Associations of prospective and retrospective measures of child maltreatment with psychopathology: A meta-analysis

(Child maltreatment measures and psychopathology)

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Key points

Question. Do prospective and retrospective measures of childhood maltreatment show different associations with psychopathology?

Findings. In this meta-analysis of 24 studies (including 15,485 individuals), psychopathology was more strongly associated with retrospective than prospective measures of childhood maltreatment. The associations between retrospective measures of childhood maltreatment and psychopathology were stronger when the assessment of psychopathology was based on self-reports and was focused on internalising/emotional disorders.

Meaning. The results support cognitive theories of childhood maltreatment-related psychopathology, which focus on subjective interpretation, conscious recall, and their associated schemas as key targets for intervention.

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Abstract

Importance. Prospective and retrospective measures of childhood maltreatment identify largely different groups of individuals. However, it is unclear if these measures are differentially associated with psychopathology.

Objective. To meta-analyse the associations of prospective and retrospective measures of childhood maltreatment with psychopathology.

Data sources. Based on a pre-registered protocol, we searched Embase, PsychINFO and MEDLINE for peer-reviewed studies published by January 1, 2023 that measured the associations of prospective and retrospective measures of child maltreatment with psychopathology.

Study selection. Titles and abstracts of all articles captured by the search and full texts of potentially eligible studies were independently screened by two authors. Observational studies with measures of the association of prospective and retrospective measures of childhood maltreatment with psychopathology were included.

Data extraction and synthesis. Multiple investigators independently extracted data. Multi-level random-effects meta-analyses were used to pool the results and test predictors of heterogeneity.

Main outcome and measures. Associations between prospective or retrospective measures of child maltreatment and psychopathology, both unadjusted and adjusted (i.e., the association between prospective measures of maltreatment with psychopathology adjusted for retrospective measures, and vice versa). Moderation of the above associations by pre-selected variables.

Results. The meta-analyses were based on 24 studies including 15,485 individuals. Retrospective measures of childhood maltreatment showed stronger associations with psychopathology relative to prospective measures, in both unadjusted analyses

(retrospective measures: Odds Ratio [OR]=2.21, 95% Confidence Interval [CI]=1.94-2.42 vs prospective measures: OR=1.56, CI=1.39-1.76) and adjusted analyses (retrospective measures: OR=2.14, 95%CI=1.90-2.42 vs prospective measures: OR=1.27, 95%CI=1.13-1.41). There was no statistically significant moderation of the unadjusted or adjusted associations between prospective measures of child maltreatment and psychopathology. The associations between retrospective measures and psychopathology were stronger when the assessment of psychopathology was based on self-reports and was focused on internalising/emotional disorders.

Conclusions and relevance. Psychopathology is more strongly associated with retrospective measures—which capture the first-person, subjective appraisal of childhood events reflected in memory recall—compared to prospective measures—which essentially capture third-person accounts of such events. Maltreatment-related psychopathology may be driven by subjective interpretations of experiences, distressing memories, and associated schemas, which could be targeted by cognitive interventions.

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Associations of prospective and retrospective measures of child maltreatment with psychopathology: A meta-analysis

Childhood maltreatment is a key trans-diagnostic risk factor for psychopathology.[1] Maltreatment can be measured prospectively, as children are growing up—typically relying on informant (e.g., parents) reports or official records (e.g., court records, child protection records). Maltreatment can also be measured retrospectively—relying on self-reports in adolescence or adulthood. Contrary to common assumptions, prospective and retrospective measures of childhood maltreatment largely identify different individuals and constructs.[2]

Because prospective and retrospective measures of childhood maltreatment identify different constructs, it is important to understand whether the two constructs show differential associations with psychopathology, in order to identify the most relevant measures for etio-pathological studies and the most relevant targets for intervention.[3] Existing research provides initial evidence for stronger association of retrospective vs prospective measures of maltreatment with psychopathology.[4–6] However, it is unclear if the evidence is consistent across cohorts and assessment methods, and if inconsistencies can be explained by differences in study characteristics. Here we present, to our knowledge, the first quantitative assessment of the relative associations of prospective and retrospective measures of childhood maltreatment with psychopathology.

METHODS

Data sources

Following a pre-defined protocol registered on Prospero (CRD42022329262), we

conducted a systematic review and meta-analysis in line with the PRISMA and MOOSE guidelines (Supplementary Tables 1-2). We searched Embase, PsychINFO and MEDLINE for peer-reviewed studies that measured the associations of prospective and retrospective measures of child maltreatment with psychopathology and were written in English and published from database inception until January 1, 2023. Search terms were: (child* maltreatment, child* abuse, child* neglect, child* bull*, child* trauma, child* adversity, early life stress*) AND* (prospective, objective, official records, court records, CPS records, parent report, informant report) AND (retrospective, subjective, self-report) AND (mental health, mental illness, psychopathol*, psychiatric, internali*, externali*, depress, anxi*, panic, obsessive compulsive, self inj*, self harm*, suicide, eating disorder, schiz*, psychotic, psychosis, bipolar, ADHD, attention deficit hyperactivity disorder, attention, hyperactiv*, neurodev*, conduct, anti-social, anti-social, substance, alcohol, drug, cannabis).

Study selection

Titles and abstracts of all articles captured by the search were independently screened by two authors with doctoral or post-doctoral qualifications, blind to the other's decision. Full texts of potentially eligible studies were then screened independently by two authors. Agreement between raters was very high for title and abstract screening (kappa=0.95) and full-text screening (kappa=0.89). Observational, peer-reviewed studies with measures of the association between prospective and retrospective measures of childhood maltreatment and psychopathology were included.

Child maltreatment was defined as any of the following between birth and age 18: physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect,

institutional neglect/deprivation, harsh physical discipline/corporal punishment, or broader measures of victimization/adversity that included any of these forms of maltreatment.

Prospective measures were defined as assessments of maltreatment made whilst children were growing up (e.g., before age 18). Retrospective measures were defined as subsequent assessment of the same individuals' exposure undertaken at any age.

