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# **The cost of love: financial consequences of insecure attachment in antisocial youth**

Running head: Cost of insecure attachment

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## **Abstract**

**Background:** Knowing that your parent or caregiver will be there for you in times of emotional need and distress is a core aspect of the human experience of feeling loved and being securely attached. In contrast, an insecure attachment pattern is found in many antisocial youth and is related to less sensitive caregiving. Such youth are often distrustful of adults and authority-figures, and are at high risk of poor outcomes. As they become adults, they require extensive health, social and economic support, costing society ten times more than their well-adjusted peers. However, it is not known whether insecure attachment itself is associated with higher costs in at-risk youth, independently of potential confounders, nor if cost differences are already beginning to emerge early in adolescence.

**Methods:** *Sample:* 174 young people followed-up aged 9–17 years (mean 12.1, sd 1.8): 85 recruited with moderate antisocial behaviour (80<sup>th</sup> percentile) from a school screen aged 4-6 years; 89 clinically referred with very high antisocial behaviour (98<sup>th</sup> percentile) aged 3-7 years. *Measures:* costs by detailed health economic and service-use interview; attachment security to mother and father from interview; diagnostic interviews for oppositional and conduct problems; self-reported delinquent behaviour.

**Results:** Costs were greater for youth insecurely attached to their mothers (secure £6,743 per year, insecure £10,199,  $p=0.001$ ) and more so to fathers (secure £1,353, insecure £13,978,  $p<0.001$ ). These differences remained significant (mother  $p=0.019$ , father  $p<0.001$ ) after adjusting for confounders, notably family income and education, intelligence and antisocial behaviour severity.

**Conclusions:** Attachment insecurity is a significant predictor of public cost in at-risk youth, even after accounting for covariates. Since adolescent attachment security is influenced by caregiving quality earlier in childhood, these findings add support to the public health case for early parenting interventions to improve child outcomes and reduce the financial burden on society.

**Key words:** antisocial behaviour; attachment; youth; economic cost; caregiving quality; parenting

Mental health problems cost the economy dearly. The recent *Lancet Commission* report on mental health (Patel et al., 2018) estimated that mental disorders will cost the global economy \$16 trillion by 2030; currently in the USA, they cost at least \$193bn a year in lost earnings alone (Insel, 2008). The authoritative OECD report (2018) estimated mental illnesses cost the UK economy £94 billion per year, chiefly due to early onset disorders and lost productivity. Most mental health disorders start before the age of 18 (Kim-Cohen et al., 2003) so understanding drivers of cost at this early stage of the life-course is particularly relevant, as reviewed by Beecham et al. (2014). These findings that early onset disorders are especially costly are supported by large cross-sectional surveys (Knapp et al., 2015). However, a limitation of most economic analyses is their focus on particular diagnoses (“cost of illness” studies) and not the risk and protective factors that pre-date the onset of disorder and that underlie a broad array of mental health outcomes in a trans-diagnostic fashion. The effect of caregiving quality is a prime candidate for an economic analysis associated with risk and protective factors, since it has enduring and widespread effects on mental health and functioning throughout the lifespan and is a frequent target of interventions (Scott, Briskman, & O'Connor, 2014). In this paper we calculate the costs associated with attachment insecurity, a leading index of suboptimal caregiving quality, in an at-risk sample of adolescents.

Amongst child and adolescent disorders, those characterised by persistent and pervasive antisocial behaviour, namely Conduct Disorders (including Oppositional Defiant Disorder) are especially relevant since they are common and predict the greatest risk of poor outcomes with high cost. They affect around 5% of the population (Sadler et al., 2018) and carry a 5–10 fold increased risk in adulthood of violent offending, heavy drug misuse, teenage parenthood, leaving school with no qualifications and living off state benefits (Fergusson, Horwood, & Ridder, 2005). In the UK the cost in adulthood for typical cases has been estimated at £260,000 each (Parsonage, Khan, & Saunders, 2014), while in the USA, the highest-risk youth cost \$2.3 million each (Cohen & Piquero, 2009). Longitudinal studies of actual service use show that they cost ten times as much as controls and that a wide range of agencies bear the burden, especially criminal justice, education, and welfare (Scott, Knapp, Henderson, &

