

ONLINE SUPPLEMENTARY

Methodology Notes

Additional inclusion/exclusion criteria for neurological participants:

The inclusion/exclusion criteria for neurological patients with brain lesions include: male and female subjects equal to or older than 18 years of age, who have sustained cerebral infarction, cerebral hemorrhage, herpes simplex encephalitis, focal surgical ablations of the cerebrum, lobar atrophy, cerebral anoxia, or selected instances of cerebral contusion. Subjects were not included in the study if they 1) were under 18 years of age, 2) had intellectual disabilities, dementia, psychiatric disease, or a history of alcohol or drug abuse, or 3) had multiple, behaviorally confounding lesions. The inclusion/exclusion criteria for the normal comparison group are: Caucasian, male and female subjects who have no known neurological, psychiatric, or neuropsychological impairment, no history of drug or alcohol abuse, and are in good health.

Other scales:

Below scales and questionnaires were administered in addition to the main picture rating task in all experiments.

PANAS. The 20-item Positive and Negative Affect Schedule (PANAS), includes two mood scales, one measuring positive affect and the other measuring negative affect. Each item is rated on a 5-point scale ranging from 1 (“very slightly or not at all”) to 5 (“extremely”) to indicate the extent to which the respondent has felt this way at the time they were answering (“right now”, “at the present moment”). The scale is used to construct two measures by adding up 10 items for each mood (negative and positive). Each affect scale ranges from 10 to 50 (Watson, Clark, and Tellegen 1988; Watson and Clark 1994). Higher values indicate higher affect.

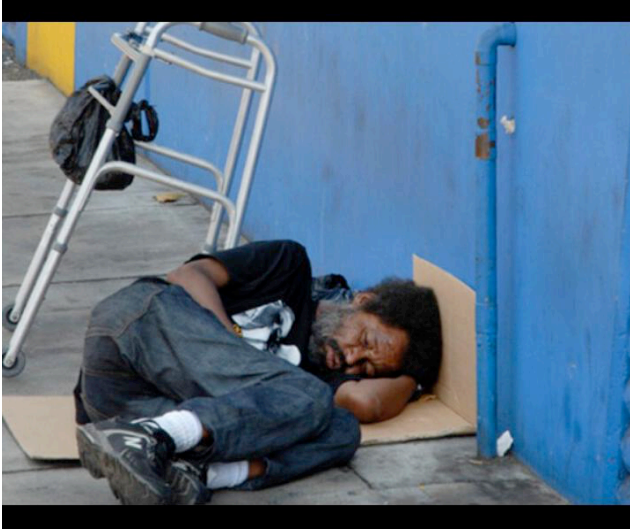
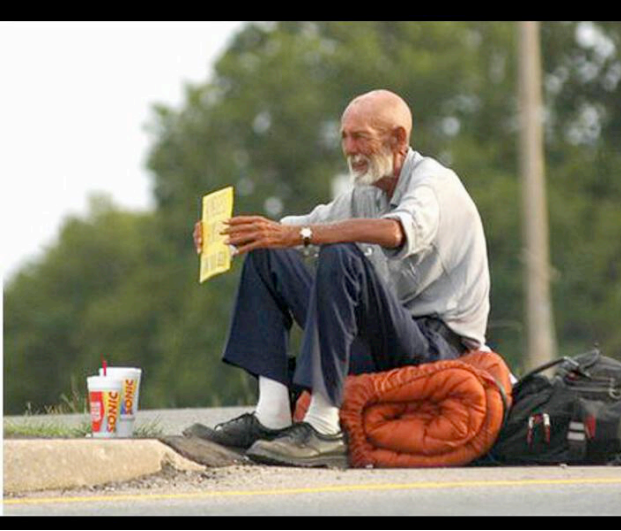
Racial Contact Questionnaire. Racial contact is assessed by first asking respondents to list all of their black acquaintances and then rate each acquaintance in terms of how well he or she was known on a 7-point scale ranging from “1, know/ knew as only an acquaintance” to “7, know/knew very well” (Ito et al. 2004). Contact score is a cumulative index that sums the level of contact with the black acquaintances per respondent. Higher values indicate more contact.

