

# Effect of Touching Care on Fear in French and Japanese Subjects

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# Introduction

Touch plays a key role in interpersonal emotional regulation :

- touch between intimate partners enhances affect and well-being.
- it plays a crucial role in maternal-child bonds, and promotes the child's ability to self-regulate.
- Comforting touch alleviates distress.

Interaction between the observation-execution network and emotion regulation network may contribute to pain reduction during social touch.



# Introduction

- Is this effect innate, or the outcome of education and cultural biases?



- In order to answer this question, we compared the regulation of emotions between people living in Japan and those living in France (to identify the common points and the differences).



# Aim

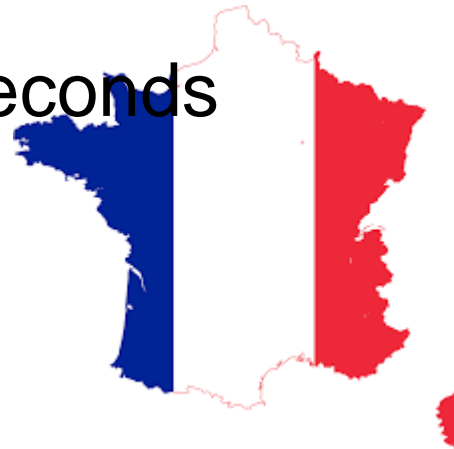
Measure the effect of empathy on the regulation of emotions :

- Volunteers watched videos triggering negative emotions with a virtual reality headset.
- Emotional response measured by electroencephalographic evoked potentials (EEG).



# Method

- Subjects: 7 healthy Japanese adults, 7 French adults
- Stimulus: Using VR 3D 360-degree video, shown with VR goggles
  - ① Fear emotion-inducing video
  - ② Videos that do not induce fear
- Intervention: touching, no touching
  - ⇒ In Japanese, randomly every 5 seconds
  - ⇒ The French went every minute



# Method



①



②



③

Fear Videos : ① Horror : <https://www.youtube.com/watch?v=9vqBDiDpLmU>

② Roller Coaster : <https://www.youtube.com/watch?v=injtBhJCNdA>

Not Fear Video : ③ <https://www.youtube.com/watch?v=zURLuAHOZ> w



# Result

CORRELATION COEFFICIENTS BETWEEN PSD AND SUBJECTIVE SCORE (JAPANESE SUBJECTS)

Frequency range	Area	Horror video	Coaster video
$\delta$	Frontal	0.527	0.322
$\delta$	Central	0.366	0.143
$\delta$	Parietal	0.034	-0.156
$\theta$	Frontal	0.230	-0.038
$\theta$	Central	-0.208	0.025
$\theta$	Parietal	-0.269	-0.049
$\alpha$	Frontal	0.138	-0.247
$\alpha$	Central	0.063	-0.195
$\alpha$	Parietal	0.074	-0.376
$\beta$	Frontal	0.519	0.277
$\beta$	Central	0.641	0.679
$\beta$	Parietal	0.652	0.058
$\gamma$	Frontal	0.381	-0.051
$\gamma$	Central	0.351	-0.010
$\gamma$	Parietal	0.164	-0.570

CORRELATION COEFFICIENTS BETWEEN PSD AND SUBJECTIVE SCORE (FRENCH SUBJECTS)

Frequency range	Area	Horror video	Coaster video
$\delta$	Frontal	-0.555	0.383
$\delta$	Central	-0.581	0.035
$\delta$	Parietal	-0.575	-0.418
$\theta$	Frontal	-0.474	0.522
$\theta$	Central	-0.576	-0.029
$\theta$	Parietal	-0.545	-0.264
$\alpha$	Frontal	-0.677	0.499
$\alpha$	Central	-0.710	0.155
$\alpha$	Parietal	-0.871*	0.068
$\beta$	Frontal	-0.496	0.466
$\beta$	Central	-0.611	0.270
$\beta$	Parietal	-0.688	0.159
$\gamma$	Frontal	-0.355	0.423
$\gamma$	Central	-0.496	0.265
$\gamma$	Parietal	-0.583	0.126



# Result

Figure 1 PSD difference: Japanese, Delta (\*:  $p < 0.05$ )

