The impact of timing and frequency of parental criminal behaviour and risk factors on offspring offending

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This paper explores mechanisms of intergenerational transmission of criminal behaviour by investigating specifically the timing and frequency of the parents' criminal behaviour while including risk factors for criminal behaviour. The results demonstrate a dose–response relationship: parents' number of criminal convictions is positively related to offspring's conviction rate. Furthermore, children whose parents had only been convicted before the child's birth have more convictions than those whose parents had never been convicted. Children whose parents had been convicted after the child's birth have more convictions than those whose parents had only been convicted before the child's birth, but this difference can be explained partly by the observation that the latter group had fewer risk factors for crime. When parental convictions at different ages were examined, children whose parents had been convicted between their 7th and 13th birthdays exhibit more criminal behaviour than children whose parents were convicted in other periods, but none of the differences were significant. There does not appear to be a sensitive period for the impact of parental criminal behaviour. The results demonstrate support for static as well as dynamic explanations of intergenerational transmission such as the transmission of a criminogenic environment and/or mediation through risk factors.

Keywords: intergenerational transmission; mechanisms; parental criminality; developmental criminology; risk factors

Introduction

Many studies have shown evidence for intergenerational transmission of criminal behaviour: children whose parents exhibit criminal behaviour have a higher risk of becoming criminal themselves (Farrington, 1997; Thornberry, 2009). Criminal parents are among the strongest family factors predicting offending (Farrington, 2011). A seemingly basic question, but largely unstudied, is how timing and frequency of parents' criminal behaviour is related to offspring's offending. By timing we refer to the age of offspring when the parent committed criminal acts leading to conviction, and by frequency we refer to the number of parental criminal convictions. Most studies investigating intergenerational transmission simply link any lifetime offending of the parent to any lifetime offending of the child. This paper aims to explore intergenerational transmission of criminal behaviour by investigating specifically the timing and frequency of the parents’ criminal behaviour. It seeks an

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answer to the following questions: Do offspring have more criminal convictions when parents had more convictions? and Does the timing of parents’ criminal convictions in the offspring’s life have an impact on offspring offending?

Theoretical background

Several theoretical frameworks are relevant to this research question. In this section, mechanisms of intergenerational transmission as described by Farrington (2011) will be discussed first. Second, a connection will be made with static versus dynamic theories or a population heterogeneity versus state dependence viewpoint. Third, the idea of a critical or sensitive period, a developmental psychological concept, will be explained and a connection will be made to the current research. Fourth, I will discuss the concepts of a cumulative developmental versus life-course perspective (Ireland, Smith, & Thornberry, 2002); or whether experiences early in life versus more proximal events will have a stronger impact. This will be followed by a discussion of previous research on timing and frequency.

Mechanisms of intergenerational transmission

Farrington (2011) described six explanations for the intergenerational transmission of criminal behaviour: intergenerational exposure to multiple risk factors, mediation through environmental risk factors, teaching and co-offending, genetic mechanisms, assortative mating and official (police and justice) bias. These explanations are not mutually exclusive and they are empirically intertwined; a combination of these mechanisms could explain intergenerational transmission. Exactly which (of these) mechanisms are responsible for intergenerational transmission has not been assessed conclusively. By investigating the timing and frequency of parental criminality in the child’s life it is possible to examine these mechanisms. For example, an association between parental offending before a child’s birth and that child’s later offending militates against transmission through social learning but supports genetic mechanisms or transmission of a criminogenic environment. Similarly one would expect that, if social learning were the mechanism responsible for transmission, children whose parents are more frequent offenders would have an increased risk of offending themselves. The social learning mechanism explains transmission through direct and mutual influences of family members on each other; the parent is a social role model for the children (Bandura, 1973, 1977). Moreover, according to Sutherland’s Differential Association Theory people will commit delinquent acts when they have learned more motivations to break rather than to follow the law (Sutherland & Cressey, 1955). When parents are more frequent offenders, children have more opportunities to observe and imitate their parents’ delinquent behaviour and motivations and thus one would expect more offspring crime.

By investigating risk factors it is possible to examine whether a criminogenic environment could explain intergenerational transmission. A risk factor is ‘a characteristic, experience, or event that, if present, is associated with an increase in the probability (risk) of a particular outcome over the base rate of the outcome in the general (unexposed) population’ (Kazdin, Kraemer, Kessler, Kupfer, & Offord, 1997, p. 377). Children whose parents have been convicted might grow up in a more criminogenic environment characterised by risk factors such as low family
Socio-Economic Status (SES), low family income, poor housing, large family size, teen mother at birth of first child, parental conflict, low parental interest in education and poor job record of the father. Farrington (2011, p. 133) describes how successive generations ‘may be entrapped in poverty, have disrupted family lives, may experience single and teenage parenting, and may live in the most deprived neighborhoods’. These risk factors might explain why these children have a higher conviction rate.

Static versus dynamic theories
Investigating timing and frequency of criminal behaviour also relates to theories on population heterogeneity versus state dependence; or whether the development of criminal behaviour is static versus dynamic (Nagin & Paternoster, 1991, 2000). Population heterogeneity assumes that people differ in their propensity to exhibit criminal behaviour. This can be seen as a static theory of crime; people are born in a certain way or behaviour patterns are developed early in life, but later experiences do not influence people’s behaviour. An example of a static theory is Gottfredson and Hirschi’s (1990) general theory of crime. According to Gottfredson and Hirschi children develop self-control early in life and this will determine whether they commit crime. If criminal behaviour is transmitted from parents to children this is due to transmission of self-control, and parental convictions after childhood should not influence offspring’s criminal behaviour (van de Rakt, Ruiter, de Graaf, & Nieuwbeerta, 2010). State dependence theorists, in contrast, believe that experiences in life may actually influence people’s behaviour (Nagin & Paternoster, 1991, 2000). Such theories are dynamic, because the tendency for a certain individual to commit crime can change over the life-course. While criminal behaviour has a causal effect on subsequent criminality, other experiences also influence the tendency to commit crime. If parents are convicted this might influence the child’s behaviour at that moment. This could influence the person earlier in childhood, but also in adolescence. Intergenerational transmission through genetic mechanisms and inter-generational exposure to multiple risk factors would fall under the static explanations, while mediation through environmental risk factors, teaching and co-offending, assortative mating and official (police and justice) bias could be seen as dynamic theories of intergenerational transmission.

