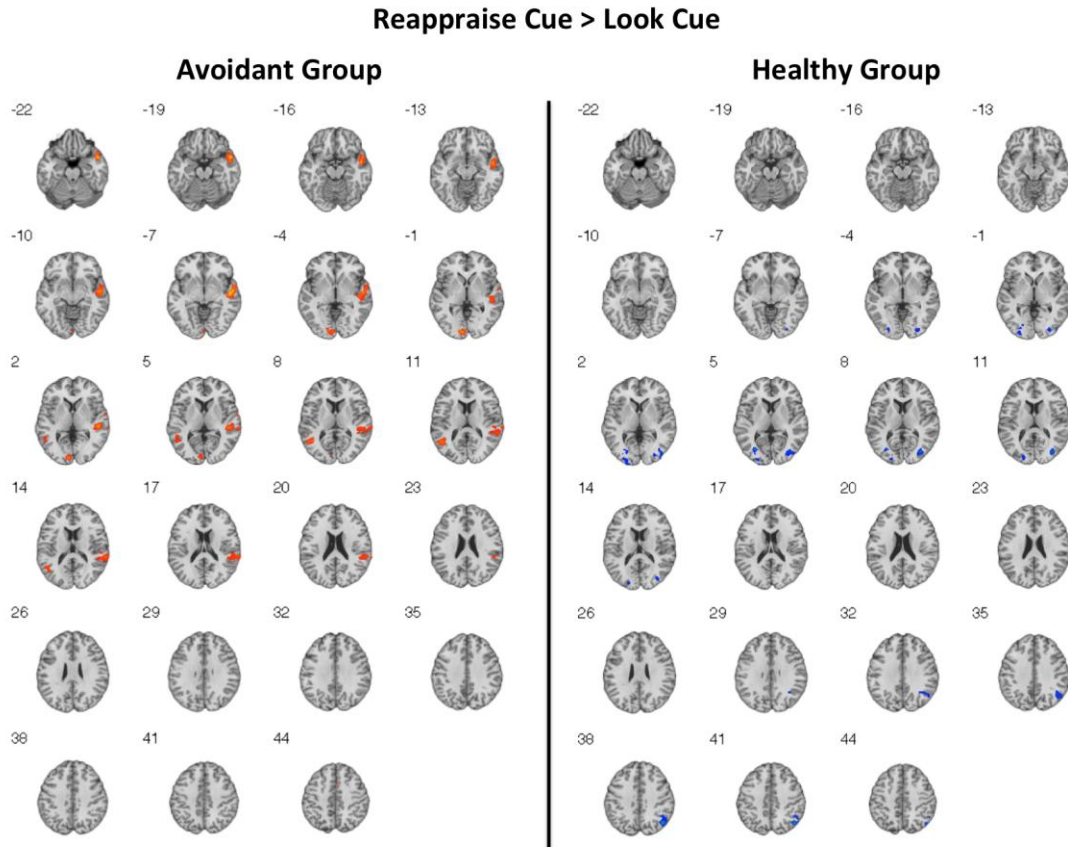


Figure S1. Neural correlates of reappraisal anticipation (Reappraise Cue > Look Cue) in each group. Thresholded at $p < 0.01$, $k = 53$ voxels (FWE-corrected, $p < 0.05$).