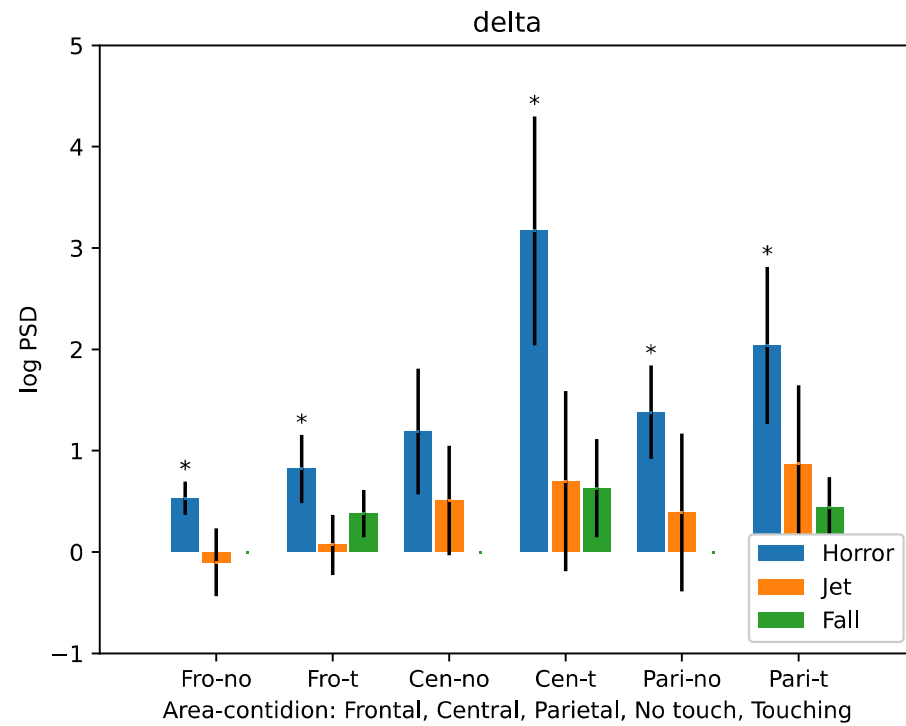
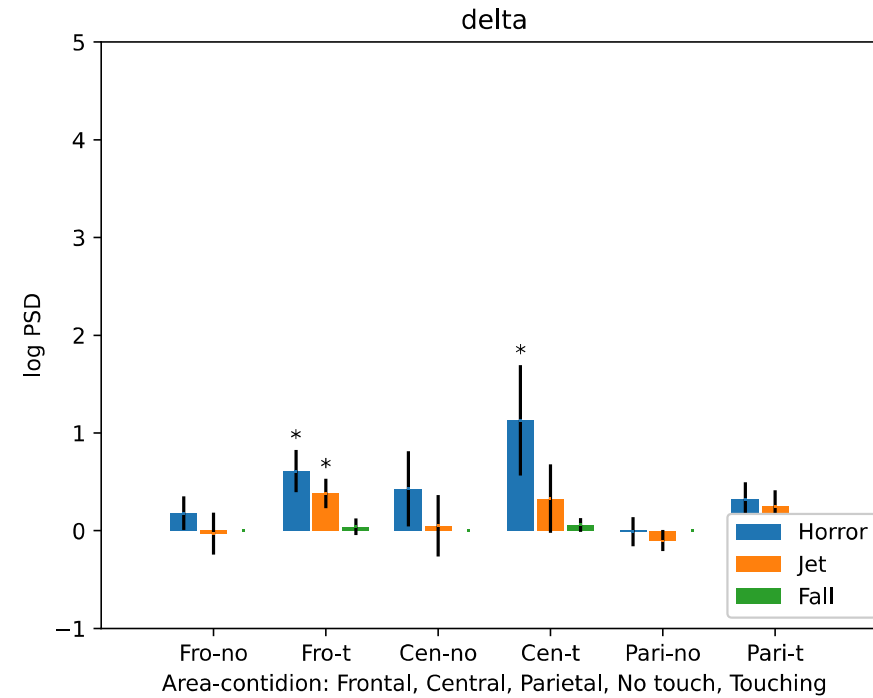


Figure 2 PSD difference: French, Delta (\*:  $p < 0.05$ )





# Discussion

In both populations :

- Broadband increase of EEG activity in touch vs. non touch condition. Could be a correlate of improved emotional regulation.
- Significant  $\delta$  range activity increase in the frontal and central areas (known correlate of emotional regulation) in touch condition, during the horror video (most fearful stimulus).

→ cross-cultural positive effect of touching care on emotional regulation



# Discussion



Between the two populations :

- Japanese population: no significant difference when comparing touch vs. non touch cognition.
- French population : several areas presented significant changes between those conditions.
- French population only : parietal  $\alpha$  activity (correlate of relaxed states) anti-correlated with subjective reports of fear.

Cultural specificities in emotional regulation strategies ?

Note : experimental bias might have affected these results.

