**Supplementary Table 1**. Questions asked about Psychotic Experiences

**Supplementary Appendix 1.** Confounding factors and Time-dynamic covariate factors

**Supplementary Appendix 2.** Statistical analysis

**Supplementary References.**

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| **Supplementary Table 1. Questions asked about Psychotic Experiences** |
| **1.1** | **a)  These questions are about certain beliefs or unpleasant thoughts that people sometimes experience.  In the past 5 years (since you were 30) have you ever** | **No** | **Maybe** | **Yes** |   |
|  | Believed you were being secretly tested or experimented on | 1 | 2 | 3 |   |
|  | Believed that someone was plotting against you or trying to hurt or poison you | 1 | 2 | 3 |   |
|  | Believed that someone was spying on you | 1 | 2 | 3 |   |
|  | Been bothered by the belief that someone was following you | 1 | 2 | 3 |   |
|  | Thought that people whom you didn’t know, were talking about you or laughing at you | 1 | 2 | 3 |   |
|  | Believed that someone was reading your mind | 1 | 2 | 3 |   |
|  | Believed that you could hear what another person was thinking, even though they were not speaking | 1 | 2 | 3 |   |
|  | Believed that others could hear your thoughts | 1 | 2 | 3 |   |
|  | Believed that a person, power or force could control your movements or thoughts against your will | 1 | 2 | 3 |  |
|  | Believed that someone or something could put thoughts into your mind that were not your own | 1 | 2 | 3 |   |
|  | Felt that someone or something took your thoughts out of your mind | 1 | 2 | 3 |   |
|  | Been convinced that someone you had not met was in love with you | 1 | 2 | 3 |   |
|  | Believed that you were being sent special messages through the television or radio, or that a programme, song or news story had been made just for you | 1 | 2 | 3 |   |
|  | Felt strange forces working on you, as if you were being hypnotised, hit by x-rays or laser beams, or as if magic was being performed on you | 1 | 2 | 3 |   |
|  | Believed that you did something terrible for which you should have been punished | 1 | 2 | 3 |  |

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| --- | --- | --- | --- | --- | --- |
| **1.2** | **a)  In the past 5 years, have you ever** | **No** | **Maybe** | **Yes** |   |
|  | Had the experience of seeing things, or people, that others who were there at the time could not see, that is, having a vision when you were completely awake? | 1 | 2 | 3 |   |
|  | Experienced, more than once, hearing things or hearing voices that other people could not hear | 1 | 2 | 3 |   |
|  | Heard voices that were commenting on what you were doing or thinking | 1 | 2 | 3 |   |
|  | Heard voices that were telling you what to do | 1 | 2 | 3 |   |
|  | Heard two or more voices talking to each other, that other people could not hear | 1 | 2 | 3 |   |
|  | Carried on a conversation with the voices that other people could not hear | 1 | 2 | 3 |   |
|  | Been bothered by strange smells around you that no one else seemed to be able to smell, perhaps an odour coming from your own body | 1 | 2 | 3 |   |
|  | Had unusual feelings inside, or on your body, like being touched when there was nothing there, or feeling as if something was moving inside your body | 1 | 2 | 3 |   |
|  | Been bothered by strange tastes in your mouth that were not from anything you had eaten | 1 | 2 | 3 |  |

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**Supplementary Appendix 1. Confounding factors and Time-dynamic covariate factors**

**Confounding factors**

A number of potential confounding factors were abstracted from the study database, on the basis that they have been shown to be related to both abuse exposure and PEs in adolescence and adulthood. These factors included:

Socioeconomic factors in childhood

*Family socioeconomic status (at birth).* This was assessed at the time of the participant’s birth using the Elley and Irving1 scale of socioeconomic status for New Zealand. This scale classifies SES into levels on the basis of paternal occupation ranging from 1 = professional occupations to 6 = unskilled occupations.

*Maternal age.*The mother’s age was recorded at the birth of each cohort member.

*Maternal education.* Maternal education levels were assessed at the participant’s birth using a three point scale: 1 = mother lacked formal educational qualifications (had not graduated from high school); 2 = mother had secondary level qualifications (had graduated from high school); 3 = mother had tertiary level qualifications (had obtained a university degree or tertiary technical qualification).

*Family living standards (0-10 years).* At each year a global assessment of the material living standards of the family was obtained via interviewer rating. Ratings were made on a five point scale that ranged from “very good” to “very poor”. These ratings were averaged over the 10 year period to give a measure of typical family living standards during this period.

Family functioning factors in childhood

*Changes of parents (to age 15).* As part of the study data on changes of parents were collected at annual intervals.2 These data were used to construct a measure of the number of changes of parent figures during the interval from birth to the age of 15 years, including changes due to parental separation/divorce, reconciliation, remarriage, death, and other changes of custodial parents.

*Parental history of alcohol problems.* At the 15 year assessment, the parents of cohort members were questioned concerning their history of alcoholism or alcohol problems. On the basis of this questioning 11.9% of the sample were classified as having a parental history of alcoholism/alcohol problems.

