

Being unwanted and other very early predictors of adult psychopathy

Georgia Zara, Henriette Bergstrøm and David P. Farrington

Abstract

Purpose – This paper aims to present new evidence from the Cambridge Study in Delinquent Development (CSDD) showing the extent to which obstetric (e.g. abnormal birth weight, confinement at birth, severe abnormality of pregnancy, etc.) and early childhood and family factors (illegitimate child, unwanted conception, family overcrowding, etc.) have predictive effects on psychopathic traits measured later in life at age 48 years.

Design/methodology/approach – Data collected in the CSDD are analysed. This is a prospective longitudinal study of 411 London men from age 8 to age 61 years.

Findings – The results suggest that none of the obstetric problems were predictive of adult psychopathy. However, some other early childhood factors were significant. Unwanted conception (by the mother) was significantly associated with high psychopathy. The likelihood of being an unwanted child was higher when the mother was younger (19 years or less), and when the child was illegitimate. The poor health of the mother and living in an overcrowded family were also significant in predicting psychopathy in adulthood, as well as both psychopathic personality (F1) and psychopathic behaviour (F2).

Originality/value – These findings suggest the influence of very early emotional tensions and problematic social background in predicting psychopathic traits in adulthood (at age 48 years). They also emphasise the importance of investigating further the very early roots of psychopathic traits.

Keywords Psychopathy, Attachment, Longitudinal study, Prevention, Early risk factors, Obstetric factors

Paper type Research paper

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Criminology has traditionally failed to take the full life course into consideration when attempting to explain antisocial and criminal behaviour. As a result, relevant insights into criminal trajectories and precursors to antisociality and criminality have been neglected (Farrington, 2005). This also applies to the study of psychopathy, where much of the knowledge of the development of psychopathy comes from cross-sectional studies that generally only target a specific period in the life course (e.g. adulthood) (Farrington and Bergstrøm, 2018, 2022; Zara *et al.*, 2021). Research on precursors and correlates of psychopathy has yielded inconsistent results (De Brito, *et al.*, 2021; Lynam *et al.*, 2007), and some (Thomson, 2019) have argued that these inconsistencies could be because of the nature of psychopathy. The “elusive category” that Lewis (1974) referred to when talking about psychopathy continues to remain a relevant terminology even after decades of research on the construct (Vitale, 2022).

Psychopathy is a personality disorder that is characterised by a constellation of affective, interpersonal, lifestyle and antisocial symptoms that cluster together (Hare, 2003). The “prototypical” psychopath is charming and manipulative, lacks empathy and has shallow affect. The combination of all these features makes what is considered psychopathic personality (or Factor 1). This prototypical psychopath is impulsive, takes advantage of others, is involved in an erratic, irresponsible and antisocial lifestyle and engages often in

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criminal behaviour. All these prototypical features comprise what is considered psychopathic behaviour (or Factor 2). Though psychopathy and antisocial personality disorder (ASPD) are often considered to be similar because they share a chronic antisocial lifestyle pattern, and clinical research has shown that they are moderately correlated, they are rather distinct disorders (De Brito *et al.*, 2021). The affective and interpersonal features are those that distinguish psychopaths from individuals diagnosed with a broader range of ASPD symptoms as also emphasised in the DSM-5 (American Psychiatric Association, 2013; see De Brito *et al.*, 2021; Hare and Neumann, 2009).

This distinction seems especially relevant when assessing psychopathy: much reliance on the behavioural expressions of the disorder (such as an erratic and deviant life style, antisocial and criminal behaviour) might lead to an inaccurate assessment or diagnosis (for a critical review see Boduszek and Debowska, 2016). Research shows that affective and interpersonal traits tend to be stable over time (Blonigen *et al.*, 2006) and antisocial and criminal behaviour tends to decline over time (Farrington, 2019b, 2021). Hence, affective and interpersonal deficits are likely to be at the core of psychopathy (Boduszek and Debowska, 2016), whereas a deviant life style and involvement in criminality are possible behavioural manifestations of psychopathy (Skeem and Cooke, 2010). For instance, in a study carried out by Boduszek *et al.* (2021), different populations (prisoners, community adults, university students and adolescents) were compared on four sets of psychopathy traits (affective responsiveness, cognitive responsiveness, interpersonal manipulation and egocentricity). Findings showed the presence of qualitatively different groups of psychopathy, with prisoners being not more psychopathic than non-prisoners. It is interesting to note that the high psychopathy group for their prisoner and student samples amounted to approximately 7% (Boduszek *et al.*, 2021).