Psychopathology was defined as diagnoses or symptoms/dimensions of the following: internalising problems (i.e., depression, anxiety, panic disorder, obsessive-compulsive disorder, eating disorder, suicidal ideation, self-harm, suicide attempt), externalising problems (i.e., conduct disorder, antisocial behaviour, substance abuse, criminality), thought disorder (i.e., psychotic symptoms/experiences, schizophrenia, bipolar disorder), neurodevelopmental disorders (i.e., autism, attention-deficit hyperactivity disorder), or a general psychopathology factor. We included measures of psychopathology assessed at any age if they were assessed concurrently to or after the observational period for childhood maltreatment.

Data extraction

Data were extracted independently by four authors (each covering 50% of the studies) and double-entered to detect inaccuracies. Inconsistencies were discussed and resolved in consensus meetings and relevant missing information was requested from authors of the original studies. Data extraction included: sample characteristics (e.g., sex, ethnicity, sample size); characteristics of the prospective measure (e.g.,

exposure type, measure type, measure informant, observational period, age at assessment); characteristics of the retrospective measure (e.g., exposure type, measure type, measure informant, observational period, age at assessment); characteristics of the mental health outcome (e.g., type of mental health outcome, measure type, measure informant, age at assessment); unadjusted and adjusted associations between prospective measure and psychopathology; unadjusted and adjusted associations between retrospective measure and psychopathology; study quality characteristics (e.g., representativeness of the exposed sample, selection of unexposed participants, whether the different assessments cover the same time-period of exposure, whether confounds were controlled for, whether retrospective measures were collected prior to mental health outcomes).

Statistical analysis

All analyses were conducted in R (version 4.1.1.) using the *metafor* package.[7] The script and dataset are available at: https://github.com/jr-baldwin/pro-retro-psychopathology.

Not all studies included reported adjusted associations between prospective and retrospective measures with psychopathology. However, in cases where studies reported both (i) the agreement between prospective and retrospective measures, and (ii) the unadjusted associations between prospective and retrospective measures with psychopathology, we constructed correlation matrices incorporating prospective measures, retrospective measures, and psychopathology. Using these correlation matrices and the respective study sample size, we then ran structural equation mod-

els using the *lavaan* package[8] to estimate the partial correlations between the different measures of maltreatment and psychopathology. As a cross-check, we used this method to reproduce partial correlations that were reported by an original study[5] and found that the estimates were equivalent to approximately 2 decimal places.

The individual study effect sizes were then converted to log odds values, and meta-analytic results were exponentiated for presentation as odds ratios. As most studies reported multiple effect sizes (e.g., multiple maltreatment subtypes or multiple mental health outcomes), we used multilevel random effects meta-analysis models to account for these dependencies.[9] Three levels of variance in effect sizes were specified: random-sampling variance, within study variance, and between-study variance. We initially included an additional between-sample level, but this was omitted as it didn't capture any variance in effect sizes.

We firstly examined the unadjusted meta-analytic associations between prospective or retrospective measures of child maltreatment and psychopathology. Next, we examined the adjusted meta-analytic associations between prospective or retrospective measures of maltreatment and psychopathology (i.e., the association between prospective measures of maltreatment with psychopathology adjusted for retrospective measures, and vice versa). To estimate heterogeneity, we used the I^2 statistic, which reflects the proportion of the observed variance that is due to true variation in effect sizes if sampling error was eliminated.

We then conducted sensitivity analysis testing for publication bias and undue influence of individual cohorts, studies, or effect sizes. To test for publication bias, we

used an extension of the Egger's test for multilevel meta-analysis models[10], which tests for whether study variance moderates the meta-analytic effect size. Three leave-one-out analyses were conducted to test for undue influence of individual studies by examining changes in estimates across permutations which omitted in turn each cohort, study, or effect size.

Finally, we used meta-regressions to test whether the meta-analytic associations between prospective and retrospective measures of maltreatment and psychopathology were moderated by a set of a-priori defined factors, including type of maltreatment, type of psychopathology, type of prospective or retrospective measure, age at retrospective report, informant for psychopathology, study design (i.e., whether psychopathology was assessed at the same time or after the assessment of retrospective measures, namely cross-sectional or longitudinal design, respectively), sex distribution, and study quality.

RESULTS

Search results

The systematic search identified k=24 studies with data on the associations between prospective or retrospective measures of child maltreatment and psychopathology (Supplementary Figure 1).[4,5,11–32] The studies were based on 16 cohorts including n=15,485 individuals (51.0% female, aged 21.3 years at retrospective report; Table 1). The meta-analyses of the unadjusted associations between prospective or retrospective measures with psychopathology was based on 188 effect sizes from 24 studies. The meta-analyses of the corresponding adjusted associations were based

on 180 effect sizes from 23 studies. Study quality assessment is described in Supplementary Table 3.

Meta-analyses of unadjusted associations between prospective and retrospective measures of maltreatment with psychopathology

The unadjusted association between prospective measures of childhood maltreatment and psychopathology was OR=1.56, 95%CI=1.38-1.76 (Figure 1, Panel A) with heterogeneity I^2=86.1%. The meta-analytical results were not significantly biased by small-study effects (aka publication bias; Egger's test p=0.0876; Supplementary Figure 2, Panel A). Furthermore, the results were not biased by individual studies, with leave-one-out analyses finding average effect sizes ranging between OR=1.51-1.59 after omitting each cohort in turn (Supplementary Figures 3-4, Panel A).

The unadjusted association between retrospective measures of childhood maltreatment and psychopathology was OR=2.21, 95%CI=1.94-2.52 (Figure 1, Panel B) with I^2=89.9%. The meta-analytical results were not significantly biased by small-study effects (Egger's test p=0.2594; Supplementary Figure 2, Panel B) or large-study effects (leave-one-out analyses range OR=2.11-2.27; Supplementary Figures 3-4, Panel B).

The unadjusted association between retrospective measures of childhood maltreatment and psychopathology was 44% greater than the unadjusted association based on prospective measures, and the difference in effect sizes was statistically significant (Wald test p=0.00012).

When restricting the analysis to the 180 effect sizes from the 23 studies which also reported adjusted associations between prospective or retrospective measures of child maltreatment with psychopathology, the meta-analytic findings for the unadjusted associations were very similar (prospective measures: OR=1.58, 95%CI=1.40-1.79; retrospective measures: OR=2.24, 95%CI=1.96-2.56).

Meta-analyses of adjusted associations between prospective and retrospective measures of maltreatment with psychopathology

The adjusted association between prospective measures of childhood maltreatment and psychopathology was OR=1.27, 95%CI=1.13-1.41 (Figure 1, Panel C) with I^2=89.7%. The meta-analytical results were not significantly biased by small-study effects (Egger's test p=0.102; Supplementary Figure 2, Panel C) or large-study effects (leave-one-out analyses range OR=1.22-1.33; Supplementary Figures 3-4, Panel C). This adjusted association was 47% smaller than the equivalent unadjusted association, and the difference in effect sizes was statistically significant (p=0.0132).

The adjusted association between retrospective measures of childhood maltreatment and psychopathology was OR=2.14, 95%CI=1.90-2.42 (Figure 1, Panel D) with I^2=91.7%. The meta-analytical results were not significantly biased by small-study effects (Egger's test p=0.8973; Supplementary Figure 2, Panel D) or large-study effects (leave-one-out analyses range OR=2.02-2.20; Supplementary Figures 3-4, Panel D). This adjusted association was 4% smaller than the equivalent unadjusted association, and the difference in effect sizes was not statistically significant (p=0.7384).

The adjusted association between retrospective measures of childhood maltreatment and psychopathology was 69% greater than the adjusted association based on prospective measures, and the difference in effect sizes was statistically significant (p=3x10-10).

Moderation of the associations between prospective and retrospective measures of maltreatment with psychopathology

Because of the significant heterogeneity in the effect sizes for unadjusted and adjusted associations between prospective or retrospective measures of child maltreatment and psychopathology, we examined possible moderation of the associations by type of maltreatment, type of psychopathology, type of prospective or retrospective measure, age at retrospective report, informant for psychopathology, study design, sex distribution, and study quality.

There was no statistically significant moderation of the unadjusted and adjusted associations between prospective measures of child maltreatment and psychopathology (Table 2).

In contrast, as shown in Figure 2, Panel B (and Table 3), the *unadjusted* association between retrospective measures of child maltreatment and psychopathology was moderated by the type of maltreatment (Qmod=15.35, p=0.009), with stronger associations between emotional abuse and psychopathology relative to ACEs (p=0.035), neglect (p=0.0006), or sexual abuse (p=0.007); furthermore, retrospective measures of physical abuse were also more strongly associated with psychopathology relative to measures of neglect (p=0.028). The unadjusted association between retrospective

measures of child maltreatment and psychopathology was also moderated by the type of psychopathology (Qmod=10.19, p=0.001; with stronger associations between retrospective measures and internalising disorders versus externalising disorders; Figure 2, Panel C). Additionally, the unadjusted association between retrospective measures of child maltreatment and psychopathology was moderated by the informant for psychopathology (Qmod=4.37, p=0.037; with stronger association for self-reports of psychopathology than reports from others; Figure 2, Panel D). Similarly, the *adjusted* association between retrospective measures of child maltreatment and psychopathology was moderated by the informant for psychopathology (Qmod=10.32, p=0.001; with stronger association for self-reports on psychopathology than reports from others; Figure 2, Panel D). However, the unadjusted and adjusted associations between retrospective measures of maltreatment and psychopathology were not moderated by the type of retrospective measure, age at retrospective report, study design (longitudinal vs cross-sectional assessment of psychopathology) or study quality (Table 3).

DISCUSSION

Our meta-analysis of 24 studies including 16 cohorts featuring 15,485 individuals found that psychopathology is more strongly associated with retrospective than prospective measures of child maltreatment. This difference was observed when the associations between prospective or retrospective measures and psychopathology were tested separately (44% greater for retrospective measures in unadjusted analyses) and increased when the associations were tested jointly to account for their interdependence (69% greater for retrospective measures in adjusted analyses). The effect sizes for the associations between prospective measures and psychopathology were small and decreased by about 1/5 after accounting for retrospective measures

(equivalent Cohen's d=0.25 and d=0.13, respectively). In contrast, the effect sizes for the associations between retrospective measures and psychopathology were moderate and did not vary substantially after accounting for prospective measures (equivalent Cohen's d=0.44 and d=0.42, respectively). Overall, the results suggest that psychopathology is more strongly associated with retrospective measures—which capture the first-person, subjective appraisal of childhood events reflected in memory recall—compared to prospective measures—which essentially capture third-person accounts of such events.

Our moderation findings identified factors that contribute to the larger effect sizes between retrospective measures of maltreatment and psychopathology. The associations between retrospective measures and psychopathology were stronger when the assessment of psychopathology was based on self-reports (versus reports from other informants) and was focused on internalising/emotional disorders (versus externalising disorders). Furthermore, retrospective reports of emotional abuse showed stronger unadjusted associations with psychopathology compared to other types of maltreatment. These findings suggest various possible interpretations of the meta-analytical results, which are not mutually exclusive. On the one hand, the associations between retrospective measures and psychopathology may be inflated (particularly for emotional disorders) due to common-method bias[33], and particularly recall bias.[34] For example, evidence suggests that increases in depressive symptoms over time may lead to small increases in retrospective reports of maltreatment[35], suggesting a small degree of recall bias. On the other hand, personal experiences of child maltreatment as captured by retrospective reports may causally influence psychopathology. Notably, we found that the associations between retrospective measures

and psychopatholgy were still present (although smaller in magnitude) when the assessment of psychopathology was based on other informants, or when the focus was on externalising disorders. This suggests that reporting biases (e.g., recall bias linked to emotional disorders) cannot fully explain the findings. Furthermore, longitudinal prospective analyses have shown that, above and beyond the influence of current and past psychopathology on memory recall, retrospective measures of childhood maltreatment are associated with risk for later emotional disorders[36], lending additional support to causal interpretations of the meta-analytical findings. Finally, because the age at retrospective report did not moderate the associations, the stronger associations between retrospective measures and psychopathology are unlikely to emerge artifactually because of memory amplification by lifetime psychopathology.[37] In contrast, the associations between prospective measures of childhood maltreatment and psychopathology were not moderated by key variables considered.