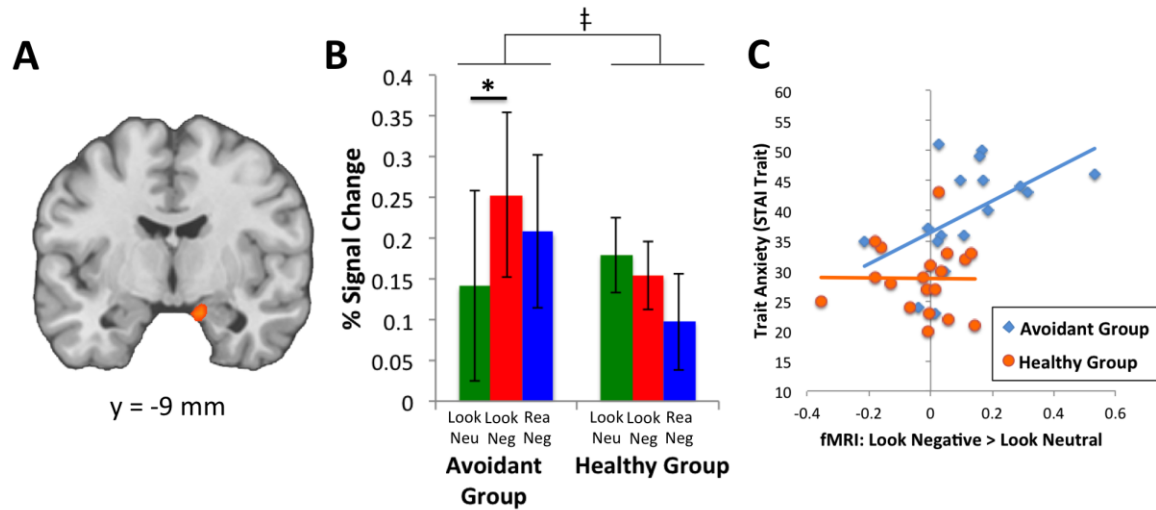


Figure S2. Hyper-reactivity (Look Negative > Look Neutral) in right amygdala in avoidant patients during image presentation. (A) Right amygdala ROI. (B) Extracted beta weights for each condition during the image presentation period for the ROI shown in (A). (C) Correlation between reactivity (Look Negative > Look Neutral) and trait anxiety scores for each group for the ROI shown in (A). † reflects a significant group-by-condition interaction, $F(2,72)=5.98$, $p<0.01$. Main effects of group and condition were not significant. * represents a significant within-group difference, $p<0.05$, two-tailed.

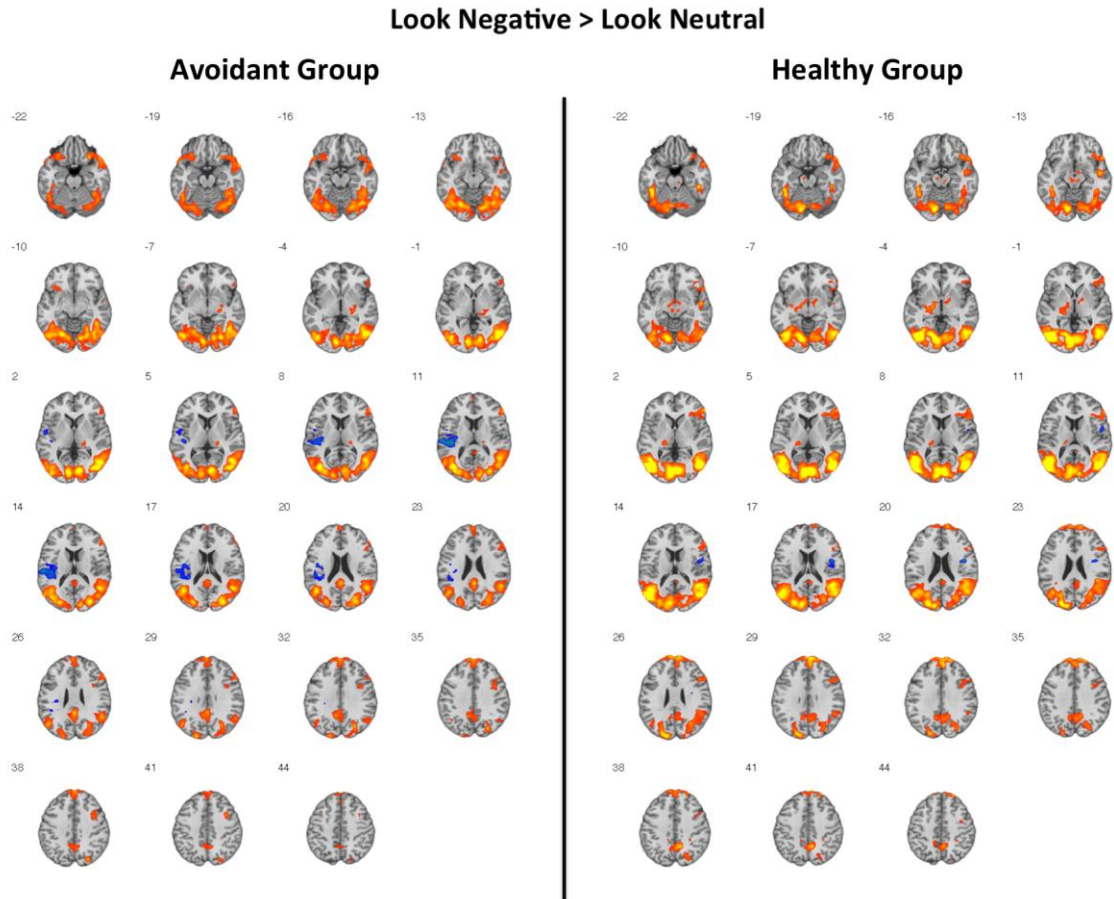


Figure S3. Neural correlates of reactivity (Look Negative > Look Neutral) in each group.