Sensitive period for development
Something that Farrington does not discuss in his mechanisms is whether it matters when the child has been exposed to the parent’s criminal behaviour. Is there something that resembles a critical or sensitive period when children are more vulnerable to adverse influences like parental criminal behaviour? The idea of a critical period was first proposed for language development (Lenneberg, 1967; Penfield & Roberts, 1959). The critical period hypothesis states that human beings develop language in a specific period of their life. There is an increased sensitivity in this period and if the child is not being stimulated during this critical phase, it is much harder or even impossible to acquire language. The term sensitive period appears to apply better to the development of behaviour, because it is less strict; during an optimal period the person is especially responsive to certain stimuli (Berk, 2009; Bukatko & Daehler, 2001). The boundaries of this phase are more loosely
defined than those of a critical period (Bornstein, 1989). Stimulation during this sensitive period can exert a long-lasting impact on the development of behaviour, and emotional deprivation or trauma in specific periods might prevent children from developing social skills and appropriate behaviour (Knudsen, 2004; Scott, 1962). Most research on the sensitive period focuses on the development of desired behaviour (Berk, 2009; Bukatko & Daehler, 2001; Harley & Wang, 1997). Hardly any research has been carried out on the existence of a sensitive period for the development of undesirable behaviour such as delinquency.

Applying the idea of a sensitive period to the development of delinquent behaviour, the impact of parents’ criminal behaviour might be different at different ages and developmental stages of the child. For example, an advantage for younger children (pre-school age, 0–6 years) might be that they are not aware of their parents’ criminal behaviour. A disadvantage is that they have not fully developed their behavioural repertoire and might be more vulnerable to imitating their parents’ aggressive behaviour. Furthermore, they might not have developed coping strategies to handle the stressful situation of a parent’s conviction and they cannot just run away to their friends to escape a stressful situation. They are also more likely to be present when their parents are arrested. In contrast, school-age children (7–12 years) are more likely to be at school when their parents are arrested. However, they are more likely to be aware of their parents’ illegitimate behaviour and may experience greater stigma from society than younger children. According to Labelling Theory, people behave according to the label society attaches to them (Lemert, 1967). Stigma might cause children to develop delinquent behaviour. These children are also still developing their behavioural repertoire and coping strategies. They are still loyal to their parents, and might, therefore, be more likely to imitate their parent’s delinquent behaviour than older teenagers. Furthermore, they are not yet independent enough to go away and escape a problematic home situation with delinquent parents. Older children (13–18 years) do have this advantage of becoming independent. They spend more time without their parents and have more options to escape a possibly detrimental situation. They might have developed more coping strategies to deal with such a situation (Compas, 1987; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Goodman & Gotlib, 1999; Sroufe & Rutter, 1984). However, adolescence is a period in which delinquent behaviour increases and peer influence becomes more important (Warr, 2002). When adolescents do not want to associate with their parents, they could resist by displaying no delinquent behaviour as a reaction. What appears more likely, however, is that they associate with children from other problem families, which might lead to delinquent behaviour as well (Garbarino, 1989; Myers, Smarsh, Amlund-Hagen, & Kennon, 1999). Furthermore, these children are rapidly developing their own personal and social identity, which often involves a lot of insecurity. They might experience more stigma and/or stress of having a criminal parent and are more likely to react to this by engaging in offensive behaviour (Agnew, 1992, 1997; Besemer, van der Geest, Murray, Bijleveld, & Farrington, 2011; Larson & Asmussen, 1991; Larson & Ham, 1993).

**Cumulative developmental versus life-course perspective**

The issue of timing also relates to a cumulative developmental versus life-course perspective (Ireland et al., 2002). The cumulative developmental perspective based on
developmental psychology and psychopathology assumes that experiences early in life have a long-lasting impact. These experiences will influence children’s development, behaviour and coping skills. According to this perspective, detrimental experiences will have a stronger impact in early childhood than in adolescence. Moffitt’s (1993) theory for life-course persistent offenders is a good example; she describes how delinquent behaviour starts in early childhood and develops cumulatively for life-course persistent offenders. The life-course perspective, in contrast, does not deny the impact of experiences early in life, but states that more proximal events have a stronger impact. The life-course perspective assumes a more dynamic development of behaviour, where experiences can always impact on children’s development. Sampson and Laub’s (1993) age-graded theory of crime is an example of this perspective: it assumes that certain experiences will impact on people’s criminal behaviour all throughout their lives. The cumulative developmental perspective would hypothesise a stronger impact of parental convictions in early childhood, whereas the life-course perspective predicts a stronger impact of parental convictions in later childhood or adolescence.

**Previous research**

Few previous studies have focused on the timing of parents’ crime in the child’s life. Van de Rakt et al. (2010) studied the impact of the timing of parental criminal convictions on offspring offending and found that the risk of conviction for offspring in a certain year increased when the father had been convicted in that year. They also found that this effect was stronger in adolescence. Besemer et al. (2011) examined the timing of parental imprisonment and found that parental incarceration was only related to offspring’s criminal behaviour when it occurred after the child’s seventh birthday. West and Farrington (1977) found that sons whose fathers had been convicted after the son’s 10th birthday had only a marginally greater chance of conviction than sons whose fathers’ last conviction occurred before the son’s birth. Related research has examined the impact of child maltreatment on children’s delinquent behaviour and demonstrated that, contrary to most developmental theories of adverse influences that suggest that younger children are more vulnerable (Putnam, 1997), adolescent maltreatment is significantly related to offspring’s problem and delinquent behaviour as well as other negative consequences later in life, while childhood maltreatment is not (Eckenrode et al., 2001; Ireland et al., 2002; Smith, Ireland, & Thornberry, 2005; Thornberry, Ireland, & Smith, 2001).

