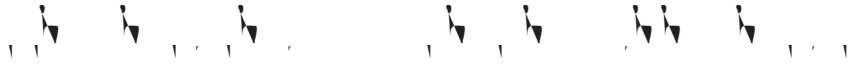


Research Report



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e a e, e ece . ec ded e a ac e e e -  
e a ed e a (ERP) a d f c a a e c e a ce  
a e (fMRI) f a ad e e a e d a e ce  
( - afe) e e a a d e a e e (Q a d  
Ha , 2009a). We f d a e de fca fe e a



f e c e c e e e d (T1: 0-220 ; T2: 220-440 ; T3: 440-660 ; T4:660-880 ; T5: 880-1100 afe e), a a e d F V . 2 a a d b . B . a d a f e e e a e d c e d e a b a d E R S a 220-1100 . T e a E R S a b e e d a 660-880 e f a - c e a a e a ( . e : C : 56.3%; FC1: 71.1%; afe e : C : 58.1%; FC : 66.8%). H e e , . a d a f e e e a e d c e d e a a b a d E R D b e e e 220 a d 1100 a e a 440-660 e e e a e a e a e a ( . e : PO6: 43.6%; P4: 39.3%; afe e : P7: 38.2%; P5: 36.2%). R . a d a f e e e a e a d c e d e a a b a d E R D a 220-1100 a c a e a 440-660 a e e e a e a e e c d e ( . e : PO6: 50.6%; P7: 49.8%; afe e : PO6: 47.8%; P3: 46.0%).

### 2.2.2. ERD/ERS associated with personal events

T e a a d a a b a d a c e a c a e d e a e e a e F V . 2 c a d d . B . a d a f e e a e d c e d e a b a d E R S e e f a a e a a c a e a 880-1100 ( . e : AF3: 66.7%; AF7: 59.9%; afe e : FP: 185.5%; AF3: 146.8%) b e a a b a d E R D a c a e a 440-660 ( . e : PO4: 39.6%; P6: 39.3%; afe e : P6: 30.7%; PO6: 30.5%) a d e a a b a d E R D e e a e a e a e a a c a e a 440-660 ( . e : PO6: 48.8%; PO4: 48.2%; afe e : PO6: 47.3%; P6: 45.4%).

### 2.2.3. EEG activity associated with identification of environmental risks

T e e a e c a . a c e e c f c a . e d e d e f c a f . e e , e c a e d e a V - d e f e a a d a a b a d E R S / E R D d c e d b . a d a f e e b c d c V a e e a e d e a e a a . f a a c e (ANOVA) V a e c e (R . . S a f e ) a d H e e e (L e f . R V ) a - b e c d e e d e a a b e .

T e e f f e c f a e c e c a . a c e e d e d e f c a f e e a e e a e d F V . 3 a . A V f c a a e f f e c f V a e c e a b e e d a 260-380 e e f a a e a (F1-F2: F(1,13)=4.75, p<0.05; F3-F4: F(1,13)=6.14, p<0.05) a d a 740-980 e e a e a - e a a e a (P3-P4: F(1,13)=10.00, p<0.01; PO3-PO4: F(1,13)=8.12, p<0.05; TP7-TP8: F(1,13)=11.31, p<0.01; T7-T8: F(1,13)=10.12, p<0.01), e d e f c a f . e e e a e d c e d e a e a b a d E R S e a e e d e f c a f a f e e e a e . L e a a b a d e a a e a e a c a e d e f c a f . a a f e e e a e a e a 660-860 (F3-F4:F(1,13)=6.45, p<0.05; FC3-FC4: F(1,13)=6.79, p<0.05; C5-C6: F(1,13)=10.37, p<0.01; PO5-PO6: F(1,13)=6.19, p<0.05; CP5-CP6: F(1,13)=12.42, p<0.01; TP7-TP8: F(1,13)=12.13, p<0.01; T7-T8: F(1,13)=12.85, p

<0.05; TP7T8:(1,13)=10.07,



F(1,13)=10.91,  $p < 0.01$ ; FC3-FC4: F(1,13)=10.13,  $p < 0.01$ ; C3-C4: F(1,13)=6.52,  $p < 0.05$ ).