Debate is still ongoing as to how psychopathy develops and how it is affected by early life events, as described in a vast literature (Beaver *et al.*, 2012; Bergström and Farrington, 2018; Boduszek *et al.*, 2019; Farrington and Bergström, 2018, 2021; Glenn, 2018; Jackson and Beaver, 2016; Thomson, 2019; Zara and Farrington, 2016), but there is a clear research gap when it comes to the potential role of obstetric and early infancy factors (Thomson, 2019). This is an important gap to address, as the study of these factors may have implications for how we understand the development of psychopathy, bridging our knowledge between biological, psychological and social factors.

Farrington and Bergström (2021) investigated the extent to which early risk factors, measured at ages 8–10, could predict psychopathy in adulthood, at age 48. They investigated the risk factors which were judged to be most important in the Cambridge Study in Delinquent Development (CSDD). They found that the best predictors of Factor 1 were attending a high delinquency rate school, high daring, high hyperactivity and low verbal intelligence, while the best predictors of Factor 2 were high troublesomeness, high daring, high dishonesty and low family income.

In light of these previous findings, the aim of the present paper is to investigate to what extent very early risk factors (e.g. measured at birth) predict psychopathy at age 48. Only a few studies have attempted to investigate which childhood factors predict callous-unemotional behaviour in childhood (Bedford *et al.*, 2017) and psychopathic traits in adolescence (Beaver *et al.*, 2014; Kerig *et al.*, 2012) or adulthood (Glenn *et al.*, 2007; Jackson and Beaver, 2016). However, no previous studies have investigated very early predictors of psychopathy in middle age.

Identifying precursors of psychopathy: from the early beginnings

Pregnancy and infancy are crucial for individual development and later social adjustment (Olds *et al.*, 1998) because they are closely intertwined with attachment (Vaughn *et al.*, 2008). Attachment is a basic human need that fosters connection to others and involves a

close relationship between the infant and the primary caregiver (Beckett and Taylor, 2010). John Bowlby (1969) defined attachment as a unique relationship between the infant and her/his main caregiver (usually the mother) that is the foundation for further (healthy or unhealthy) development. The child's sense of trust or distrust towards the world depends on it (Gurol and Palot, 2012). Research (Brandon *et al.*, 2009; Cranley, 1981) shows that attachment starts at a prenatal level. In other words, prenatal attachment creates the foundation for developing the emotional closeness and psychological bond between the pregnant mother and her unborn infant (Bretherton and Waters, 1985; Condon and Corkindale, 1997). Circumstances surrounding the pregnancy and birth (obstetric variables) can also influence later life outcomes of the child. Some can be indicators of neuropsychological problems (Tibbetts and Piquero, 1999), others can impact upon the emotional stability of the individual (Barker *et al.*, 2011), and others can influence social adjustment to life (Olds *et al.*, 1998; Van den Bergh *et al.*, 2005). For example, stress during pregnancy has been related to later psychopathic traits of the child (Gao *et al.*, 2016).

Studies conducted on human beings have revealed that care deprivation and family stressors, especially early in life, have a major effect on right brain regulation (Ishikawa and Raine, 2003) and on emotional and mental development (Mack *et al.*, 2011). Behavioural effects could be seen in weakened social interactions, school drop-out, conduct disorders (Loeber *et al.*, 1998), aggressive and hostile behaviours during childhood (Dekleyn and Greenberg, 2008), behavioural disorders during adolescence and experiences of drug abuse and social maladjustment during adulthood (Sroufe, 2005).

Results have however been mixed. For example, unwanted pregnancy might contribute to an increased risk for later criminal behaviour of the offspring (Donahue and Levitt, 2000), albeit its effect has more recently been contested (Shoesmith, 2015). Low birth weight has been found to be a positive predictor for general criminality (Tibbetts and Piquero, 1999), and for internalising problems (Boyle *et al.*, 2011) but not for psychopathy.

