The right anterior temporal lobe variant of prosopagnosia

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INTRODUCTION

Prosopagnosia following right anterior temporal lesion alone has rarely been described.

It has been hypothesized that anterior temporal lesions could cause an associative or amnesic variant of prosopagnosia.

Does this occur with lesions limited to the right anterior temporal lobe?

What type of face-processing deficits occur?

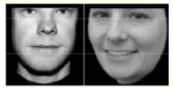
METHODS

Standard neuropsychological testing assessed general cognitive impairments.

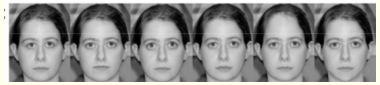
Assess face detection, perception, imagery, semantic people knowledge

A. Face detection

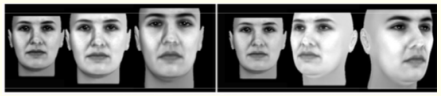
B. Gender categorization



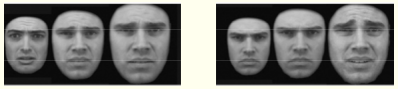
C. Perception of facial structure



D. Viewpoint invariance



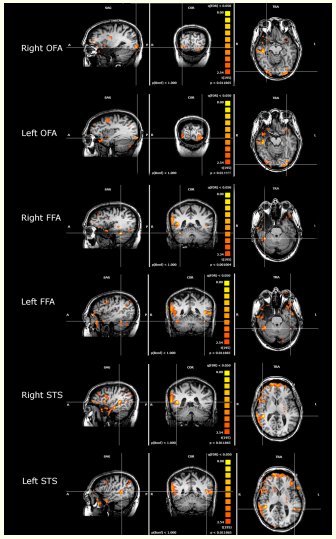
E. Expression and identity perception



3T MRI for structural and functional imaging, using dynamic face localizer neuroimaging protocol to characterize the core face-processing network.

SUBJECTS

2 acquired prosopagnosia subjects (R-AT2, R-AT3) with herpes simplex encephalitis, intact right and left FFA, OFA, and STS on fMRI.



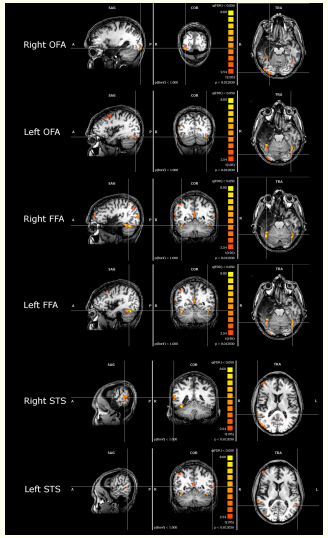


Table 1. Patient descriptions

	R-AT2	R-AT3
age	30	37
duration	5yr	8yr
lesion	herpes simplex encephalitis	
handedness	L	R
field defect	none	
Benton	47/54	38/54
Warrington (faces)	27/50	31/50

Figure 3. Structural MRI images

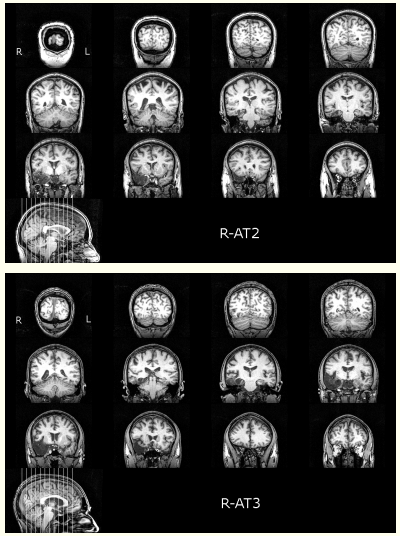


Table 2. Test results

			controls mean	controls s.d.	R-AT2 score	R-AT2 z	R-AT3 score	R-AT3 z
Famous face familiarity		d'	2.78	0.42	0.65	-5.07	0.90	-4.48
		c'	0.25	0.41	0.71	2.34	-0.83	-2.64
Semantic name knowledge								
Forced-choice name familiarity		%	89.2	10.2	95.0	0.57	100.0	1.06
Occupation sorting of names		%	92.2	6.8	100.0	1.15	98.0	0.85
Face detection								
Faces vs. face parts		A'	0.992	0.01	0.986	-0.60	0.993	0.01
		RT	1425	413	1301	0.30	1317	0.26
Face vs. non-face		A'	0.994	0.01	1.000	0.56	1.000	0.56
		RT	1365	363	1351	0.04	871	1.36
Body vs. non-body		A'	0.989	0.02	1.000	0.50	1.000	0.50
		RT	1386	297	1496	-0.37	1404	-0.06
Cambridge face perception test		n	34.5	14.65	40	-0.38	62	-1.88
Face view invariance								
	same view	%	89.71	7.43	91.6	0.25	87.5	-0.29
	different views	%	85.4	12.1	69.5	-1.31	73.9	-0.95
Face gender		A'	96.0	3.0	95	0.33	96.5	0.17
Face expression vs. identity								
identity	expression fixed	%	94.8	5.6	86.9	-1.41	66.7	-5.00
	expression varying	%	93.1	5.5	77.8	-2.78	83.3	-1.79
expression	identity fixed	%	95.0	4.5	100.0	1.11	94.4	-0.14
	identity varying	%	95.0	6.0	55.6	-6.57	100	0.85
Expression films test		%	90.0	4.0	82.8	-1.80	84.0	-1.50
Face imagery								
	feature	%	92.8	5.0	78.9	-2.78	36.8	-11.21
	global	%	94.1	5.9	66.7	-4.65 *	61.1	-5.59

* No different than chance

RESULTS

- Perform well on tests of perception of facial configuration and facial features, gender, and face detection.
- RAT2 had slight difficulty with invariant representations.
- Very impaired on face familiarity and face imagery.
- Semantic knowledge good - performed well on identifying famous names and linking occupation to names.

CONCLUSIONS

•The right anterior temporal variant of prosopagnosia is characterized:

a) by impaired access to facial memories

b) with relatively preserved face perception and semantic knowledge about people.

•These findings are consistent with an associative or amnesic functional subtype of prosopagnosia.

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