Maughan, 2001). Recently, the Dunedin longitudinal follow up study to age 38 years found that individuals with persistent early onset conduct problems comprised 9% of the population, yet accounted for 53% of all convictions, 25% of welfare benefit claims, 21% of dispensed prescriptions and 16% of emergency department visits. 50% also accrued high service use across all three domains of criminal justice, health, and social welfare services, compared to only 11% of those with low conduct problems (Rivenbark et al., 2018).

Whilst the above studies show that youth antisocial behaviour is a strong indicator of risk of poor outcomes and high cost, they do not address underlying causal influences that contribute to the problem, which may partly explain these costs and be associated with additional costs. This study investigates attachment insecurity as such a source of financial burden. Our focus on attachment, a leading index of caregiving quality, reflects our emphasis on potentially modifiable risk factors across the whole population, compatible with a public health approach rather than only studying clinical extremes.

Attachment theory, originally formulated by Bowlby (1969, 1973, 1980), has emerged as a dominant model for understanding the mechanisms by which the quality of the caregiving environment shapes children's social and emotional development and affects their capacity for close relationships. It has been extensively integrated into several treatment models (Steele & Steele, 2018). Attachment-based assessments distinguish individuals who have a Secure attachment – an internalized representation of that caregiver as sensitive and responsive to their emotional needs and thereby providing a “haven of safety”, or secure base, in Bowlby's terminology (Bowlby, 1982) – from those with an Insecure attachment – an internalized representation of that caregiver as insensitive and not reliably available to meet their emotional needs, leading the individual to respond in an avoidant/dismissing, resistant/preoccupied, or disorganised manner (Target, Fonagy, & Shmueli-Goetz, 2003). Many studies show the reliability and validity of attachment-based assessments in adolescence, and link attachment insecurity with a range of social, emotional and relationship difficulties (Allen, Porter,

McFarland, McElhaney, & Marsh, 2007; Scott, Briskman, Woolgar, Humayun, & O'Connor, 2011). Notably, there is a robust association between attachment insecurity and child antisocial behaviour, with meta-analyses showing effect sizes of 0.3 to 0.5 (Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010). This association means that any increased costs of attachment insecurity could be a confound of antisocial behaviour, so a rigorous test of the costs of attachment quality needs to take it into account.

An attachment pattern, described as Secure or Insecure, reflects the specific relationship quality with a particular caregiver, and so attachment security may differ with the mother and the father. Fathers often play a somewhat different role from mothers in children's upbringing, and this may be especially important for young people at-risk through antisocial behaviour. A secure internalised paternal representation may reflect a positive model of a good authority figure, and vice-versa an insecure internalised representation may leave an adolescent feeling uncared for by authority and feel less affiliation to rules (Carlson, 2006). Accordingly, this study therefore measured attachment security to both parents and estimated costs separately for each.

## **Methods**

### **Participants**

Young people were part of the SPACE study (Scott et al., 2014), a follow-up of a moderate-risk and a high-risk sample of children carried out from 2011–2014.

#### *Moderate risk sample*

109 children aged 4–6 years were originally recruited through screening in schools for antisocial behaviour in mainstream primary schools (cut-off: *Strengths and Difficulties Questionnaire (SDQ)* (Goodman, 2001) conduct problems scale score  $\geq 5$  or *DSM-IV* oppositional defiant disorder symptoms score  $\geq 10$ ; mean score 80<sup>th</sup> percentile for antisocial behaviour) and took part in an RCT of the *Incredible*

*Years* parenting programme (Scott et al., 2014). 90 were followed up aged 9.2–13.1 (mean 11.0, *sd* 0.9) years (for characteristics see Table 1); economic data were available on 85.