Similarly, few studies have investigated the frequency of parents’ criminal behaviour. West and Farrington (1977) found that fathers with one conviction only and fathers with two or more convictions had the same proportion of convicted sons, which does not necessarily support a social learning mechanism. Van de Rakt, Nieuwbeerta, and de Graaf (2008) investigated conviction trajectories of both parents and children. They found that children whose fathers belonged to a more persistent trajectory group were more likely to also be in such a trajectory group, but Besemer and Farrington (2012) did not find this relationship between trajectory groups.

This paper attempts to fill this gap in knowledge by specifically investigating the impact of timing and frequency of parents’ criminal behaviour on offspring criminal
behaviour. The following hypotheses will be tested using data from the Cambridge Study in Delinquent Development (CSDD).

**Hypotheses**

1. **The number of offspring convictions will increase when a parent has been convicted for more offences.**

If the data support this hypothesis, this supports several of Farrington’s proposed mechanisms. When a parent offends more often, stronger social learning is expected, but one might also expect a stronger biological basis, more risk factors and a stronger official bias. This hypothesis is, therefore, not necessarily to contrast the different mechanisms, but more a first test to see how intergenerational transmission might work and whether one can differentiate between children whose parents are more or less persistent offenders.

2. **Offspring of parents who have only been convicted before the child’s birth will have more criminal convictions than offspring of parents who have never been convicted up to the child’s 19th birthday.**

3. **Having a convicted parent before birth (versus an unconvicted parent) still predicts a higher conviction rate after controlling for risk factors for crime.**

Both these groups did not experience parental conviction during their childhood. Although the first group’s parents had been convicted previously, assuming that these parents desisted from crime, these parents were not criminal role models for their children during childhood. We obviously do not know whether these parents really desisted and to what extent they might still have been a criminal role model, but for the purpose of this article, it is assumed that they indeed desisted from crime. If these parents still transmit criminal behaviour more strongly than parents who have never been convicted, this could be explained by either genetic mechanisms or because these parents continue to live in a criminogenic environment, thereby transmitting certain risk factors to their children.

To investigate whether a more criminogenic environment can explain a higher conviction rate for the first group, several variables known to be risk factors for criminal behaviour will be included in a multivariate regression analysis. The method section will describe these risk factors in more detail.

4. **Intergenerational transmission will be stronger when parents have been convicted after the child’s birth.**

5. **Having a parent convicted after the child’s birth (versus before birth) still predicts a higher conviction rate after controlling for risk factors for crime.**

As with hypothesis 2, it is assumed that parents who had been convicted only before their child’s birth desisted from crime. Thus, these parents were a less criminal role model than parents who had been convicted after the child’s birth. When the data confirm this hypothesis, it demonstrates that the experience of a parental conviction makes a difference. This would support dynamic theories of transmission such as the
social learning mechanism, because children whose parents had been convicted after the child’s birth had a (stronger) criminal role model. It could also be possible that this group grew up in a more criminogenic environment with more risk factors for crime. To investigate this last option, I will again include risk factors for criminal behaviour in a multivariate regression analysis.

6. Intergenerational transmission will be stronger when parents have been convicted when the child was older (timing in the child’s life – social learning: identification).

The theories discussed above suggest that parental crime and convictions can have an impact for specific reasons at different ages and do not clearly point to one age group that might be more vulnerable than others. Previous research, however, tends to conclude that older children are more strongly impacted by parental conviction, imprisonment and maltreatment. Therefore, it is expected that intergenerational transmission is stronger when children were older at the time of parental conviction. When the data support this hypothesis, this also agrees with dynamic theories of crime and a life-course perspective. It would strengthen the idea that stigma and identification with the criminal parent might be important in intergenerational transmission.

Method

Sample (CSDD)

These hypotheses are investigated by using data from the CSDD, a prospective longitudinal study that has followed 411 males from London born around 1953. At the time they were first contacted in 1961–1962, these males were all living in a working-class inner-city area of South London. The sample was chosen by taking all of the boys who were then aged 8–9 and on the registers of six state primary schools within a one-mile radius of a research office that had been established. Hence, the most common year of birth for these males was 1953. In nearly all cases (94%), their family breadwinner in 1961–1962 (usually the father) had a working-class occupation (skilled, semi-skilled or unskilled manual worker). Most of the boys were white and of British origin. Donald J. West originally directed the study and David P. Farrington, who has worked on it since 1969, has directed it since 1982. The males have been studied at frequent intervals between the ages of 8 and 50. Information on criminal convictions and self-reported delinquency was collected over the course of these years. In addition, police records of offending of the parents and siblings of these 411 males have been collected. For the current study, only the police records have been used, because self-reports were not available for parents and siblings. For more information and major findings see West (1969, 1982), West and Farrington (1973, 1977), Farrington and West (1990), Farrington (1995, 2003), Farrington et al. (2006) and Farrington, Coid, and West (2009).

The current investigation studied the original men, their parents and their full biological siblings. Investigating the siblings increased the sample size and enabled a broadening of the analysis as females were included. A sample was taken from the siblings: people born between January 1946 and September 1962. The last criminal
record search for siblings took place in September 2002. Choosing this date limit made it possible to investigate conviction data for all subjects up to their 40th birthday. This birth range resulted in a sample of 1184 children (402 females and 782 males, including the original men). Because the data collection started with families that had at least one boy born in 1953–1954, the data set did not contain families with girls only. Therefore, the proportion of males to females in the current sample was approximately 2:1.

**Measures**

*Criminal convictions*
Offending of both parents and offspring was measured by using official criminal records. Convictions were searched in the Criminal Record Office in London (Farrington, Barnes, & Lambert, 1996). The date when the offence was committed was used to time the delinquency. If no commission date was known, the conviction date was used. Offences were defined as acts leading to convictions, and only one offence per day was counted. This rule was adopted so that each separate behavioural act could yield only one offence; if all offences had been counted, the number of offences would have been greater than the number of criminal behavioural acts, resulting in an overestimation of criminal behavioural acts (Farrington et al., 2006). Convictions were counted for relatively serious offending ranging from theft, burglary, fraud to robbery, sexual offences and murder. Minor offences such as drunkenness and traffic offences were excluded.

*Predictor and outcome variables*

Hypothesis 1 posits that the frequency of parents’ crime will influence offspring’s criminal behaviour: the more convictions the parent had, the more convictions the child will have. Before investigating whether the frequency of parents’ offending was related to offspring offending, it was first investigated whether the fact that the parent had a conviction was significantly related to offspring offending. The reason this variable was used is because the aim of this hypothesis was to find out whether the frequency of parents’ crime had a separate impact on children’s offending behaviour over and above the fact that parents had a conviction. Therefore, two predictor variables were used: a dichotomous variable on whether parents had a conviction between their 12th and 40th birthdays, and a continuous variable with the number of convictions in this period. For hypotheses 2–4 several predictor variables with groups of children were computed. For hypothesis 2, two groups were created: one with children whose parents had only been convicted before the child’s birth and not up until the child’s 19th birthday versus those whose parents had never been convicted up until the child’s 19th birthday. For hypothesis 3, the first group from hypothesis 2, children whose parents had only been convicted before the child’s birth, was compared to children whose parents had been convicted at some point between the child’s birth and 19th birthday (without looking at what occurred before or after this period). For hypothesis 4, three groups were compared: children whose parents had been convicted when the children were between 0 and 6, 7 and 12, versus 13 and 18 year olds. These groups are not mutually exclusive: children whose parents had
been convicted in more than one period, have been included in every period in which their parents had been convicted.\textsuperscript{2}

The outcome variable for all hypotheses was the offspring’s conviction rate, defined as the number of convictions for crimes committed between the 12th and 40th birthdays. In this variable, non-offenders are also included. Thus, an offender in this paper is defined as someone who had been convicted of an offence between these ages. This was studied separately for all children, and for sons and daughters separately. Separating the analyses by offspring gender was done, because boys and girls might react differently to stressful life events such as parental convictions (Farrington et al., 1996). In general, boys display more externalising problem behaviour such as delinquency, while girls have more internalising problems such as anxiety and depression (Capaldi, DeGarmo, Patterson, & Forgatch, 2002; Robins, 1966, 1986). Investigating differences between the two genders remains outside the scope of this article, but results are mentioned for each gender separately, precisely because girls tend to show less criminal behaviour.

Furthermore, for hypotheses 3 and 5, risk factors were added to the analysis. First, it was investigated which risk factors were significantly related to the outcome variable: conviction rate between the 12th and 40th birthdays. The following eight variables were significantly related to the offspring’s conviction rate: low family SES, low family income, poor housing, large family size, teen mother at birth of first child, parental conflict, parents’ interest in education and poor job record of the father. These are all dichotomous variables measured at either age 8 or 10, coded 1 if the child had the risk factor, coded 0 if the factor was absent (for more details on how these were measured, see Farrington & Painter, 2004). Multiple risk factors have a cumulative effect: the more risk factors, the more problem behaviour (Farrington et al., 2009; Loeber, Farrington, Stouthamer-Loeber, & van Kammen, 1998; Thornberry, Freeman-Gallant, Lizotte, Krohn, & Smith, 2003). The eight risk factors also correlated with each other. Therefore, these risk factors were summarised by taking the mean value. The risk factor mean was included in a multivariate regression analysis together with the variable indicating whether parents had been convicted only before birth versus never (hypothesis 3), respectively with the variable whether parents had been convicted only before birth versus afterwards (hypothesis 5).

**Analytic approach**

*Generalised Estimating Equations (GEE)*

The hypotheses were analysed using GEE in SPSS (for more technical information on GEE, see: Lipsitz, Laird, & Harrington, 1991; Zeger & Liang, 1992). The sample consisted of siblings clustered within families. With the clustering of siblings, conventional statistics are inappropriate, because they do not take into account the dependencies between cluster members (Ananth, Platt, & Savitz, 2005). However, GEE uses this within-cluster similarity. It weights each cluster of data according to the within-cluster correlation (Hanley, Negassa, Edwardes, & Forrester, 2003). When there is no correlation between family members, the cluster receives a weight of 1 and cluster members are treated as if they were independent subjects. Highly correlated siblings receive a lower weight. Using these weights, GEE then analyses the relationships between the variables considering the dependencies within clusters.
GEE can deal with a large number of small clusters and is, therefore, especially suited for the current data with a large number of families, generally consisting of fewer than 10 members (Liang & Zeger, 1993). Within GEE it is possible to choose different analytical models. Negative binomial regression was used because the dependent variable offspring’s conviction rate was highly skewed; many people had never been convicted. With such a skewed distribution it was inappropriate to run a linear regression analysis. Negative binomial regression analysis suitably deals with skewed distributions. Furthermore, the predictor variable number of parental convictions (hypothesis 1) was also positively skewed and, therefore, log-transformed in the analysis. A value of one has been added to all scores before performing the log natural transformation.3

Results

Parents’ frequency of crime

First, children’s offending was regressed on whether parents had a conviction or not. The dichotomous predictor variable was coded 1 if either the father or the mother had a conviction between their 12th and 40th birthdays. This proved to be a significant predictor of offspring’s conviction rate (see Table 1). The conviction rate ratio is 3; children whose parents had been convicted had three times more convictions than children whose parents had not been convicted. This applied to sons as well as daughters. Secondly, parents’ frequency of offending was used as a predictor variable. The continuous variable was a sum of the number of convictions the father and mother each had between their 12th and 40th birthdays. This also proved to be a significant predictor of children’s conviction rate (see Table 2). The more convictions parents had, the more convictions children had. Again, this applied to sons as well as daughters.

Our third step combined the dichotomous and continuous variable, because the aim was to investigate whether the frequency of parents’ crime had a separate impact on children’s offending behaviour over and above the fact that the parent had a conviction. Only children whose parents had at least one conviction were included.

Table 1. Impact of parental conviction (when parent aged 12–39) on offspring’s conviction rate.

