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Research report

The role of the left anterior temporal lobe in language processing revisited: Evidence from an individual with ATL resection

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ABSTRACT

(ATL) - O / - - . T ATL . A ATL - ATL - (LGG). T : ; ( ) ( ), . T ATL .

1. Introduction

T B (. ., D ., 2004; F , 2001; S ., 2006), - - . O , (ATL)

* *Corresponding authors.* S K L . C N L , B N U , B 100875, PR C .
E- : @ (. B), @ (. H).

0010-9452/$
. :10.1016/ . .2009.12.002

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. O ATL
/ [1]
(. ., P ., 2007; R ., 2004;
R ., 2006),
. A ATL
(. ., D ., 1996, 2004; D ., 2008;
G ., 2001; T , 2006, 2009). B
T
(SD)
(P ., 2007 ; D ., 2005;
, 1975). P SD
-
(. .,
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F
. S
SD (. ., M .,
1999; M ., 2000; M , 2007
)
(T ., 2009). T
P . (2007)
1)
(C M , 2006;
M C , 2009) 2)
" ATL.
ATL-
A ATL
/
. E
(HSVE) A
(. ., B ., 2009; L R ., 2007;
N ., 2007; P ., 2007).
T (L R ., 2009; P ., 2007)
(TMS). ATL
ATL
ATL
(. .,
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I
T ATL'
(. .,
), D ., 1996, 2004; R .,
2008; D . (1996)
127 (106
HSVE)
. T
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", . .,
. O
(F
, $p = .0001$). T
(IT)
B IT
. C
(PET)
T
. S (D ., 2004; R
., 2008)
ATL
N
(R ., 2008):
IT
R
IT . T ,
(D ., 1996)
ATL . E ,
ATL
P ATL
(TLE)
, (. ., F ., 1999;

[1] T

T , ., 2002; G ., 2003; G ., 2005; M , 1978). T *word retrieval* (.,). N . D . (2008) ATL / D ATL. T . (1996), ATL S ATL TLE, ATL- . P ATL- (C ., 2003; J L R , 2006) - TLE (., P ., 2007; H ., 2003). S LGG (D ., 2007). F , D . (2002 , 2002 , 2003) LGG B , . U PET TMS T . (2001, 2005) LGG H, ATL . A , SD (L R , 2007). E (S ., 2006; ., 2005). I LGG (TLE) (., SD). N ATL (., D ., 2008), ; . T ATL . M, TLE LGG ATL- . G /. T ATL- ATL (, L R ., 2009; P ., 2007). I ATL LGG ATL. . H : 1) ; 2) ; 3) ; / / . S

2. Case background

, SK 28 -. , - . H . T H, ,-3278 A -316(007),-321( )-365( )-216( )-331( )