Lalumière *et al.* (2001) conducted two comprehensive studies on the role of developmental problems in psychopathy. Most relevant to the current discussion is the first study of 800 psychopathic ($n = 157$) and non-psychopathic ($n = 643$) offenders, where a wide range of obstetric problems were recorded. The most common obstetric problems were "mother older than 35 at subject's birth" (7%), "use of forceps/instruments during delivery" (7%) and "prolonged labour and delivery" (4%). As Lalumière *et al.* (2001) highlighted, the overall level of obstetric problems was low. A scale was created to measure the number of obstetric problems, and this was then correlated with the psychopathy checklist-revised (PCL-R) scores. Interestingly, a higher PCL-R score was *negatively* related to obstetric problems. This means that those who scored higher on psychopathy were *less likely* to have experienced problems around the time of birth.

Perinatal and early risk factors were recently examined in a sample of 1,631 children (51.5% girls) from the Quebec Longitudinal Study of Child Development, to explore trajectories of psychopathic traits across childhood (Bégin *et al.*, 2021). A few perinatal factors (e.g. psychotropic exposures) and most child (e.g. difficult temperament) and family life factors (e.g. maternal depression, low marital support, socio-economic adversities) significantly increased the odds of a high-stable trajectory of psychopathy or the exacerbation of psychopathic traits across childhood.

Jackson and Beaver (2016) analysed data from the National Longitudinal study of Adolescent Health (Add Health) on the potential effect of breast feeding. Add Health was started almost 30 years ago as a large ($n = 90,000$) US-based prospective longitudinal study. For their 2016 research, a subsample of participants ($n = 2,500$) was analysed. Psychopathic traits were measured at Wave 4 and assessed using personality indicators, while breast feeding was measured both dichotomously and as a duration variable. The results indicated that, when controlling for a range of other variables (e.g. age, sex, SES),

not having been breastfed or having a short period of breastfeeding were significant predictors of psychopathy, even though the effects were small (Jackson and Beaver, 2016). Interestingly, Jackson and Beaver (2016) also found that low maternal attachment was predictive of later psychopathic traits. This latter finding can be viewed in light of Meloy's (1988) theory.

According to Meloy (1988), psychopathy involves a poor capacity to bond, that implies a disorder of profound detachment and a disorder of extreme attachment (Meloy, 2002). In other words, the roots of psychopathy might be better understood and assessed by looking at a person's early experiences with primary attachment figures. Early experiences of childhood rejection from caregivers could lead to aggression and hostility in adulthood (Leary *et al.*, 2006) and are also likely to shape later life outcomes and psychopathic traits (Bowlby, 1952; Barker *et al.*, 2011; Jackson and Beaver, 2016; Kochanska and Kim, 2013; van der Zouwen *et al.*, 2018).

Dutton *et al.* (1996), studying the characteristics of male abusive personality, found that paternal rejection was the strongest predictor of an abusive personality. Also, Barnow *et al.* (2002) found that parental rejection played a significant role in the development of ASPD, especially when characteristics such as callousness and aggressiveness were prevalent. Using a large birth cohort of over 4,000 males in Denmark, Raine *et al.* (1994) found that, among those who experienced maternal rejection in infancy (at Age 1) and birth complications, nearly 9% were involved in violent crime by Age 18, compared to less than 4% of those who had experienced only rejection, birth complications, or neither.

The present study

The aim of this paper is to present new evidence from the CSDD on obstetric and infancy factors and to examine the extent to which factors early in life may have predictive effects on psychopathic traits later in life.

Despite its potential importance for future development, there is a lack of research on obstetric and early infancy factors in relation to later psychopathy (Thomson, 2019). The following research questions will guide the current investigation:

- RQ1. Will obstetric complications predict psychopathic traits at age 48?
- RQ2. Will early infancy conditions and early family factors predict psychopathic traits at age 48?
- RQ3. Will these obstetric complications and early problems have a predictive role depending on the particular cluster of psychopathic traits (Factor 1 versus Factor 2)?

Methods

Sample

The current investigation analyses data from the CSDD. As described elsewhere (Farrington, 2019a, 2021), the CSDD is a prospective longitudinal study of delinquent and criminal behaviour in a community sample of 411 males. The study started in the early 1960s, which explains why some terms used to define some measured variables may sound a little out of date.

