Social Cognitive and Affective Neuroscience, 2016, 1 10

doi: 10.1093/scan/nsv086

2015

Social status modulates the neural response to unfairness

1,3,4,5

100871, 201804, 100871, 100871,

104@

Abstract

Key words: CC;

Introduction

(G , 1982). et al., 1989) et al., 2011), et al., 2012), , 2011) et al., 2011). (A et al., 2013; H et al., 2014). A et al. (2013)

Received: 15 2015; Revised: 13 2015; Accepted: 26 2015

Materials and methods

Participants

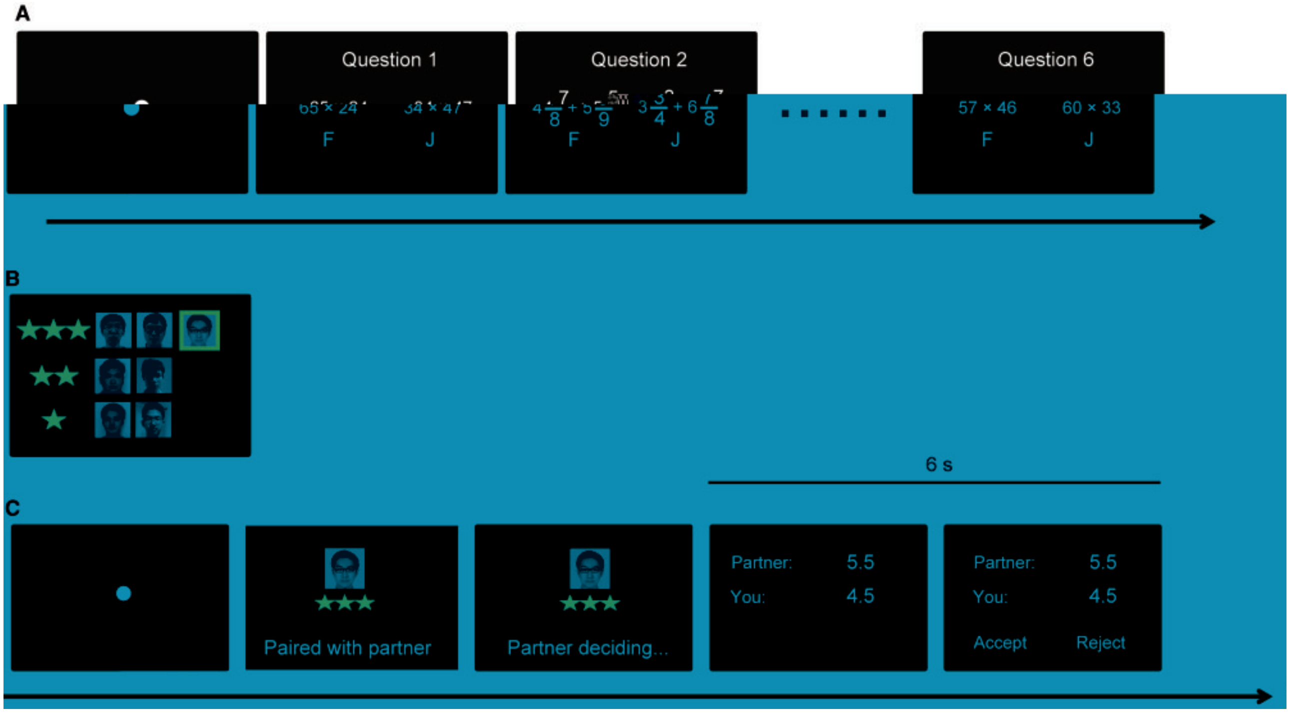

Fig. 1. (A). 10 G (B). A G (C). E G 24 G (1 2). A 1 2 (1 5 y 10 y). 3 3 6).