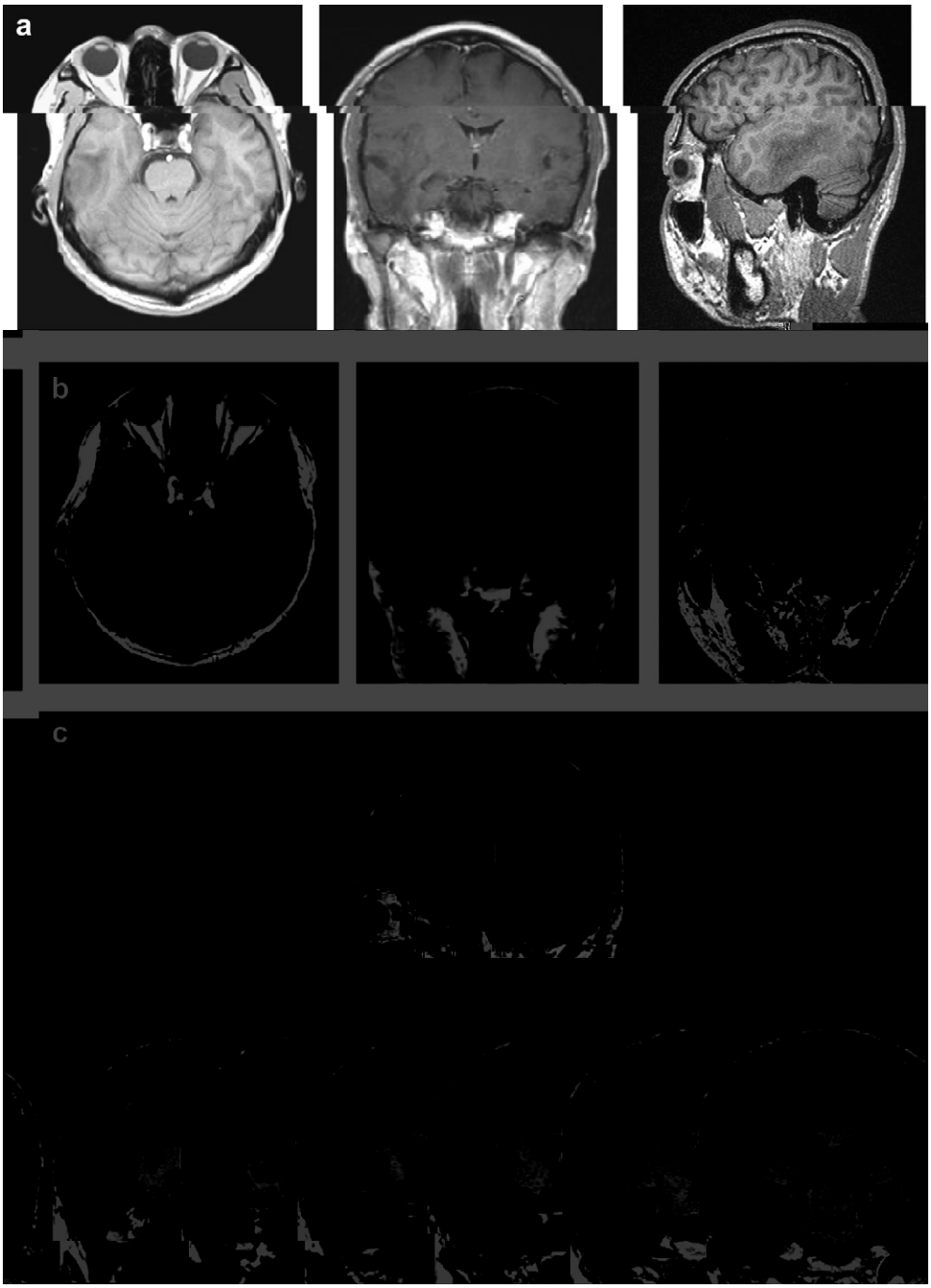

Fig. 1 – MRI scans of ZSK. a) Pre-operation scans. b) Scans at the time of our neuropsychological testing (four months post operation). c) Standardized post-operative MRI in Talairach and Tournoux system. Six coronal slices are presented to depict the extent of the lesion.

(:// / /, F . 1). T (III, S '). T

. T

A

T BNU CNL (B H ,)

.T 5 × 2.5 .H

-

(H O G II). T

- MRI - (G K , 1983):

完全不对. 给底下的小姑娘吃, 站到那个圆凳上. 那个是阿姨吧. 阿姨在擦盘子. 这边在流水, 没有关上水管. 外面的风景不错…”

(R : A . I I … . S . T . A . I ’ , , G …”). H - , , , . H ” ” H - (40/40), ” , - , (40/40), - - (19/20). H (45/45) - (15/15), / (. ., -). H , , (: 27/34; : 33/34).

. T - - (E 1) - (E 1); - (E 2) - (E 2). T . E - 1 2 SK ( ) - (L . , R ., 2009; P. ., 2007). E 1 2 9 - A N 2007 E 1 2 S 2008 ( ) M 2009 (.). F (. .,), L - - . R . T , , C , SK.

3. Experiment 1: conceptual knowledge assessments

3.1. *Experiment 1a: off-line conceptual tasks*

3.1.1. *Method*

T SK’ . S T 1 3 , .

3.1.1.1. ORD PICTURE MATCHING. *1) Word–picture matching task with 64-item semantic battery (N = 64,* B ., 2000). I , (. ., , / , .), SK ; *2) Word–picture matching task from BNU CNlab (N = 50).* T ( ) . I 1/3 , ; 1/3 / , , 1/3 .

3.1.1.2. Sentence picture matching ($N = 20$). T

3.1.1.3. Picture ord verification ($N = 162$). I SK

(B H , 2004). T S (1980)

3.1.1.4. Face

. I , ,

. 2) *Task 12 in* B
(BORB, $N = 30$, R , H , 1993).
T PPT.

3.1.1.7. S NON M JUDGMENT ($N = 84$). T C
(B ., 1994),
(- - , . ., ,
). T 26 (13
13), 26 ( ), 16
16 .

3.1.1.8. ATTRIBUTE JUDGMENT ($N = 322$). T C
C A
C S (1998),
. T
,,
. T
(B ., 2007).

3.1.2. *Results*

SK'
T 1,
SK'
C
G (2002),
SK

3.2. *Experiment 1b: on-line conceptual tasks*

SK'
E 1 , ATL-
ATL
SK ATL
. B P .
(2007) L R . (2009), TMS
-
(RT)
ATL
. T
SK SK'
RT .