#### *High risk sample*

120 children aged 3–7 years were originally referred to child mental health clinics for antisocial behaviour (98<sup>th</sup> percentile on SDQ conduct problems scale) and also took part in an RCT of the *Incredible Years* parenting programme (Scott et al., 2014). 93 were followed up aged 9 to 17 (mean 13.1, *sd* 1.8), economic data were available on 89 (Table 1).

#### **Measures**

*Antisocial behaviour.* Antisocial acts were assessed by the young people using the *Self-Report Delinquency (SRD)* questionnaire (Smith & McVie, 2003). This consists of 18 items covering a range of antisocial acts divided into three scales (home problems, school misbehaviour, substance abuse), its psychometric properties are good.

DSM-IV-R Oppositional-Defiant Disorder (ODD) and Conduct Disorder (CD) symptoms were assessed using the *Child and Adolescent Psychiatric Assessment (CAPA)* semi-structured diagnostic interview administered to parents (Angold et al., 1995). The mean ICC reliability on 20 cases for ODD and CD criteria was 0.85 (range 0.78–0.93) (Scott et al., 2014).

*IQ* was assessed by a trained examiner using the *Wechsler Abbreviated Scale of Intelligence* (Wechsler, 1999).

*Attachment security* was assessed using the *Child Attachment Interview (CAI)* (Target et al., 2003). The CAI is a well-validated semi-structured interview designed to elicit young people's mental representations of their parental attachment figures through asking them a series of questions about specific experiences of caregiving. Responses were coded according to a manual, and ratings were made separately for each parent, *n*=168 mothers and 148 fathers. We report the Secure versus Insecure designation. Two coders were trained by the instrument developers, reliability on 20 training

cases for the Secure–Insecure split was 90% agreement ( $\kappa=0.79$ ). Coders were blind to other data collected on the youths and did not conduct the interviews.

*Family characteristics.* A structured interview with the primary caregiver assessed details about family structure and income, ethnicity and parental education.

*Service use and costs.* Annual costs were calculated using the Client Service Receipt Inventory (CSRI) (Beecham & Knapp, 2001). The CSRI is a well-established semi-structured interview where parents are asked about health, educational and social care services used by their child, or by family members related to the child’s behaviour, over preceding 12 months. Costs for each type of service use were then calculated based on unit costs at 2010 prices (Appendix 1). The unit costs were taken from official sources where possible (Curtis, 2010; Department of Health and Social Care, 2011) or else from a compilation (Beecham, Bauer, & Stevens, 2011). The unit costs (per appointment, per contact, etc.) were multiplied by frequency and duration of service use for each agency; they have not been inflated to current equivalent values as the difference between secure/insecure was the main study objective.

### **Statistical analysis**

All statistical analyses were performed using SPSS 25.0. Multiple imputation was performed for missing values of covariates. Due to the left-skewness of the cost data, a Tweedie distribution was assumed and data were analysed using generalised linear models which do not assume a normal distribution. Total cost was the dependent variable. Based on previous literature and *a priori* assumptions, several covariates were included: sample (moderate vs high risk); maternal education and eligibility for free school meals to indicate socio-economic status; youth sex, age and intellectual ability; antisocial behaviour was indexed from both youth report (SRD) and from parent interviews for ODD and CD symptoms. Subgroups according to intervention status in the earlier childhood studies were combined to increase statistical power. Separate analyses were conducted for attachment to mother and father.

### **Ethics**



The study was approved by the research ethics committee of King's College London (Reference 242/03), and written informed consent was obtained from parents and youths.

### **Role of the funding source**

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

## **Results**

### **Participant characteristics**

Table 1 shows the characteristics of the youths. 73% were male; a high proportion of their mothers had left school at 16 (75%, vs national norm 18%), many were eligible for free school meals (29% vs 17% norm). 33% of the youth were from an ethnic minority (norm 11%). The rate of self-reported delinquent acts was high (6.4 vs 1.1 norm) (Smith & McVie, 2003), as were ODD symptoms (1.7 vs 0.5 norm) (Sadler et al., 2018) and CD symptoms (0.83 vs 0.38 norm) (Sadler et al., 2018). As expected in at-risk samples, rates of attachment security were significantly lower than in normative samples.