<table>
<thead>
<tr>
<th>Offspring conviction rate 12–39</th>
<th>Parent no conviction</th>
<th>Parent conviction</th>
<th>CR ratio</th>
<th>PC/PN</th>
<th>B</th>
<th>95% CI B</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>CR (SD)</td>
<td>N</td>
<td>CR (SD)</td>
<td>PC/PN</td>
<td>B</td>
<td>95% CI B</td>
</tr>
<tr>
<td>All children</td>
<td>790</td>
<td>0.82 (2.46)</td>
<td>394</td>
<td>2.43 (4.75)</td>
<td>3.0</td>
<td>1.12</td>
<td>0.77 to 1.47</td>
</tr>
<tr>
<td>Sons</td>
<td>521</td>
<td>1.15 (2.90)</td>
<td>261</td>
<td>3.35 (5.51)</td>
<td>2.9</td>
<td>1.12</td>
<td>0.75 to 1.48</td>
</tr>
<tr>
<td>Daughters</td>
<td>269</td>
<td>0.18 (0.93)</td>
<td>133</td>
<td>0.64 (1.58)</td>
<td>3.6</td>
<td>1.26</td>
<td>0.47 to 2.06</td>
</tr>
</tbody>
</table>

Notes: 95% CI B, 95% confidence interval B; CR, conviction rate; N, number of children; PC, parent conviction; PN, parent no conviction; SD, standard deviation.

*The conviction rate ratio is calculated as the mean conviction rate for children with a convicted parent (CR/PC) divided by the mean conviction rate for children whose parents have no convictions (CR/PN).
and the number of parental convictions was used as predictor variable. The results demonstrate that the number of parental convictions was a significant predictor of offspring’s conviction rate, over and above the parents having a conviction (Table 3). To give an indication of the magnitude of the number of parental convictions: children whose parents had one parental conviction had on average 1.64 convictions (SD = 3.33), children whose parents had 2–3 convictions had 2.23 convictions (SD = 4.20), while children whose parents had four or more convictions had on average 3.51 convictions (SD = 6.19). There was no significant relationship when daughters were analysed separately. The results support the hypothesis that the number of offspring convictions increases when parents had been convicted more often.

**Timing of parents’ crime in the child’s life**

After examining the frequency of parental criminal behaviour, the timing was investigated. Descriptive results are presented in Table 4, which presents the average conviction rates and standard deviations for each of the groups compared and the number of offspring involved. These results will be described more fully in each of the following sections.

**Parent convicted before the child’s birth versus never**

Hypothesis 2 posits that children whose parents had been convicted only before the child’s birth would have a higher conviction rate than children whose parents had never been convicted either before or during the offspring’s childhood. The results for comparing these two groups are presented in Table 5 (step 1). Children whose parents had only been convicted before the child’s birth had significantly more convictions than children whose parents had never been convicted (1.62 versus 0.62, B = 0.96, p < 0.001). Although parents had only been convicted before the child’s
birth, their children still committed more crime than children whose parents had never been convicted.

To investigate whether the difference between these groups could be explained by the transmission of a criminogenic environment, the risk factor mean was included in the regression analysis. Children whose parents had never been convicted have a lower risk factor mean compared to children whose parents had been convicted before birth. These two groups differ significantly on four of the risk factors: children whose parents had never been convicted have a lower chance to come from a large family, to live in poor housing, to have a mother who was a teenager when her first child was born and to have a father with a poor job record. The risk factor mean was included in a multivariate regression analysis together with the variable whether parents had been convicted only before birth versus never. This was only done where the groups were significantly different in the previous analysis (step 1, all children and sons only). The results presented in Table 5 (step 2) demonstrate that the significant relationship for group membership (parent never convicted versus convicted before the child’s birth) remained when controlling for risk factors. When risk factors were added to the analysis, the impact of the parent’s conviction became slightly smaller in every analysis (the $B$s are smaller). Apparently, risk factors explain part of the difference in conviction rate between children whose parents had

<table>
<thead>
<tr>
<th>Offspring conviction rate</th>
<th>All children</th>
<th>Sons only</th>
<th>Daughters only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N$</td>
<td>CR (SD)</td>
<td>$N$</td>
</tr>
<tr>
<td>Parental conviction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never until offspring’s 19th birthday</td>
<td>733</td>
<td>0.62 (1.83)</td>
<td>479</td>
</tr>
<tr>
<td>Before offspring’s birth only</td>
<td>110</td>
<td>1.62 (3.13)</td>
<td>76</td>
</tr>
<tr>
<td>When offspring 0–18</td>
<td>332</td>
<td>2.76 (5.23)</td>
<td>220</td>
</tr>
<tr>
<td>When offspring 0–6</td>
<td>192</td>
<td>2.73 (5.19)</td>
<td>128</td>
</tr>
<tr>
<td>When offspring 7–12</td>
<td>138</td>
<td>3.70 (6.38)</td>
<td>89</td>
</tr>
<tr>
<td>When offspring 13–18</td>
<td>134</td>
<td>3.09 (5.67)</td>
<td>83</td>
</tr>
</tbody>
</table>

Notes: CR, conviction rate; $N$, number of children; SD, standard deviation.

Table 5. Comparing offspring’s conviction rate for children whose parents had only been convicted before the child’s birth versus those whose parents had never been convicted up until the child’s 19th birthday and the impact of risk factors.

<table>
<thead>
<tr>
<th></th>
<th>CR ratio</th>
<th>$B$</th>
<th>95% CI $B$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>All children</td>
<td>Step 1 – PCB versus PN</td>
<td>2.6</td>
<td>0.96</td>
<td>0.52 to 1.39</td>
</tr>
<tr>
<td></td>
<td>Step 2 – PCB versus PN</td>
<td>0.82</td>
<td>0.40 to 1.25</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Risk factors</td>
<td>1.13</td>
<td>0.26 to 1.99</td>
<td>0.011</td>
</tr>
<tr>
<td>Sons</td>
<td>Step 1 – PCB versus PN</td>
<td>2.5</td>
<td>0.88</td>
<td>0.44 to 1.31</td>
</tr>
<tr>
<td></td>
<td>Step 2 – PCB versus PN</td>
<td>0.72</td>
<td>0.30 to 1.14</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Risk factors</td>
<td>1.33</td>
<td>0.42 to 2.24</td>
<td>0.004</td>
</tr>
<tr>
<td>Daughters</td>
<td>Step 1 – PCB versus PN</td>
<td>2.9</td>
<td>1.10</td>
<td>−0.12 to 2.32</td>
</tr>
</tbody>
</table>

Notes: 95% CI $B$, 95% confidence interval $B$; CR, conviction rate; PCB, parental conviction before birth child only; PN, parent never convicted up until child’s 19th birthday.
been convicted only before birth versus never. However, the conviction itself also has an impact. Apparently, parents who had been convicted before their child was born transmit a propensity to their children to commit crime, even though these children did not actually experience parental conviction. It appears that both the fact that parents had been convicted and the presence of risk factors can explain the difference between these two groups. The results support hypothesis 2 as well as hypothesis 3. The next step in the analyses compared children whose parents had only been convicted before birth with children whose parents had been convicted during the offspring’s childhood.