These findings should be interpreted in the context of some limitations. First, the stronger association of retrospective vs prospective measures of childhood maltreatment with psychopathology might reflect misclassification.[4,36] For example, this might occur because prospective measures of maltreatment are not very sensitive and do not capture all cases of maltreatment that are later reported through retrospective measures—particularly for maltreatment types that are more private, hidden by the perpetrators, and untold by the victims (i.e., sexual abuse).[2] However, the findings for prospective measures were similar across maltreatment types (e.g., sexual abuse vs physical abuse) and prospective measure types (e.g., official court records vs parent reports) with different detection sensitivity. Second, because many of the studies in-

cluded did not account for key potential confounders, it is unlikely that the associations reported reflect entirely causal effects. However, a meta-analysis of quasi-experimental studies including both prospective and retrospective measures found that, even in these stringent tests, childhood maltreatment has small causal effects on psychopathology.[38] Third, due to the lack of available data from the original studies, we were not able to disentangle the role of potential explanatory variables (e.g., age at, severity, or duration of maltreatment) in the associations between prospective and retrospective measures of childhood maltreatment and psychopathology. Fourth, although meta-regression analyses in Tables 2 and 3 showed no significant moderation of the reported effect sizes by study design, only three studies had longitudinal design with temporal separation between retrospective measures of maltreatment and assessment of psychopathology. Building on our recent work[36], more longitudinal studies are needed in this area, particularly to disentangle causal vs non-causal associations between retrospective measures of maltreatment and psychopathology. Finally, it is unclear if the findings presented here could be generalised to other samples or forms of adversity. However, the unadjusted effect sizes for prospective measures in our meta-analysis overlap with effect sizes in other meta-analyses on the links between child maltreatment and psychopathology.[39–41] Furthermore, our findings are consistent with those from a meta-analysis on the links between objective and subjective measures of a broader set of childhood adversities and psychopathology, which included bullying victimisation and neighbourhood adversity as well as 5 of 24 studies on maltreatment examined here.[42] Despite these limitations, the findings have important implications to conceptualise and treat psychopathology related to childhood maltreatment.

In particular, the meta-analytical findings highlight the potential etio-pathological role of autobiographical memories captured by retrospective measures of childhood maltreatment. The role of autobiographical memory has not been explicitly formulated in dominant biological theories (e.g., toxic stress, biological embedding)[43,44], which focus on the consequences of documented exposure to maltreatment. Psychoanalytic ('repression') and body-based (e.g., 'The body keeps the score') theories focus on unconscious memories that cannot be accessed by voluntary recollection.[45,46] In contrast, the meta-analytical findings presented here support cognitive theories, which posit that our interpretation of events, conscious recall, and their associated schemas are more strongly associated with psychopathology than the mere events.[47] As such, evidence-based treatment for trauma-related psychopathology (e.g., trauma-focused cognitive-behavioural therapy)[48] and novel memory therapeutics[49–51] may hold the key to buffering the impact of childhood maltreatment on psychopathology.

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References

1. Arango C, Dragioti E, Solmi M, et al. Risk and protective factors for mental disorders beyond genetics: an evidence-based atlas. *World Psychiatry*. 2021;20(3):417-436. doi:10.1002/wps.20894

2. Baldwin JR, Reuben A, Newbury JB, Danese A. Agreement Between Prospective and Retrospective Measures of Childhood Maltreatment: A Systematic Review and Meta-analysis. *JAMA Psychiatry*. 2019;76(6):584-593. doi:10.1001/jamapsychiatry.2019.0097

3. Danese A. Annual Research Review: Rethinking childhood trauma-new research directions for measurement, study design and analytical strategies. *J Child Psychol Psychiatry*. 2020;61(3):236-250. doi:10.1111/jcpp.13160

4. Danese A, Widom CS. Objective and subjective experiences of child maltreatment and their relationships with psychopathology. *Nat Hum Behav*. 2020;4(8):811-818. doi:10.1038/s41562-020-0880-3

5. Reuben A, Moffitt TE, Caspi A, et al. Lest we forget: comparing retrospective and prospective assessments of adverse childhood experiences in the prediction of adult health. *J Child Psychol Psychiatry*. 2016;57(10):1103-1112. doi:10.1111/jcpp.12621

6. Coleman O, Baldwin JR. Prospective versus retrospective measures of child maltreatment and their relationships with health. In: *Innovative Methods in Child Maltreatment Research and Practice: Advances in Detection, Causal Estimation, and Intervention*. Springer International Publishing; 2023:3-16.

7. Viechtbauer W. Conducting Meta-Analyses in *R* with the **metafor** Package. *J Stat Softw*. 2010;36(3):1-48. doi:10.18637/jss.v036.i03

8. Rosseel Y. lavaan: An R Package for Structural Equation Modeling. *J Stat Softw*. 2012;48(2):1-36. doi:10.18637/jss.v048.i02

9. Assink M, Wibbelink CJM. Fitting three-level meta-analytic models in R: A step-by-step tutorial. *Quant Methods Psychol*. 2016;12(3):154-174. doi:10.20982/tqmp.12.3.p154

10. Rodgers MA, Pustejovsky JE. Evaluating meta-analytic methods to detect selective reporting in the presence of dependent effect sizes. *Psychol Methods*. 2021;26(2):141-160. doi:10.1037/met0000300

11. Baldwin JR, Caspi A, Meehan AJ, et al. Population vs Individual Prediction of Poor Health From Results of Adverse Childhood Experiences Screening. *JAMA Pediatr*. 2021;175(4):385. doi:10.1001/jamapediatrics.2020.5602

12. Brown J, Berenson K, Cohen P. Documented and Self-Reported Child Abuse and Adult Pain in a Community Sample: *Clin J Pain*. 2005;21(5):374-377. doi:10.1097/01.ajp.0000149797.16370.dc

