

Supporting Information

Rasch et al. 10.1073/pnas.0907425106

SI Methods

Genotyping. The common *ADRA2B* variant consists of an in-frame deletion of three acidic residues. Specifically, glutamic acid residues 301–303 in the third intracellular loop of the receptor, which are part of a large glutamic acid stretch (glu12; amino acids 297–309), are absent in about 30% of Caucasians. This deletion is accompanied by such in vitro functional consequences as reduced receptor-mediated inhibition of adenylyl cyclase, greater EC₅₀, and decreased agonist-promoted phosphorylation and receptor desensitization (1). DNA was extracted from saliva samples by using standard procedures. PCR products were stained with ethidium bromide and run on a 3% agarose gel. The forward primer, 5'-AGAAGGAGGGTGTGGTGGGG-3', and reverse primer, 5'-ACCTATAGCACCCACGC-CCT-3', were used, with an annealing temperature of 58 °C. Reactions were run in duplicate and rated by two blinded investigators.

n-Back Test. Between picture presentation and recall, participants performed on the 0- and 2-back versions of the n-back working memory task (2). In this task, letters are presented successively in the center of the screen. In the 0-back condition, subjects had to respond to the occurrence of the letter “x,” which is a baseline measure of general attention, concentration, and reaction time. The 2-back task requires subjects to respond to a letter repetition with one intervening letter (g – S – f – s). The latter condition required both the maintenance of the last two letters in memory and updating these remembered stimuli as each new stimulus was presented. The difference between the 2-back and the 0-back conditions represents a reliable measure of working memory and has been extensively used in behavioral as well as brain imaging experiments (3).

1. Small KM, Brown KM, Forbes SL, Liggett SB (2001) Polymorphic deletion of three intracellular acidic residues of the alpha 2B-adrenergic receptor decreases G protein-coupled receptor kinase-mediated phosphorylation and desensitization. *J Biol Chem* 276:4917–4922.
2. Gevins A, Cuttito B (1993) Spatiotemporal dynamics of component processes in human working memory. *Electroencephalogr Clin Neurophysiol* 87:128–143.
3. Owen AM, McMillan KM, Laird AR, Bullmore E (2005) N-back working memory paradigm: A meta-analysis of normative functional neuroimaging studies. *Hum Brain Mapp* 25:46–59.

Table S1. Brain activity during encoding of negative vs. neutral pictures

Region	BA	No. of voxels	L/R	MNI coordinates			t(56)	Z	P*
				x	y	z			
<i>Negative > neutral pictures</i>									
Amygdala		30	L	-22	-6	-20	7.79	6.39	0.000 FWE
		12	R	19	0	-20	6.85	5.81	0.000 FWE
Occipital cortex/fusiform gyrus	19	4,545	L	-52	-69	4	12.17	Inf.	0.000 FWE
	37		R	44	-52	-16	11.38	Inf.	0.000 FWE
Postcentral gyrus	2	141	L	-63	-22	28	8.47	6.77	0.000 FWE
	2	109	R	69	-25	28	7.72	6.35	0.000 FWE
Superior temporal gyrus	38	292	R	39	0	-20	7.88	6.44	0.000 FWE
Amygdala/inferior frontal lobe/insula		659	L	-22	-6	-20	7.79	6.39	0.000 FWE
Superior parietal lobule	7	82	R	28	-52	60	7.76	6.37	0.000 FWE
Medial frontal gyrus	10	168	L	-6	52	20	7.65	6.30	0.000 FWE
Middle temporal gyrus	21	45	R	52	-17	-24	7.45	6.19	0.000 FWE
Cingulate gyrus	24	50	L	-8	-17	36	7.02	5.92	0.000 FWE
<i>Neutral > negative pictures</i>									
No suprathreshold clusters									

L and R indicate left and right hemisphere, respectively.
 *P value after FWE correction for the whole-brain volume.