**Before versus after birth**

Hypothesis 4 posits that children whose parents had been convicted after the child’s birth exhibit more criminal behaviour than children whose parents had been convicted only before their birth. The results for comparing these two groups are presented in Table 6 (step 1). Children whose parents had been convicted only before the child’s birth had on average 1.62 convictions, compared to 2.76 convictions for children whose parents had been convicted after the child’s birth (Table 4). This was significantly different (CR ratio = 1.7, \( B = 0.55, \ p = 0.017 \)). When sons and daughters were analysed separately, the strength of the difference between the two groups appeared to be stronger for daughters (CR ratio = 2.6 versus 1.7), but the difference was not significant (\( p = 0.167 \)).

The difference between children whose parents had been convicted before birth versus afterwards could be explained by the observation that the latter group experienced parental conviction and had a stronger criminal role model, but similarly, there could be a difference in risk factors between these groups. Children whose parents had been convicted only before the child’s birth had a lower risk factor mean compared to children whose parents had been convicted after their birth. The latter group was more likely to come from a background with low family income, large family size, poor job record of father and less interest in education by parents.

Table 6. Comparing offspring’s conviction rate for children whose parents had only been convicted before the child’s birth versus those whose parents had been convicted between the child’s birth and 19th birthday and the impact of risk factors.

<table>
<thead>
<tr>
<th></th>
<th>CR ratio</th>
<th>B</th>
<th>95% CI B</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>All children</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1 – PCB versus PC 0–18</td>
<td>1.7</td>
<td>0.55</td>
<td>0.10 to 1.00</td>
<td>0.017</td>
</tr>
<tr>
<td>Step 2 – PCB versus PC 0–18</td>
<td>0.36</td>
<td>-0.09 to 0.81</td>
<td>0.120</td>
<td></td>
</tr>
<tr>
<td>Risk factors</td>
<td>1.27</td>
<td>0.54 to 2.00</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Sons</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1 – PCB versus PC 0–18</td>
<td>1.7</td>
<td>0.64</td>
<td>0.19 to 1.10</td>
<td>0.006</td>
</tr>
<tr>
<td>Step 2 – PCB versus PC 0–18</td>
<td>0.43</td>
<td>-0.01 to 0.87</td>
<td>0.057</td>
<td></td>
</tr>
<tr>
<td>Risk factors</td>
<td>1.47</td>
<td>0.77 to 2.17</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Daughters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1 – PCB versus PC 0–18</td>
<td>2.6</td>
<td>0.80</td>
<td>-0.34 to 1.94</td>
<td>0.167</td>
</tr>
</tbody>
</table>

Notes: 95% CI B, 95% confidence interval B; CR, conviction rate; PCB, parental conviction before birth child only; PC 0–18, parent convicted between child’s birth and 19th birthday.
Again, where the groups were significantly different in the previous analysis (step 1, all children and sons only), the risk factor variable was included in a multivariate regression analysis together with the variable whether parents had been convicted only before birth versus afterwards. The results presented in Table 6 (step 2) demonstrate that the impact of the parental conviction decreased when risk factors were taken into account. Whether parents had been convicted before birth or afterwards was not a significant predictor anymore, but the risk factor variable was. Apparently, the difference between children who experienced parental conviction before birth versus afterwards can be largely explained by the observation that these children differ in the number of risk factors for crime.

These results support the hypothesis 4 that intergenerational transmission is stronger when parents have been convicted after the child’s birth. However, the results do not support hypothesis 5, rather they show that this transmission can be largely explained by the observation that children whose parents were convicted after the child’s birth had more risk factors for crime; that is, they grew up in a more criminogenic environment.

**Offspring age at parent’s convictions**

For hypothesis 6, three groups were compared: children whose parents had been convicted when the children were between 0 and 6, 7 and 12, versus 13 and 18 years old. Results from the analyses comparing the three groups with each other and with the group of children whose parents had been convicted only before the child’s birth are presented in Table 7. All groups have a higher average number of convictions than children whose parents had only been convicted before the child’s birth (CR ratio between 1.6 and 3.9). Children whose parents had been convicted when the children were between ages 7 and 12 had the highest number of convictions (3.70), followed by the 13–18 group (3.09) and the 0–6 group (2.73; Table 4). However, the differences between these groups were not statistically significant. The results do not support the hypothesis that intergenerational transmission is stronger when parents have been convicted when the child was older. Furthermore, there does not appear to be a sensitive period for the impact of parental crime.

**Discussion**

This study investigated whether the frequency of parents’ criminal behaviour and timing of parent’s criminal behaviour in the child’s life has an impact on offspring’s criminal behaviour. Six hypotheses were tested. First, the results demonstrated that parents’ frequency of criminal behaviour was significantly related to offspring offending. Secondly, examining the timing of parents’ convictions, the results demonstrated that even when parents had only been convicted before birth, their children had more convictions than children whose parents had never been convicted before or during the offspring’s childhood. Thirdly, this difference remained significant when risk factors were taken into account, even though the risk factors explained part of the difference. These results support static theories of transmission such as genetic mechanisms and/or a transmission of the criminogenic environment. Fourthly, children whose parents had been convicted after the child’s birth had more convictions than those whose parents had only been convicted before the child’s
birth. Fifthly, however, the impact of a parental conviction after birth became insignificant when risk factors were taken into account. Sixthly, children whose parents had been convicted when the children were between age 7 and 12 had the highest conviction rate, but none of the differences comparing the impact of parental conviction at different ages were significant. What do these results mean? Although the age group 7–12 had the highest conviction rate, none of the differences between the age groups were significant. The results demonstrate an impact of parental conviction at each age group and do not support the idea of a sensitive period for the impact of parental criminal behaviour. The results could not differentiate between the cumulative developmental and life-course perspective; parental conviction in all age periods had an impact on offspring offending. This study did not find such strong results as found in an earlier study of the impact of timing of maltreatment with the Rochester Youth Development Study (Ireland et al., 2002; Smith et al., 2005; Thornberry et al., 2001). It would be valuable to replicate the current study using different samples of people to investigate the impact of timing of parental convictions of offspring offending behaviour.