13. Cooley DT, Jackson Y, Stoolmiller M. Discrepancies in youth self-report and case file report of maltreatment and association with internalizing and externalizing symptoms. *Child Abuse Negl*. 2022;133:105845. doi:10.1016/j.chiabu.2022.105845

14. Dion J, Gervais J, Bigras N, Blackburn ME, Godbout N. A Longitudinal Study of the Mediating Role of Romantic Attachment in the Relation Between Child Maltreatment and Psychological Adaptation in Emerging Adults. *J Youth Adolesc*. 2019;48(12):2391-2402. doi:10.1007/s10964-019-01073-4

15. Elwyn L, Smith C. Child Maltreatment and Adult Substance Abuse: The Role of Memory. *J Soc Work Pract Addict*. 2013;13(3):269-294. doi:10.1080/1533256X.2013.814483

16. Everson MD, Smith JB, Hussey JM, et al. Concordance Between Adolescent Reports of Childhood Abuse and Child Protective Service Determinations in an At-Risk Sample of Young Adolescents. *Child Maltreat*. 2008;13(1):14-26. doi:10.1177/1077559507307837

17. Herrenkohl TI, Fedina L, Hong SH, Lee JO, Saba S. Associations between prospective and retrospective measures of child abuse and self-reported adult health at midlife. *Child Abuse Negl*. 2021;120:105203. doi:10.1016/j.chiabu.2021.105203

18. Kisely S, Strathearn L, Mills R, Najman JM. A comparison of the psychological outcomes of self-reported and agency-notified child abuse in a population-based birth cohort at 30-year-follow-up. *J Affect Disord*. 2021;280:167-172. doi:10.1016/j.jad.2020.11.017

19. Kisely S, Strathearn L, Najman JM. Self-reported and Agency-Notified Child Abuse as a Contributor to Health Anxiety in a Population-Based Birth Cohort Study at 30-Year Follow-up. *J Acad Consult-Liaison Psychiatry*. 2022a;63(5):445-453. doi:10.1016/j.jaclp.2022.02.003

20. Kisely S, Strathearn L, Najman JM. A comparison of psychosis-like symptoms following self-reported and agency-notified child abuse in a population-based birth cohort at 30-year-follow-up. *Schizophr Res*. 2022b;239:116-122. doi:10.1016/j.schres.2021.11.029

21. McGee RA, Wolfe DA, Yuen SA, Wilson SK, Carnochan J. The measurement of maltreatment: A comparison of approaches. *Child Abuse Negl*. 1995;19(2):233-249. doi:10.1016/0145-2134(94)00119-F

22. Mills R, Kisely S, Alati R, Strathearn L, Najman J. Self-reported and agency-notified child sexual abuse in a population-based birth cohort. *J Psychiatr Res*. 2016;74:87-93. doi:10.1016/j.jpsychires.2015.12.021

23. Naicker SN, Norris SA, Richter LM. Secondary analysis of retrospective and prospective reports of adverse childhood experiences and mental health in young adulthood: Filtered through recent stressors. *EClinicalMedicine*. 2021;40:101094. doi:10.1016/j.eclinm.2021.101094

24. Negriff S, Schneiderman JU, Trickett PK. Concordance Between Self-Reported Childhood Maltreatment Versus Case Record Reviews for Child Welfare–Affiliated Adolescents: Prevalence Rates and Associations With Outcomes. *Child Maltreat*. 2017;22(1):34-44. doi:10.1177/1077559516674596

25. Newbury JB, Arseneault L, Moffitt TE, et al. Measuring childhood maltreatment to predict early-adult psychopathology: Comparison of prospective informant-reports and retrospective self-reports. *J Psychiatr Res*. 2018;96:57-64. doi:10.1016/j.jpsychires.2017.09.020

26. Patten SB, Wilkes TCR, Williams JVA, et al. Retrospective and prospectively assessed childhood adversity in association with major depression, alcohol consumption and painful conditions. *Epidemiol Psychiatr Sci*. 2015;24(2):158-165. doi:10.1017/S2045796014000018

27. Scott KM, McLaughlin KA, Smith DAR, Ellis PM. Childhood maltreatment and DSM-IV adult mental disorders: Comparison of prospective and retrospective findings. *Br J Psychiatry*. 2012;200(6):469-475. doi:10.1192/bjp.bp.111.103267

28. Shaffer A, Huston L, Egeland B. Identification of child maltreatment using prospective and self-report methodologies: A comparison of maltreatment incidence and relation to later psychopathology. *Child Abuse Negl*. 2008;32(7):682-692. doi:10.1016/j.chiabu.2007.09.010

29. Smith CA, Ireland TO, Thornberry TP, Elwyn L. Childhood maltreatment and antisocial behavior: Comparison of self-reported and substantiated maltreatment. *Am J Orthopsychiatry*. 2008;78(2):173-186. doi:10.1037/0002-9432.78.2.173

30. Tajima EA, Herrenkohl TI, Huang B, Whitney SD. Measuring child maltreatment: A comparison of prospective parent reports and retrospective adolescent reports. *Am J Orthopsychiatry*. 2004;74(4):424-435. doi:10.1037/0002-9432.74.4.424

31. Talmon A, Widom CS. Childhood Maltreatment and Eating Disorders: A Prospective Investigation. *Child Maltreat*. 2022;27(1):88-99. doi:10.1177/1077559520988786

32. Widom CS, Morris S. Accuracy of Adult Recollections of Childhood Victimization: Part 2. Childhood Sexual Abuse. *Psychol Assess*. 1997;9(1):34-46.

33. Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J Appl Psychol*. 2003;88(5):879-903. doi:10.1037/0021-9010.88.5.879

34. Dalgleish T, Werner-Seidler A. Disruptions in autobiographical memory processing in depression and the emergence of memory therapeutics. *Trends Cogn Sci*. 2014;18(11):596-604. doi:10.1016/j.tics.2014.06.010

35. Goltermann J, Meinert S, Hülsmann C, et al. Temporal stability and state-dependence of retrospective self-reports of childhood maltreatment in healthy and depressed adults. *Psychol Assess*. 2023;35(1):12-22. doi:10.1037/pas0001175

36. Danese A, Widom CS. Associations Between Objective and Subjective Experiences of Childhood Maltreatment and the Course of Emotional Disorders in Adulthood. *JAMA Psychiatry*. 2023;80(10):1009-1016. doi:10.1001/jamapsychiatry.2023.2140

37. Southwick SM, Morgan III A, Nicolaou AL, Charney DS. Consistency of memory for combat-related traumatic events in veterans of Operation Desert Storm. *Am J Psychiatry*. 1997;154(2):173-177. doi:10.1176/ajp.154.2.173

38. Baldwin JR, Wang B, Karwatowska L, et al. Childhood Maltreatment and Mental Health Problems: A Systematic Review and Meta-Analysis of Quasi-Experimental Studies. *Am J Psychiatry*. 2023;180(2):117-126. doi:10.1176/appi.ajp.20220174

39. Fitton L, Yu R, Fazel S. Childhood Maltreatment and Violent Outcomes: A Systematic Review and Meta-Analysis of Prospective Studies. *Trauma Violence Abuse*. 2020;21(4):754-768. doi:10.1177/1524838018795269

40. Gardner MJ, Thomas HJ, Erskine HE. The association between five forms of child maltreatment and depressive and anxiety disorders: A systematic review and meta-analysis. *Child Abuse Negl*. 2019;96:104082. doi:10.1016/j.chiabu.2019.104082

41. Li M, D'Arcy C, Meng X. Maltreatment in childhood substantially increases the risk of adult depression and anxiety in prospective cohort studies: systematic review, meta-analysis, and proportional attributable fractions. *Psychol Med*. 2016;46(4):717-730. doi:10.1017/S0033291715002743

42. Francis ER, Tsaligopoulou A, Stock SE, Pingault J, Baldwin JR. Subjective and objective experiences of childhood adversity: a meta-analysis of their agreement and relationships with psychopathology. *J Child Psychol Psychiatry*. 2023;64(8):1185-1199. doi:10.1111/jcpp.13803

43. Danese A, McEwen BS. Adverse childhood experiences, allostasis, allostatic load, and age-related disease. *Physiol Behav*. 2012;106(1):29-39. doi:10.1016/j.physbeh.2011.08.019

44. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, Molecular Biology, and the Childhood Roots of Health Disparities: Building a New Framework for Health Promotion and Disease Prevention. *JAMA*. 2009;301(21):2252-2259. doi:10.1001/jama.2009.754

45. Freud S. Three essays on the theory of sexuality. *SE*. 1905;7:125-243.

46. Van der Kolk B. *The Body Keeps the Score: Mind, Brain and Body in the Transformation of Trauma*. Penguin; 2014.

47. Ehlers A, Clark DM. A cognitive model of posttraumatic stress disorder. *Behav Res Ther*. 2000;38(4):319-345. doi:10.1016/S0005-7967(99)00123-0

48. Cohen JA, Mannarino AP. Trauma-Focused Cognitive Behavioural Therapy for Children and Parents. *Child Adolesc Ment Health*. 2008;13(4):158-162. doi:10.1111/j.1475-3588.2008.00502.x

49. Dalgleish T, Hitchcock C. Transdiagnostic Distortions in Autobiographical Memory Recollection. *Nat Rev Psychol*. 2023;2(3):166-182.

50. Monfils MH, Holmes EA. Memory boundaries: opening a window inspired by reconsolidation to treat anxiety, trauma-related, and addiction disorders. *Lancet Psychiatry*. 2018;5(12):1032-1042. doi:10.1016/S2215-0366(18)30270-0

51. Phelps EA, Hofmann SG. Memory editing from science fiction to clinical practice. *Nature*. 2019;572(7767):43-50. doi:10.1038/s41586-019-1433-7

Table 1. Description of the studies included in the meta-analyses.

Author (year)	Cohort	Sample size (% female)	Ethnicity (% white)	Exposure type	Prospective measure			Retrospective measure			Psychopathology measure				Adjusted effect reported
					Measure type	Source	Age at assessment (years)	Measure type (name where validated)	Source	Age at assessment (years)	Psychopathology type	Measure type	Source	Age at assessment (years)	
Baldwin et al. (2021)[11]	Dunedin	918 (50%)	93	ACEs	Official records; interview; questionnaire	Social service; parent; teacher; interviewer; paediatrician; nurse	3-15	Interview (CTQ, Family History Screen)	Self	38	Mental health problems; depression; anxiety; self-harm; suicide attempt; ADHD; alcohol dependence; drug dependence	Interview	Self	45	N
Brown et al. (2005)[12]	Two County Cohort	642 (49%)	NA	Physical abuse	Official records	New York State Central Registry	Not reported	Interview	Self	22	Depression	Interview	Self	22	N
Cooley et al. (2022)[13]	SPARK	470 (48.5%)	34.5	Physical abuse; sexual abuse; emotional abuse; neglect	Official records	Child protection	13.2	Interview MMCS adapted for self-report	Self	13.2	Externalising symptoms; internalising symptoms	Interview	Self	13.2	Y
Danese & Widom (2020)[4]	Widom Midwest	1196 (48.7%)	62.9	Maltreatment; physical abuse; sexual abuse; neglect	Official records	Court records	6.4	Interview (CTS, SRCAP)	Self	28.7	Psychopathology; internalising disorder; externalising disorder; depression; dysthymia; generalised anxiety disorder; PTSD; antisocial personality disorder; alcohol abuse or dependence; drug abuse or dependence	Interview	Self	28.7	Y
Dion et al. (2019)[14]	Canada school	605 (56%)	NA	Maltreatment	Questionnaire	Self	14	Questionnaire	Self	24.5	Psychological distress	Questionnaire	Self	24	N
Elwyn & Smith (2013)[15]	Rochester	803 (27.1%)	17.9	Maltreatment	Official records	Child protection	0-17	Interview	Self	22.7	Drug problems; alcohol problems	Interview	Self	30	N
Everson et al. (2008)[16]	LONGSCAN	350 (51%)	20	Physical abuse; sexual abuse; emotional abuse	Official records	Child protection	0-12	Interview (LONGSCAN self-report)	Self	12	Trauma symptoms; internalising symptoms; externalising symptoms	Interview	Self; caregiver	12	N