Table S2. Brain activity during encoding of positive vs. neutral pictures

Region	BA	No. of voxels	L/R	MNI coordinates			t(56)	Z	P*
				x	y	z			
<i>Positive > neutral pictures</i>									
Amygdala		16	L	-19	-3	-16	4.00	3.74	0.005 SVC
		5	R	19	-3	-20	3.64	3.44	0.013 SVC
Occipital lobe	18	1,017	L	-14	-72	-4	12.67	Inf.	0.000 FWE
Middle temporal gyrus	39	135	L	-52	-72	8	8.22	6.63	0.000 FWE
	39	158	R	52	-69	8	7.74	6.36	0.000 FWE
Orbitofrontal gyrus	11	46	L	-3	47	-20	6.90	5.85	0.000 FWE
Medial frontal gyrus	10	52		0	61	16	6.44	5.55	0.000 FWE
Anterior cingulate gyrus	32	99	R	3	44	0	6.44	5.55	0.000 FWE
Inferior frontal gyrus	47	39	L	-33	19	-20	6.24	5.41	0.000 FWE
<i>Neutral > positive pictures</i>									
Fusiform gyrus	37	112	R	28	-41	-12	8.78	6.93	0.000 FWE
Superior occipital gyrus	19	28	R	39	-83	24	7.09	6.61	0.000 FWE
Parahippocampal gyrus	36	38	L	-30	-41	-20	6.43	5.53	0.000 FWE

L and R indicate left and right hemisphere, respectively.

*P values with SVC are values after SVC for the bilateral amygdala. P values with FWE are values after FWE correction for the whole-brain volume.

Table S3. Emotional subsequent memory effect for negative and positive pictures

Region	BA	No. of voxels	L/R	MNI coordinates			t(56)	Z	P
				x	y	z			
<i>Dm_{negative} > Dm_{neutral}</i>									
Fusiform gyrus	37	21	R	36	-52	-16	4.75	4.34	0.000
Precentral gyrus	4	72	R	58	-22	40	4.62	4.23	0.000
Inferior temporal gyrus	37	50	R	44	-63	0	4.19	3.89	0.000
Hippocampus/parahippocampus		6	L	-14	-17	-24	4.18	3.88	0.000
Middle occipital gyrus	19	12	L	-50	-74	-4	3.72	3.50	0.000
Postcentral gyrus	3	6	R	66	-14	24	3.70	3.48	0.000
	3	6	L	-61	-22	36	3.43	3.26	0.001
Insula	13		L	-33	19	12	3.26	3.10	0.001
Amygdala			R	19	0	-20	2.61	2.52	0.006
Deletion carriers only			R	30	0	-20	2.61	2.45	0.007
Noncarriers only			R	19	0	-20	2.50	2.35	0.009
<i>Dm_{positive} > Dm_{neutral}</i>									
Anterior hippocampus			L	-28	-8	-24	3.30	3.14	0.001
Amygdala			L	-25	-3	-24	1.86	1.83	0.034
Deletion carriers only			L	-25	3	-20	2.44	2.31	0.010
Noncarriers only			L	-19	-3	-24	1.33	1.32	0.093

Dm: remembered > forgotten pictures. L and R indicate left and right hemisphere, respectively.

Table S4. Genotype-dependent ESM effect for negative and positive pictures

Region	BA	No. of voxels	L/R	MNI coordinates			t(55)	Z	P
				x	y	z			
<i>Deletion > no deletion for $Dm_{negative} > Dm_{neutral}$</i>									
Postcentral gyrus	43	3	L	-52	-11	16	3.49	3.30	0.000
Insula	13		L	-44	-6	12	3.00	2.87	0.002
<i>No deletion > deletion for $Dm_{negative} > Dm_{neutral}$</i>									
Occipital lobe	18	6	L	-19	-102	-8	3.70	3.48	0.000
<i>Deletion > no deletion for $Dm_{positive} > Dm_{neutral}$</i>									
Insula	13	16	L	-47	-6	16	4.02	3.75	0.000
<i>No deletion > deletion for $Dm_{positive} > Dm_{neutral}$</i>									
No suprathreshold voxels									

Dm: remembered > forgotten pictures. L and R indicate left and right hemisphere, respectively.