**Appendix S1**

***Maltreatment history***

**Table S1** –Maltreatment history of Maltreated group (Mal). CM = Childhood Maltreatment; y = years.

| **ID** | **Group** | **Age (y)** | **Sex** | **CM onset****(y of age)** | **CM** **duration (y)** | **Forms of maltreatment****experienced a** | **Number of distinct abuses** **and neglect episodes b** | **Severity of Maltreatment c** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| STbo1 | **Mal** | 15 | M | 4 | 11 | P, N, E | 5 | 4,0 |
| STbo10 | **Mal** | 14 | M | 4 | 10 | P, N, E | 5 | 2,7 |
| STbo102 | **Mal** | 16 | M | 4 | 12 | P, N, E | 6 | 3,0 |
| STbo104 | **Mal** | 16 | M | 4 | 12 | P, N, E | 9 | 4,0 |
| STbo105 | **Mal** | 17 | M | 4 | 13 | P, N, E | 6 | 3,0 |
| STbo107 | **Mal** | 16 | M | 4 | 12 | P, N, E | 6 | 3,7 |
| STbo109 | **Mal** | 13 | M | 4 | 9 | P, N, E | 5 | 4,0 |
| STbo11 | **Mal** | 16 | M | 4 | 12 | P, N, E | 6 | 2,7 |
| STbo12 | **Mal** | 17 | M | 4 | 13 | P, N, E | 7 | 3,3 |
| STbo128 | **Mal** | 17 | M | 4 | 13 | P, N, E | 6 | 4,0 |
| STbo13 | **Mal** | 17 | M | 4 | 13 | P, N, E | 6 | 4,0 |
| STbo130 | **Mal** | 17 | M | 4 | 13 | P, N, E | 6 | 4,0 |
| STbo131 | **Mal** | 17 | M | 4 | 13 | P, N, E | 5 | 4,0 |
| STbo132 | **Mal** | 13 | M | 4 | 9 | P, N, E | 7 | 4,0 |
| STbo14 | **Mal** | 16 | M | 4 | 12 | P, N, E | 5 | 3,0 |
| STbo15 | **Mal** | 13 | M | 4 | 9 | P, N, E | 5 | 4,0 |
| STbo2 | **Mal** | 16 | M | 4 | 12 | P, N, E | 6 | 4,0 |
| STbo8 | **Mal** | 16 | M | 4 | 12 | P, N, E | 5 | 2,7 |
| STbo9 | **Mal** | 16 | M | 4 | 12 | P, N, E | 5 | 4,0 |
| STch106 | **Mal** | 9 | M | 4 | 5 | P, N, E | 8 | 4,0 |
| STch11 | **Mal** | 6 | M | 4 | 2 | P, N, E | 6 | 4,0 |
| STch110 | **Mal** | 10 | M | 4 | 6 | P, N, E | 8 | 4,0 |
| STch113 | **Mal** | 10 | M | 4 | 6 | P, N, E | 7 | 4,0 |
| STch12 | **Mal** | 10 | M | 4 | 6 | P, N, E | 8 | 4,0 |
| STch13 | **Mal** | 10 | M | 4 | 6 | P, N, E | 8 | 4,0 |
| STch17 | **Mal** | 6 | M | 4 | 2 | P, N, E | 6 | 3,7 |
| STch24 | **Mal** | 10 | M | 4 | 6 | P, N, E | 6 | 4,0 |
| STch25 | **Mal** | 9 | M | 4 | 5 | P, N, E | 6 | 3,3 |
| STch28 | **Mal** | 8 | M | 4 | 4 | P, N, E | 5 | 4,0 |
| STch30 | **Mal** | 8 | M | 4 | 4 | P, N, E | 6 | 4,0 |
| STch31 | **Mal** | 6 | M | 4 | 2 | P, N, E | 3 | 3,0 |
| STch32 | **Mal** | 6 | M | 4 | 2 | P, N, E | 3 | 4,0 |
| STch33 | **Mal** | 6 | M | 4 | 2 | P, N, E | 6 | 4,0 |
| STch34 | **Mal** | 5 | M | 4 | 1 | P, N, E | 6 | 4,0 |
| STch36 | **Mal** | 6 | M | 4 | 2 | P, N, E | 7 | 4,0 |
| STch38 | **Mal** | 7 | M | 4 | 3 | P, N, E | 6 | 2,7 |

a – Forms of maltreatment was derived from sanitary or forensic confirmatory reports. P = physical abuse, N = neglect, E = emotional abuse.