Stereotype Assessment Scale. Stereotype Assessment indicates the number of stereotypes each respondent reported to know about blacks from a list of 24 stereotypes (lazy, ignorant, low in intelligence, poor, stupid, unreliable, aggressive, rude, loud, hostile, uneducated, sexually perverse, criminal, rhythmic, musical, athletic, intelligent, kind, sportsmanlike, straightforward, sensitive, artistic, loyal to family, honest) (Devine and Elliot 1995). Respondents are instructed to select those adjectives that they know to be part of the cultural stereotype whether or not they believe the stereotype to be true. If the respondent reported to know of that stereotype, it is coded as “1” if not “0”. The final measure is an additive scale ranging from “0” to “24”; higher values indicate more knowledge of stereotypes.

Symbolic Racism. This scale consists of a series of statements relating to race and politics to which the participant must state their agreement (Henry and Sears 2002, Sears and Henry 2005). First, each item is coded so that the response indicated higher values. Then, to compensate for the differences in the number of response options (some are on a scale of four some three), each item is coded on a 0 to 1 scale, so items with three response options are recoded as 1 = 0, 2 = .50, and 3 = 1, and the other items are recoded as 1 = 0, 2 = .33, 3 = .66, and 4 = 1 (see Henry and Sears 2002 for this coding strategy). The final measure is an average score across eight items (ranging from 0 to 1). Higher values reflect more racial animosity.

EXAMPLE PICTURES

Pictures of lower class people



Pictures of middle class people



Pictures of upper class people

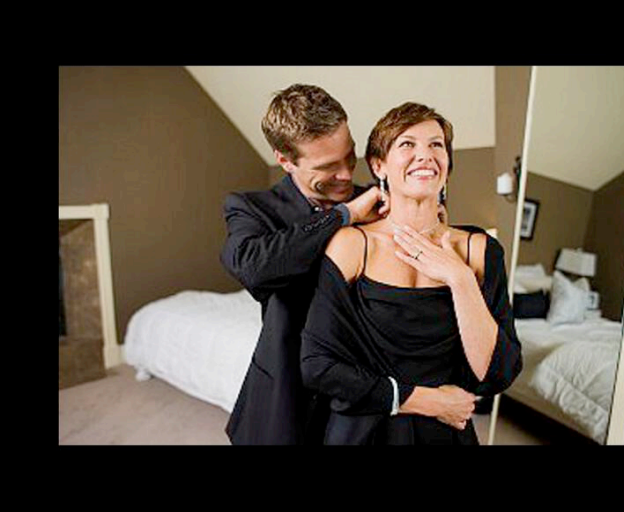


Table A1. Comparison of the details in pictures across race and socioeconomic status categories

Per picture		Per picture category ¹				Visual Complexity ²
Average number of people	Number of men	Number of children	Number of people with direct eye gaze	Number of smiling people		
<i>Lower class:</i>						
Black	1	23 (% 89)	1 (% 4)	8 (% 31)	1 (% 4)	1.9 (0.7)
White	1	20 (% 77)	0 (% 0)	7 (% 27)	0 (% 0)	1.7 (0.5)
<i>Middle class:</i>						
Black	3	40 (% 54)	31 (% 42)	41 (% 55)	66 (% 89)	1.7 (0.5)
White	3	34 (% 47)	28 (% 38)	38 (% 53)	65 (% 89)	1.7 (0.7)
<i>Upper class:</i>						
Black	1	24 (% 71)	0 (% 0)	15 (% 44)	24 (% 71)	1.7 (0.7)
White	1	24 (% 71)	0 (% 0)	16 (% 47)	25 (% 74)	1.7 (0.7)

Note 1: Numbers in parentheses indicate the percentage per category. For example, for black lower class category, 89 per cent of the total number of people in pictures is men.

Note 2: Numbers in parentheses indicate standard deviations.

Table A2. Principal components factors analysis results

Variable	Factor1	Factor2	Uniqueness
Anger	0.92	-0.11	0.14
Sadness	0.79	-0.44	0.18
Happiness	-0.70	0.64	0.09
Fear	0.70	0.06	0.51
Disgust	0.88	-0.20	0.18
Envy	-0.10	0.83	0.30
Pity	0.73	-0.44	0.27
Pride	-0.22	0.84	0.25
Variance	3.82	2.24	-
Difference	1.58	-	-
Cumulative Proportion	0.48	0.76	

Note: Results rotated with orthogonal varimax. Factors with eigenvalues greater than 1 are reported.