*Parental history of depression/anxiety.* At age 15 years the young person's parents were asked if they had a history of anxiety disorders or depressive disorders. On the basis of responses to this questioning 29.9% of the sample were classified as having a parental history of anxiety disorders or depressive disorders.

*Parental history of criminal offending.* When participants were aged 15 years, parents were questioned about their involvement in criminal offending. Participants were classified as having a parental history of criminal offending if any parent reported a history of criminal offending (12.4% of the cohort).

*Parental history of illicit substance use.* When sample members were aged 11 their parents were questioned about parental usage of illicit drugs including cannabis. On the basis of this questioning 27.5% of the sample were classified as having parents who used cannabis or other illicit drugs.

*Parental intimate partner violence (IPV).* At the age of 18, sample members were questioned concerning their experience of violence between parental figures during their childhood (prior to age 16 years), with questions derived from Conflict Tactics Scale. CTS: 3 The items were chosen on the basis that the behaviors could have been readily observed and reported on by the participant, and also to span the potential range of violent behavior from verbal abuse to physical assault. Separate questioning was conducted for violence initiated by the father against the mother and for violence initiated by the mother against the father, and combined into a single scale score representing overall exposure across both parents.

## *Parental Bonding (Maternal and Paternal Care and Protection).* To measure parental bonding, the maternal care and protection scales of the Parental Bonding Instrument PBI: 4 were administered to the cohort members at the age of 16 years. The young person was asked to rate her mother on the PBI items describing the quality of maternal care and protection throughout their childhood. The care scale measures the extent to which the parents provide support, affection and nurturing with a high score indicating high levels of care. The protection scale measures the extent to which parents exhibit tendencies to over protection or over control with a high score indicating tendencies to over control. The reliabilities of the resulting scale scores were assessed using coefficient alpha and found to be good: maternal care α = .89; paternal care α = .91; maternal over protection α = .85; paternal over protection α = .87.

Individual factors

*Gender.*Recorded at birth.

*IQ.* Child cognitive ability was assessed at ages 8 and 9 using the Revised Wechsler Intelligence Scale for Children. WISC-R: 5 Total scores were computed on the basis of results on four verbal and four performance subscales. The split half reliabilities of these scores were .93 at age 8 and .95 at age 9. For the purposes of these analyses the observed WISC-R total IQ scores at age 8 and 9 were combined by averaging over the two administrations.

*Quality of parental attachment (age 15).* Parental Attachment was assessed at age 15 years using the parental attachment scales developed by Armsden and Greenberg.6 The full parental attachment scale was used in this analysis and this scale was found to have good reliability (α = .87).

*Child behavior problems (ages 7-9; conduct, attention, and anxious/withdrawn behavior problems).* When sample members were aged 7, 8, and 9 years, information on child behavior problems was obtained from parental and teacher report. Parental reports were obtained from an interview with the child’s mother using a behavior questionnaire that combined items from the Rutter7 and Conners8 parental questionnaires. Parallel to the maternal report, the child’s class teacher was asked to complete a combined version of the Rutter7 and Conners9 teacher questionnaires. Factor analysis of the item-level report data showed that it was possible to select items from these reports that formed uni-dimensional scales reflecting the extent of parent-reported and teacher reported behavior problems in three domains of behavior10, 11: a) conduct problems: the extent to which the child exhibited aggressive, oppositional, and conduct disordered behaviors; b) attentional problems: the extent to which the child exhibited restless, inattentive, or hyperactive behaviors; and c) anxious/withdrawn behaviors: the extent to which the child displayed a tendency to behave in a shy, anxious or withdrawn manner. For the purposes of the present analysis, the parent and teacher reports were summed for each domain and the resulting scores averaged over the three year period to produce three scale score measures reflecting the extent of the child’s tendencies to conduct problems, attentional problems, and anxious/withdrawn behavior problems at ages 7-9. The alpha reliabilities of these scales were .97, .93, and .87 respectively.

*Adolescent major depression, anxiety disorder and suicidal ideation (age 15).* At age 15 sample members and their parents were interviewed separately concerning the extent of the young person’s symptoms of major depression and anxiety disorders during the preceding year, and the extent to which sample members experienced thoughts of suicide. Symptomatology was assessed using items from the self-report and parent report forms of the Diagnostic Interview Schedule for Children12 respectively, supplemented by additional items to assess DSM-III-R criteria. Suicidal thoughts were assessed via custom-written survey items. On the basis of this information, sample members were classified as having major depression, anxiety disorder or suicidal ideation during the period 14-15 years if, on the basis of either parent or self-report, they met DSM-III-R criteria for a major depressive episode or anxiety disorder, or reported any suicidal thoughts.

*Childhood neuroticism and extraversion (age 14).*At age 14, trait measures of neuroticism and extraversion were assessed using a short form version of the Eysenck Personality Inventory.13 The reliability of this scale assessed using coefficient alpha were .80 and .78, respectively.