b – Number of distinctive episodes was derived from sanitary or forensic confirmatory reports.

c – Severity of maltreatment was calculated as the mean severity scores obtained at Kaufman's score at Physical Abuse Rating Scale, Neglect rating scale and Emotional Maltreatment rating scale (Kaufman et al., 1994).

**Appendix S2**

***Control Analyses***

Isolating the effect of a single CM moderator is particularly difficult, especially when studying severe CM conditions. Longer durations are indeed generally associated with higher number of distinct maltreatment episodes and greater CM severity. Taking advantage from rigorous maltreatment history reports filled for forensic and sanitary purposes, control analyses were conducted to assess the potential effects of other moderators on victims’ affective and social development. Following the literature, the number of distinct maltreatment episodes were computed as the total number of episodes of neglect, physical abuse and emotional abuse reported in sanitary or forensic records. Severity of maltreatment was calculated as the mean severity scores obtained with the Kaufman’s Physical Abuse, Neglect and Emotional Maltreatment rating scales (Kaufman et al., 1994). The scores were assigned based on the factual descriptions of the forensic and sanitary reports.

Multivariate multiple regressions were conducted on Mal Group separately for Corrugator EMG activity, Zygomaticus EMG activity, RSA and LF-HRV, including Number (i.e., number of distinct maltreatment and neglect episodes) as predictor and Emotion (i.e., Anger, Fear, Joy and Sadness) as multivariate dependent measure. Three different regression models (i.e., linear, logarithmic, and quadratic) were tested to find the most fitting impact trajectory describing the relation between Number and participants’ physiological responses to facial expressions of emotions. Among the models showing a significant effect of Number (p < 0.05) the one with the lowest Wilks’ lambda value (Λ) was selected as best representative. The significant effect was then assessed running univariate tests.

Multiple regression models including Number as predictors were also conducted separately for baseline RSA, baseline LF-HRV and Afa values. Also in this case, the same 3 regression models were tested to find the most fitting impact trajectory describing the relation between Number and participants’ baseline autonomic parameters and explicit recognition bias. Among the models showing a significant effect of Number (p < 0.05), the one with the lowest Akaike Information Criterion (AIC) value was selected as best representative. The significant effect was then assessed running univariate tests.

The same analyses were applied on the Severity index.

Considering the number of episodes, none of the models tested were significant. Differently, when severity index was included as predictor, the only significant model was the quadratic one performed on LF-HRV responses. These results suggest to use the severity index as a more reliable indicator of CM harshness instead of the number of episodes, at least in the present population. Furthermore, they are consistent with the literature supporting the effect of CM severity on the sympathetic branch of the autonomous nervous system. Future studies should better address this initial insight in a properly designed investigation.

Please see Table S2 for all statistical details.

**Table S2** – Results of control analyses. EMG = electromyography; RSA = respiratory sinus Arrythmia; LF-HRV = Low Frequency Heart Rate Variability; Afa = Anger false alarms; df = degree of freedom; **Λ =** Wilks' lambda value; AIC = Akaike Information Criterion; \* = p < 0.05.