Table A3. Demographic and clinical characteristics, and attitude scales for each lesion patient

Patient ID	VMPFC (Unilateral)					Amygdala (Left)			Amygdala (Right)	
	0318	0770	1983	2391	2577	2403	2492	2555	1465	2962
Sex	M	F	F	F	M	F	F	F	M	M
Age	72	70	49	67	71	54	42	42	82	56
Education	14	16	13	14	12	12	12	12	14	14
Class	W	M	W	M	W	M	M	W	M	W
Handedness	R	R	R	R	R	R	L	R	R	L
Chronicity	37	27	17	13	14	14	12	12	22	10
PANAS	28	32	32	15	29	39	39	28	45	43
Pos. PANAS	10	11	10	17	10	11	11	12	17	10
Neg. PANAS										
Etiology	Meningioma resection	Meningioma resection	SAH	Meningioma resection	SAH; ACoA	Anterior temporal lobe resec.	Anterior temporal lobe resec.	Anterior temporal lobe resec.	Herpes Simplex Encephalitis	Anterior temporal lobe resec.
WAIS – III FSIQ	143	108	108	109	84	104	101	87	110	107
BDI	0	6	5	4	7	4	3	6	8	3
Racial contact	15	0	11	43	0	28	44	2	12	9
Stereotypes	12	6	12	10	18	16	8	13	8	11
Symbolic Racism	0.4	0.4	0.6	0.3	0.7	0.4	0.4	0.5	0.2	0.5

Note: Age is in years at time of testing. Education is education in years of formal schooling. Class is self-reported social class (W=working class, M=middle class). Handedness reports dominant hand (R=right, M=Mixed, L=left). Chronicity is the time between lesion onset and completion of the present experiment, in years. Etiology denotes the cause of neurological damage. ACoA = anterior communicating artery. SAH = subarachnoid hemorrhage. BDC patients had brain damage due to surgical intervention (n = 2) or cerebrovascular disease (n = 4). WAIS-III, Wechsler Adult Intelligence Scale-III scores (FSIQ = full-scale IQ), 80–89 is low average, 90–109 is average, 110–119 is high average, 120+ is superior). BDI, Beck Depression Inventory, a measure of baseline mood (raw scores reported. According to the BDI-II manual, “Nondepressed” individuals had mean BDI-II scores of 7.7 (SD 5.9), whereas “mildly depressed,” “moderately depressed,” and “severely depressed” individuals had mean BDI-II scores of 19.1 (SD 5.7), 27.4 (SD 10.0), and 33.0 (SD 12.0), respectively (Beck, Steer, and Brown 1996).

Table A4. Mixed effects regression results for the lesion study

	Desirability-related	Distressful
	b/se	b/se
<i>MAIN EFFECTS:</i>		
<i>Stimuli Race</i>		
Black	0.01 (0.01)	-0.04*** (0.01)
<i>Stimuli Social Class</i>		
Middle Class	0.50*** (0.01)	-0.50*** (0.01)
Upper Class	0.35*** (0.01)	-0.48*** (0.01)
<i>Lesion Groups</i>		
vmPFC	0.02 (0.08)	0.03 (0.05)
AMY	0.14 (0.08)	-0.09 (0.05)
<i>INTERACTION EFFECTS:</i>		
<i>Stimuli Race by Class</i>		
Black x Middle Class	-0.01 (0.02)	0.04** (0.01)
Black x Upper Class	0.00 (0.02)	0.04** (0.01)
<i>Stimuli Race by Lesion Groups</i>		
Black x vmPFC	-0.01 (0.03)	0.01 (0.02)
Black x AMY	-0.01 (0.03)	0.04 (0.02)
<i>Stimuli Class by Lesion Groups</i>		
Middle Class x vmPFC	0.00 (0.03)	-0.03 (0.02)
Middle Class x AMY	-0.01 (0.03)	0.16*** (0.02)
Upper Class x vmPFC	-0.04 (0.03)	-0.03 (0.02)
Upper Class x AMY	0.03 (0.03)	0.20*** (0.02)
<i>Stimuli Race by Class by Lesion Groups</i>		
Black x Middle Class x vmPFC	-0.09* (0.04)	-0.01 (0.03)
Black x Middle Class x AMY	0.05 (0.04)	-0.06 (0.03)
Black x Upper Class x vmPFC	-0.04 (0.04)	0.00 (0.03)
Black x Upper Class x AMY	0.04 (0.04)	-0.06* (0.03)

Note: White and the normal/BDC comparison group are the reference categories.

*** p < 0.001, ** p < 0.01, * p < 0.05. Numbers in parentheses indicate standard errors.

Table A5. Principal factors analysis results for the behavioral data from the fMRI experiment.