## *Novelty Seeking (age 16).* When sample members were aged 16 years they were administered the novelty seeking items of the Tridimensional Personality Questionnaire.14 Novelty seeking assesses the extent to which the individual is "impulsive, exploratory, excitable, disorderly and distractible".14 These items were summed to produce an overall novelty seeking measure. The reliability of this scale was assessed using coefficient alpha and found to be moderately good (α = .76).

**Time-dynamic covariate factors (ages 25-30, 30-35)**

It could be argued that any associations between childhood abuse exposure and adult PEs may in part be mediated by mental health and substance use disorders occurring contemporaneously with PEs. In addition, life stress and long-term unemployment may also be regarded as possible mediators of this association. In order to examine this issue, a series of measures of mental health and substance use disorder, along with life stress and unemployment were selected from the study database. These measures included:

Major depression, anxiety disorders, PTSD, alcohol use disorder, nicotine dependence, cannabis use disorder, other illicit drug use disorder.

To control for any possible effects of correlated mental health and substance use disorders, time-dynamic measures of DSM-IV15 major depression, anxiety disorders, PTSD, alcohol use disorder, nicotine dependence, cannabis use disorder, other illicit drug use disorder were used. At ages 30 and 35 years, participants were questioned regarding symptoms of the above-named disorders during the period since the previous assessment using CIDI16 items and DSM-IV15 diagnostic criteria. The assessment of nicotine dependence was limited to current (past- month) and based on custom-written questions to assess DSM-IV symptoms of nicotine dependence. Sample members who met DSM diagnostic criteria for any disorder during either assessment period (25–30, and 30–35 years) were classified using a series of dichotomous measures as having that specific disorder during that period.

Stressful life events.

To control for any possible effects of stressful life events in linking abuse exposure and PEs, time-dynamic measures of stressful life events were used. Exposure to stressful life events was assessed by questioning respondents about life events for each 12-month period over the periods 25-30 and 30-35 years. Life events were assessed using a 30-item inventory based on the Holmes and Rahe17 Social Readjustment Rating Scale supplemented by custom-written survey items. These items spanned several domains, including: changes to living situation; death/illness; relationship problems/difficulties; problems with family members/family members’ crises; problems with friends/friends’ crises; crime victimisation; and other problems, but omitted questions concerning unemployment (for which there was a separate measure, below). All items were scored on a 0 to 4 scale with 0 representing “no event”, 1 “not upset/distressed”, 2 “a little upset/distressed”, 3 “moderately upset/distressed”, and 4 “very distressed”, based on the recommendations by Brown and Harris.18,19 Using this information, a measures of exposure to stressful life events was created, computed by summing the 0 to 4 scaling for each item for each 12-month period, and then summing over each assessment period, resulting in a total life events distress score for the periods 25-30 and 30-35 years.

Unemployment.

At each assessment at ages 30 and 35 years, cohort members were asked a series of questions concerning their history and patterns of employment and unemployment since the previous assessment. One set of questions examined whether cohort members had been unemployed and looking for work for 3 or more months during any calendar year since the previous assessment. For the purposes of the present study, this information was used to classify participants during each assessment period (25–30, and 30–35 years) as to whether they had been unemployed for three or more months during any calendar year since the previous assessment.

**Supplementary Appendix 2. Statistical analysis**

The data analyses took place over several steps. In the first step, the bivariate associations between the classification of exposure to CSA and CPA and the repeated measures of PEs in adulthood were obtained by fitting a series of negative binomial Generalized Estimating Equation (GEE) models to the data. These models were of the form:

Log (Yit) = B0 + B1X1 +B2X1υi (EQ1)

where Log (Yit) represented the log rate of either abnormal thought symptoms, or abnormal perception symptoms at time t (t = 25-30 years, 30-35 years) for individual I, X1 and X2 were a pair of dummy variables representing the classification of either CSA or CPA to age 16 years, and υi the individual specific error term. The measures of CSA and CPA were represented by a pair of dummy variables (B1 and B2), which allowed Wald chi squared tests of differences between groups. The fitted models also included age terms (not shown) to allow for across time changes in the rate or mean of each outcome. This and adjusted models below were fitted using Stata 14.

In the second step, the bivariate associations between the the classification of exposure to CSA and CPA and the potential confounding factors noted above were obtained via Spearman’s rank-order correlations, estimated using SAS 9.4.

In the third step of the analyses, the associations between: a) abnormal thought symptoms and abnormal perception symptoms at ages 30 and 35; and b) mental health, substance use, life stress and unemployment at ages 30 and 35; were obtained via Spearman’s rank-order correlations, estimated using SAS 9.4.

In the next step, the models shown in EQ1 (above) was extended to include the potential confounding factors noted above, as well as terms for both CSA and CPA. All potential confounding factors were entered into the models simultaneously, after which methods of forward and backward substitution were used to arrive at a set of stable and parsimonious models containing only statistically significant (p < .05) or marginally significant (p < .10) confounding factors. All covariate factors were entered into the models in their original metrics. Estimates of the incidence rate ratio (IRR) and 95% confidence interval (CI) were obtained by exponentiating the fitted model parameters (*eB*).

In the final step of the analyses, the adjusted models described above were further extended to include the time-dynamic covariate factors described above, entered simultaneously.

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