► Insert Table 1 here

Table 2 shows the inter-correlation amongst variables. Attachment security was not significantly related to child gender, ethnicity or measures of family socio-economic status (maternal education, eligibility for free school meals), but was weakly correlated with IQ (0.27 mother, 0.22 father), and weakly negatively correlated to oppositional defiant symptoms (-0.22 mother, -0.20 father). Total cost was moderately correlated to ODD symptoms (0.39), CD symptoms (0.37), and self-report delinquency score (0.22). Higher cost was negatively correlated with attachment security, (-0.23 mother, -0.25

father). In addition, ignoring all covariates, mean costs were greater in the high-risk sample (£14,627, range £0–£536,031, *sd* £63,770) than the moderate risk sample (£1,267, range £0–£15,608, *sd* £2501).

► Insert Table 2 here

Table 3 shows costs according to attachment security to mother and father. Children securely attached to their mother cost £6,743, whereas those insecurely attached cost £10,119 ( $p=0.001$ , Mann-Whitney U test). Differences were more striking for fathers, securely attached youths cost £1,353 whereas insecurely attached youths cost £13,978, an over tenfold difference. The greatest part of the cost came from those youths who had to be placed out of home due to their risky behaviour, next came extra costs incurred by schools, followed by family-borne costs (e.g. repairs, productivity loss), and additional health and social care services for the family. Whilst not necessarily large at this age, the differences between insecurely and securely attached youth were double or more across nearly all domains.

► Insert Table 3 here

Finally, a multiple regression was carried out to determine whether the difference in cost between securely and insecurely attached youth remained significant after controlling for covariates. The model (Table 4) showed that older youth, males, those eligible for free school meals, and those with more antisocial behaviour as determined by semi-structured interview cost more. Once these factors were taken into account, youth IQ and self-report delinquency did not add to costs, nor sample. However, attachment insecurity continued to predict highly significant cost differences (to mother  $p=0.018$ , to father  $p\leq 0.001$ ).

► Insert Table 4 here

Because there were a few cases (n=4) with very high costs (>£17,500), we re-analysed the results, removing these extreme outliers. The results were very similar, again showing highly significant differences in costs for insecure and secure attachment, both to mother and father [data available from last author].

### **Supplementary analyses**

Three supplementary analyses were conducted to extend the findings. First, the significance of the difference in total costs from insecure attachment was similar in the moderate and high risk samples, demonstrated by a non-significant interaction between sample and attachment security predicting total cost. Second, insecure attachment was again associated with increased costs across nearly all domains in the moderate and high risk samples. Third, the economic effects were calculated of a secure attachment to both parents, to one parent only, or to neither parent. There were 81 cases secure to both parents, 70 insecure to both parents but only 23 secure to mother but insecure to father; there were no children at all secure to their father but insecure to their mother. This limited our ability to assess interaction effects of security to one parent but not the other, as there were few secure to mother and none to father.

### **Discussion**

As far as we are aware, this is the first study to investigate the financial costs associated with attachment security, a key marker of caregiving quality associated with a wide range of social, emotional and behavioural outcomes in children and adolescents (Allen et al., 2007; Scott et al., 2011). The results showed that in a key group of young people, those at risk of poor outcomes due to moderate or severe early-onset antisocial behaviour, insecure attachment was associated with significantly greater cost, both overall and across individual domains such as education, social care

and health. Importantly, costs were greater even after controlling for multiple other risk factors known to be associated with increased health costs and service utilization, including socio-economic background, child age, gender and IQ, and severity of antisocial behaviour – most of which were independently associated with increased economic burden. Interestingly, attachment security to fathers made a considerably greater difference to costs than attachment security to mothers. While at this stage of early adolescence total costs were relatively modest, the values presented here were only over one year. Since the cost of individuals at-risk of poor outcomes due to early-onset antisocial behaviour gets much larger as they move into adulthood, the impact of attachment insecurity is also likely to accumulate to a far greater figure over the lifetime.