The CSDD originally involved a cohort of boys from the registers of six state schools in a working-class area of South London. An office was established for the study in 1961 in this area, and the six state primary schools enlisted in the study were within a one-mile radius of the office. All boys aged 8–9 in those schools were included in the study, so the sample was representative of boys living in the area. There were no private schools in the area. These CSDD men have been followed across the life-course, from age 8 through to age 61 (Farrington *et al.*, 2021; Farrington and Jolliffe, 2022). Most of the CSDD men were

Caucasian and from a working-class background and left school by age 16 (61%); their father's employment was mainly unskilled and semi-skilled manual work in 93.7% of cases, which was higher than the national average at that time of 78.3%. Interviews with the men at age 48 focused on information about their relationships and involved 365 (92.6%) of the 394 men who were still alive (Farrington *et al.*, 2006).

The survey received ethical approval from the Home Office, Cambridge Institute of Criminology and the Ethics Committee of the Institute of Psychiatry, King's College London.

Measures

In total, 18 risk factors, divided into three main categories of life development, were analysed: obstetric complications (i.e. abnormal birth weight, abnormal confinement at birth, obstetric abnormality, severe abnormality of pregnancy) were based on medical records; childhood conditions (i.e. boy's health, dull mother, feeding problems in infancy, fretful baby, illegitimate child, milestones in infancy, toilet training, unwanted conception, young mother); and family conditions (i.e. father's and mother's past and present health, family overcrowding) were based on psychiatric social worker interviews with the parents when the boy was age 8–9.

Obstetric conditions. Abnormal birth weight was assessed as being very low (below 2.5 kg) or very high (above 4.5 kg). Confinement was considered severely abnormal if more than one of the following complications occurred: asphyxia, bleeding after the onset of labour, caesarean section, foetal distress and forceps delivery. Any obstetric abnormality was recorded if present and assessed. Severe abnormality of pregnancy could include antepartum haemorrhage (bleeding after 28 weeks of gestation before the onset of labour), cases with albuminuria, severe toxemia and pre-eclampsia.

Childhood conditions. Unwanted conception was defined as an undesirable accident in which the mother definitely felt resentful of the pregnancy and possibly attempted to terminate it. The child's illegitimacy was recorded if the child was born out of wedlock and if the mother and the father were not married to each other at the time of birth registration (Kiernan, 1971).

The psychiatric social workers who visited the homes provided an assessment of the cognitive level of the boy's mother (e.g. dull mother) and of the general well-being of the boy and his parents. Information about the boy included fretfulness, which described a baby (up to age 1 year) who was unhappy, whined constantly, could not be calmed and was difficult to soothe. The boy's health was rated as unhealthy if the boy had severe bouts of illness (e.g. bronchitis, asthma) or persistent illness (e.g. otitis). Infant milestones were measured by assessing any form of delay in walking or talking that was classified as a dysfunctional developmental delay (e.g. onset of walking after at 18 months or talking after 2 years). Toilet training was rated as rigid if the determination to get the baby clean by a certain age was influenced by the mother's fear, anger, or emotionality and if the child was punished for accidents.

Family conditions. An overcrowded family referred to the number of children and also to the number of rooms available in the house (e.g. fewer rooms than children). The past health of the father and mother was considered unhealthy if significant illnesses, major surgeries or accidents had affected their health. The current poor health of the father and mother was assessed by the psychiatric social worker; chronic or recurrent illness was considered if it was likely that it could cause persistent relapses, periods of illness or disability. (For detailed descriptions of all these childhood risk factors in the CSDD, see West and Farrington, 1973, 1977).

Psychopathy. Psychopathic traits were assessed as part of the in-person interview at age 48 using the psychopathy checklist: screening version (PCL:SV; Hart *et al.*, 1995), which is the shorter version of the more comprehensive PCL-R (Hare, 2003). The PCL:SV is adapted

for use with community samples: it consists of 12 items, each rated on a three-point ordinal scale (0, 1 and 2) for a total score of 24 (Hart *et al.*, 1995). The PCL:SV measures psychopathy based on two factors, which both have scores from 0 to 12. Factor 1 is a measure of psychopathic personality: F1-PP. Factor 2 is a measure of psychopathic behaviour: F2-PB.

