

Criminal Behaviour and Mental Health
19: 109–124 (2009)
Published online in Wiley InterScience
(www.interscience.wiley.com) DOI: 10.1002/cbm.717

Family factors in the intergenerational transmission of offending

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ABSTRACT

Background *Convicted parents tend to have convicted children, but there have been few previous studies of transmission between three generations, especially including both records and interviews for hundreds of people.*

Method *In the Cambridge Study in Delinquent Development (CSDD), 411 south London males have been followed up from age 8 to age 48. These males (generation 2, G2) are compared with their fathers and mothers (generation 1, G1), and with their biological sons and daughters (generation 3, G3).*

Results *There was significant intergenerational transmission of convictions from G1 males to G2 males, and from G2 males to G3 males. Convictions of fathers still predicted convictions of sons after controlling for risk factors, but the predictive efficiency was reduced. Transmission was less from G1 females to G2 males, and from G2 males to G3 females. There was little evidence of intergenerational transmission from G1 to G3, except from grandmothers to granddaughters.*

Conclusions *The intergenerational transmission of offending may be mediated by family, socio-economic and individual risk factors. Intervention to reduce intergenerational transmission could target these risk factors. Copyright © 2009 John Wiley & Sons, Ltd.*

Introduction

There is no doubt that offending runs in families. Criminal parents tend to have criminal children (Farrington and Welsh, 2007). However, there have been relatively few studies of the intergenerational transmission of offending since the early cross-sectional research of Glueck and Glueck (1950) and Ferguson (1952), and the early longitudinal surveys of McCord (1977) and Robins et al. (1975).

Farrington et al. (1996, p. 47) speculated that 'this may partly be because most American criminologists were trained as sociologists and are concerned to avoid any suggestion that offending might be genetically transmitted (although, of course, the concentration of offending in families might also be explainable by environmental transmission)'.

The intergenerational transmission of offending has been extensively investigated in the Cambridge Study in Delinquent Development (CSDD), which is a prospective longitudinal survey of the development of offending and antisocial behaviour in 411 south London males (Farrington, 2003; Farrington et al., 2006). Analyses reported by Farrington et al. (1975) and by West and Farrington (1977) were based on convictions of all family members up to the end of 1973, when the study males were aged 20, on average. The results showed that 48% of the study males with convicted fathers were themselves convicted compared with only 19% of those with unconvicted fathers. The percentage of males who were convicted did not vary according to whether the father was last convicted before or after the boy's birth, suggesting that there was no direct behavioural influence of criminal fathers on criminal sons. There was no evidence that criminal fathers directly encouraged their sons to commit crimes or taught them criminal techniques. On the contrary, criminal fathers condemned offending by their sons. Hardly any criminal fathers co-offended together with study males (Reiss and Farrington, 1991).

Convicted fathers were significantly likely to be married to convicted mothers. (For this generation, cohabitation outside marriage was uncommon.) However, even restricting the analysis to those married to unconvicted mothers, convicted fathers still predicted the study males' offending. Indeed, a convicted father predicted the boys' offending even when no other family member was convicted. The influence of a convicted father did not vary according to the extent of his criminal record (whether he had two or more convictions as an adult).

Convicted fathers also predicted self-reported offending by the study males. However, at all levels of self-reported offending, a convicted father was associated with an increased likelihood of the boy being convicted. This suggests that a boy from a known criminal family who was apprehended for offending might have been more likely to be prosecuted and convicted than a boy from a non-criminal family. A convicted father was especially associated with poor parental supervision, which may have been one link in the chain between convicted fathers and convicted sons.

Over half (54%) of study males with convicted mothers were themselves convicted, compared with 23% of those with unconvicted mothers. The majority of convicted mothers were married to convicted fathers. However, even restricting the analysis to those married to unconvicted fathers, convicted mothers still predicted the boy's offending. There was some evidence that a convicted mother was a better predictor than a convicted father of convictions by daughters. A convicted mother was especially associated with poor parental child-rearing

behaviour (harsh or erratic discipline, cruel or neglecting attitude, parental conflict).