The finding that other factors such as social deprivation (here indexed by entitlement to free school meals and less maternal education), male sex, older age and higher levels of antisocial behaviour were associated with greater financial burden is in line with prior studies (Cohen & Piquero, 2009; Parsonage et al., 2014; Scott et al., 2001; Rivenbark et al., 2018), suggesting these results reliably replicate other research. This increases the plausibility of the finding that including a major measure of adolescents' experience of caregiving quality adds substantially to the economic burden they place on society.

The mechanisms through which good quality caregiving and secure attachment lead to improved social outcomes and lower costs are unclear. One possibility is that individuals with a secure attachment may have better emotional regulation, leading to more stable relationships with peers and teachers, which may then be less likely to lead to referral to educational or mental health agencies. Another possibility is that adolescents with secure attachments may, when they experience stress and adversity, be more resilient and better able to cope directly – including seeking out the support of the caregiver, so requiring fewer external services. And for the few children who were taken into public care, it is possible that earlier antisocial behaviour led to higher cost and also less chance of making a secure attachment with their birth parents. We are not able to differentiate between

these or other explanations. The finding that the costs associated with insecure attachment quality with fathers was greater than mothers was unanticipated, but supports the continued greater attention to the role of fathers in observational and treatment studies (Lamb, 2010), where for example secure attachment to fathers is associated with better emotional regulation and more harmonious peer relationships (Allen et al., 2007).

### **Strengths and limitations**

This study had a number of strengths. The sample is large for studies using intensive research methods to assess attachment security and includes both youth with moderately elevated antisocial behaviour drawn from a community sample and youth with high levels of antisocial behaviour who were referred to clinical services. The samples selected had started in early childhood with antisocial behaviour, who are a particularly important group in terms of their poor long-term outlook and their impact on society (Fergusson et al., 2005). The study adopted a multi-method, multi-informant approach, including investigator ratings from semi-structured parent interviews of symptomatology and service use, youth self-reports, and blinded objective psychometric assessments and attachment codings. The analysis made extensive adjustments for potentially confounding covariates.

A limitation is the cross-sectional design, which precludes concluding that all costs were causally influenced by attachment security. Although the samples were specifically chosen for their risk status, the cost estimates may not generalize to other risk samples indexed by other characteristics, or to the population more broadly; replication with other samples would be useful. Further economic research is now needed using alternative caregiving measures, investigating a range of underlying risk and protective influences, across different ages. A further limitation is that the study was not designed to evaluate the effectiveness of the earlier parenting intervention on attachment security, which was not measured at the time; the intervention was designed along social learning theory lines to target antisocial behaviour and has been reported separately (Scott et al., 2014).

## **Implications**

Recent research suggests that individual differences in adolescent attachment security can be traced to earlier caregiving quality (O'Connor, Woolgar, Humayun, Briskman, & Scott, 2018). Fortunately, there are a number of programmes designed to improve attachment security in young children and accumulating evidence from trials that they are effective (Steele & Steele, 2018). However, there is much less evidence on their economic benefits across childhood and adolescence. More broadly, as this study illustrates, there is a need for additional programmatic research on the costs of key modifiable risks for child and adolescent physical and mental health. The quality of caregiving is a key factor since it not only affects mental health and psychosocial functioning across the lifespan (Raby et al., 2015), but also, in the form of Adverse Childhood Experiences, is increasingly recognised as influencing physical health (Brown et al., 2009). Such economic evaluations would place the case for considerable investment in parenting programmes into a public health and economic context.

The results of this and other studies suggest that society would benefit from taking a public health approach to promoting good quality caregiving to improve the well-being of children and young people and reduce their cost on society. This could be achieved through supportive policies and widespread availability of good quality parenting programmes that address attachment and involve fathers (Tully et al., 2017).

## **Declarations of interest**

The authors declare no competing interests.

## **Acknowledgement**

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## **Key points**

- attachment security is a key concept beyond infancy into adolescence and predicts better adjustment and fewer mental health problems; it is related to the quality of caregiving
- youth who display antisocial behaviour have a higher incidence of insecure attachment and are at high risk of poor social and mental health outcomes

- To date, no studies have looked at the cost implications of insecure attachment, despite it being an important trans-diagnostic risk factor
- This study found that young adolescents at risk of poor outcomes through antisocial behaviour incurred greater costs if they were insecurely attached to their mothers. Cost differences were even greater for those who were insecurely attached to their fathers, and remained after controlling for potential confounders
- The results support early intervention on public health grounds to promote good quality caregiving through evidence-based parenting programmes to improve the well-being of children and young people and reduce their cost on society

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**Table 1.** Demographic and clinical characteristics of participants

Characteristic	Total sample (n=174)	Moderate risk sample (n=85)	High risk sample (n=89)	National Norms/low risk sample*
Child age in years (mean, SD)	12.09 (1.77)	11.00 (0.90)	13.14 (1.77)	
Male	127 (73.0%)	60 (70.6%)	67 (75.3%)	51%
Ethnic minority	42 (33%)	21 (42%)	21 (24%)	11%
Maternal education (left school by age 16)	131 (75.3%)	52 (61.2%)	79 (88.8%)	18%
Free school meals	50 (28.7%)	26 (30.6%)	24 (27.0%)	17%
Full IQ (WASI)	101.5 (15.9)	106.3 (16.6)	97.0 (13.8)	100
ODD count (CAPA)	1.73 (2.03)	1.12 (1.84)	2.31 (2.04)	0.50 (Angold et al., 1995)
CD count (CAPA)	0.83 (1.20)	0.47 (0.89)	1.18 (1.34)	0.38 (Angold et al., 1995)
Delinquency volume (SRD)	6.40 (13.67)	2.60 (5.76)	9.93 (17.49)	1.1 (Smith & McVie, 2003)
Secure attachment to mother (CAI)	104 (59.8%)	60 (70.6%)	44 (49.4%)	68%* (Scott et al., 2011)
Secure attachment to father (CAI)	81 (46.6%)	49 (57.6%)	32 (36.0%)	55%* (Scott et al., 2011)

Abbreviations: CAI: Child Attachment Interview, CAPA: Child and Adolescent Psychiatric Assessment, CD: Conduct disorder, ODD: Oppositional defiant disorder, SRD: Self-Report Delinquency, WASI: Wechsler Abbreviated Scale of Intelligence.

**Table 2.** Correlation between measures (Spearman's rho)

	Child age	Child gender	Maternal education	Free school meals	Full IQ	ODD count	CD count	Delinquency	Ethnicity	Attachment to mother	Attachment to father
Child gender	-0.010										
Maternal education	-0.234**	-0.012									
Free school meals	0.053	-0.043	-0.217**								
Full IQ	-0.265**	-0.073	0.357**	-0.134							
ODD count	0.020	0.026	-0.069	0.021	-0.152*						
CD count	0.202**	0.005	-0.200**	0.178*	-0.275**	0.534**					
Delinquency	0.180*	0.022	-0.171*	0.007	-0.021	0.180*	0.072				
Ethnicity	0.167*	0.71	-0.043	0.146	-0.112	-0.134	0.040	0.029			
Attachment to mother	-0.117	-0.077	0.117	0.029	0.265**	-0.217**	-0.113	-0.043	0.052		
Attachment to father	-0.125	-0.055	0.106	0.069	0.221**	-0.201**	-0.172*	-0.052	0.012	0.766**	
<b>Total cost</b>	0.179*	0.131	-0.154*	0.167*	-0.303**	0.392**	0.371**	0.221**	-0.039	-0.234**	-0.253**

Annotation: \*: correlation significant at  $p < 0.05$ ; \*\*: correlation significant at  $p < 0.01$ .