Variable	Factor1	Factor2	Uniqueness
Anger	0.96	-0.15	0.07
Sadness	0.81	-0.39	0.20
Happiness	-0.54	0.79	0.07
Fear	0.61	-0.56	0.31
Disgust	0.80	-0.34	0.24
Envy	-0.30	0.81	0.26
Pity	0.79	-0.36	0.25
Pride	-0.14	0.95	0.08
Variance	3.61	2.92	-
Difference	0.69	-	-
Cumulative Proportion	0.45	0.82	

Note: Results rotated with orthogonal varimax. Factors with eigenvalues greater than 1 are reported.

Table A6. Mixed effects regression results for the behavioral data from the fMRI experiment

	Desirability-related	Distressful
	b/se	b/se
<i>MAIN EFFECTS:</i>		
<i>Stimuli Race</i>		
Black	0.00 (0.02)	0.00 (0.01)
<i>Stimuli Social Class</i>		
Middle Class	0.55*** (0.02)	-0.54*** (0.01)
Upper Class	0.42*** (0.02)	-0.49*** (0.01)
<i>INTERACTION EFFECTS:</i>		
Black x Middle Class	-0.08** (0.03)	-0.01 (0.02)
Black x Upper Class	-0.01 (0.03)	-0.02 (0.02)

Note: White and Low Class are the reference categories.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Numbers in parentheses indicate standard errors.

Table A7. Regions of significant activation for the main effects in a whole-brain analysis

Anatomical Location	mm ³	x	y	z	t-score		mm ³	x	y	z	t-score
<u>Black Upper</u>						<u>White Upper</u>					
R. Lingual Gyrus	134730	-5	83	-13	12.701	R. Lingual Gyrus	127548	-5	83	-13	14.812
R. Mid Orbital Gyrus	9207	-5	-35	-1	-8.861	R. Anterior Cingulate Cortex	7992	-5	-38	6	-9.674
R. Angular Gyrus	6291	-44	62	42	-7.375	R. Inferior Parietal Lobule	5859	-44	56	45	-6.717
R. Middle Cingulate Cortex	3537	-2	41	36	-5.763	R. Cuneus	4752	-8	71	21	-6.988
R. Precentral Gyrus	2403	-50	-2	42	7.209	L. Angular Gyrus	2727	50	62	30	-5.886
R. Inferior Frontal Gyrus	2133	-53	-14	24	5.232	R. Precentral Gyrus	2214	-50	-2	39	7.496
L. Supra Marginal Gyrus	1971	59	38	33	-4.709	R. Middle Frontal Gyrus	2160	-29	-32	39	-10.537
R. Rectal Gyrus	1431	-2	-44	-10	6.625	L. Middle Frontal Gyrus	1458	29	-23	42	-8.389
L. Middle Frontal Gyrus	1377	26	-23	36	-6.18	L. Precuneus	1431	11	56	21	-6.533
R. Pallidum	1350	-8	2	3	5.373	R. Inferior Frontal Gyrus	1350	-38	-44	3	-16.493
R. Superior Occipital Gyrus	1215	-26	71	42	5.373	L. Precuneus	1269	17	41	6	-7.407
L. Superior Temporal Gyrus	999	62	32	18	-4.608	R. Inferior Frontal Gyrus	1215	-53	-14	24	5.971
R. Middle Frontal Gyrus	999	-26	-44	33	-5.824	R. Mid Orbital Gyrus	1107	-2	-53	-4	5.549
L. Pallidum	972	8	2	6	6.031	L. Inferior Frontal Gyrus	1107	38	-20	-7	5.179
R. Fusiform Gyrus	918	-35	5	-34	4.947	L. SMA	1080	2	-2	48	5.385
L. Calcarine Gyrus	918	11	65	15	-6.41	L. Inferior Frontal Gyrus	1026	41	2	27	5.566
R. Precuneus	648	-8	71	30	-6.056	R. Fusiform Gyrus	783	-35	8	-34	5.713
						L. Fusiform Gyrus	702	26	-5	-37	5.344
						R. Precuneus	648	-2	68	48	5.542
<u>Black Lower</u>						<u>White Lower</u>					
R. Lingual Gyrus	122769	-5	80	-13	13.436	R. Lingual Gyrus	133326	-5	83	-13	12.493
R. Middle Frontal Gyrus	22788	-29	-41	33	-11.988	L. Inferior Frontal Gyrus	28323	32	-47	-10	-8.863
L. SupraMarginal Gyrus	4698	59	41	30	-5.725	L. Inferior Parietal Lobule	5940	50	53	36	-5.567
R. Precentral Gyrus	4536	-44	5	30	7.713	R. Inferior Parietal Lobule	4347	-44	56	45	-6.022
Black Lower						White Lower					
R. Inferior Parietal Lobule	3699	-47	53	45	-7.015	R. Precentral Gyrus	2322	-44	5	30	7.802
L. Cuneus	2403	-2	71	30	-7.97	R. Precuneus	1971	-20	41	6	-7.148