M e e e **Y**, e f d a e a b a d e a c a e d e d e f c a f . e e e a e e e e f a / c e a / a e a a e a c e a e d e a **Y** c e f d e **Y** e e f . e e a e (260-300 , C :  $r = 0.546$ ,  $p < 0.05$ ; 820-860 , P :  $r = 0.553$ ,  $p < 0.05$ ; **F Y** 3b). T e **Y** e a e e e a b a d e , e e . e e e a e e e a e d.

#### 2.2.4. EEG activity associated with identification of personal risks

T e d e f c a f . e a e f a e d e c e a e d e a a a b a d e e a e e d e f c a f a f e e a e (  $> 0.05$ , **F Y** 3a). H e e , a a b a d e d e c e a e d **Y** f c a . e d e f c a f . a a f e e a e , a d c a e d b e **Y** f c a a e f f e c t V a e c e e e b a d a a a 740-900 (PO5-PO6: F(1,13)=6.68,  $p < 0.05$ ; P3-P4: F(1,13)=5.68,  $p < 0.05$ ; P7-P8: F(1,13)=6.15,  $p < 0.05$ ; T7-T8: F(1,13)=12.85,  $p < 0.01$ ; FC3-FC4: F(1,13)=5.24,  $p < 0.05$ ; C3-C4: F(1,13)=5.49,  $p < 0.05$ ) a d e e a a b a d a 740-940 (PO5-PO6: F(1,13)=9.30,  $p < 0.01$ ; P3-P4: F(1,13)=6.86,  $p < 0.05$ ; P7-P8: F(1,13)=5.61,  $p < 0.05$ ; CP3-CP4: F(1,13)=4.88,  $p < 0.05$ ; T7-T8: F(1,13)=12.85,  $p < 0.01$ ; F3-F4: F(1,13)=6.02,  $p < 0.05$ ; FC3-FC4: F(1,13)=4.91,  $p < 0.05$ ).

#### 2.2.5. Distinct neural oscillations associated with environmental and personal risk identifications

N e a c a e e b  $\rho$  c e d ANOVA R (E e a . P e a ) a d V a e c e (R . . Safe) a

- b  $\rho$  c d e e d e a a b e c f e d c c a . a c e a c a e d e f c a f e e a a d e a . ANOVA f e a b a d e e d a e a b e e a c f R V a e c e a 260-380 e e f a - c e a a e a (F3-F4: F(1,13)=7.01,  $p < 0.05$ ; FC3-FC4: F(1,13)=6.43,  $p < 0.05$ ; C3-C4: F(1,13)=5.16,  $p < 0.05$ , **F Y** 4a) a d e e a e a e a e a (PO3-PO4: F(1,13)=5.65,  $p < 0.05$ ; P3-P4: F(1,13)=5.07,  $p < 0.05$ ; CP3-CP4: F(1,13)=4.74,  $p < 0.05$ , **F Y** 4d), **Y** e **Y** a . e e a e e d c e d **Y** e a e e a b a d a c . e a e a f e e e a e e e e a a e e e a e a b e e d f e a e e . ANOVA f a a b a d e a e d a **Y** f c a e a c f R V a e c e a 580-860 ( e a a : PO3-PO4: F(1,13)=11.58,  $p < 0.01$ ; PO7-PO8: F(1,13)=12.33,  $p < 0.01$ ; P3-P4: F(1,13)=11.91,  $p < 0.01$ ; P7-P8: F(1,13)=10.99,  $p < 0.01$ ; CP3-CP4: F(1,13)=11.35,  $p < 0.01$ ; TP7-TP8: F(1,13)=9.41,  $p < 0.01$ ; T7-T8: F(1,13)=7.21,  $p < 0.05$ ; C3-C4: F(1,13)=9.74,  $p < 0.01$ ; FC3-FC4: F(1,13)=6.31,  $p < 0.05$ , **F Y** 4b a d e a d a 780-940 ( e a a : PO3-PO4: F(1,13)=7.89,  $p < 0.05$ ; PO7-PO8: F(1,13)=8.40,  $p < 0.05$ ; P3-P4: F(1,13)=6.05,  $p < 0.05$ ; P7-P8: F(1,13)=4.77,  $p < 0.05$ ; CP3-CP4: F(1,13)=6.64,  $p < 0.05$ ; TP7-TP8: F(1,13)=8.02,  $p < 0.05$ ; T7-T8: F(1,13)=7.30,  $p < 0.05$ ; **F Y** 4c), d c a **Y** a e e e a e f a a b a d e e d e d e f c a f e e a a a d e a .

