# Supplementary file 10

## Likelihood Ratio Tests

Here, we provide the results of the likelihood ratio tests we calculated for the patterns of results from the results section and discussion. We calculated the probability of the observed ratio of statistically significant results and null effects or results pointing in the opposite direction under the assumption that either the null or the alternative hypothesis is true (based on code provided by Lakens & Etz, 2017). The likelihood ratio is a comparison of how well the two hypotheses (in this case, H0 and H1) predict the observed data (given alpha =0.05 and a power of 0.8). It is important to note that the likelihood ratios are neither intended to serve as quantitative, meta-analytic metrics, nor do they provide any information on effect sizes of the studies or weigh the included studies by quality measures (as typically done in a meta-analysis). Likelihood ratios provide a heuristic estimation of whether the overall pattern of results across the included studies is rather in favor of the H0 or the H1. We believe that this provides additional information as it is highly unlikely that in a set of studies all (i.e., 100%) will yield significant effects even if an effect does exist. Hence, a heterogeneous pattern is more accepted than not expected and may still speak in favor of a specific effect (Lakens & Etz, 2017).

**Summary of Results - Threat learning**
For fear acquisition, 9 out of 21 studies reported blunted responses to the threat cue in individuals with a history of ACEs, yielding a likelihood ratio of 520.90. This indicates that the likelihood that the alternative hypothesis (i.e., there is an effect) is true is 521 times higher than the likelihood that the null hypothesis is true. In contrast, 3 out of 21 studies report enhanced responding to the threat cue in individuals with a history of ACEs which yields a likelihood ratio of 369,934,661.74 in favor of the null hypothesis (i.e., not in favor of an effect in this direction). For threat generalization, 5 out of 7 studies reported blunted responding to threat cues in individuals reporting ACEs compared to controls, yielding a likelihood ratio of 46,474.28 in favor of the alternative hypothesis (i.e., blunted responding).

**Summary of Results - Reward learning**
Of the 28 studies that reported behavioral measures of reward learning performance, 14 studies reported a significant reduction in reward learning or the valuation of rewarding outcomes. Fourteen studies reported no significant group differences or associations with ACEs in reward learning. This pattern of findings yields a likelihood ratio of 24,208,574.79 implying that - given the data - the alternative hypothesis (i.e., blunted reward learning) is 24,208,574.79 times more likely to be true than the null hypothesis.

**Discussion - No evidence from the literature for a link between specific ACE types and reward and/or threat learning**
**Threat-specific experiences and behavioral indices of threat learning:** Four out of 9 studies focusing on threat-specific experiences show blunted responding to threat-cues in individuals with a history of ACEs (Kuehl et al., 2020; Lis et al., 2020; McLaughlin, 2016; Thome et al., 2018) while three studies report null-findings (Jovanovic et al., 2009; Rowland et al., 2022; Stenson et al., 2021). This pattern of findings yields a likelihood ratio of 27.10, implying that - given the data - association between threatening experiences and blunted threat responding is 27.10 times more likely than the null hypothesis. Two out of these 9 studies report enhanced threat responding in individuals who report a history of ACEs (Marusak et al., 2021; Morrison et al., 2022), yielding a likelihood ratio of 213.12 in favor of the null hypothesis (i.e., not in favor of an effect in this direction).

Since there are only two studies focusing exclusively on **deprivation-related ACEs**, we could not calculate a likelihood ratio for this.

**Threat-specific experiences and behavioral indices of reward learning:** Four studies focusing on threat specific experiences (Hanson et al., 2017; Harms et al., 2018; Letkiewicz et al., 2022; Pechtel & Pizzagalli, 2013) report blunted reward learning, while only one study (Cisler et al., 2019) revealed a null result. Based on these findings, the likelihood ratio test suggests that an association between threat-only experiences and blunted responding is 13,797.05 times more likely than a null result.

**Deprivation-specific experiences and behavioral indices of reward learning:** Four studies (H. Delgado et al., 2022; Sheridan et al., 2018; White et al., 2022; Wismer Fries & Pollak, 2017) show reduced behavioral reward learning performance in the group exposed to deprivation experiences while three studies show no differences at the behavioral level (Gonzalez et al., 2016; Mehta et al., 2010; Smith & Pollak, 2022). Two additional studies did not provide behavioral measures of reward learning (Mullins et al., 2020; Romens et al., 2015). A likelihood ratio test provides further evidence that - given the data - an association between deprivation and blunted reward responding is 611.50 times more likely than a null result.

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