Herrenkohl et al. (2021)[17]	Lehigh USA	303 (47.5%)	83.8	Maltreatment; physical abuse	Official records; interview	Child protection; parent	1.5-11	Interview	Self	18	Alcohol problems	Interview	Self	46	N
Kisely et al. (2021)[18]	Mater University	2425 (60.1%)	93	Maltreatment; physical abuse; emotional abuse; neglect; sexual abuse	Official records	Child protection	0-16	Questionnaire (CTQ)	Self	30	Depression; anxiety; PTSD	Questionnaire	Self	30	N
Kisely et al. (2022a)[19]	Mater University	2458 (59.8%)	NA	Maltreatment; physical abuse; emotional abuse; neglect; sexual abuse	Official records	Child protection	0-16	Questionnaire (CTQ)	Self	30	Health anxiety	Questionnaire	Self	30	N
Kisely et al. (2022b)[20]	Mater University	2427 (60%)	93.6	Maltreatment; physical abuse; emotional abuse; neglect; sexual abuse	Official records	Child protection	0-16	Questionnaire (CTQ)	Self	30	Delusions; visual hallucinations; auditory hallucinations	Questionnaire	Self	30	N
McGee et al. (1995)[21]	Western Ontario	160 (56%)	NA	Physical abuse; sexual abuse; emotional abuse; neglect	Official records	Social worker	0-17	Interview	Self	13.8	Internalising symptoms; Externalising symptoms	Interview	Self; caregiver	13.8	N
Mills et al. (2016)[22]	Mater University	2304 (57.3%)	87	Sexual abuse	Official records	Child protection	0-16	Questionnaire (CTQ)	Self	21	Depression; anxiety; PTSD	Questionnaire	Self	21	N
Naicker et al. (2021)[23]	Birth to Twenty Plus	1592 (52%)	6	ACEs	Questionnaire	Parent; self	Caregivers reported on their children from 5- 11 years, and participants provided self-reports from 11-18 years	Questionnaire	Self	22.5	Somatization; anxiety; depression; psychological distress	Questionnaire	Self	22.5	Y
Negriff et al. (2017)[24]	LA cohort	221 (53%)	10	Physical abuse; sexual abuse; emotional abuse; neglect	Official records	Child protection	9-13	Interview (CTI)	Self	18	Depression; PTSD; anxiety; cannabis use; alcohol use	Questionnaire	Self	18	Y
Newbury et al. (2018)[25]	E-Risk	2055 (51%)	NA	Maltreatment; physical abuse; sexual abuse; physical neglect; emotional abuse/neglect	Interview; official records	Parent; child protection	5-12	Interview (CTQ)	Self	18	Depression; anxiety; self-injury, alcohol/cannabis dependence; conduct disorder	Interview	Self	18	Y

Patten et al. (2015)[26]	NLSCY & NPHS	1896 (48.3%)	NA	ACEs	Interview	Parent, self	0-11	Interview	Self	20	Depression; high alcohol use	Interview	Self	20	Y (only prospective)
Reuben et al. (2016)[5]	Dunedin	950 (48%)	93	ACEs	Official records; interview	Social service; parent; teacher; interviewer; paediatrician; nurse	3-15	Interview (CTQ, Family History Screen)	Self	38	Psychopathology	Interview	Self	38	Y
Scott et al. (2012)[27]	NZ Mental Health Survey	1413 (57.6%)	NA	Maltreatment	Official records	Child protection	Not reported	Interview	Self	21.5	Depression; anxiety; alcohol abuse/dependence; drug abuse/dependence	Interview	Self	21.5	N
Shaffer et al. (2008)[28]	Minnesota longitudinal	170 (47%)	80	Maltreatment	Interview; official records; observation	Parent; child protection; teacher; self	0-17.5	Interview (AAI)	Self	19	Emotional and behavioural problems. internalising problems; externalising problems; any/multiple psychiatric disorders	Interview	Teacher; caregiver; self	16/17.5	Y
Smith et al. (2008)[29]	Rochester	850 (50%)	17.9	Maltreatment	Official records	Child protection	0-17	Interview	Self	22.7	Drug use	Interview	Self	16/22	N
Tajima et al. (2004)[30]	Lehigh USA	457 (45.7%)	73.3	Physical abuse	Interview	Parent	9.5	Interview	Self	18	Alcohol abuse; marijuana abuse; depression	Interview	Self	18	Y
Talmon & Widom (2022)[31]	Widom Midwest	807 (53.2%)	59.2	Maltreatment; physical abuse; sexual abuse; neglect	Official records	Court records	6.4	Interview (CTS, SRCAP)	Self	29	Anorexia nervosa; bulimia nervosa	Interview	Self	41	N
Widom & Morris (1997)[32]	Widom Midwest	576 (100%)	62.9	Sexual abuse	Official records	Court records	0-11	Interview	Self	28.7	Suicide attempt	Interview	Self	28.7	N

N.B., The acronyms for measurement names are defined as follows: CTQ – Childhood Trauma Questionnaire; MMSC – Modified Maltreatment Classification System; CTS – Conflict Tactics Scale; SRCAP – Self-Report of Childhood Abuse Physical; CTI – Comprehensive Trauma Interview; AAI – Adult Attachment Interview.