|  |  |  |
| --- | --- | --- |
|  | **Number effect** | **Severity effect** |
|  | **Model** | **df** | **f** | **p** | **Λ** | **AIC** | **Model** | **df** | **f** | **p** | **Λ** | **AIC** |
| **Corrugator EMG** | linear | 1,29 | 0.45 | 0.77 | 0.77 |  | linear | 1,29 | 0.29 | 0.14 | 0.14 |  |
|  | logarithmic | 1,29 | 0.47 | 0.75 | 0.75 |  | logarithmic | 1,29 | 1.98 | 0.12 | 0.12 |  |
|  | quadratic | 2,28 | 0.86 | 0.55 | 0.54 |  | quadratic | 2,28 | 0.52 | 0.16 | 0.15 |  |
| **Zygomaticus EMG** | linear | 1,30 | 0.60 | 0.67 | 0.67 |  | linear | 1,30 | 1.39 | 0.26 | 0.26 |  |
|  | logarithmic | 1,30 | 0.40 | 0.8 | 0.8 |  | logarithmic | 1,30 | 1.33 | 0.28 | 0.28 |  |
|  | quadratic | 2,29 | 0.53 | 0.82 | 0.82 |  | quadratic | 2,29 | 0.74 | 0.65 | 0.65 |  |
| **RSA** | linear | 1,34 | 1.5 | 0.22 | 0.22 |  | linear | 1,34 | 1.44 | 0.24 | 0.24 |  |
|  | logarithmic | 1,34 | 1.28 | 0.3 | 0.3 |  | logarithmic | 1,34 | 1.52 | 0.22 | 0.22 |  |
|  | quadratic | 2,33 | 1.14 | 0.35 | 0.35 |  | quadratic | 2,33 | 1.1 | 0.38 | 0.38 |  |
| **Baseline RSA** | linear | 1,34 | 0.46 | 0.50 |  | 129.4 | linear | 1,34 | 0.04 | 0.83 |  | 129.4 |
|  | logarithmic | 1,34 | 0.42 | 0.51 |  | 129.5 | logarithmic | 1,34 | 0.05 | 0.81 |  | 129.5 |
|  | quadratic | 2,33 | 0.22 | 0.80 |  | 131.4 | quadratic | 2,33 | 0.2 | 0.81 |  | 131.4 |
| **Afa** | linear | 1,33 | 0.001 | 0.97 |  | 276.9 | linear | 1,33 | 0.1 | 0.76 |  | 276.8 |
|  | logarithmic | 1,33 | 0.03 | 0.87 |  | 276.8 | logarithmic | 1,33 | 0.07 | 0.80 |  | 276.8 |
|  | quadratic | 2,32 | 0.65 | 0.53 |  | 277.5 | quadratic | 2,32 | 0.70 | 0.50 |  | 277.4 |
| **LF-HRV** | linear | 1,34 | 0.45 | 0.77 | 0.77 |  | linear | 1,34 | 0.85 | 0.50 | 0.50 |  |
|  | logarithmic | 1,34 | 0.57 | 0.68 | 0.69 |  | logarithmic | 1,34 | 0.89 | 0.47 | 0.47 |  |
|  | quadratic | 2,33 | 0.41 | 0.91 | 0.90 |  | quadratic\* | 2,33 | 2.16 | 0.04 | 0.47 |  |
| **Baseline LF-HRV** | linear | 1,34 | 0.69 | 0.41 |  | 126.1 | linear | 1,34 | 0.65 | 0.42 |  | 126.1 |
|  | logarithmic | 1,34 | 0.62 | 0.44 |  | 126.2 | logarithmic | 1,34 | 0.66 | 0.43 |  | 126.1 |
|  | quadratic | 2,33 | 0.34 | 0.72 |  | 128.1 | quadratic | 2,33 | 0.32 | 0.73 |  | 128.1 |

