

Kim, S; Fonagy, P; Allen, J; Strathearn, L; (2014) Mothers' unresolved trauma blunts amygdala response to infant distress. *Social Neuroscience* , 9 (4) [10.1080/17470919.2014.896287](https://doi.org/10.1080/17470919.2014.896287).

**Table 1.** Sociodemographic and behavioral characteristics of mothers by trauma status ( $N = 42$ )

Characteristic	No trauma ( $n = 25$ )	Unresolved trauma ( $n = 17$ )	$p$
Maternal age, mean $\pm$ $SD$	27.3 $\pm$ 4.3	29.5 $\pm$ 4.9	.13
Maternal race, $n$ (%)			.11
White	13 (52.0)	13 (76.5)	
Non-White	12 (48.0)	4 (23.5)	
Marital status, $n$ (%)			.86
Married	17 (68.0)	12 (70.6)	
Not married	8 (32.0)	5 (29.4)	
Maternal education, $n$ (%)			.94
College incomplete	6 (24.0)	4 (23.5)	
College/university degree	10 (40.0)	6 (35.3)	
Postgraduate degree	9 (36.0)	7 (41.2)	
Socioeconomic status, mean $\pm$ $SD$ <sup>a</sup>	49.9 $\pm$ 10.4	51.9 $\pm$ 9.8	.58
Maternal IQ <sup>b</sup>	109 $\pm$ 9.1	109.1 $\pm$ 7.2	.86
Maternal depression (BDI), mean $\pm$ $SD$ <sup>c</sup>	4.9 $\pm$ 4.4	3.5 $\pm$ 2.3	.40
Maternal personality pathology (PDQ)			
Total score, mean $\pm$ $SD$ <sup>d</sup>	23.4 $\pm$ 12.0	19.4 $\pm$ 9.8	.27
Maternal parenting stress (PSI)			
Child Domain Total Score, mean $\pm$ $SD$	93.7 $\pm$ 15.0	91.4 $\pm$ 13.6	.65
Parent Domain Total Score, mean $\pm$ $SD$	116.0 $\pm$ 24.2	112.4 $\pm$ 19.9	.65
Total Stress Score, mean $\pm$ $SD$ <sup>e</sup>	209.6 $\pm$ 31.8	196.0 $\pm$ 38.4	.25
Maternal temperament (ATQ)			
Effortful Control, subscale score, mean $\pm$ $SD$	4.5 $\pm$ 0.6	4.6 $\pm$ 0.9	.80
Negative Affect, subscale score, mean $\pm$ $SD$	4.1 $\pm$ 0.7	3.8 $\pm$ 0.8	.28
Extraversion/Surgency, subscale score, mean $\pm$ $SD$	4.8 $\pm$ 0.8	4.9 $\pm$ 0.7	.72
Orienting Sensitivity, subscale score, mean $\pm$ $SD$	5.1 $\pm$ 0.7	4.9 $\pm$ 0.7	.35

*Note.* The  $p$  values represent those from the  $t$  and  $\chi^2$  tests for continuous and dichotomous variables, respectively. BDI = Beck Depression Inventory-II; PDQ =

Personality Disorder Questionnaire-4+; PSI = Parenting Stress Index; ATQ = Adult Temperament Questionnaire – Short Form.

<sup>a</sup> Socioeconomic status was estimated using Hollingshead (1975)'s Four-Factor Index of Social Status, and represents joint information with partner, when applicable. <sup>b</sup>

Maternal Full Scale IQ was estimated from the Wechsler Test of Adult Reading (WTAR).

<sup>c</sup> BDI-II score of  $\leq 9$  indicate minimal depression. <sup>d</sup> PDQ-4+ total score of  $\geq 50$  is highly suggestive of DSM-IV personality disorder. <sup>e</sup> PSI Total Stress Score of  $< 260$  is considered normal range.

**Table 2.** Early and late phase amygdala BOLD response for trauma status by stimulus type.

(a) No trauma ( $n = 25$ )						
	Early phase			Late phase		
	Own	Unknown	Difference ( $z$ ) <sup>b</sup>	Own	Unknown	Difference ( $z$ ) <sup>b</sup>
Happy	1.91 ± 0.18	0.99 ± 0.15	5.23 <sup>***</sup>	0.66 ± 0.23	0.51 ± 0.19	0.96
Sad	1.61 ± 0.19	1.22 ± 0.17	2.16 <sup>*</sup>	1.04 ± 0.18	0.65 ± 0.21	2.42 <sup>*</sup>
Difference ( $z$ ) <sup>a</sup>	-2.58 <sup>**</sup>	2.01 <sup>*</sup>		3.00 <sup>**</sup>	1.14	
(b) Unresolved trauma ( $n = 17$ )						
	Early phase			Late phase		
	Own	Unknown	Difference ( $z$ ) <sup>b</sup>	Own	Unknown	Difference ( $z$ ) <sup>b</sup>
Happy	1.48 ± 0.20	0.87 ± 0.26	2.86 <sup>**</sup>	1.00 ± 0.19	0.73 ± 0.16	1.36
Sad	1.44 ± 0.20	1.03 ± 0.21	1.92 <sup>†</sup>	0.63 ± 0.15	0.90 ± 0.12	-1.37
Difference ( $z$ ) <sup>a</sup>	-0.25	1.15		-2.38 <sup>*</sup>	1.10	

*Note.* The values shown are z-normalized BOLD signal change values ( $M \pm SE$ )

extracted from the anatomically defined bilateral amygdala mask. There was no effect of laterality; data from the left and right amygdala are hence presented in conjunction.

<sup>a</sup> z-statistic comparing sad and happy infant faces, at each level of infant face identity (own vs. unknown) x trauma status (no trauma vs. unresolved trauma), within the final mixed-effects linear regression model. <sup>b</sup> z-statistic comparing own and unknown infant

faces, at each level of infant face affect (happy vs. sad) x trauma status (no trauma vs. unresolved trauma), within the final mixed-effects linear regression model.

†  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .