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# Emerging severe personality disorder in childhood

Eileen Vizard

## Abstract

Personality disorder does not suddenly emerge at age eighteen years old. There are obvious links between early childhood temperament and the development of personality traits in later childhood. Nevertheless, clinicians do not routinely assess aspects of a child's personality as part of a mental health examination. This may stem from a fear of 'labelling' a child should any problems in personality development be noted, particularly those likely to progress to a personality disorder in adult life. At present, there is little research evidence informing the development of the most commonly presenting adult personality disorders such as borderline and narcissistic personality disorders. There is also a dearth of information about normative personality development in childhood. In contrast, research evidence and clinical experience show that there are behavioural and neuro-cognitive markers for emerging antisocial personality disorder in early childhood. Brain imaging studies have suggested that early childhood trauma may adversely affect the development and functioning of the child's brain. Research has also shown a genetic component in children with psychopathic (callous-unemotional) CU traits. Because adult individuals with psychopathic traits are over-represented in populations of the most dangerous incarcerated offenders, early identification of children with psychopathic traits is clearly important.

**Keywords** antisocial; callous-unemotional; imaging; neuro-cognitive; psychopathy

## Background

Recent government initiatives have invested in secure facilities for adult offenders with Dangerous Severe Personality Disorders (DSPD) whose high levels of psychopathy may make them refractory to treatment.<sup>1</sup> Government has set up the Social Exclusion Task Force to intervene with children and families deemed to be 'high risk/high harm', many of whom also have risk factors for developing antisocial personality disorder.<sup>2,3</sup> The National Academy for Parenting has been set up to provide evidence-based parenting input for high-risk families with young children. For the middle age band of childhood and adolescence (11–18 years old), multi-systemic treatment (MST) sites have been set up to provide treatment for offending children and young people. Research has

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shown that this type of intervention is more effective in reducing offending behaviour and also cheaper than treatment as usual.<sup>3</sup> Therefore, there is current interest from government, across the life span, in identifying the early childhood indicators of later personality disorder, making effective parenting inputs to high-risk families, providing treatment for adolescent antisocial youth and trying to find some way of containing and treating some of the most dangerous adult offenders in the country. As yet, little research has been done on the most effective way to intervene with the most high-risk children showing psychopathic, callous-unemotional (CU) traits, although they may be unlikely to respond to more traditional parenting approaches.<sup>4–6</sup>

## Epidemiology

Studies of adults with antisocial personality disorder show that they share common childhood risk factors for delinquency.<sup>7–9</sup> Conduct disorder (CD) in childhood has been robustly linked to the later development of antisocial behaviour and psychiatric disorder. Nearly 40% of children with a diagnosis of CD have been noted to develop serious psychosocial disturbance in adult life.<sup>7,10–13</sup> A connection between multiple symptoms of CD and adult antisocial behaviour at age 18 years has been shown to indicate a possible 'dose' relationship.<sup>14</sup>

There is also an association between genotype, childhood maltreatment and the risk of developing antisocial behaviour. New research evidence and a meta-analysis showed that, across studies, the association between maltreatment and mental health problems was significantly stronger in the group of males with the genotype linked to low versus high monoamine oxidase A activity.<sup>15</sup>

There is some evidence that antisocial behaviour arises in individuals with childhood histories of attention deficit hyperactivity disorder (ADHD) rather than CD, but this is controversial. It has been posited that alone ADHD is not a precursor of antisocial personality but, rather, that it increases the risk of antisocial personality when it co-occurs with CD.<sup>16</sup>

A diagnosis of Oppositional Defiant Disorder (ODD) in pre-school children might be thought to overlap with CD criteria and identify treatment needs for these children. However, in a review of the criteria for Diagnostic and Statistical Manual of Mental Disorders (DSM)-V CD,<sup>6</sup> it was noted that 'very few studies of pre-schoolers have examined both ODD and CD in the same samples, and no conclusion can yet be reached regarding whether ODD is sufficient to identify treatment at this age or whether a CD diagnosis would improve clinical practice and service delivery'.

The possible disadvantages of preschool CD diagnosis include the fact that aggressive behaviour is common and developmentally normative in pre-schoolers, that conduct problems will decrease across the first 10 years of life and that 'down-aging' diagnostic criteria validated for older adolescents to younger children may promote over-diagnosis.<sup>6</sup> Of the estimated 15% of 5 year olds who display signs of ODD, there are subsequent 'in-flows' and 'out-flows' of individuals from a trajectory towards adolescence. The result is that one-fifth can be expected to escape from this high-risk group by age 8 years, and by age 17 years fewer than half of those in the original ODD group of 5 year olds will fulfil criteria for conduct disorder.<sup>3</sup>

Similarly, desistance from an initial conduct disorder diagnosis is well known. In Robins's 30-year follow-up of a child guidance sample of conduct disordered children, 60–70% did not go on to become adults with antisocial personality disorder.<sup>10</sup> Longitudinal delinquency studies show heterotypic continuity with a range of offence types and early and late onset, desistent and persistent, potential pathways towards adult antisocial behaviour.<sup>6,17,18</sup>

Moffitt's 2008 review also examined the role of subgroups and concluded that the two main age-of-onset subtypes (childhood onset persistent and adolescent onset) conveyed differential information about individuals' characteristic problems, were reliable and had clinical utility. Clear distinctions could be made about the family backgrounds, course and prognosis of the two subtypes of CD. In summary, the childhood onset persistent type showed a wide range of problems, including parental antisocial behaviour, greater genetic liability, neuro-cognitive deficits, low IQ, hyperactivity and peer difficulties, whereas the adolescent group tended to score within normal limits on these measures.<sup>6</sup>

CU traits also distinguish a subgroup of CD children. These CU children show extreme behaviour problems, a stronger genetic risk, more severe and pro-active aggression,<sup>19</sup> more heritability of antisocial traits<sup>20</sup> and at-risk neuro-cognitive profiles.<sup>6</sup> The neuro-cognitive profile of children with CU traits is suggestive of amygdala/orbitofrontal dysfunction, shown by insensitivity to punishment and distress cues<sup>21,22</sup> and is similar to that seen in adult psychopaths.<sup>23</sup> In a large community sample ( $n = 5770$ ) of young people in the UK, CU traits independently predicted the number and intensity of conduct, emotional and hyperactivity symptoms at follow-up.<sup>24</sup> CD children with CU traits differ from 'CD alone' children in that they show punishment insensitivity and are indifferent to conventional parenting programmes, which tend to use 'time out' interventions.<sup>5</sup>

A very similar profile of children with CU traits was noted in a recent study of conduct disordered children ( $n = 280$ ), which identified a high-risk subgroup with psychopathic traits. The subgroup, described as having emerging severe personality disorder (ESPD) traits, shared many known risk factors for antisocial behaviour, with multiple CD symptoms, an at-risk neuro-cognitive profile, an early onset of persistent physical aggression towards others and twice as many convictions for violent offences than the non-ESPD group. The study also identified an early onset, delinquent developmental trajectory towards late adolescence and adult life for the ESPD group, in line with Moffitt's 2008 review.<sup>26,6</sup>

### Normal personality development and psychopathology

Personality traits have been noted in humans since ancient times and the four body 'humours' (black and yellow bile, blood and phlegm) have been linked to particular personality styles over the centuries. It has long been recognized by researchers (and by parents) that differences in infant temperament can be detected at an early stage in life. Temperament in children was first studied fully in the New York Longitudinal Study (NYLS), which resulted in a nine-trait classification of infant temperament.<sup>25</sup> These traits were clustered into three clinically useful categories of temperament – 'easy', 'difficult' and 'slow to warm up'. Early 'difficult' temperament has subsequently been shown to be a well-known

risk factor for a range of adverse outcomes in later childhood.<sup>7,26</sup> Some childhood temperamental traits (e.g. shyness/inhibition) have been linked to biological markers of physiological arousal such as higher salivary cortisol levels and larger eye pupils than non-shy/uninhibited children, with evidence for the stability of the classification inhibition/non-inhibition during a 14 month–7 year follow-up period.<sup>27</sup>

A recent study tested whether temperament and psychophysiology serve as very early childhood indicators (at 3 years) of those with psychopathic personalities in adulthood (at 28 years). Behavioural measures of temperament and skin conductance measures were taken from a sample of 335 children aged 3 years and compared with controls. These individuals were then tested at age 28 years with the Hare Self-Report Psychopathy scale II. Results showed that high scorers on the Hare SRP-II were less fearful and inhibited, more sociable and had longer skin conductance recovery times than controls at 3 years, but they also showed increased autonomic arousal and skin conductance orienting, contrary to expectations.<sup>28</sup> These findings have been interpreted as showing both the stability over time and the capacity for change of the child psychopathy construct. They also appear to suggest a link between temperament, early childhood psychophysiology and later psychopathic personality. The implication is that psychopathic characteristics appear to capture a temperamental pattern which is relatively stable.<sup>29</sup>

An inherited temperament theory of personality disorder was earlier described in which four independent factors of temperament were identified and said to form the foundation of later personality traits.<sup>30</sup> More recently, a unified 'biopsychosocial' theory of personality development has been proposed.<sup>31</sup> However, the question of whether and to what extent there is a continuum between early childhood temperament and the later development of personality has also been raised.<sup>32</sup>

Linked to personality development is the physical development of the child and adolescent brain with particular emphasis on the pre-frontal cortex. Two main changes have been shown in the child's brain before and after puberty.<sup>33</sup> Firstly, increasing myelination of axons in the frontal cortex continues well into adolescence with a concurrent increase in the speed of neuronal transmission. Secondly, two waves of synaptogenesis and synaptic pruning occur in childhood and after puberty. The second wave of synaptic pruning is thought to be essential for fine tuning the frontal cortex neural networks.<sup>33</sup> MRI studies have now confirmed that there are linear increases in white matter and non-linear decreases in grey matter during adolescence, and recent studies have indicated that the brain may not reach full maturity until well after adolescence.<sup>34</sup> Functional MRI (fMRI) studies allow the adolescent brain to be seen in action undertaking experimental tasks. Risk taking and poor decision-making when risk is involved are common features in adolescents. Two recent fMRI studies showed that adolescents were less efficient than adults in performing the relevant tasks primarily because their brain circuitry was less mature and hence less effective.<sup>35,36</sup> Brain studies of clinical populations differ from these results. Emerging findings from a structural brain imaging study comparing the brains of CD/CU boys with normal controls show increases in grey matter concentration and volume in the brains of the CD/CU boys and not in the controls. The increased grey

matter concentration and volume occurs in areas associated with emotion regulation, empathy and morality and is suggestive of a possible delay in cortical maturation.<sup>37</sup>

### Diagnosis and formulation

DSM-IV<sup>38</sup> takes a categorical approach to disorders, including conduct and personality disorders. A clinical issue arising from this categorical approach is that adolescents are excluded from a diagnosis of DSM-IV Antisocial Personality Disorder before the age of 18 years and the International Classification of Diseases (ICD)-10<sup>39</sup> Dissocial Personality Disorder before 16 or 17 years. In practice, as the preceding review of the literature makes clear, evidence of an emerging personality disorder is usually seen several years before this age but the clinician is unable to apply a formal diagnosis to an adolescent despite the potentially serious prognostic implications for adult life.

In a recent review<sup>6</sup> the pros and cons of considering a continuum approach to conduct disorder in DSM-IV are discussed along with the possibility of altering the criteria to include new information on subtypes, such as early-onset CD, family history, CU traits and other factors. However, there is still not quite enough evidence to alter the criteria for CD in DSM-V.<sup>6</sup> If this is correct, it leaves the clinician working with young people who show signs of emerging severe personality disorder with the dilemma that the young person does not completely fulfil formal DSM-IV criteria for CD, which could, in turn, preclude that young person from a subsequent diagnosis of antisocial personality disorder. However, the research evidence (reviewed above and in Moffitt et al<sup>6</sup>) in relation to childhood trajectories towards adolescent and adult antisocial behaviour is so robust that the term 'emerging severe personality disorder' has been coined and proposed as a developmental disorder of childhood.<sup>26,40</sup> In the absence of a formal diagnostic nomenclature for children with such problems it is suggested that their presenting features and the age-based failure to fulfil criteria for, for example, antisocial personality disorder are discussed in developmental terms within the formulation section of a full, multi-axial mental state examination. A suggested template for describing the mental state findings of children and young people presenting to any Child and Adolescent Mental Health Service (CAMHS) using the DSM-IV and ICD-10 multi-axial system is shown in Figure 1. This template will allow for discussion of various diagnoses for which the individual fulfils or just fails to fulfil criteria, such as CD and antisocial personality disorder, so that important concerns about current mental health and behaviour are not lost to subsequent clinicians.

### Assessment measures

Many clinicians do not routinely undertake assessments of adolescent personality in their clinical settings and most are unfamiliar with psychometric measures of adolescent personality. The Millon Adolescent Clinical Inventory (MACI) is a widely used and validated measure of personality functioning and psychological difficulties in adolescents aged 13–19 years. The MACI measures personality patterns across 11 indices, which assess habitual, mostly maladaptive ways of thinking, feeling and behaving. Recently, two MACI psychopathy scales have been shown to

have predictive validity, particularly in relation to general and violent offending.<sup>41</sup>

Assessment of psychopathy in children is not undertaken routinely since there are still concerns about the reliability and validity of assessment tools and the potentially negative effects of attaching a label of psychopathy to developmentally immature children.<sup>42</sup> However, the instruments used to assess psychopathy in children and adolescents are reviewed in Dolan<sup>42</sup> as follows: Psychopathy Checklist – Youth Version;<sup>43</sup> Psychopathy Screening Device (or Antisocial Process Screening Device);<sup>44</sup> Childhood Psychopathy Scale;<sup>45</sup> Youth Psychopathic Traits Inventory.<sup>46</sup>

Because the young people seen for assessment of possible emerging severe personality disorder are likely to be children who raise child protection concerns as well as showing antisocial behaviour, a multi-agency approach to assessment and treatment is essential (Figure 2).<sup>47,48</sup>

### Prevention and treatment

As discussed above, CD is strongly linked to the later development of antisocial personality disorder.<sup>7,10–14</sup> Antisocial personality disorder in adult life is associated with high levels of criminal behaviour and cost to the public purse.<sup>3,49</sup> It has been known for decades that a small proportion of offenders are responsible for a disproportionate amount of recorded crime. In a sample of 400 boys born in 1953, 6% were subsequently responsible for half the criminal convictions recorded up to the age of 32 years.<sup>50</sup> Hence, identification of early childhood precursors to antisocial behaviour is crucial if cost-effective prevention is to occur.<sup>51</sup>

Prevention of antisocial personality disorder in children has been described at three levels: primary (universal); secondary (geographically or individually targeted); tertiary (individually targeted).<sup>3</sup>

Different types of preventive interventions at all three levels have been identified to include: Triple P (all levels); Nurse–Family partnership (level 2); Incredible Years (level 2); Functional Family Therapy (levels 2 and 3); Multi-Systemic Therapy (level 3); Multi-Dimensional Treatment Foster Care (level 3).

It is clear that the more universal preventive services (level 1) are attractive to government and the public because they are less stigmatizing, more likely to have higher take up and less expensive to deliver. In contrast, the specialist services (level 3), which are individually targeted at 'high-risk/high-harm' children and families will be seen by some as stigmatizing, they will be expensive to deliver because of the high costs of staff training, the length of engagement in treatment needed and the relatively small number of families being targeted.<sup>51</sup> Preventive services at level 2 address the needs of families with identifiable high-risk younger children from age 2–5 years. These services seem to offer a practical, evidence-based way forward with younger children and their parents, with a low risk of stigmatization.

Finally, failure to intervene with conduct-disordered, socially-excluded children will eventually incur very significant costs to the public purse. It has been calculated that children with CD at age 10 years will cost a range of public services an average of £70,000 by age 27 years.<sup>49</sup> However, questions still remain about how and in what way preventive interventions should occur with the highest-risk group of children and families (i.e. those children at risk of developing psychopathic traits with the potential

**Template for psychiatric assessment in children and adolescents**

**Psychiatric assessment**

i. **Physical appearance, behaviour, rapport etc**

ii. **Mental state**

**DSM IV and ICD 10 multi-axial system for child and adolescent psychiatric reports**  
*DSM IV and ICD 10 are psychiatric classification systems for mental illness, emotional and behavioural disturbances and are laid out below under a number of axes or headings. These multi-axial systems give a concise description of the young person's functioning which is described in greater detail elsewhere in the report.*

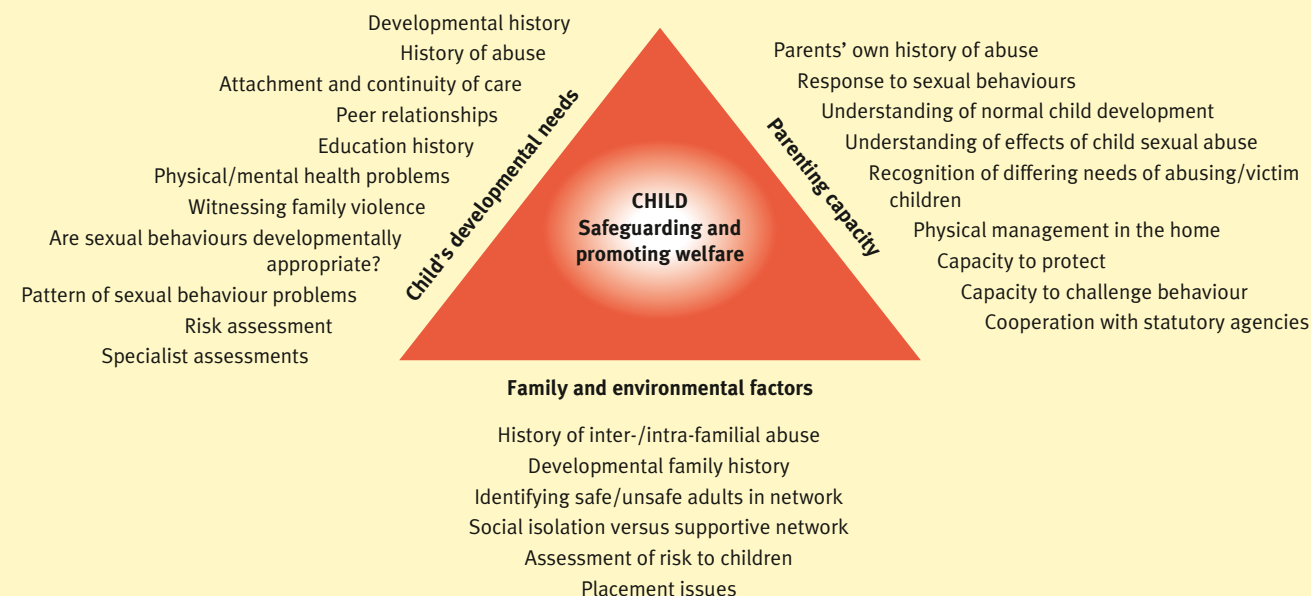
DSM IV		ICD 10	
<b>AXIS I</b>		<b>AXIS I</b>	
<b>Clinical disorders</b>		<b>Clinical syndrome</b>	
<b>Other conditions that may be a focus of clinical attention</b>			
<i>Code number</i>	<i>Disorder</i>	<i>Code number</i>	<i>Disorder</i>
<b>AXIS II</b>		<b>AXIS II</b>	
<b>Personality disorders</b>		<b>Disorders of psychological Development</b>	
<b>Mental retardation</b>			
<i>Code number</i>	<i>Disorder</i>	<i>Code number</i>	<i>Disorder</i>
<b>AXIS III</b>		<b>AXIS III</b>	
<b>General medical disorders</b>		<b>Mental retardation</b>	
<i>Code number</i>	<i>Disorder</i>	<i>Code number</i>	<i>Disorder</i>
<b>AXIS IV</b>		<b>AXIS III</b>	
<b>Psychosocial and environmental problems</b>		<b>Medical illness</b>	
<i>List of problems</i>		<i>Code number</i>	<i>Disorder</i>
<b>AXIS V</b>		<b>AXIS V</b>	
<b>Global assessment of functioning: GAF =</b>		<b>Abnormal psychosocial conditions</b>	
		<i>List of problems</i>	
		<b>AXIS VI</b>	

iii. **Formulation**

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Figure 1

## National Clinical Assessment and Treatment Service Model for Sexually Harmful Behaviour 2007



(Adapted from Department of Health Framework for the Assessment of Children in Need and their Families.)

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Figure 2

for a poor adult outcome, including prolific offending and an even greater cost for public services).

### Conclusions

Recent findings from studies of brain structure and functioning, experimental psychology, genetics and longitudinal studies have shown that personality continues to develop across childhood into early adult life and possibly beyond. It is likely that personality has its roots in early childhood temperament. It is also likely that environmental influences will affect the genetic propensity of brain tissue to develop adversely or in a more positive, functional manner. This will in turn result in appropriate or inappropriate social and behavioural responses at different times in the child's development. If this is correct the emergence of severe personality disorder traits, such as childhood psychopathy, will be dependent upon persistent environmental stressors affecting brain structure and function over a number of years, including sensitive periods for brain and social development in childhood.

Research also supports the notion of stability of the construct of childhood psychopathy over time and longitudinal studies show a robust correlation between psychopathy, violence and recidivism in adolescence and adult life. However, the plasticity of brain development over the first decades of life may also mean that personality (and by extrapolation personality disorder) has the ability to change and that it is not set in stone by late adolescence. If this is the case, there may be grounds for optimism in terms of early identification of high-risk/high-harm children and therapeutic intervention to remove them from adverse developmental trajectories. ♦

### REFERENCES

- 1 Howells K, Krishnan G, Daffern M. Challenges in the treatment of dangerous and severe personality disorder. *Advances in Psychiatric Treatment* 2007; **13**: 325–32.
- 2 Cabinet Office. Reaching out: an action plan on social exclusion. London: Stationery Office, 2006.
- 3 Utting D, Monteiro H, Ghate D. Interventions for children at risk of developing antisocial personality disorder (Policy Research Bureau messages). London: Policy Research Bureau, 2007.
- 4 Hodgins S. Persistent violent offending: what do we know? Assessment, risk and outcome in severe personality disorder. *Br J Psychiatry* 2007; **190**(suppl 49): S12–14.
- 5 Hawes DJ, Dadds MR. The treatment of conduct problems in children with callous-unemotional traits. *J Consult Clin Psychol* 2005; **73**: 737–41.
- 6 Moffitt TE, Arseneault L, Jaffee SR, et al. Research review: DSM-V conduct disorder: research needs for an evidence base. *J Child Psychol Psychiatry* 2008; **49**: 3–33.
- 7 Rutter M, Giller H, Hagell A. Antisocial behaviour by young people. Cambridge: Cambridge University Press, 1998.
- 8 Royal College of Psychiatrists. Offenders with personality disorder: council report CR71. London: Royal College of Psychiatrists, 1999.
- 9 Farrington DP, Coid JW. Early prevention of adult antisocial behaviour: Cambridge studies in criminology. Cambridge: Cambridge University Press, 2003.
- 10 Robins LN. Sturdy childhood predictors of adult antisocial behaviour: replications from longitudinal studies. *Psychol Med* 1978; **8**: 611–22.
- 11 Rutter M, Giller H. Juvenile delinquency: trends and perspectives. London: Penguin, 1983.

- 12 Farrington DP. The development of offending and antisocial behaviour from childhood. *J Child Psychol Psychiatry* 1995; **36**: 929–64.
- 13 Coid J. 'High risk' or 'population' strategies? In: Farrington DP, Coid JW, eds. Early prevention of adult antisocial behaviour: Cambridge studies in criminology. Cambridge: Cambridge University Press, 2003.
- 14 Zoccolillo M, Pickles A, Quinton D, Rutter M. The outcome of childhood conduct disorder: implications for defining adult personality disorder and conduct disorder. *Psychol Med* 1992; **22**: 971–86.
- 15 Kim-Cohen J, Caspi A, Taylor A, et al. MAOA, maltreatment and gene-environment interaction predicting children's mental health: new evidence and a meta-analysis. *Molecular Psychiatry* 2006; **11**: 903–13.
- 16 Loeber R, Green SM, Lahey BB. Risk factors for adult antisocial behaviour. In: Farrington DP, Coid JW, eds. Early prevention of adult antisocial behaviour: Cambridge studies in criminology. Cambridge: Cambridge University Press, 2003.
- 17 Broidy LM, Tremblay RE, Brame B, et al. Developmental trajectories of childhood disruptive behaviours and adolescent delinquency: a six-site cross-national study. *Dev Psychol* 2003; **39**: 222–45.
- 18 McCrory E, Hickey N, Farmer E, Vizard E. Recurrent sexually harmful behaviour in early childhood: a marker for life course persistent antisocial behaviour. *J Forensic Psychiatry Psychol*, in press.
- 19 Frick PJ, Marsee MA. Psychopathy and developmental pathways to antisocial behavior in youth. New York: Guilford press, 2006.
- 20 Viding E, Blair RJR, Moffitt TE, Plomin R. Evidence for substantial genetic risk for psychopathy in 7 year olds. *J Child Psychol Psychiatry* 2005; **46**: 592–97.
- 21 Blair RJR, Peschardt KS, Budhani S, et al. The development of psychopathy. *J Child Psychol Psychiatry* 2006; **47**: 262–75.
- 22 Dadds MR, Perry Y, Hawes DJ, et al. Attention to the eyes and fear-recognition deficits in child psychopathy. *Br J Psychiatry* 2006; **189**: 280–81.
- 23 Lynam DR, Gudonis L. The development of psychopathy. *Annu Rev Clin Psychol* 2005; **1**: 381–407.
- 24 Moran P, Ford T, Butler G, Goodman R. Callous and unemotional traits in children and adolescents living in Great Britain. *Br J Psychiatry* 2008; **192**: 65–6.
- 25 Thomas A, Chess S, Birch HG, et al. Behavioural individuality in early childhood. New York: New York University Press, 1963.
- 26 Vizard E, Hickey N, McCrory E. Developmental trajectories towards sexually abusive behaviour and emerging severe personality disorder in childhood: the results of a three year UK study. *Br J Psychiatry* 2007; **190**(suppl 49): S27–32.
- 27 Kagan J, Snidman N. Temperamental factors in human development. *Am Psychol* 1991; **46**: 856–62.
- 28 Glenn AL, Raine A, Venables PH, Mednick SA. Early temperament and psychophysiological precursors of adult psychopathic personality. *J Abnorm Psychol* 2007; **116**: 508–18.
- 29 Salekin RT, Lochman JE. Child and adolescent psychopathy: the Search for protective factors. *Crim Justice Behav* 2008; **35**: 159–72.
- 30 Buss AH, Plomin R. A temperament theory of personality development. New York: Wiley Interscience, 1975.
- 31 Cloninger CR, Svrakic DM, Przybeck TR. A psychobiological model of temperament and character. *Arch Gen Psychiatry* 1993; **50**: 975–90.
- 32 Salekin RT. Developmental pathways towards childhood psychopathy: the potential for effective interventions. In: Paper given to Department of Health seminar on early intervention in personality disorder with socially excluded high risk/high harm children. London, November 2007.
- 33 Blakemore SJ, Choudhury S. Development of the adolescent brain: implications for executive function and social cognition. *J Child Psychol Psychiatry* 2006; **47**: 296–312.
- 34 Sowell ER, Thompson PM, Tessner KD, Toga AW. Mapping continued brain growth and gray matter density reduction in dorsal frontal cortex: inverse relationships during post adolescent brain maturation. *J Neurosci* 2001; **21**: 8819–29.
- 35 Bjork JM, Knutson B, Fong GW, et al. Incentive elicited brain activation in adolescents: similarities and differences from young adults. *J Neurosci* 2004; **24**: 1793–802.
- 36 Baird A, Fugelsang J, Bennett C. What were you thinking: an fMRI study of adolescent decision-making. In: Poster presented at Cognitive Neuroscience Society meeting. New York, USA, April 2005.
- 37 DeBrito SA, Mechelli A, Wilke M, et al. Size matters: increased gray matter in boys with conduct problems and callous-unemotional traits (submitted for publication).
- 38 American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-IV-TR). Washington DC: American Psychiatric Association, 2000.
- 39 World Health Organization. ICD-10 classification of mental and behavioural disorders. Clinical descriptions and diagnostic guidelines, Geneva: WHO, 1992.
- 40 Vizard E, French L, Hickey N, Bladon E. Severe personality disorder emerging in childhood. A proposal for a new developmental disorder. *Crim Behav Ment Health* 2004; **14**: 17–28.
- 41 Salekin RT, Zeigler TA, Larrea MA, et al. Predicting dangerousness with two million adolescent inventory psychopathy scales: the importance of egocentric and callous traits. *J Pers Assess* 2003; **80**: 154–63.
- 42 Dolan M. Psychoapthic personality in young people. *Advances in Psychiatric Treatment* 2004; **10**: 466–73.
- 43 Forth AE, Kosson DS, Hare RD. The Hare psychopathy checklist: youth version (PCL – YV) – rating guide. Toronto, Ontario: Multi-Health Systems, 2004.
- 44 Frick PJ. Callous-unemotional traits and conduct problems: applying the two-factor model of psychopathy to children. In: Cooke D, Forth A, Hare R, eds. Psychopathy: theory, research and implications for society. Dordrecht: Kluwer, 1998.
- 45 Lynam DR. Pursuing the psychopath: capturing the fledgling psychopath in a nomological net. *J Abnorm Psychol* 1997; **106**: 425–38.
- 46 Andershed H, Kerr M, Stattin H. Psychopathic traits in non-referred youths: a new assessment tool. In: Blaauw E, Sheridan L, eds. Psychopaths – current international perspectives. Oxford: Elsevier, 2002.
- 47 Department of Health, Department for Education and Employment and Home Office. Framework for the assessment of children in need and their families. London: Stationery Office, 2000.
- 48 Vizard E. Adolescent sexual offenders. *Psychiatry* 2007; **6**: 433–37.
- 49 Scott S, Knapp M, Henderson J, Maughan B. Financial cost of social exclusion: follow up study of antisocial children into adulthood. *Br Med J* 2001; **323**: 191 7306.
- 50 Farrington DP, West D. Criminal, penal and life histories of chronic offenders: risk and protective factors and early identification. *Crim Behav Ment Health* 1993; **3**: 492–523.
- 51 Knapp M. Economic evaluation and conduct disorders. In: Hill J, Maughan B, eds. Conduct disorders in childhood. Cambridge: Cambridge University Press, 1999.