The reliability of the PCL:SV, as a measure of psychopathy, is reported elsewhere (Acheson, 2005; see also Auty *et al.*, 2015). In the CSDD, the PCL:SV was administered by a trained forensic psychiatrist (Crystal Romilly) and then independently rescored by a PhD-level psychologist (Simone Ullrich) (Farrington and Bergström, 2021). The total scores of the two diagnostic raters correlated 0.95.

When studying childhood predictors of total psychopathy scores, Farrington and Bergström (2018) noted that these scores were non-linearly related to offending and to violence convictions. Hence, they decided to dichotomise them into high (10 or more) versus low (0–9) PCL:SV scores and found that high scorers were qualitatively different from low scorers. They also dichotomised into high F1-PP (3+) and high F2-PB (5+) scores; dichotomised variables permit an easy and very understandable method of studying how predictors influence outcomes (Farrington and Bergström, 2021).

While psychopathic personality can be found at a subclinical level in the general population (Ene *et al.*, 2022), suggesting that psychopaths are not a distinctive class of individuals (Edens *et al.*, 2006), thresholds can be used to make prevention and treatment recommendations. Establishing thresholds does not deny the dimensional nature of psychopathy, but they may be of practical use. For this investigation, in light of previous studies (Farrington and Bergström, 2018; Zara and Farrington, 2016), the total psychopathy score and Factor 1 (psychopathic personality) and Factor 2 (psychopathic behaviour) scores were dichotomised (please see note on Table 1 for cut off scores).

Analytical strategy

For psychologists and criminologists, individuals are rather more interesting than variables, and the dichotomisation of explanatory variables encourages a focus on the person that encompasses the identification of those individuals who are directly influenced by several risk factors, and who may specifically benefit from specialised early prevention (Farrington and Loeber, 2000).

On a critical note, dichotomisation of continuous variables could have some cost (e.g. losing information, statistical drawbacks), and this should be taken into account before splitting data into two categories (Altman and Royston, 2006). However, variables may be nonlinearly related to outcomes, as research shows (Farrington and Bergström, 2018, 2021), and variables are rarely measured on normally distributed equal-interval scales (like height and weight). Bearing this in mind, dichotomisation makes it possible to compare the predictive strengths of variables, to equalise the sensitivity of their measurement and to better understand which findings can be translated into practice (Agresti, 2007, 2019; Farrington and Loeber, 2000; Hanson, 2022).

In line with past recommendations by Farrington and Loeber (2000), all variables were dichotomised into the “worst” quarter versus the remainder. This cut-off point was decided *a priori*, and supported by previous research findings using the CSDD data (Farrington, 2019b), and other longitudinal data (Loeber *et al.*, 1999). Dichotomisation did not cause a great loss of information because most variables were measured on 2, 3 or 4 point scales.

Odds ratios (OR) were calculated between the early obstetric complications and family problems and later psychopathic traits. A series of logistic regression analyses were carried out to explore the probability of a specific outcome occurring (e.g. high psychopathic traits)