**Appendix S3**

***Raw LF-HRV and RSA values***

**Table S3** – Raw autonomic data. LF-HRV = Low Frequency Heart Rate Variability; RSA = Respiratory Sinus Arrythmia; Con = Control Group; Mal = Maltreatment Group. LF-HRV are expressed in msec2, whereas RSA values are reported in ln(msec)2.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group** | **Age** | **LFHRV baseline** | **LFHRV ANGER** | **LFHRV FEAR** | **LFHRV JOY** | **LFHRV SADNESS** | **RSA Baseline** | **RSA ANGER** | **RSA FEAR** | **RSA JOY** | **RSA SADNESS** |
| Con | 5 | 7,66 | 6,44 | 6,91 | 6,44 | 6,95 | 7,63 | 6,36 | 6,77 | 6,25 | 6,83 |
| Con | 6 | 7,4 | 7,47 | 7,29 | 7,63 | 7,14 | 7,02 | 6,97 | 6,89 | 7,07 | 6,86 |
| Con | 6 | 7,45 |  | 7,71 | 7,32 | 7,19 | 7,2 |  | 7,62 | 7,1 | 7,01 |
| Con | 7 | 7,7 | 7,87 | 8,37 | 8,68 | 8,32 | 7,57 | 7,74 | 8,25 | 8,49 | 8,16 |
| Con | 7 | 8,46 | 8,11 | 8,13 | 8,2 | 8,17 | 8,4 | 8,12 | 8,03 | 8,05 | 8,13 |
| Con | 8 | 9,6 | 9,04 | 9,16 | 8,42 | 7,74 | 9,59 | 8,97 | 9,19 | 8,39 | 7,66 |
| Con | 8 | 6,48 | 6,47 | 6,28 | 6,6 |  | 6,4 | 6,39 | 6,16 | 6,52 |  |
| Con | 8 | 5,55 | 5,01 | 5,64 | 5,67 | 5,29 | 5,24 | 4,53 | 5,17 | 5,31 | 4,95 |
| Con | 8 | 6,98 | 6,48 | 6,51 | 7,01 | 7,12 | 7,01 | 6,44 | 6,37 | 6,91 | 7,12 |
| Con | 8 | 7,63 | 7,41 | 7,21 | 7,72 | 8,2 | 7,54 | 7,23 | 7,13 | 7,51 | 8,06 |
| Con | 8 | 7,73 | 7,73 | 8,22 |  | 7,84 | 7,47 | 7,43 | 7,92 |  | 7,63 |
| Con | 9 | 5,74 | 5,72 | 6,26 | 6,03 | 6,01 | 5,51 | 5,4 | 6,15 | 5,82 | 5,79 |
| Con | 9 | 8,42 | 8,12 | 8,4 | 8,44 | 8,28 | 8,36 | 7,93 | 8,22 | 8,26 | 7,98 |
| Con | 10 | 5,83 | 5,18 | 5,81 | 6,19 | 5,74 | 5,75 | 5,04 | 5,54 | 6,02 | 5,51 |
| Con | 12 | 6,37 | 6,8 | 6,89 | 6,28 | 6,15 | 6,21 | 6,44 | 6,5 | 6 | 5,99 |
| Con | 13 | 6,68 | 6,48 | 6,26 | 6,59 | 6,91 | 6,49 | 5,94 | 5,94 | 6,37 | 6,42 |
| Con | 13 | 6,39 | 6,7 | 6,48 | 6,06 | 6,4 | 6,35 | 6,45 | 6,18 | 5,61 | 6,01 |
| Con | 14 | 8,11 | 7,22 | 8,13 | 8,31 | 7,89 | 7,76 | 7,16 | 8,04 | 8,07 | 7,48 |
| Con | 15 | 7,25 | 7,1 | 6,97 | 7,1 | 7,57 | 7,13 | 6,71 | 6,63 | 6,81 | 7,11 |
| Con | 15 | 6,49 | 6,11 | 5,87 | 6,29 | 6,27 | 6,03 | 5,62 | 5,59 | 5,75 | 5,76 |