1000 2000 . A 3000 3000 . A . A 3000 . E 20 4 : 1/9, 1.5/8.5, 2/8, 2.5/7.5, 3/7; : 4/6, 4.2/5.8, 4.5/5.5, 4.8/5.2, 5/5) (3.2/6.8, 3.8/6.2) 8 24 G 2 (10 , 10 4). A 24 G, 24 G. A G ( ) B 6 10 G . A 7-

(1 = ; 7 =) G (1 = ; 7 =). (10) G G. F ( ) A (A , 2000), C. . F 10 G

MRI data acquisition

GE- 750 3.0 , C. 2*- (B D) 40 AC C 3.1 2000 , 30 ,

90° 200 × 200 ,
3.1 × 3.1 × 3.1 .

fMRI preprocessing

8 (
D C),
A AB ( ). F , .
, , - ,
, 3 × 3 × 3 ,
(-) y
F H G . D -
1/128 H y.

General linear model analyses

y -
(G)
(B D) , -
B D G
G (-
). F - y ,
:
, . - , , -
, , . - ,
, , . - .
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y (H F). F -
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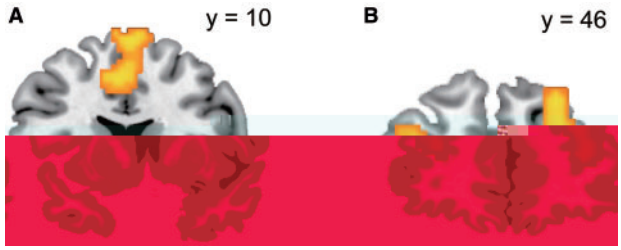

Fig. 3. > ACC, A (A) D FC (B). A P < 0.05 (- P < 0.001 23).

y/ y F(1, 22) = 97.59, P < 0.001, η^2 = 0.81, - (5.26 ± 0.15) (2.35 ± 0.15). A , , F(1,22) = 12.58, P = 0.002, η^2 = 0.36 F(1,22) = 10.07, P = 0.004, η^2 = 0.31 . , - (3.4 ± 0.06) (3.0 ± 0.06), y (5.73 ± 0.12) (4.94 ± 0.12). y. (r = 0.46, P = 0.028, d.f. = 21) , - G (r = 0.82, P < 0.001, d.f. = 21). A y, y (.) (, P = 0.6; y - , P = 0.35; , P = 0.74).

fMRI results

Main effects of social status and fairness. G, G B D - G G G . C (y *et al.*, 2003, B *et al.*, 2010), , ACC, y / (A/ CC; F 3A 1), D FC (F 3B). > ; , (P < 0.005, = 46 , P < 0.05 A), y A (x = −39, y = 11, z = −8, *T*- = 3.10, *k* = 75). (>) .

Interaction between social status and fairness. , y (–) – (H – H)

Table 1. B (- >) , P < 0.05 (- P < 0.001, = 23)

				T-	(*k*)
	x	y	z		
: > F					
ACC/ A ,	6	23	37	5.20	479
D FC	36	50	16	4.75	182
	−36	50	22	4.12	45
- : (>) > (H > H)					
A	−21	−4	−11	4.76	41
	−15	−19	4	4.16	47
G y	−36	−22	64	3.66	54

Note. = ; ; A = , H C = .

y (x = −21, y = −4, z = −11; F 4A), (x = −15, y = −19, z = 4; F 4C) (x = −36, y = −22, z = 64; y F). y (0.14 ± 0.02) (0.07 ± 0.02, P = 0.015), (0.08 ± 0.02) (0.12 ± 0.02, P = 0.140) (F 4B). (0.04 ± 0.02) (−0.04 ± 0.02, P = 0.001), (−0.005 ± 0.02) (−0.02 ± 0.02, P = 0.469) (F 4D).

Correlation analyses. A , y y . F (H), A (2) y - (F 5).

Functional connectivity analysis. G y A (H –) y (F 5), y - A - CC (C 2009) (F 6 2). A - y A .

Discussion

- . H , y (*et al.*, 1967; y, 2005; G *et al.*, 2007), , y .