Thresholded at $p < 0.01$, $k = 53$ voxels (FWE-corrected, $p < 0.05$).

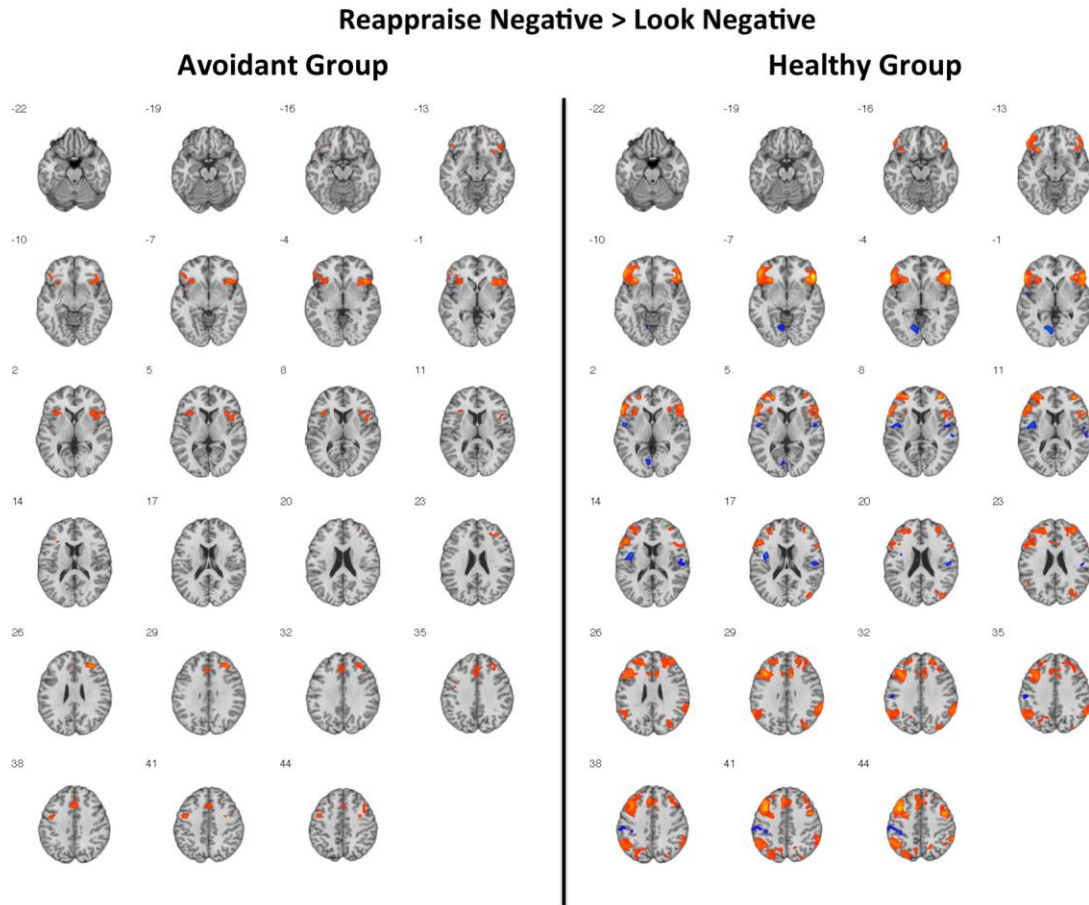


Figure S4. Neural correlates of regulation (Reappraise Negative > Look Negative) in each group. Thresholded at $p < 0.01$, $k = 53$ voxels (FWE-corrected, $p < 0.05$).

Table S1 – Neural correlates of reappraisal anticipation (Reappraise Cue > Look Cue) in each group

Avoidant Group

Region		k	x	y	z	T max	T mean
Superior Temporal Gyrus (BA 22)	RH	430	51	-12	-6	6.985	3.698
Lingual Gyrus (BA 17)	LH	61	-15	-90	-3	5.108	3.610
Medial Frontal Gyrus (BA 6)	RH	88	6	0	63	5.081	3.355
Middle Temporal Gyrus (BA 39)	LH	63	-42	-57	9	4.516	3.570

Healthy Group

Region		k	x	y	z	T max	T mean
Precuneus (BA 39)	RH	76	45	-66	39	-5.318	-3.377
Middle Occipital Gyrus (BA 19)	LH	59	-30	-75	6	-5.019	-3.204
Middle Occipital Gyrus (BA 19)	RH	82	36	-78	9	-4.553	-3.282

Maximum and mean t-values are shown for each cluster. Coordinates are in MNI space and refer to the peak activation. Thresholded at $p < 0.01$, $k = 53$ voxels (FWE-corrected, $p < 0.05$).