| Con | 16 | 5,65 | 6,73 | 7,12 | 6,86 | 7,01 | 5,06 | 6,42 | 6,85 | 6,31 | 6,4 |
| Con | 16 | 8,62 |  | 7,43 | 7,03 |  | 8,54 |  | 6,86 | 6,68 |  |
| Con | 16 | 6,5 |  | 6,37 | 6,52 | 6,12 | 6,1 |  | 5,95 | 6,24 | 5,62 |
| Con | 16 | 7,29 |  | 6,88 | 7,44 | 7,02 | 6,99 |  | 5,96 | 6,74 | 6,57 |
| Con | 16 | 6,88 | 7,09 | 7,32 | 6,86 | 7,09 | 6,69 | 6,63 | 6,96 | 6,58 | 6,65 |
| Con | 16 | 7,52 | 7,09 | 6,16 | 7,32 | 7,24 | 7,2 | 6,78 | 5,82 | 6,94 | 6,83 |
| Con | 16 | 7,67 | 7,25 | 7,26 | 7,32 | 7,34 | 7,47 | 7,07 | 7,19 | 7,18 | 7,2 |
| Con | 16 | 7,97 | 8,36 | 6,98 | 8,07 | 7,83 | 7,88 | 8,08 | 6,54 | 7,67 | 7,61 |
| Con | 16 | 7,93 | 7,75 | 8,39 | 8,07 |  | 7,7 | 7,49 | 7,88 | 7,48 |  |
| Con | 16 | 7,66 | 8,14 | 7,55 | 7,86 | 8,23 | 7,57 | 7,8 | 7,24 | 7,71 | 7,98 |
| Con | 17 | 7,49 |  | 7,19 | 6,86 |  | 7,18 |  | 6,65 | 6,69 |  |
| Con | 17 | 8,55 | 8,61 | 8,41 | 8,45 | 8,76 | 8,39 | 8,52 | 8,3 | 8,26 | 8,69 |
| Con | 17 | 7,54 | 7,49 | 7,57 | 7,55 | 7,36 | 7,26 | 7 | 7,19 | 7,21 | 7,14 |
| Con | 17 | 6,3 | 6,63 | 5,62 | 6,52 | 7,19 | 5,75 | 5,85 | 4,73 | 5,55 | 6,16 |
| Con | 17 | 8,12 | 8,36 | 8,42 | 8,11 | 8,32 | 7,98 | 7,93 | 8,22 | 7,73 | 8,15 |
| Con | 17 | 6,92 | 7,19 | 6,92 | 7,38 | 7,22 | 6,7 | 6,78 | 6,69 | 6,91 | 6,6 |
| Con | 17 | 8,28 |  | 7,87 | 8,26 | 8,14 | 7,87 |  | 7,27 | 7,72 | 7,61 |
| Mal | 5 | 4,08 |  | 4,3 | 4,05 | 3,64 | 3,96 |  | 3,63 | 3,82 | 3,46 |
| Mal | 6 | 4,22 | 4,4 | 4,1 | 4,73 | 4,58 | 3,67 | 3,75 | 3,56 | 3,99 | 3,8 |
| Mal | 6 | 7,7 | 8,37 | 8,75 |  | 8,68 | 7,66 | 8,25 | 8,66 |  | 8,63 |
| Mal | 6 | 7,35 | 7,07 | 7,18 | 7,03 | 7,11 | 7,36 | 6,9 | 7,22 | 6,97 | 7,1 |
| Mal | 6 | 6,96 | 6,39 | 6,83 | 6,95 | 7,19 | 6,49 | 6,29 | 6,66 | 6,7 | 6,89 |
| Mal | 6 | 6,78 | 7,05 | 6,59 | 6,69 | 6,75 | 6,72 | 6,66 | 6,46 | 6,4 | 6,55 |
| Mal | 6 | 5,46 | 6,41 | 6,19 |  | 5,96 | 5,29 | 6,04 | 5,86 |  | 5,64 |
| Mal | 7 | 8,48 | 8,82 | 8,6 | 8,71 | 8,86 | 8,35 | 8,78 | 8,63 | 8,65 | 8,81 |
| Mal | 8 | 7,9 | 7,19 | 7,27 | 7,23 | 7,16 | 7,74 | 6,96 | 7,08 | 6,82 | 7,01 |
| Mal | 8 | 7,2 | 7,14 | 7,53 | 7 | 7,29 | 7,05 | 6,98 | 7,28 | 6,82 | 6,97 |
