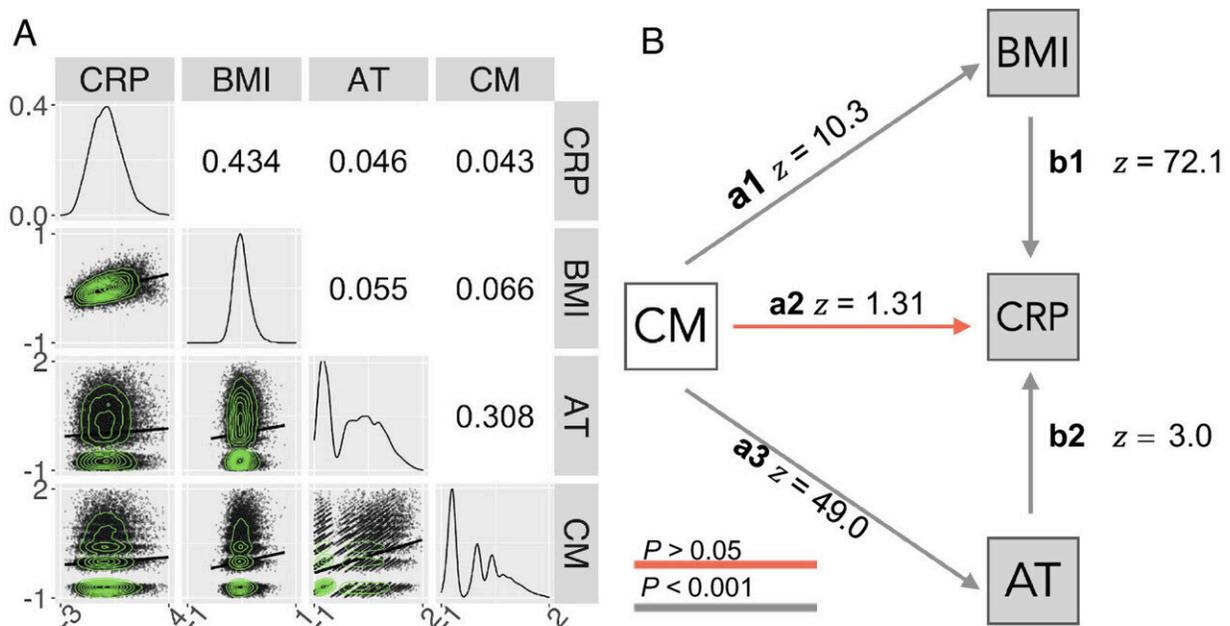


# Study unpicks why childhood maltreatment continues to impact on mental and physical health into adulthood

April 11 2024, by Craig Brierley



Relationships between childhood maltreatment, adult trauma, BMI, and CRP. (A) Correlation matrix representing pair-wise Spearman's correlations (Upper triangle) and scatterplots of the relationships between each pair of variables, with solid lines indicating fitted linear regression models (Lower triangle). The diagonal represents the probability density function for each variable. All correlations were significantly greater than zero, with  $FDR \leq 0.05$ . (B) Path diagram representing direct effects of retrospectively ascertained CM (white) on the contemporaneously measured adult (log-transformed) variables, AT, CRP, and BMI (gray). Standardized path coefficients are given as Wald (z) statistics. Credit: *Proceedings of the National Academy of Sciences* (2024). DOI:

10.1073/pnas.2304704121

Individuals who experienced maltreatment in childhood—such as emotional, physical, and sexual abuse or emotional and physical neglect—are more likely to develop mental illness throughout their entire lives, but it is not yet well understood why this risk persists. Many decades after maltreatment first took place.

In a study [published](#) in *Proceedings of the National Academy of Sciences*, scientists from the University of Cambridge and Leiden University found that [adult brains](#) continue to be affected by childhood maltreatment in adulthood because these experiences make individuals more likely to experience obesity, inflammation, and traumatic events, all of which are risk factors for poor health and well-being, which in turn also affect brain structure and therefore brain health.

The researchers examined MRI brain scans from approximately 21,000 adult participants aged 40 to 70 years in UK Biobank, as well as information on body mass index (an indicator of metabolic health), CRP (a blood marker of inflammation), and experiences of childhood maltreatment and adult trauma.

Sofia Orellana, a Ph.D. student at the Department of Psychiatry and Darwin College, University of Cambridge, said, "We've known for some time that people who experience abuse or neglect as a child can continue to experience [mental health problems](#) long into adulthood and that their experiences can also cause long term problems for the brain, the [immune system](#) and the metabolic system, which ultimately controls the health of your heart or your propensity to diabetes for instance."

"What hasn't been clear is how all these effects interact or reinforce each

other."

Using a type of statistical modeling that allowed them to determine how these interactions work, the researchers confirmed that experiencing childhood maltreatment made individuals more likely to have an increased body mass index (or obesity) and experience greater rates of trauma in adulthood.

Individuals with a history of maltreatment tended to show signs of dysfunction in their immune systems, and the researchers showed that this dysfunction is the product of obesity and repeated exposure to [traumatic events](#).

Next, the researchers expanded their models to include MRI measures of the adult's brains and were able to show that widespread increases and decreases in brain thickness and volume associated with greater [body mass index](#), inflammation, and trauma were attributable to childhood maltreatment having made these factors more likely in the first place. These changes in [brain structure](#) likely mean that some form of physical damage is occurring to brain cells, affecting how they work and function.

Although there is more to do to understand how these effects operate at a [cellular level](#) in the brain, the researchers believe that their findings advance our understanding of how adverse events in childhood can contribute to a life-long increased risk of brain and mind health disorders.

Professor Ed Bullmore from the Department of Psychiatry and an Honorary Fellow at Downing College, Cambridge, said, "Now that we have a better understanding of why [childhood maltreatment](#) has long-term effects, we can potentially look for biomarkers—biological red flags—that indicate whether an individual is at increased risk of

continuing problems. This could help us target early on those who most need help, and hopefully aid them in breaking this chain of ill health."

**More information:** Sofia C. Orellana et al, Childhood maltreatment influences adult brain structure through its effects on immune, metabolic, and psychosocial factors, *Proceedings of the National Academy of Sciences* (2024). [DOI: 10.1073/pnas.2304704121](https://doi.org/10.1073/pnas.2304704121)

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