Table 1 Early predictors of psychopathy versus PCL:SV scores

Predictors	Psychopathic traits				F1-PP				F2-PB			
	Low	High	OR	p	Low	High	OR	p	Low	High	OR	p
	(n = 236)	(n = 68)			(n = 249)	(n = 55)			(n = 233)	(n = 71)		
	%	%			%	%			%	%		
<i>Obstetric complications</i>												
Low birth weight	5.2	2.2	0.40	n.s.	4.9	0.2.8	0.55	n.s.	5.3	2.1	0.39	n.s.
Abnormal confinement at birth	20.9	17.4	0.80	n.s.	19.6	22.2	1.17	n.s.	21.7	14.9	0.63	n.s.
Obstetric abnormality	52.9	52.2	0.97	n.s.	51.5	58.3	1.32	n.s.	53.9	48.9	0.82	n.s.
Severe abnormality during pregnancy	20.9	21.7	1.05	n.s.	20.2	25.0	1.31	n.s.	21.7	19.1	0.85	n.s.
<i>Childhood conditions</i>												
Dull mother	18.9	13.4	0.66	n.s.	19.1	11.3	0.54	n.s.	17.8	17.4	0.974	n.s.
Feeding problems in infancy	28.8	35.0	1.33	n.s.	28.4	38.3	1.56	n.s.	28.7	34.9	1.33	n.s.
Fretful baby	21.6	19.4	0.87	n.s.	21.7	18.4	0.81	n.s.	22.6	15.9	0.65	n.s.
Illegitimate child	3.4	10.3	3.27	0.01	4.0	9.1	2.39	0.06	3.9	8.5	2.30	0.06
Milestones in infancy	16.5	19.4	1.21	n.s.	16.9	18.0	1.08	n.s.	16.2	20.3	1.32	n.s.
Poor health of boy	33.3	29.2	0.83	n.s.	32.8	30.8	0.91	n.s.	32.7	31.3	0.94	n.s.
Toilet training	17.6	16.4	0.92	n.s.	18.7	10.4	0.51	n.s.	18.1	14.5	0.77	n.s.
Unwanted conception (by mother)	16.3	32.8	2.51	0.004	18.4	27.1	1.65	0.09	17.5	28.1	1.85	0.03
Young mother (19 years or less)	21.6	27.9	1.41	n.s.	22.1	27.3	1.32	n.s.	21.0	29.6	1.58	0.07
<i>Family conditions</i>												
Family overcrowding (ages 8–9)	16.1	30.8	2.32	0.01	16.9	30.2	2.12	0.01	14.9	34.3	2.99	0.001
Poor health of parents (at present)												
Father	21.2	26.2	1.32	n.s.	22.1	23.5	1.09	n.s.	21.2	26.2	1.32	n.s.
Mother	24.0	38.5	1.98	0.01	24.2	40.4	2.10	0.01	24.7	35.8	1.71	0.04
Poor health of parents (in past)												
Father	27.9	36.1	1.46	n.s.	28.2	36.7	1.48	n.s.	27.4	37.5	1.59	0.06
Mother	28.1	36.9	1.50	0.09	29.9	31.4	1.07	n.s.	28.4	35.8	1.41	n.s.

Notes: PCL:SV scores for all factors were dichotomised. Factor 1 – Psychopathic personality (F1-PP). Factor 2 – Psychopathic behaviour (F2-PB). High score on PCL:SV = 6 or more. High score on F1-PP = 3 or more. High score on F2-PB = 4 or more. All significant ORs do not overlap the null value (e.g., OR = 1). One-tailed tests were used because of clear directional predictions

according to whether a set of predictors (e.g. unwanted conception) is statistically important.

Results

Table 1 shows the ORs between the obstetric variables and adult psychopathy at age 48. None of the obstetric problems were predictive of psychopathy, either for the total psychopathy score or for the factor scores. ORs between early childhood conditions and adult psychopathy are also shown on Table 1. Some early childhood problems were significantly predictive of psychopathic traits at age 48. Unwanted conception (by the mother) was significantly (OR = 2.51, $p = 0.004$) related to high psychopathy. This means that, if the CSDD male was the result of an unwanted pregnancy, this increased his risk of being high on psychopathic traits later in life. At the factor level, unwanted conception was near significance when related to F1 (OR = 1.65, $p = 0.09$) and significantly related to F2 (OR = 1.85, $p = 0.03$). F1 reflects psychopathic personality traits, and F2 reflects the impulsive lifestyle and antisocial traits of psychopathy.

The likelihood of being an unwanted child was higher for younger mothers (19 years or less) (OR = 1.65, $p = 0.06$). Moreover, being an unwanted child was significantly more likely when the child was illegitimate (i.e. parents not married) (OR = 4.31, $p = 0.001$). Being identified as an illegitimate child was also predictive of later total psychopathy (OR = 3.27, $p = 0.01$), while the relationship was near significance ($p = 0.06$) for F1 and F2.

Looking at parents' health, a poor health of the mother at present was significant in predicting total adult psychopathy (OR = 1.98, $p = 0.01$), and also psychopathic personality

(F1) and psychopathic behaviour (F2). On the other hand, the poor health of the father was only near significance in predicting psychopathic behaviour (F2).

All other childhood factors examined (health, being fretful, feeding problems, toilet training and infancy milestones) were not significant in predicting psychopathy.

A series of stepwise logistic regression analyses was carried out to predict high versus low psychopathic traits. All significant variables in Table 1 are included in the analysis as predictors. Unwanted conception (by the mother), mother's health (at present) and family overcrowding (at ages 8–10) were significant predictors of high psychopathic traits. Table 2 shows all significant results.