Secondly, when comparing children whose parents had been convicted before versus after the child’s birth, risk factors were more important than the parental conviction itself. This supports the transmission of a criminogenic environment more than the social learning perspective. After taking into account this criminogenic

<table>
<thead>
<tr>
<th>Table 7. The impact of the timing of parents’ convictions in the child’s life on offspring’s conviction rate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR ratio</td>
</tr>
<tr>
<td>All children</td>
</tr>
<tr>
<td>PCB versus PC 0–6</td>
</tr>
<tr>
<td>PCB versus PC 7–12</td>
</tr>
<tr>
<td>PCB versus PC 13–18</td>
</tr>
<tr>
<td>PC 0–6 versus 7–12</td>
</tr>
<tr>
<td>PC 0–6 versus 13–18</td>
</tr>
<tr>
<td>PC 7–12 versus 13–18</td>
</tr>
<tr>
<td>Sons</td>
</tr>
<tr>
<td>PCB versus PC 0–6</td>
</tr>
<tr>
<td>PCB versus PC 7–12</td>
</tr>
<tr>
<td>PCB versus PC 13–18</td>
</tr>
<tr>
<td>PC 0–6 versus 7–12</td>
</tr>
<tr>
<td>PC 0–6 versus 13–18</td>
</tr>
<tr>
<td>PC 7–12 versus 13–18</td>
</tr>
<tr>
<td>Daughters</td>
</tr>
<tr>
<td>PCB versus PC 0–6</td>
</tr>
<tr>
<td>PCB versus PC 7–12</td>
</tr>
<tr>
<td>PCB versus PC 13–18</td>
</tr>
<tr>
<td>PC 0–6 versus 7–12</td>
</tr>
<tr>
<td>PC 0–6 versus 13–18</td>
</tr>
<tr>
<td>PC 7–12 versus 13–18</td>
</tr>
</tbody>
</table>

Notes: 95% CI B, 95% confidence interval B; CR, conviction rate; PCB, parental conviction before birth child only; PC 0–6, parent convicted at some point between child’s birth and seventh birthday; PC 7–12, parent convicted at some point between the child’s 7th and 13th birthday; PC 13–18, parent convicted at some point between the child’s 13th and 19th birthday.
environment it does not matter whether children actually experienced the parental conviction; they exhibit similar levels of criminal behaviour. Unfortunately, this study is unable to make statements about what is actually causing the behaviour. The risk factors could be causing the offspring’s offending separately from the parents’ offending; the risk factors could be causing the parents’ as well as the children’s crime; or the parent’s offending could be causing the risk factors and the risk factors could then cause the offspring offending. It was not possible to investigate the temporal sequence of risk factors and parent and offspring offending and, therefore, this study could not differentiate between Farrington’s (2011) continuity versus mediation through risk factors mechanism. Farrington (1997) describes how crime ‘seems to be only one element of a larger syndrome of anti-social behaviour which arises in childhood and usually persists into adulthood’ (p. 363). People who demonstrate delinquent behaviour also exhibit problems in other areas of their life, such as unemployment, drug use, heavy alcohol use and unstable living accommodation. Farrington’s first explanation describes how these circumstances are transmitted from parents to children. Crime is not directly transmitted from parents to children, but rather through continuity of a constellation of antisocial features. The second mechanism is related to the first, but here the risk factors are mediating factors. A mediator is ‘the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest’ (Baron & Kenny, 1986, p. 1173). Parental criminality causes the mediating factor and this mediating factor causes the offspring’s criminality. Mediating factors can be the same risk factors as in the first mechanism, such as poverty, living in a bad neighbourhood, poor parenting practices and so on. The mediator is a link in the causal chain between parents’ and children’s criminality. It would be interesting to investigate whether these risk factors are part of a larger syndrome of antisocial behaviour or whether these are mediating factors in intergenerational transmission.

Although this study could not differentiate between the two mechanisms, it does demonstrate that it is important to include risk factors for crime when investigating the timing of parents’ criminal behaviour. The results demonstrate that part of the difference between children whose parents had been convicted before versus after the child’s birth and between this latter group and children whose parents had never been convicted could be explained by the presence of risk factors in the children’s life. Children whose parents had been convicted grow up in a more criminogenic environment characterised by low family SES, low family income, poor housing, large family size, teen mother at birth of first child, parental conflict, parents’ interest in education and poor job record of father. This criminogenic environment is even stronger when parents had been convicted after the child’s birth. Farrington’s (2011) postulation that intergenerational transmission can be explained by transmission of a cycle of deprivation and antisocial behaviour is thus supported.

Thirdly, even though studying gender differences remained outside the scope of this paper, it is interesting to compare the results for males and females. In the frequency analyses, the number of parental convictions over and above the fact that parents have a conviction is only a significant predictor for sons, but not for daughters analysed separately. This insignificance might be due to the lower number of girls in the sample, but the magnitude of the impact also appears to be smaller for girls than for boys (the $B$ is smaller). An explanation for this difference might be that boys and girls react differently to stressful life events such as parental convictions.
In general, boys display more externalising problem behaviour such as delinquency, while girls have more internalising problems such as anxiety and depression (Capaldi et al., 2002; Robins, 1966, 1986). However, the difference between girls who experienced parental conviction before versus after birth is larger than the difference for boys, although the difference is not significant for girls (CR ratio 2.6 versus 1.7 for boys). This does not support this explanation. Moffitt, Caspi, Rutter, and Silva (2001) have studied boys’ and girls’ different reactions to several risk factors such as parental criminality. Yet, they found few differences between the sexes in the effect of these risk factors, so this explanation of different reaction patterns appears unlikely.