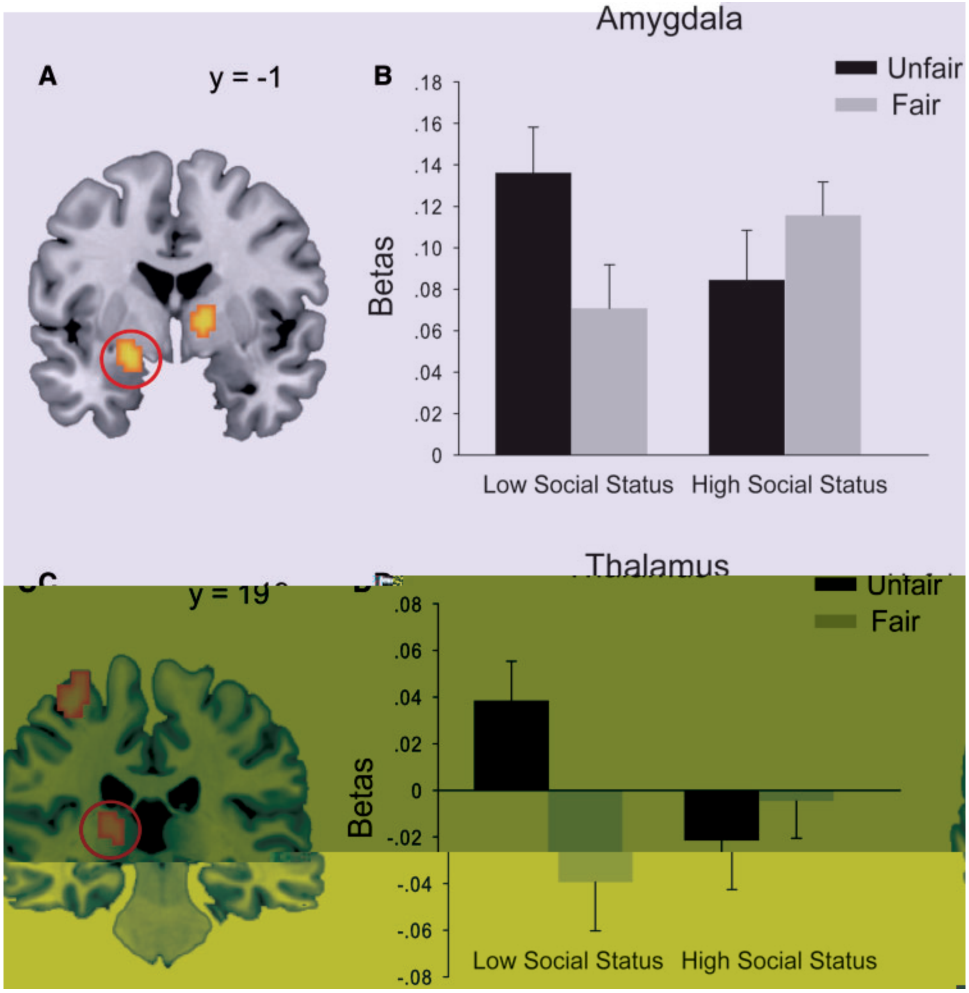

Fig. 4. (–) – (H – H) (A). A (B). (–) – (H – H) (C). A (D). 3 . A $P < 0.05$ ($P < 0.001$ 23).

H G. , A. , ACC/ A D FC vs G F , A. A. ACC/ CC A. ACC/ CC

et al., 2001; A et al., 2013; H et al., 2014). (B G. (et al., 2010), 4 5 (G et al., 2015), (et al., 2012). (F et al., 2006), G,

