

Anastasiya Ivanova<sup>1,2</sup>, David Torrents-Rodas<sup>1,2</sup>, Beatriz Molinuevo<sup>1,2</sup>, Marina Monguillot<sup>1,2</sup>, Montserrat Corrales<sup>3</sup>, Albert Bonillo<sup>4</sup>, Esther Martínez-Membrives<sup>1,2</sup>, Josep A. Ramos-Quiroga<sup>1,3</sup> and Rafael Torrubia<sup>1,2</sup>

<sup>1</sup> Dept. Psiquiatria i Medicina Legal. UAB; <sup>2</sup> Institut de Neurociències. UAB; <sup>3</sup> Servei de Psiquiatria Vall d'Hebron i Vall d'Hebron Institut de Recerca  
<sup>4</sup> Departament de Psicobiologia i de Metodologia de les Ciències de la Salut. UAB.

[Anastasya.Ivanova@uab.cat](mailto:Anastasya.Ivanova@uab.cat)

## INTRODUCTION

Fear conditioning is a form of associative learning by which a neutral stimulus becomes a conditioned stimulus (CS) that elicits a fear response after being paired with an innately aversive stimulus (unconditioned stimulus, US). Fear conditioning has been widely studied as a source of individual differences in the pathogenesis of both anxiety disorders and psychopathy, nevertheless, research using children samples has been scarce. The study of fear conditioning in children can be helpful to explain the development of individual differences in fear and anxiety.

## AIM

To implement in a clinical children's sample a modified version of a differential fear conditioning paradigm for children developed by Neumann, et al. (2008).

## METHOD

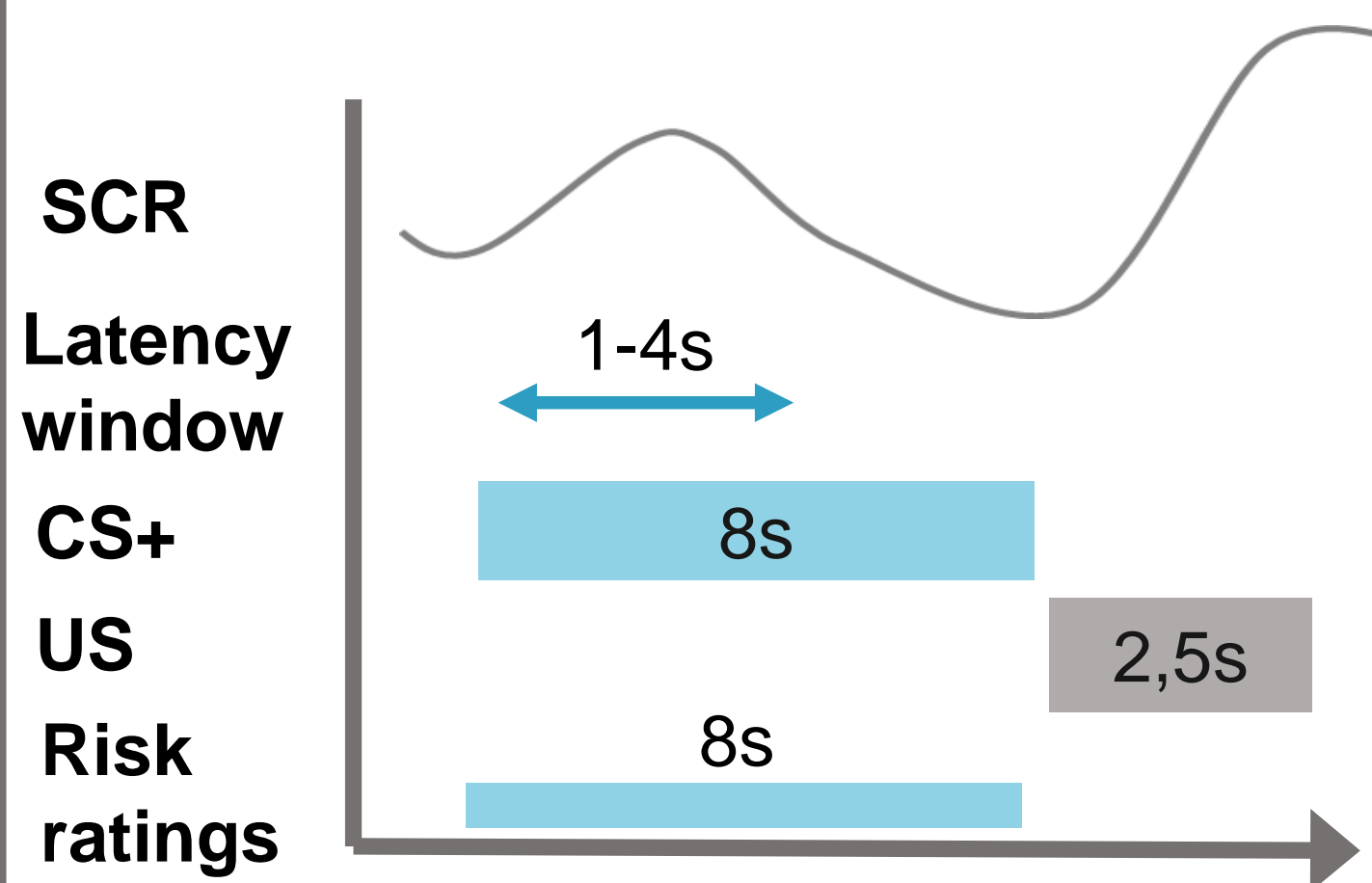
### CONDITIONING PARADIGM

The modified Neumann et al., (2008) task consisted of three phases:

- **Pre-acquisition Trials (N=4):** only geometric shapes as conditioned stimuli (CS+ and CS-) were presented.
- **Acquisition Trials (N=16):** CS+ and CS- were presented. CS+ was always followed by the US (an unpleasant sound of metal scraping on slate of 83 dB). No stimulus followed the CS-.
- **Post-acquisition Trials (N=16):** only CS+ and CS- were presented.

Changes in skin conductance responses (SCR) and online risk ratings for US were used as measures of fear conditioning.

### SCHEMATIC DIAGRAM

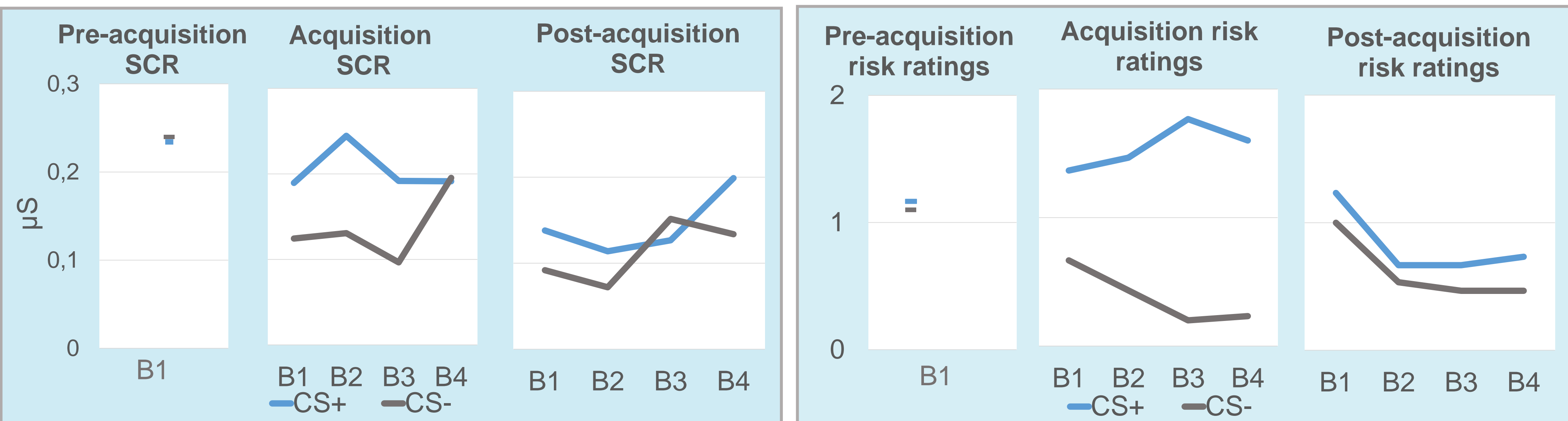


### PARTICIPANTS

- **15 male volunteers** (M=9.87 years old; SD=1.96) recruited from the Psychiatry Service at Vall d'Hebron Hospital.
- **Inclusion criteria:** a) ages 5-12 years old; b) IQ  $\geq$  70; and c) reading comprehension of the Spanish language.

**DATA RECORDING:** SCR was recorded from the distal phalanges of the index and the middle left-hand fingers by means of two Ag/AgCl electrodes filled with electrolyte. The GSR100C module (Biopac Systems) was used to provide a constant voltage of 0.5V and to amplify the recorded signal. The signal was sampled at a rate of 125 Hz. SCR magnitudes in microsiemens ( $\mu$ S) were computed as the difference between the maximum SCR value occurring 1-4s after CS onset and the previous minimum value during latency window. Trials  $<0.05 \mu$ S were scored as 0.

## RESULTS



During pre-acquisition, no significant differences in responses to CS+ and CS- were found neither for SCR ( $F_{1,14}=0.00$ ; n.s.) nor for risk ratings for US ( $F_{1,14}=0.09$ ; n.s.). In acquisition phase, participants showed differential conditioning indicated by greater SCR ( $F_{1,14}=9.08$ ;  $p < .01$ ) and greater risk ratings ( $F_{1,14}=33.18$ ;  $p < .001$ ) to the CS+ than to the CS-. In post-acquisition phase, extinction was observed, as SCR ( $F_{1,14}=0.78$ ; n.s.) and risk ratings ( $F_{1,14}=1.04$ ; n.s.) to CS+ were not significantly different from those to CS-.

## CONCLUSIONS

The results suggest that the paradigm is a useful procedure to study fear learning processes in children.

## REFERENCES

[1] Neumann, D. L., Waters, A. M., Westbury, H. R. & Henry, J. (2008). The use of an unpleasant sound unconditional stimulus in an aversive conditioning procedure with 8- to 11- year-old children. *Biological Psychology*, 79(3), 337-342.

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