Unfortunately it was not possible to examine the impact of fathers’ and mothers’ convictions separately, because the number of mothers with a conviction was too low. It would be interesting to investigate a possible different impact of fathers’ versus mothers’ convictions. Women committing crime are less usual. Being such an exception might lead to more stigma in society and official bodies such as the police might pay more attention to women and their families. Furthermore, intergenerational transmission and social learning may be stronger in same-gender relationships (Farrington et al., 1996). The current study should be replicated with a larger data-set to investigate whether mothers’ and fathers’ convictions have a different impact on sons and daughters.

What do these results mean to policy-makers who want to break the cycle and reduce intergenerational transmission of criminal behaviour? It appears that parents’ criminal behaviour, but also risk factors for crime are related to more offspring crime. Some of these risk factors are static and harder to change such as a large family size or having a mother who was a teenager when her first child was born. Other risk factors are slightly more open to change such as low family income, poor housing, poor job record of father and low interest in education by parents. The current study was unable to investigate whether there is a causal relationship between these risk factors and offspring criminal behaviour, but if there is a causal relationship this might be an opportunity to prevent or reduce intergenerational transmission of criminal behaviour. Apart from family-based prevention programmes that focus on parents’ child rearing techniques (for more information see, for example, Farrington & Welsh, 2007; Kazdin, 1997), it might be fruitful to improve on these dynamic risk factors. For example, improving on someone’s employability might not only decrease that person’s criminal behaviour (as demonstrated by van der Geest, Bijleveld, & Blokland, 2011; Verbruggen, Blokland, & van der Geest, 2011), but also their children’s future criminal behaviour. Even the more static factors, such as teenage motherhood, are open to intervention.

It must be recognised that the results from this study might not be easily generalisable to today’s situation or to other countries. This sample of boys and girls was born in England in the 1940–1960s when family structures were different from today. Genetic mechanisms of transmission might stay the same, but the influence of other social role models apart from the parents might be larger nowadays. Furthermore, nowadays and in other societies it might be easier to develop out of a criminogenic environment. In England, geographical and cultural class boundaries were strong, and birth class had a strong forecasting effect on children’s life-path (Blanden, Gregg, & Machin, 2005; Breen, 2004; Musterd, 2005). In other societies it might be easier to escape the criminogenic environment, while in England, parental...
conviction and associated factors may have sustained risk factors for crime further in life because they are much more connected to social and cultural class factors.

This study undoubtedly has limitations. First, only official data have been used and these suffer from a dark number; part of offending that is not measured by official statistics (Bijleveld, 2007; Fisher & Ross, 2006; Maguire, 2007). This means that only part of people’s total offending behaviour may be visible, we see the tip of the iceberg. People are likely to commit more offending behaviour that is undetected, and many people will never appear in official statistics even though they have exhibited criminal behaviour. Official convictions are only indicators of offending behaviour. It would be interesting to investigate the impact of timing and frequency of parental crime using self-reported data on offending behaviour for both generations.

Second, there are obviously many more factors involved in intergenerational transmission besides the timing and frequency of parental behaviour and the risk factors that were included in the multivariate analyses. Official bias or assortative mating was not investigated specifically and the mechanisms discussed could also be examined in other ways. It is vital that more studies are carried out to increase knowledge on intergenerational transmission of criminal behaviour.

Despite these limitations, this study has contributed to our understanding of intergenerational transmission on several points. As far as known to the author, no other study previously investigated the presence of a sensitive period and the impact of timing of parental crime in the child’s life on offspring offending into adulthood. Only one study previously investigated the number of fathers’ convictions, but none included mothers’ convictions. By using a large prospective sample with information on convictions for both parents, this study demonstrated support for static as well as dynamic explanations of intergenerational transmission such as genetic mechanisms, the transmission of a criminogenic environment and/or mediation through risk factors.

Acknowledgements
I am greatly indebted to David Farrington and Donald West for the data collection of the Cambridge Study in Delinquent Development. Furthermore, I would like to thank Catrien Bijleveld, David Farrington, and the IoC Writing Group as well as the anonymous PCL reviewers and the editor for their helpful comments on drafts of this paper. This work was supported by the Gates Cambridge Trust. Data collection for the Cambridge Study in Delinquent Development was funded by the UK Home Office.

Notes
1. Assortative mating is defined as ‘the tendency for people to form unions with similar others’ (Moffitt et al., 2001, p. 185). People tend to affiliate with those who are similar to themselves, and antisocial people tend to marry and have children with other antisocial people. Children with two criminal parents have an increased risk to show antisocial behaviour, they experience a ‘double whammy’ effect (Moffitt et al., 2001, p. 195; West & Farrington, 1977). They inherit an antisocial phenotype twice and grow up in a criminogenic home environment. However, I argue that assortative mating is not a mechanism in itself, because other explanations such as genetic, social learning or risk factor mechanisms are needed to explain transmission in the first place. Assortative mating only posits that the intergenerational transmission is stronger with two than with one criminal parent.
2. Analyses with mutually exclusive groups led to similar conclusions. Furthermore, analyses where groups were combined (0–6 and 7–12, 7–12 and 13–18, 0–6 and 13–18) and
compared with each other and with the groups studied in this article did not lead to significant results. The age cut-off points were chosen to create groups with a similar age interval. Furthermore, 0–6 years of age represents a pre-school age, 7–12 represents primary school, while 13–18 year olds are likely to be in secondary school, further education or working.

3. Log natural transformation of a count variable with a skewed distribution is recommended (Tabachnick & Fidell, 2007) and used widely in criminological research (e.g. Krahn, Hartnagel, & Gartrell, 1986; Messner, 1989; Neapolitan, 1994, 1995, 1997). The following formula was used for the log natural transformation: \( \log(x) = \ln(x+1) \).

References


Thornberry, T.P. (2009). The apple doesn’t fall far from the tree (or does it?): Intergenerational patterns of antisocial behavior – The American Society of Criminology 2008 Sutherland address. *Criminology, 47*, 297–325.