Table A7. Regions of significant activation for the main effects in a whole-brain analysis

Anatomical Location	mm ³	x	y	z	t-score		mm ³	x	y	z	t-score
Gyrus											
R. Middle Temporal Gyrus	675	-50	47	3	4.598						
R. Inferior Temporal Gyrus	648	-65	32	-16	-5.375						
	<u>Non-human Pleasant</u>						<u>Non-human Unpleasant</u>				
R. Lingual Gyrus	132462	-5	83	-13	17.628	R. Lingual Gyrus	142614	-5	83	-13	16.73
L. Inferior Frontal Gyrus	10611	44	2	27	7.035	L. Inferior Frontal Gyrus	14472	50	-26	15	9.782
R. Angular Gyrus	6453	-50	65	33	-7.491	L. Cuneus	10719	-2	68	24	-8.398
L. Cuneus	6318	2	71	27	-6.978	R. Mid Orbital Gyrus	10368	-5	-44	-1	-7.579
R. Precentral Gyrus	5292	-44	5	30	7.125	R. Precentral Gyrus	10341	-44	5	30	7.133
R. Precuneus	2133	-11	71	48	5.353	R. Angular Gyrus	3348	-47	62	36	-6.302
R. Mid Orbital Gyrus	1809	-2	-35	-1	-5.876	L. SMA	2322	-2	-5	45	6.369
L. SMA	1620	-2	-2	45	5.183	L. Pallidum	891	8	2	6	4.948
R. ParaHippocampal Gyrus	1107	-20	5	-22	5.926	R. Inferior Temporal Gyrus	783	-65	29	-16	-5.851
R. Middle Frontal Gyrus	1107	-26	-29	45	-6.508	L. Superior Parietal Lobule	675	23	71	51	4.231
R. Inferior Frontal Gyrus	1080	-47	-35	15	5.481						
R. Middle Temporal Gyrus	1053	-65	26	-10	-6.905						
R. Fusiform Gyrus	864	-32	5	-37	6.105						
L. Superior Temporal Gyrus	837	44	17	3	-8.68						

Note: Anatomical Locations are based on nearest voxel coordinates on the Eickhoff-Zilles atlas (AFNI's CA_N27_ML Atlas). Peak activation is reported in Talairach coordinates (RAI). Uncorrected $p < 0.005$, corrected $p < 0.05$.

Table A8. Regions of activation for the main effects in ROI analyses

	Volume (mm ³)	x	y	z	Maximal t-score
MPFC:					
Black Upper	1269	-5	-53	-13	6.625
White Upper	1674	-5	-50	-13	5.549
White Middle	2106	-2	-53	-16	6.604
White Lower	1107	-2	-53	-16	5.432
Right Amygdala:					
Black Upper	702	-29	2	-19	5.023
Black Lower	837	-26	-2	-19	5.592
Black Middle	486	-26	2	-16	4.818
White Upper	567	-29	2	-19	5.114
White Lower	351	-26	2	-16	5.935
White Middle	459	-29	2	-19	3.586
Non-human Unpleasant	1107	-29	-2	-19	6.259
Left Amygdala:					
Black Upper	702	20	2	-19	6.549
Black Lower	459	20	2	-16	5.024
Black Middle	513	20	5	-16	4.763
White Upper	405	20	5	-16	6.336
White Lower	324	20	5	-19	5.123
White Middle	243	20	2	-19	3.804
Non-human Pleasant	729	23	2	-19	7.364
Non-human Unpleasant	675	20	5	-16	5.061

Note: Anatomical locations are based on nearest voxel coordinates on the Eickhoff-Zilles atlas (AFNI's CA_N27_ML Atlas). Peak activation is reported in Talairach coordinates (RAI). Uncorrected $p < 0.05$, corrected $p < 0.05$.