Having a convicted parent or a convicted older sibling by the 10th birthday were consistently among the best, aged 8–10, predictors of a boy's later offending and antisocial behaviour. Apart from behavioural measures such as troublesomeness and daring, they were the strongest predictors of a boy's juvenile convictions (Farrington, 1992). A convicted parent and a convicted older sibling were also the best predictors, after poor supervision, of juvenile self-reported delinquency (Farrington, 1992). Apart from behavioural measures, having a convicted parent was also the best, aged 8–10, predictor of the study males' convictions up to age 32 (Farrington, 1993). Furthermore, having a convicted parent by the 10th birthday predicted criminal and antisocial outcomes independently of all other variables. In logistic regression analyses, a convicted parent was the second-best predictor of convictions up to age 32 (Farrington, 1993), and it was an important independent predictor of chronic offenders up to age 32 (Farrington and West, 1993).

Later research on the CSDD, based on criminal record searches of the males up to age 40 and all their biological relatives, found that convictions of one family member were strongly related to convictions of every other family member (Farrington et al., 1996; Rowe and Farrington, 1997). Convictions were highly concentrated in families. While 64% of all families contained at least one convicted person, only 6% of the families accounted for half of all the convictions. About three-quarters of convicted fathers and convicted mothers had a convicted child. Same-sex relationships (e.g. father–son) within and between generations were stronger than opposite-sex relationships (e.g. father–daughter). Very little of the association between convictions of family members was attributable to co-offending.

Although there are few studies of the intergenerational transmission of offending, there are even fewer studies of intergenerational transmission between three generations (but see Capaldi et al., 2003; Thornberry et al., 2003). In the CSDD, the only previous study of three generations (boys, their parents and their children) was completed by Smith and Farrington (2004), based on data collected when the study males were aged 32. These workers found that convicted mothers and fathers predicted convictions of the boys and of their female partners, and also conduct problems of their children. Convictions of female partners, but not of study males, also predicted conduct problems of their children. There was some evidence that the intergenerational transmission of antisocial behaviour was mediated by family factors such as parental authoritarianism and poor parental supervision. There was continuity from parents to sons in poor parental supervision.

The main aim of the present paper is to extend these analyses to the study males aged 50, to investigate the intergenerational transmission of offending between three generations and the extent to which it might be mediated by

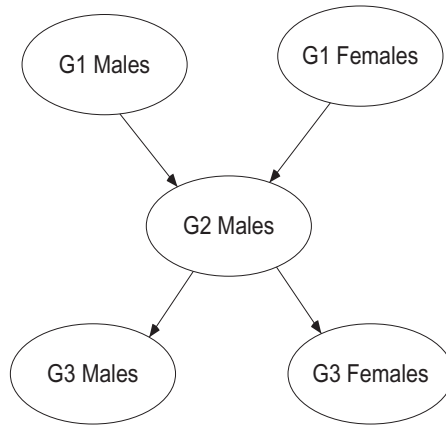


Figure 1: Design of the study

family factors such as poor parental supervision. The following nomenclature is used: generation 2 (G2) refers to the study males; generation 1 (G1) refers to their parents; and generation 3 (G3) refers to their children. Figure 1 shows the inter-generational transmission investigated in this article.

Method

The CSDD is a prospective longitudinal survey of the development of offending and antisocial behaviour in 411 males. At the time they were first contacted, in 1961–1962, these boys were all living in a working-class inner-city area of south London. The sample was chosen by taking all 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. Therefore, the most common year of birth of these males was 1953.

In nearly all cases (94%), the family breadwinner at that time (usually the father) had a working-class occupation (skilled, semi-skilled or unskilled manual worker). Most of the males (87%) were white and were of British origin. The majority of the boys were living in conventional two-parent families with both a father and a mother figure: at age 8–9, only 6% of the boys had no operative father and only 1% had no operative mother. This was, therefore, overwhelmingly a traditional white, urban, working-class sample of British origin.