| Mal | 9 | 4,75 | 4,96 | 4,59 | 4,69 | 4,7 | 4,58 | 4,76 | 4,08 | 4,34 | 4,22 |
| Mal | 9 | 6,89 | 6,5 | 7,45 | 7,21 | 7,32 | 6,67 | 6,33 | 7,17 | 6,9 | 6,97 |
| Mal | 10 | 6,99 | 7,76 | 8,11 | 7,28 | 7,12 | 6,83 | 7,59 | 7,99 | 7,01 | 6,95 |
| Mal | 10 | 6,83 | 5,76 | 6,39 | 6,49 | 6,05 | 6,55 | 5,55 | 6,22 | 6,17 | 5,71 |
| Mal | 10 | 9,81 | 9,54 | 9,56 | 9,57 | 9,63 | 9,88 | 9,56 | 9,63 | 9,59 | 9,56 |
| Mal | 10 | 5,87 | 6,92 | 6,52 | 6,87 | 6,59 | 5,7 | 6,28 | 6,01 | 6,51 | 6,17 |
| Mal | 10 | 8,64 | 8,33 | 8,49 | 8,38 | 8,1 | 8,64 | 8,32 | 8,25 | 8,18 | 8,07 |
| Mal | 13 | 8,69 | 7,27 | 7,16 | 7,75 | 7,72 | 8,58 | 7,18 | 6,96 | 7,55 | 7,63 |
| Mal | 13 | 8,42 | 8,52 | 7,98 | 8,2 | 7,66 | 8,39 | 8,34 | 7,75 | 8,04 | 7,53 |
| Mal | 13 | 8,27 | 7,68 | 8,14 | 7,48 | 7,6 | 7,8 | 7,23 | 7,85 | 7,1 | 7,38 |
| Mal | 14 | 6,89 | 6,94 | 6,29 | 6,66 | 7,09 | 6,6 | 6,48 | 5,58 | 6,07 | 6,57 |
| Mal | 15 | 8,53 | 8,52 | 8,17 | 8,06 | 8,38 | 8,44 | 8,37 | 8,02 | 7,94 | 8,17 |
| Mal | 16 | 8,47 | 7,54 | 7,21 | 7,91 | 7,78 | 7,63 | 7,05 | 6,79 | 7,16 | 7,14 |
| Mal | 16 | 6,49 | 5,53 | 5,74 | 6,15 | 6,3 | 6,27 | 5,23 | 5,23 | 5,97 | 6,04 |
| Mal | 16 | 6,87 | 6,18 | 6,83 | 6,14 | 5,98 | 6,38 | 5,59 | 6,23 | 5,53 | 5,56 |
| Mal | 16 | 7,43 | 7,53 | 7,2 | 6,93 | 7,39 | 7,18 | 7,25 | 6,8 | 6,73 | 6,76 |
| Mal | 16 | 7,17 | 6,7 | 6,8 | 6,39 | 6,79 | 7,02 | 6,45 | 6,45 | 6,21 | 6,5 |
| Mal | 16 | 7,95 | 7,53 | 7,42 | 7,77 | 7,39 | 7,55 | 7,21 | 7,3 | 7,44 | 7,02 |
| Mal | 16 | 6,67 |  | 7,27 | 7,15 |  | 6,48 |  | 7,08 | 7 |  |
| Mal | 16 | 7,78 | 7,63 | 7,46 | 7,22 | 7,22 | 7,71 | 7,35 | 7,31 | 6,98 | 7,02 |
| Mal | 17 | 6,41 | 5,83 | 6,21 | 6,67 | 6,57 | 5,98 | 5,56 | 5,78 | 6,43 | 6 |
| Mal | 17 | 6,45 |  | 6,94 | 6,33 |  | 5,78 |  | 6,14 | 5,95 |  |
| Mal | 17 | 5,87 |  | 6,51 | 6,33 |  | 5,43 |  | 5,99 | 5,89 |  |
| Mal | 17 | 5,79 | 5,12 | 5,79 | 5,54 | 5,55 | 5,34 | 4,82 | 5,26 | 5,09 | 5,07 |
| Mal | 17 | 6,98 | 6,81 | 6,8 | 6,5 | 6,71 | 6,69 | 6,24 | 6,32 | 5,79 | 6,11 |
| Mal | 17 | 4,85 |  |  |  |  | 4,74 |  |  |  |  |

Missing data corresponds to recordings with more than 30% of edited beats.