**Table 3.** Cost domains (in £) per individual, by attachment security to mother and father

Cost type		Attachment to mother			Attachment to father		
		Secure (N=104)	Insecure (N=70)	p*	Secure (N=81)	Insecure (N=93)	p*
<b>Total costs</b>	Mean (SD)	6,743 (52,513)	10,119 (34,396)	0.002	1,353 (2916)	13,978 (62,430)	0.001
	Range	0–536,031	0–207,279		0–16,882	0–536,031	
	Median	369	2,222		268	1,566	
<b>Out-of-home placements</b>	Mean (SD)	5,674 (52,461)	6,898 (32,846)	0.718	579 (2,528)	11,033 (61,920)	0.846
	Range	0–534,991	0–198,800		0–16,199	0–534,991	
	Median	0	0		0	0	
<b>Additional school support</b>	Mean (SD)	594 (1,253)	1,623 (2,071)	0.008	454 (897)	1,491 (2,061)	0.014
	Range	0–5,704	0–6,760		0–3,888	0–6,760	
	Median	0	216		0	84	
<b>Family-borne costs</b>	Mean (SD)	215 (576)	429 (803)	0.047	185 (562)	403 (761)	0.048
	Range	0–4,368	0–4,617		0–4,368	0–4,617	
	Median	0	0		0	0	
<b>Health and social care services (family; related to child's behaviour)</b>	Mean (SD)	120 (608)	233 (488)	0.000	57 (251)	259 (724)	0.001
	Range	0–5,703	0–2,704		0–1,947	0–5,703	
	Median	0	0		0	0	
<b>Contact with professionals through school</b>	Mean (SD)	96 (457)	193 (572)	0.149	52 (178)	207 (667)	0.089
	Range	0–4,346	0–3,525		0–1,248	0–4,346	
	Median	0	0		0	0	
<b>Health and social care services (child)</b>	Mean (SD)	42 (114)	743 (4,805)	0.009	26 (81)	584 (4,172)	0.001
	Range	0–634	0–40,230		0–468	0–40,230	
	Median	0	0		0	0	

Annotation: \*p significance value for difference in medians by Mann-Whitney U test.

**Table 4.** Predictors of total cost (multiple regression)

Predictor	Attachment to Mother		Attachment to Father	
	Wald Chi Square	P	Wald Chi Square	P
Sample (moderate vs high risk)	0.2	0.61	0.15	0.70
Child age	48.1	<0.001	48.3	<0.001
Male	16.1	<0.001	16.2	<0.001
Minority	0.14	0.71	0.00	0.97
Maternal education level	0.21	0.65	0.55	0.46
Free school meals	9.1	0.003	11.5	0.001
Full IQ (WASI)	0.03	0.87	0.14	0.71
ODD count (CAPA)	7.8	0.005	10.1	0.002
CD count (CAPA)	41.7	<0.001	30.8	0.000
Delinquency volume (SRD)	0.68	0.41	0.63	0.43
Attachment to mother (CAI)	5.6	0.018		
Attachment to father (CAI)			16.9	<0.001

Annotation: Dependent variable: Total cost.

Abbreviations: CAI: Child Attachment Interview, CAPA: Child and Adolescent Psychiatric Assessment, CD: Conduct disorder, ODD: Oppositional defiant disorder, SRD: Self-Report Delinquency, WASI: Wechsler Abbreviated Scale of Intelligence.