Discussion

This paper presents new evidence from the CSDD by examining the extent to which obstetric and early childhood factors predict psychopathic traits later in life (at age 48).

There are several interesting findings from the current investigation. First and foremost, the *lack* of predictive relationships between obstetric problems and later psychopathy is an interesting finding in itself. It is well-known that null findings are often ignored in published research (Landis *et al.*, 2014; Mlinarić *et al.*, 2017), but this arguably limits the understanding of important psychological phenomena such as psychopathy. The lack of significant relationships is also in line with past literature (Lalumière *et al.*, 2001) and could be viewed as support for what several authors (Glenn *et al.*, 2011; Pullman *et al.*, 2021; Zara *et al.*, 2021) have argued that psychopathy is not actually maladaptive *per se*. However, the fact that psychopathy can be recognised as an adaptive strategy in response to early life stress and harsh environments (Ene *et al.*, 2022), that is beneficial in dangerous situations (Ellis and Del Giudice, 2019), does not make it a prosocial adaptation.

Consistent with the idea that children with callous-unemotional (CU) behaviours may have difficulty recognising emotional expressions, Bedford *et al.* (2017) showed in their study of early maternal sensitivity and infants' mother-directed gaze that infants with low levels of maternal face gaze exhibited higher levels of CU behaviour during face-to-face interactions at age 7, but only when maternal sensitivity was low. Bedford *et al.* (2017) highlighted the benefit of considering multiple influences in infancy, including maternal and child emotional sensitivity and behaviour, when assessing early predictors of CU behaviours.

The lack of predictive relationships between early childhood characteristics of the boy (such as poor health or rigid toilet training or poor milestones in infancy) and adult psychopathic traits, seems to reinforce the hypothesis, still under scientific scrutiny, that psychopathy does not directly emerge from a dysfunctional development. Without stepping

Table 2 Logistic regressions predicting psychopathic traits at age 48

Criterion	Predictors	B	SE(B)	Partial OR	95% CI	p
High psychopathic traits (vs low psychopathic traits)	Unwanted conception (by mother)	0.79	0.35	2.21	1.12–4.35	0.02
	Family overcrowding (ages 8–10)	0.72	0.34	2.05	1.05–4.02	0.04
High F1-PP traits (vs Low F1-PP traits)	Family overcrowding (ages 8–10)	0.60	0.36	1.83	0.90–3.70	0.09
	Mother health (at present)	0.67	0.33	1.95	1.03–3.71	0.04
High F2-PB (vs Low F2-PB)	Family overcrowding (ages 8–10)	1.10	0.32	2.99	1.60–5.60	0.001

Notes: PCL:SV scores for all factors were dichotomised. Factor 1 – Psychopathic personality (F1-PP). Factor 2 – Psychopathic behaviour (F2-PB). High score on PCL:SV = 6 or more. High score on F1-PP = 3 or more. High score on F2-PB = 4 or more. To check the assumption of no multicollinearity (*ill conditioning*) (Belsley *et al.*, 2004), the variance inflation factor (VIF) and collinearity tolerance (CT) were calculated. Although there are no strict rules about what value of the VIF should cause concern, corresponding guidelines in Menard's text (1995) suggest that, if the average VIF is not substantially greater than 1, then there is no cause for concern, while tolerance below 0.2 indicates a potential problem (Menard, 1995). In this study, VIF values were as follows: high psychopathic traits vs low psychopathic traits = 1.01; High F1-PP vs Low F1-PP = 1.02; High F2-PB vs Low F2-PB = 1.00. CT values were as follows: high psychopathic traits vs low psychopathic traits = 0.98; High F1-PP vs Low F1-PP = 0.99; High F2-PB vs Low F2-PB = 1.00

into the debate of whether psychopathy is a disorder or an adaptation (Leedom and Almas, 2012; Zara *et al.*, 2021), psychopathy may instead be a surviving response to the emotional void experienced early in life, as described by Buss *et al.* (1998), when the child is bereft of parental protection. In other words, psychopathy could be a way of shielding oneself from further rejection and emotional distancing rather than the emerging results of perinatal complications. This may help to understand differences and similarities between *affective disturbance* and *affective deficit* (Skeem *et al.*, 2007), even though, as Kerig *et al.* (2012) advocated, “acquired callousness also might involve deficits in the access to and recognition of internal emotions” (p. 277).