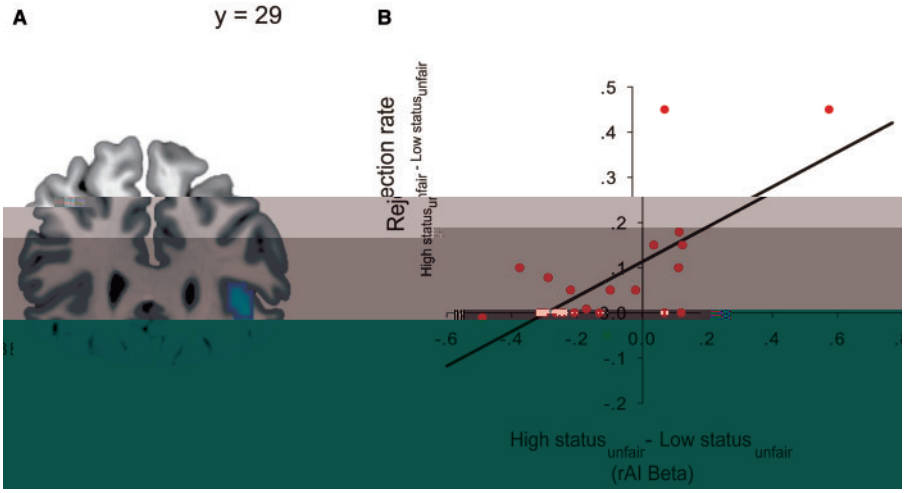

Fig. 5. G y A. G (H) (A). y A. G (B), (A). 2 3 - A P < 0.05 (- P < 0.001 23). , (A) y .

C , A., ACC/ A - D FC (y *et al.*, 2003; D *et al.*, 2009; G y *et al.*, 2014). A y A. y (C *et al.*, 2012; C -D 'A *et al.*, 2013; G y *et al.*, 2014). y, A. y . G , y (B *et al.*, 2001; A *et al.*, 2013) (B C , 2012; H *et al.*, 2014), A. y A A (y) (y *et al.*, 2003; y *et al.*, 2007; *et al.*, 2014). y

A / (C -D 'A *et al.*, 2013) A, - (*et al.*, 2009; , 2010). - , y y y (; *et al.*, 2008). , , y , - (*et al.*, 2008; *et al.*, 2012), y, G , y (*et al.*, 2008; *et al.*, 2012) y (H F , 2009; G *et al.*, 2011; *et al.*, 2014), y (*et al.*, 2008). H , y ' , G (F 4D), y (H C , 2009). y, y , - , - y

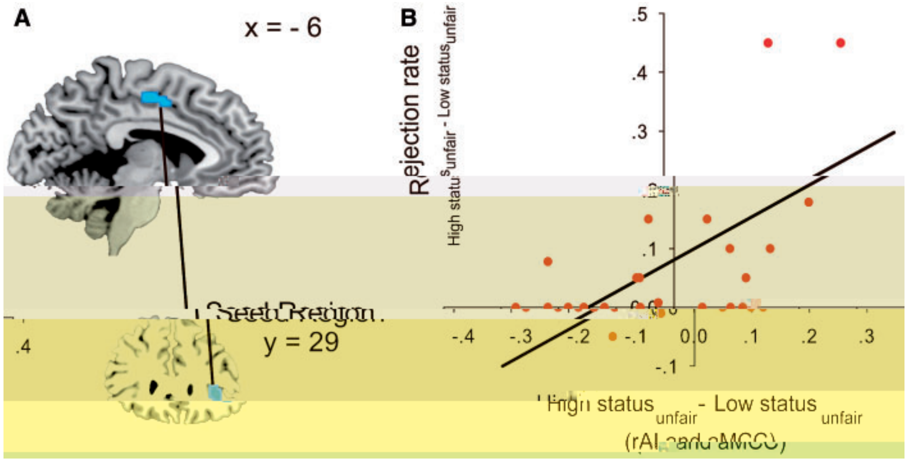

Fig. 6. ACC/ CC (A). ACC/ CC (B). P < 0.05 (P < 0.001 (A)

(C , 2010; , 2014; et al., 2014). F et al., 2014). et al. (2011)

et al., 2009). et al. (2012) (ACC) A- ACC CC vs (et al., 2003; C et al., 2012; C -D 'A et al., 2013; C 2009; F et al., 2015).

A A- A- CC CC CC, (et al., 2006; et al., 2008; C 2009;

Conclusion

G, CC,

Acknowledgements

Funding

(973 : 2010CB833904, 2015CB856400) C

F C. (91232708, 31170972).

Supplementary data

SCAN .

Conflict of interest. .

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