## Appendix 1. Unit cost for each service at 2009–2010 prices

Service	Unit Cost	Notes
<b>Additional school support</b>		
SEN Statement	£2500 per statement <sup>1</sup>	
Smaller Group	£6/hour <sup>2</sup>	
Classroom Assistant	£16/hour <sup>3</sup>	
Individual School Tuition	£33/hour <sup>2</sup>	
School Mentoring	£3/hour <sup>2</sup>	
After School Club	£9/3 hours <sup>3</sup>	
Behaviour Management	£3/hour <sup>3</sup>	
Home School Liaison	£60.5/hour <sup>3</sup>	
Extra Home Tuition	£33/hour <sup>4</sup>	
<b>Contact with professionals through school</b>		
Key Worker	£34/hour <sup>4</sup>	
Educational Psychologist	£116/hour <sup>3</sup>	
Educational Social Worker	£121/hour <sup>3</sup>	
Psychologist/Psychiatrist	£96/hour <sup>4</sup>	
GP via School Referral	£32/consult <sup>4</sup>	
Child and Family Consultation	£81/hour <sup>3</sup>	
Connexions	£59.5/hour <sup>3</sup>	0.5 hr estimated time
Charities	£13/hour <sup>3</sup>	Telephone Help-line value
<b>Health and social care services (child)</b>		
Health Visitor	£52/hour <sup>4</sup>	0.5 hr estimated time
GP Nurse	£18.5/hour <sup>4</sup>	0.5 hr estimated time
GP's Surgery	£32/consult <sup>4</sup>	
Outpatients	£149/visit <sup>4</sup>	
A&E Unit	£95/treatment <sup>4</sup>	
Paediatrician	£163/visit <sup>4</sup>	0.5 hr estimated time
Child Development Centre	£81/visit <sup>4</sup>	
Counsellor/Therapist	£81/hour <sup>4</sup>	
Psychiatric Care	£1.858 for 7-day; £447 per additional day <sup>4</sup>	
Paediatric Care	£447/bed day <sup>4</sup>	
<b>Family-borne costs (additional time spent by parents, family and friends, repairs, productivity loss)</b>		
Housework, shopping, meals, transport	£4/hour <sup>4</sup>	
Repairs	Parent-reported amount spent on repair or replacement	
Productivity loss	Household's daily income x number of days the parent reported taking off work over the last year due to the child's behaviour	
<b>Health and social care services (family use, related to child's behaviour)</b>		
GP (visits)	£32/consult <sup>4</sup>	
Prescription (number)	£39/prescription <sup>4</sup>	
Hospital Outpatient (visit)	£136/visit <sup>4</sup>	
Hospital Inpatient (days)	£523/bed day <sup>4</sup>	Short-stay inpatient value
Psychologist/Psychiatrist (visits)	£96/hour <sup>4</sup>	
Counsellor/Therapist (visits)	£44/hour <sup>4</sup>	
Family Therapist (visits)	£81/hour <sup>3</sup>	
Community/Church (visits)	£3/hour <sup>3</sup>	
Social Worker (visits)	£147/hour <sup>3</sup>	
Related Services (visits)	£13/hour <sup>4</sup>	
Any Other (visits)	£13/hour <sup>4</sup>	
<b>Out-of-home placements</b>		
Foster Care	£97/day <sup>4</sup>	
Secure Unit	£633.43/day <sup>3</sup>	
Family Member	£48.50/day <sup>4</sup>	
Other	£384.14/day <sup>4</sup>	As for LA Children's Home

<sup>1</sup>Audit Commission (Policy Focus). <sup>2</sup>Education.gov.uk. <sup>3</sup>Beecham J, Bauer A, Stevens M. EPP Unit Costs, Working paper 5v4. not publicly available; 2011. <sup>4</sup>Curtis L. Unit Costs of Health and Social Care 2010. Canterbury Personal Social Services Research Unit, University of Kent; 2010. <sup>5</sup>Department for Education, 2011. Additional notes on cost estimates for School Action and School Action Plus supports: Where the duration of contact was missing we have assumed that one hour (or one session) per week for both the baseline and follow-up data. Where supports were reported over a longer period than that requested on the questionnaire, these have been adjusted to reflect the one-year period.