Table S2 – Neural correlates of reactivity (Look Negative > Look Neutral) in each group

Avoidant Group

Region		k	x	y	z	T max	T mean
Middle Temporal Gyrus (BA 39)	LH	4964	-39	-75	9	11.322	4.390
Inferior Frontal Gyrus (BA 47)	RH	288	27	27	-27	7.916	3.863
Posterior Cingulate (BA 23)	RH	344	3	-48	24	6.395	3.703
Superior Frontal Gyrus (BA 6)	RH	192	12	18	69	5.948	3.528
Inferior Frontal Gyrus (BA 47)	LH	189	-30	27	-21	5.757	3.591
Superior Frontal Gyrus (BA 9)	LH	243	-3	60	33	5.475	3.704
Lateral Geniculum Body	RH	54	27	-24	-6	5.264	3.398
Inferior Frontal Gyrus (BA 46)	RH	153	54	39	6	5.096	3.498
Middle Frontal Gyrus (BA 6)	LH	57	-33	9	48	5.042	3.725
Inferior Semi-Lunar Lobule	LH	73	-12	-69	-45	4.947	3.626
Precentral Gyrus (BA 9)	RH	65	36	12	42	4.582	3.513
Superior Temporal Gyrus (BA 42)	LH	319	-60	-24	12	-5.643	-3.577
Medial Frontal Gyrus (BA 6)	RH	99	9	-21	60	-5.085	-3.516

Healthy Group

Region		k	x	y	z	T max	T mean
Cuneus (BA 17)	LH	5881	-6	-84	3	12.718	4.565
Precentral Gyrus (BA 6)	RH	90	45	3	60	7.235	3.748
Superior Frontal Gyrus (BA 10)	RH	492	6	63	30	6.737	3.938
Precuneus (BA 31)	RH	386	9	-51	39	6.271	3.492
Superior Temporal Gyrus (BA 22)	RH	559	51	-9	-12	6.051	3.464
Thalamus	LH	197	-12	-9	-6	5.156	3.354
Precuneus (BA 7)	RH	107	21	-57	54	4.668	3.389
Postcentral Gyrus (BA 2)	LH	250	-45	-30	63	-6.549	-3.582
Insula (BA 13)	RH	57	45	-3	18	-5.114	-3.376
Medial Frontal Gyrus (BA 6)	RH	114	3	-18	66	-3.997	-3.206

Maximum and mean t-values are shown for each cluster. Coordinates are in MNI space and refer to the peak activation. Thresholded at $p < 0.01$, $k = 53$ voxels (FWE-corrected, $p < 0.05$).

Table S3 – Neural correlates of regulation (Reappraise Negative > Look Negative) in each group

Avoidant Group

Region		k	x	y	z	T max	T mean
Middle Frontal Gyrus (BA 9)	RH	67	30	39	27	5.603	3.642
Inferior Frontal Gyrus	RH	213	42	21	-3	5.261	3.550
Precentral Gyrus (BA 6)	RH	103	33	0	42	4.679	3.325
Precentral Gyrus (BA 6)	LH	102	-45	0	42	4.573	3.353
Cingulate Gyrus (BA 32)	RH	125	3	21	39	4.102	3.257
Inferior Frontal Gyrus (BA 47)	LH	119	-45	30	-12	4.089	3.296

Healthy Group

Region		k	x	y	z	T max	T mean
Medial Frontal Gyrus (BA 6)	LH	2927	-6	6	66	7.731	3.633
Inferior Frontal Gyrus (BA 45)	RH	414	51	30	-6	7.179	3.758
Inferior Parietal Lobule (BA 40)	LH	702	-45	-57	54	6.582	3.470
Supramarginal Gyrus (BA 40)	RH	191	63	-45	30	4.636	3.387
Middle Occipital Gyrus (BA 19)	RH	83	39	-84	21	4.526	3.362
Precuneus (BA 7)	RH	159	21	-57	48	4.215	3.197
Lingual Gyrus (BA 18)	LH	71	-15	-69	-3	-4.731	-3.384
Insula (BA 13)	LH	92	-39	0	15	-4.467	-3.387
Inferior Parietal Lobule (BA 40)	LH	90	-39	-30	42	-3.846	-3.102
Postcentral Gyrus (BA 40)	RH	54	54	-18	18	-3.596	-3.091

Maximum and mean t-values are shown for each cluster. Coordinates are in MNI space and refer to the peak activation. Thresholded at $p < 0.01$, $k = 53$ voxels (FWE-corrected, $p < 0.05$).