#### 2.2.6. Hemispheric asymmetry in neural oscillations related to environmental risk identifications

ANOVA f e a b a d e e a e d e e a e e d a **Y** f c a e a c f V a e c e H e e e a



780–980 e a e a-ce a-e a aea (CP3–CP4:  $F(1,13)=5.03, p<0.05$ ; C5–C6:  $F(1,13)=8.01, p<0.05$ ; T7–T8:  $F(1,13)=6.09, p<0.05$ ), e a b a d e a c a e d e d e f c a f e e a a y e a e e e y a e f e e e . A e a b e e a c f V a e c e H e e e a a b e e d a 540–620 e a e a e a f e a a b a d (PO5–PO6:  $F(1,13)=5.52, p<0.05$ ; P3–P4:  $F(1,13)=4.99, p<0.05$ ), d e a a a b a d e e c e d b e d e f c a f e e a a a y e e e e f a y e e e . U e a a b a d e d e

d e f c a f e e a , e e , a y e a e e e y a e f e e e a 860–940 (AF3–AF4:  $F(1,13)=6.82, p<0.05$ , AF7–AF8:  $F(1,13)=5.72, p<0.05$ ; FP1–FP2:  $F(1,13)=14.55, <0.01$ ).

2.2.7. Hemispheric asymmetry in neural oscillations related to personal risk identifications

A a b a d e e d e a d e f c a a y e a e e e y a e f e e e , e y f c a e a c f V a e c e H e e e a 820–

900 ( e a a: PO7-PO8:  $F(1,13)=5.25$ ,  $p<0.05$ ; P5-P6:  $F(1,13)=5.70$ ,  $p<0.05$ ; TP7-TP8:  $F(1,13)=9.22$ ,  $p<0.05$ ; CP5-CP6:  $F(1,13)=11.71$ ,  $p<0.01$ ; T7-T8:  $F(1,13)=8.21$ ,  $p<0.05$ ; F5-F6:  $F(1,13)=6.91$ ,  $p<0.05$ ; AF3-AF4:  $F(1,13)=7.13$ ,  $p<0.05$ ) a d a 860-940 ( e a a: PO3-PO4:  $F(1,13)=5.87$ ,  $p<0.05$ ; PO7-PO8:  $F(1,13)=12.26$ ,  $p<0.01$ ; P3-P4:  $F(1,13)=9.46$ ,  $p<0.01$ ; P7

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EEG e e dea a e de fca f  
dffe e d a c a ca/ . ca a de -  
e a/e a def ed e e .c e c  
de (S c 1992; Webe e a., 2002) a e edaed b  
d c e a ec a (Q a dHa ,2009a,b).M e e,  
b ec e EEG f d V a d e ERP e  
e e a e e a a e de fed  
ea e a e a d V e e a ce V.  
E e a c a ea a ead ce ca -  
a. e e da aVe a aVe a .  
T ea . de ec fe e a ece a. f  
a be V a dca a cc e e ce fe -  
e a a ce. .A V a aba d e  
ed e de fca fe a , e de. V  
e a ec a a be dffe e f a fe -  
e a a a a ba d e ed ced a e a  
cea ed e e a .H e e, d a f e  
e a a ba d e b e a de fca a  
e a e e e V a ef e ee, a  
a ed e e a de fca .T efec  
efac a b e a a de e a Ve e a e  
eVa ee a e e a d da a be a a  
a e edaed a . b e V e ee (Da d ,1998,  
2004).

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#### 4. C. , , .

W e e ed a ERP (e.V, P200 .c e c





(E... Pe... ) ad S... Vae ce a  
- b... de e de a abe .C ea a cac aed  
be ee e a ... c e f . ee ad e d ced ea/  
a aba d e .

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**A**

T... ea c a ... ed b e Na a Na a Sce ce  
F da f C a (P ... 30630025, 30828012).

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