The predictor of unwanted pregnancy (by the mother) is not only interesting *per se*, but together with family overcrowding, and poor mother’s health seems to describe the parental emotional tension and the social background in which some of the CSDD boys grew up, offering possible explanations for the associations. For example, it could be that these factors are indicators of attachment issues between the mother and the child which are known to be related to psychopathic traits (Bowlby, 1952; Barker *et al.*, 2011; Conradi *et al.*, 2016; Craig *et al.*, 2013; Jackson and Beaver, 2016; Meloy, 1988; Schimmenti *et al.*, 2014). As research shows (Mikulincer *et al.*, 2003), experiences of insensitivity and emotional rejection (i.e. betrayal trauma) may contribute to the process of emotionally distancing oneself from others as a way of reducing or coping with social frustration and emotional disappointment. However, as Kerig *et al.* (2012) emphasised, the association between betrayal trauma and social difficulty remains largely unexplored.

Furthermore, it is also possible that the fact that the mother was unwell and unwed was associated with stress during pregnancy (Everett and Schechter, 1971), and research indicates that stress during pregnancy is related to later psychopathy of children (Gao *et al.*, 2016). At the time of the birth of the CSDD boys (1953), being pregnant outside wedlock was related to a wide range of other risk factors such as those established by Farrington and Bergström (2018).

A final potential explanation is that growing up in an overcrowded family might not have made it any easy for a child to experience the necessary emotional security, and for the mother to feel an adequate parent, with all the psychological and social consequences for their well-being and their social functioning.

These results together suggest that some early life factors are associated with a higher risk of psychopathic traits, and different pathways could be addressed to prevent the exacerbation of mother’s stress during pregnancy, the dysfunctional bond and emotional detachment between mother and child, and the daily condition within which family life is restrained and compromised. Further examination of the CSDD data needs to be carried out to explore in depth the other developmental emotional, psychological and social conditions of the CSDD men in their adolescence and early adulthood. The key need is to intervene as early as possible to prevent, reduce or avoid serious emotional difficulties and serious problem behaviours later (Allely, 2020).

Limitations

Despite its methodological strengths (Kavish *et al.*, 2020), the CSDD is not immune to limitations. In any longitudinal study, period effects must be considered. The CSDD began at a time (1961) when family and social norms were different from today (Inglehart, 2008). While views on out-of-wedlock births have changed, illegitimacy could carry a sense of rejection today as it did 60 years ago. Despite the social, cultural and historical gap that exists between the beginning and the current development of the CSDD, the present study shows that certain early experiences, such as being unwanted as a child and growing up with an unhealthy mother in an overcrowded family, influence individual development in today’s society as much as they did then.

It would have been important to assess the personality traits of the CSDD parents to examine possible patterns of intergenerational continuity from parents to children. Psychopathic traits were assessed at age 48 for the CSDD men. If CU traits and behaviours had been examined in childhood, and psychopathic traits in adolescence and early adulthood, more information might be available on how these early callous and psychopathic traits may continuously affect the psychological and social functioning of CSDD men.

Conclusions

It is remarkable that childhood factors predict adult psychopathy. These findings show the parental emotional tension and unstable social background in which some of the CSDD men grew up and that predicted psychopathic traits in adulthood (at age 48). The lack of predictive relationships between obstetric problems and later psychopathy suggests that psychopathy may be a way of shielding oneself from further rejection rather than the direct result of perinatal complications.

These findings also emphasise the importance of investigating further the early emotional roots of adult psychopathic traits. Hence, these findings are complex and encouraging. Their complexity is that, consistent with other studies (Sroufe, 2005), they confirm that early attachment experiences are crucial to the development of the person, and that children need to be nurtured and protected to become psychologically and emotionally comfortable adults. Achieving this is obviously difficult when the attachment between child and parent is compromised by many factors, not least from unwanted pregnancy and poor maternal health. However, these findings are encouraging because they suggest that a difference can be made if early intervention prevents emotional detachment from one's child and significantly enhances the role of parenting.

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