The study was originally directed by Donald J. West, and it has been directed since 1982 by David P. Farrington, who has worked on it since 1969. The major results may be found in four books (West, 1969, 1982; West and Farrington, 1973, 1977) and in summary papers by Farrington and West (1981, 1990), and Farrington (1995, 2003). The most recent report (Farrington et al., 2006) lists 145 publica-

tions from the study. These publications should be consulted for more details about the age 8–10 predictor variables measured in the present paper.

Data collection

The study males were interviewed and tested in their schools when they were aged approximately 8, 10 and 14 years, by research psychologists. They were interviewed in a research office at about ages 16, 18 and 21, and in their homes at about ages 25, 32 and 48, by young social science graduates. At all ages, except 21 and 25 years, the aim was to interview the whole sample, and it was always possible to trace and interview a high proportion: 389/410 individuals who were still alive at age 18 (95%); 378/403 who were still alive at age 32 (94%); and 365/394 who were still alive at age 48 (93%). The tests in schools measured individual characteristics such as intelligence, attainment, personality and psychomotor impulsivity, whereas information was collected in the interviews about topics such as living circumstances, employment histories, relationships with females, illnesses and injuries, and leisure activities such as drinking, fighting, drug use and offending behaviour.

In addition to interviews and tests with the boys, interviews with their parents were carried out by female social workers who visited their homes. These interviews took place about once a year, from when the boys were approximately eight years old until when they were aged 14–15 and in their last year of compulsory education. The primary informant was the mother, although many fathers were also seen. The parents provided details about such matters as the boy's daring or nervousness, family income, family size, their employment histories, their child-rearing practices (including attitudes, discipline and parental conflict), their history of psychiatric treatment, their degree of supervision of the boy and his temporary or permanent separations from them.

The teachers completed questionnaires when the boys were aged approximately 8, 10, 12 and 14 years. These questionnaires furnished data about their troublesome and aggressive school behaviour, hyperactivity or poor concentration, frequent lying, anxiety, school achievement and truancy. Ratings were also obtained from the boys' peers when they were in the primary schools, about such topics as their daring, dishonesty, troublesomeness and popularity. The men's female partners completed questionnaires when they were aged 32 and the men were personally interviewed when they were aged 48.

For the present analyses, each variable was dichotomised, as far as possible, into the 'worst' quarter of males (e.g. the quarter with lowest income or lowest intelligence) versus the remainder. This comparison was done in order to compare the importance of different variables and also to permit a 'risk factor' approach (Farrington and Loeber, 2000). Because most variables were originally classified into a small number of categories, and because fine distinctions between categories could not be made very accurately, this dichotomising did not usually involve

a great loss of information. The one-quarter/three-quarters split was chosen to match the prior expectation that about one-quarter of the sample would be convicted as juveniles. Variables were not included in the analysis if more than about 10% of the sample was not known on them. (For lists of key risk factors at different ages, see Farrington, 2006.)

Criminal records

Searches were also carried out at the central Criminal Record Office (CRO), the National Identification Service (NIS) and later from the Police National Computer (PNC) to try to locate findings of guilt of the males, of their parents, of their brothers and sisters, and of their wives and female partners (Farrington et al., 1998). The repeated searches over a 40-year period were essential, as the media for data storage changed from paper to microfiche to computer, and many records were deleted or not transferred to a new medium over time. The minimum age of criminal responsibility in England is 10 years. The CRO, NIS and PNC contain records of all relatively serious offences committed in Great Britain or Ireland. In the case of 18 study males who had emigrated outside Great Britain and Ireland by age 32, applications were made to search their criminal records in the eight countries where they had settled, and searches were actually carried out in five countries. Since most males did not emigrate until their 20s, and since the emigrants had rarely been convicted in England, it is unlikely that any convicted males were not recorded. Five unconvicted males were considered to be not at risk of a recorded conviction because they emigrated permanently before age 18 and were not searched.

The latest search of conviction records held by the NIS and PNC took place in December 2004, when most of the study males were aged 50. Altogether, 167 males (41%) were convicted up to this age (Farrington et al., 2006). In the present paper, the recorded age of offending is the age at which an offence was committed, not the age on conviction. There may be delays of several months or even more than a year between offences and convictions, making conviction ages different from offending ages. Offences are defined as acts leading to convictions, and only offences committed on different days were counted. Where two or more offences were committed on the same day, only the most serious one was counted. Most court appearances arose from only one offending day.