3.2.1. *Method*

3.2.1.1. PARTICIPANTS. F M
C SK
(: 26,).

3.2.1.2. MATERIAL, DESIGN AND PROCEDURE. F -
P . (2007),
- . T
PPT (E 1). T
;
. I ,
(. ., 11, 19)
(13). T 79
(41
PPT) 79 . T
-
I (+") -
500 .
4
. T 1 . T DMD
(F. F. , 2003)
. T
15 .

3.2.2. *Results*

RT -
. I RT
;
(/
). SK
( ) -
( ) T 3. T t
p
C G (2002)
SK'
. H
F R S D
T (RSDT) (C G , 2005;
)
SK' -
$t(4) = .822$, $p = .457$. I , SK
-

4. Experiment 2: picture naming across categories

4.1. *Experiment 2a: off-line picture naming tasks*

4.1.1. *Methods*

T SK'
D . (1996,
2004),
(.
). F S
(1980) (C , S .,
1989),

. F C
” (L). F
24 C
S P F M .

4.1.2. *Results and discussion*

SK’ -

T 2 ( ).

O S (1980) , : 1) (. ., 吉他, , / 2 / → 钢琴„ , . , / 1 2/); 2) - (- ; . .,

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„ . I
SK’
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/ - (1
0 -), ( ),
(A A),
. T
. (1998)
S . (1989).
A
/ - -
. U F /
/ - ($p = .005$), A A
($p = .012$), ($p = .007$),
($p = .029$). U - -
/ -
. I
($p = .002$). /
: 1 , 2
3 . T
SK’ (-
: $p = .001$). I / -
/
SK’

4.2. *Experiment 2b: an on-line naming task*

4.2.1. *Method*

4.2.1.1. PARTICIPANTS. T
E 1

4.2.1.2. MATERIAL. (-
) SK’
(E 2).
RT . F S -
’ (1980)
(.
, , , ,)
(. , , , ,)
. A 18
SK
E 2 . T 78
- . I
, .T
1 . T
. E 1 .

4.2.2. *Results and discussion*

T E 1
. T RT SK

T 3. F RT, SK
. I ,
E 2 :
- -
, RT
. F RSDT
-
$t(4) = 5.35$, $p = .006$.
- (T 3).
S
E 1 SK’
. H -
(E 2)
RT (E 2) -
. G SK
( )
(., C , 1997; C H , 1990;
D , 1986; L ., 1999),
(., D , 1989; D .,
1996, 2004). T
-
. O -
; ( )
. F
/

5. General discussion

(SK)
ATL ( )
. SK
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:
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( ),
( )
T
(-),
P SK’
-
ATL
(., F ., 1999; T , ., 2002;
G ., 2003). M (-

ATL

ATL (.,
P .,2009; P. .,2009). A
MRI (MRI) (S ., 2009)

. F (C .,
1998; T .,1996)

ATL . T
ATL
ATL. A

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M

(G , 1965). S ,
ATL

. I
SK'

T.
ATL

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T
ATL,
ATL

Acknowledgment

T NSFC
(30700224), BJSF (7082051), F F S
U R T P (B07008) B,
N K P S T S -
P C (2007BAI05B08) TJ,
F C R T R B
AC. N L
SK

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, , / . *Cognitive Neuropsychology*, 24: 485 504, 2007.

B JR, D RH, G , C, LL.
? A -
120 . *Cerebral Cortex*, 19: 2767 2796, 2009.

B S, L R MA, P K, G P,
H JR. N, -
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. T -
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B EL H AE. A : I
? *Brain and Language*, 89: 3 8, 2004.

C F, M, M, S M, S T. S
Brain, 132: 87 102, 2009.

C SF, F M, P P, P D, F. C -
: A
Neurocase, 4: 391 397, 1998.

C A H A. ?
Cortex, 26: 95 122, 1990.

C A H
Neurol TCmpkuttion, W1:-335(H12)32: 1.
? *Cognitive Neuropsychology*, 14: 177 208, 1997.

C A M B . T
: T
. *Cognitive Neuropsychology*, 23: 13 38, 2006.

C A S JR. D -
: T
Journal of Cognitive Neuroscience, 10: 1 34, 1998.

C JR G PH. I
: C
. *Neuropsychologia*, 40: 1196 1208, 2002.

C JR G PH. T
-
: E M,
C
Neuropsychology, 19: 318 331, 2005.

C JT, L R MA, EA, H D,
RJS. T
. *Brain*, 126: 1193 1201, 2003.

D AR. T
8( )-33 T D .

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N U, P K, T LK, M H, S EA, B P, . T : A . *Brain*, 130: 1138 1147, 2007.
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