Table 2. Moderation analyses for the associations between prospective measures of maltreatment and psychopathology

Moderator	Prospective measures (unadjusted)						Prospective measures (adjusted)					
	k	N	ES	OR (95% CI)	Q_{mod}	p-value	k	N	ES	OR (95% CI)	Q_{mod}	p-value
Type of maltreatment					10.58	0.060					2.47	0.781
Physical abuse	13	8,009	37	1.52 (1.30-1.78)			12	7,367	36	1.24 (1.04-1.49)		
Sexual abuse	12	6,910	34	1.85 (1.56-2.21)			12	6,910	34	1.42 (1.17-1.71)		
Emotional abuse	8	5,714	26	1.59 (1.32-1.91)			8	5,714	26	1.31 (1.06-1.62)		
Neglect	9	6,560	28	1.41 (1.18-1.69)			9	6,560	28	1.24 (1.02-1.52)		
Maltreatment	12	9,050	48	1.58 (1.35-1.84)			9	6,592	41	1.26 (1.05-1.52)		
ACEs	4	4,438	15	1.41 (1.05-1.88)			4	4,438	15	1.14 (0.85-1.53)		
Type of psychopathology					1.44	0.230					0.61	0.434
Internalising disorders	19	14,603	92	1.56 (1.36-1.79)			18	13,961	87	1.23 (1.07-1.41)		
Externalising disorders	13	9,806	62	1.45 (1.25-1.69)			13	9,806	62	1.31 (1.12-1.54)		
Type of prospective measure					2.94	0.401					0.93	0.818
Interview	3	2,353	7	1.48 (1.05-2.09)			3	2,353	7	1.21 (0.84-1.75)		
Questionnaire	2	2,197	5	0.88 (0.51-1.52)			2	2,197	5	1.06 (0.59-1.90)		
Official records	16	8,063	128	1.02 (0.71-1.47)			15	7,421	120	1.02 (0.69-1.50)		
Mixed	4	3,175	48	1.29 (0.83-2.00)			4	3,175	48	1.17 (0.74-1.84)		
Informant for psychopathology					0.13	0.719					0.58	0.446
Self	23	15,015	157	1.55 (1.37-1.76)			22	14,373	149	1.25 (1.11-1.40)		
Other	4	1,150	31	1.61 (1.30-2.00)			4	1,150	31	1.38 (1.08-1.76)		
Cross-sectional or longitudinal assessment of psychopathology					1.05	0.306					0.95	0.330
Cross-sectional assessment	21	15,485	175	1.59 (1.40-1.81)			20	14,483	167	1.29 (1.15-1.46)		
Longitudinal assessment	3	2,024	13	1.32 (0.93-1.86)			3	2,024	13	1.09 (0.79-1.51)		
Sex distribution	24	15,485	188	1.01 (1.00-1.02)	2.81	0.093	23	14,483	180	1.01 (1.00-1.03)	2.17	0.140
Study quality	24	15,485	188	1.02 (0.93-1.11)	0.15	0.699	24	14,483	180	1.00 (0.92-1.08)	0.00	0.969

Table 3. Moderation analyses for the associations between retrospective measures of maltreatment and psychopathology

Moderator	Retrospective measures (unadjusted)						Retrospective measures (adjusted)					
	k	N	ES	OR (95% CI)	Q_{mod}	p-value	k	N	ES	OR (95% CI)	Q_{mod}	p-value
Type of maltreatment					**15.35**	**0.009**					8.04	0.154
Physical abuse	13	8,009	38	**2.39 (2.01-2.85)**			12	7,367	37	2.40 (1.98-2.90)		
Sexual abuse	12	6,910	34	**2.12 (1.76-2.55)**			12	6,910	34	1.92 (1.58-2.34)		
Emotional abuse	8	5,714	26	**2.76 (2.27-3.36)**			8	5,714	26	2.51 (2.01-3.13)		
Neglect	9	6,560	28	**1.95 (1.61-2.37)**			9	6,560	28	1.95 (1.57-2.43)		
Maltreatment	12	9,050	47	**2.28 (1.92-2.71)**			9	6,592	40	2.18 (1.77-2.68)		
ACEs	4	4,438	15	**1.83 (1.32-2.54)**			4	4,438	15	1.95 (1.42-2.68)		
Type of psychopathology					**10.19**	**0.001**					3.60	0.058
Internalising disorders	19	14,603	92	**2.35 (2.02-2.73)**			18	13,961	87	2.27 (1.95-2.63)		
Externalising disorders	13	9,806	62	**1.87 (1.58-2.20)**			13	9,806	62	1.90 (1.60-2.26)		
Type of retrospective measure					0.05	0.819					0.02	0.880
Interview	18	10,830	145	2.23 (1.91-2.61)			17	10,188	144	2.16 (1.87-2.49)		
Questionnaire	6	4,655	42	2.15 (1.65-2.80)			6	4,655	35	2.11 (1.66-2.68)		
Age at retrospective report	24	15,485	188	1.00 (0.98-1.02)	0.17	0.676	23	14,843	180	1.00 (0.98-1.02)	0.02	0.890
Informant for psychopathology					**4.37**	**0.037**					**10.32**	**0.001**
Self	23	15,015	157	**2.28 (2.00-2.60)**			22	14,373	149	**2.28 (2.02-2.57)**		
Other	4	1,150	31	**1.77 (1.38-2.26)**			4	1,150	31	**1.45 (1.11-1.89)**		
Cross-sectional or longitudinal assessment of psychopathology					0.58	0.445					0.38	0.538
Cross-sectional assessment	21	15,485	175	2.25 (1.96-2.59)			20	14,843	167	2.17 (1.91-2.47)		
Longitudinal assessment	3	2,024	13	1.92 (1.31-2.81)			3	2,024	13	1.93 (1.35-2.75)		
Sex distribution	24	15,485	188	1.01 (0.99-1.02)	0.67	0.412	23	14,843	180	1.00 (0.99-1.02)	0.00	0.977
Study quality	24	15,485	188	1.03 (0.94-1.13)	0.47	0.495	24	14,843	180	1.02 (0.93-1.11)	0.12	0.734

Figure 1. Forest plots for the associations of prospective and retrospective measures of child maltreatment with psychopathology. The forest plots depict the study-average associations of prospective and retrospective measures of child maltreatment with psychopathology, in unadjusted and adjusted analyses. For clarity of presentation, forest plots show a single effect size per study (reflecting the average of all individual effect sizes obtained from each study). The average effect size per study and its variance were calculated using the “MAd” package [https://cran.r-project.org/web/packages/MAd/MAd.pdf].

Figure 2. Moderation analyses for the associations of prospective and retrospective measures of maltreatment with psychopathology