Convictions were only counted if they were for offences normally recorded by the CRO, NIS or PNC. All motoring offences were excluded, together with other minor crimes such as common assault and drunkenness. The most usual offences included were thefts, burglaries and unauthorised taking of vehicles, although there were also quite a few offences of violence, vandalism, fraud and drug abuse (Farrington et al., 2006). Official cautions were nationally recorded from 1995 and a few were included after that date. In order not to rely on official records for information about delinquency and crime, self-reports of offend-

ing were obtained from the males at every age from 14 onwards (Farrington, 1989).

Third-generation follow-up

Between July 2004 and March 2007, attempts were made to interview all G3 biological children of the study males who were born between 1970 (the oldest child) and 1984. Children were only targeted if their father had been interviewed, because of the requirement to seek his agreement to interviewing his child (in order to meet the standards of the South East Regional Medical Ethics Committee). In total, 336/460 eligible children (73%) were interviewed. Therefore, the CSDD is one of the few studies including personal interviews with hundreds of people in three successive generations.

In June 2006, 563 G3 children born between 1970 and 1987 were searched in the Home Office extract of the PNC. Children were not searched if they had died or emigrated permanently. The searches were problematic because of the difficulty of establishing beyond doubt that a person found was indeed the target child. This was not a problem with the G1 or G2 generations, because they were searched using paper or microfiche records which were much more detailed than the computerised PNC records given to us in 2006. The 2004 computerised PNC records were much more adequate in providing more information about the person found than the 2006 records. The interviews were extremely valuable in providing information that made it likely or unlikely that a person found was indeed the target G3 child. For example, if a person found was known to be living in London but had convictions in Scotland, it was concluded that the person was not the target G3 child. Records were only counted where we were confident that the person found was indeed the target G3 child.

Results

Offending in three generations

Table 1 shows the prevalence of convictions in the three generations. The G1 parents were searched in mid-1994 at the average ages of 68 (mothers) and 71 (fathers), neglecting deaths. The 411 study males (G2) were in 397 families because the sample included 14 pairs of brothers. About 14% of G1 mothers and 28% of G1 fathers were convicted. The percentage of G2 study males who were convicted up to age 50 (41%) was considerably greater than the corresponding percentage of G1 fathers (26%). This probably reflects increasing conviction rates from the 1930s to the 1970s in England and Wales, although many of the G1 fathers would have been away during 1939–1945 fighting in the Second World War.

Table 1: Prevalence of convictions

Relative	Average DOB	Last date searched	Average age searched	No. searched	No. convicted	% convicted
G1 female	1926.0	1994.5	68.0	397	54	13.6
G1 male	1922.1	1994.5	71.9	394	109	27.7
G1 male			50.9	394	104	26.4
G2 male	1953.5	2004.9	50.9	406	167	41.1
G2 male			25.6	406	141	34.7
G3 male	1980.4	2006.5	25.6	298	76	25.5
G3 female	1980.3	2006.5	25.7	265	17	6.4

Note: Average age searched neglects deaths and subtracts 0.5 years to allow for delays in offences entering records.

DOB, date of birth; G1, generation 1; G2, generation 2; G3, generation 3.

Table 2: Continuity of convictions

1st relative	2nd relative	% 2nd convicted		Odds ratio	Confidence interval
		1st unconv. (n)	1st conv. (n)		
G1 female	G1 male	22.3 (354)	55.6 (54)	4.4	2.4–7.9
G1 male	G2 male	33.0 (294)	63.3 (109)	3.5	2.2–5.5
G1 female	G2 male	38.4 (352)	59.3 (54)	2.3	1.3–4.2
G2 male	G3 male	15.5 (161)	37.2 (137)	3.2	1.9–5.6
G2 male	G3 female	4.4 (135)	8.5 (130)	2.0	0.7–5.5
G1 male	G3 male	22.7 (203)	32.3 (93)	1.6	0.9–2.8
G1 male	G3 female	5.1 (175)	9.1 (88)	1.8	0.7–5.0
G1 female	G3 male	25.7 (261)	24.3 (37)	0.9	0.4–2.1
G1 female	G3 female	5.4 (224)	12.2 (41)	2.5	0.8–7.4

G1, generation 1; G2, generation 2; G3, generation 3.

Of 298 G3 males searched up to the average age of 25 years, 26% were convicted, compared with 35% of G2 males who were convicted up to age 25 years. This difference may be a function of the wide range of ages of the G3 males, or it may reflect the secular decrease in conviction rates from the 1980s onwards. Another possibility is that the G3 males, on average, may be living in more favourable conditions than the G2 males; 35% of the G3 males had moved out of London to the leafy suburbs of Surrey, Sussex or Kent by age 48 (Farrington et al., 2006). Of 265 G3 females, only 6% were convicted up to age 25.

As before there was a significant tendency for convicted G1 females to mate with convicted G1 males. Table 2 shows that 56% of convicted G1 females mated with a convicted G1 male, compared with 22% of unconvicted G1 females; odds

ratio (OR) = 4.4, 95% confidence interval (95% CI) = 2.4–7.9. The OR will be used as the main measure of strength of relationship in the present paper. All these analyses were based on the latest criminal record searches for each generation.

Table 2 also shows that there was significant intergenerational transmission of offending from G1 males to G2 males; 63% of study males with convicted fathers were themselves convicted, compared with 33% of those with unconvicted fathers (OR = 3.5). These analyses were based on parent–child pairs. There was also significant intergenerational transmission of offending from G1 females to G2 males (OR = 2.3), and from G2 males to G3 males (OR = 3.2). The intergenerational transmission from G2 males to G3 females was substantial (OR = 2.0) but not significant, possibly because of small numbers of convicted G3 females. According to Cohen (1996), an OR of 2.0 or greater indicates a strong relationship. In contrast, none of the relationships between G1 parents and G3 children was statistically significant, although the relationship between G1 females (grandmothers) and G3 females (granddaughters) was strong (OR = 2.5).

Continuity from G1 to G2

To what extent might the continuity in offending between G1 and G2 have been mediated by family risk factors? Table 3 shows the most important childhood risk factors (measured at ages 8–10 years) for convictions of G2 males. Again, the OR is used as the key measure of predictive efficiency. As expected, convictions of fathers (OR = 3.1) and mothers (OR = 3.8) up to the boy's 10th birthday significantly predicted his later convictions. Unlike relationships in Table 2, these relationships are strictly predictive.

Many other risk factors were also significant predictors. This was true of socio-economic factors such as large family size (five or more children in the family; OR = 2.9) and poor housing (OR = 2.7); family factors such as poor parental supervision (OR = 2.9) and coming from a disrupted family (usually involving the loss of the father; OR = 2.7); and individual factors such as low school attainment (OR = 3.2) and high daring or risk-taking (OR = 2.9). It is possible that convicted parents in some way caused poor socio-economic, family and individual conditions, which in turn caused the boy's offending. Therefore, the intergenerational transmission of offending could be indirect rather than direct, or in other words mediated by childhood risk factors. Following Rowe and Farrington (1997), we attempted to investigate this using structural equation modelling, but were unable to do so because of the (dichotomous) nature of the variables.

In testing this intergenerational transmission of offending, three scores were developed to measure socio-economic, family and individual risks. The scores simply indicated the number of risk factors in each category that each boy possessed. For example, his score could range from 0 to 7 for family risk, because seven family risk factors are listed in Table 3. A score of the number of convicted

Table 3: Childhood predictors of convictions of G2 males

Risk factor	% G2 convicted (n)		Odds ratio	Confidence interval
	Absent	Present		
Convicted parent				
Convicted father	34.8 (305)	62.5 (96)	3.1	1.9–5.0
Convicted mother	38.4 (367)	70.3 (37)	3.8	1.8–7.9
Socio-economic				
Low family income	37.6 (311)	53.8 (93)	1.9	1.2–3.1
Large family size	35.0 (306)	61.2 (98)	2.9	1.8–4.7
Poor housing	32.3 (254)	56.7 (150)	2.7	1.8–4.2
Delinquent school	38.2 (288)	61.0 (77)	2.5	1.5–4.2
Family				
Young mother	37.5 (315)	55.1 (89)	2.0	1.3–3.3
Parental conflict	35.3 (278)	54.5 (88)	2.2	1.4–3.6
Disrupted family	36.0 (314)	60.0 (90)	2.7	1.7–4.3
Harsh discipline	36.8 (272)	49.1 (112)	1.7	1.1–2.6
Poor supervision	35.5 (304)	61.1 (72)	2.9	1.7–4.8
Low parental int. in ed.	38.1 (312)	54.0 (63)	1.9	1.1–3.3
Depressed mother	35.8 (257)	49.6 (123)	1.8	1.1–2.7
Individual				
Daring	33.8 (281)	60.0 (120)	2.9	1.9–4.6
Poor concentration	36.6 (322)	59.3 (81)	2.5	1.5–4.1
High impulsivity	36.9 (301)	54.4 (103)	2.0	1.3–3.2
Low non-verbal IQ	35.8 (302)	57.8 (102)	2.5	1.6–3.9
Low verbal IQ	37.0 (300)	54.5 (101)	2.0	1.3–3.2
Low attainment	34.1 (290)	62.2 (90)	3.2	1.9–5.2
Unpopular	36.7 (264)	48.0 (125)	1.6	1.0–2.4

Note: Not significant: low social class, depressed father, nervous-withdrawn, few friends, high neuroticism, high extraversion.

G2, generation 2; Low parental int. in ed., low parental interest in education.

parents was also calculated for each boy. Interestingly, the probability of a G2 male being convicted was not noticeably greater for those with two convicted parents (63%) compared with only one (61%).

Table 4 shows the results of successive logistic regressions predicting convictions of G2 males. When only the number of convicted parents was entered into the equation, the Wald statistic was 26.08 ($p < 0.0001$). When family and socio-economic factors were added to the equation, the Wald statistic for criminal parents decreased to 8.00 ($p = 0.005$). When individual factors were also added, the Wald statistic for criminal parents decreased still further to 5.28 ($p = 0.022$). Therefore, while criminal parents still directly predicted sons' convictions, it is possible that at least part of the link between convicted G1 parents and convicted G2 males is indirect and mediated through family and other risk factors.

Table 4: Logistic regression for convictions of G2 males

Risk score	Wald statistic	<i>p</i>
(1) Convicted parent	26.08	0.0001
(2) Convicted parent	8.00	0.005
Family factors	6.99	0.008
Socio-economic factors	9.27	0.002
(3) Convicted parent	5.28	0.022
Family factors	4.98	0.026
Socio-economic factors	2.40	ns
Individual factors	13.88	0.0002

Note: The Wald statistic is distributed as chi-squared with 1 *df*. G2, generation 2; ns = not significant.

Continuity from G2 to G3

To what extent might the continuity in offending between G2 males and G3 males have been mediated by family risk factors? The family risk factors for G2 males as fathers were less adequately measured than the family risk factors for G1 males and females. However, the most important G2 family risk factors are shown in Table 5. These relationships are not strictly predictive, because some of the risk factors could have been measured after convictions of the G3 generation.

Most of these risk factors were described by Smith and Farrington (2004) and by Farrington et al. (2006). Smith and Farrington (2004) developed measures of poor parental supervision and authoritarian fathers when the study males were aged 32. Their other measures of authoritarian mothers, uninvolved fathers and inconsistent parents were not related to convictions of G3 males or G3 females. A G2 male was a young father if he was aged 18–21 when his G3 child was born. Most of other family factors were elements of the measures of life success developed when the G2 males were aged 32 and 48, and described by Farrington et al. (2006). Spouse assault at age 32 was reported by the man, while spouse assault at age 48 was reported by his female partner (using the Conflict Tactics Scale). A disrupted family at age 48 was coded if the G3 child was not living with both biological parents.

The most important family risk factors that predicted convictions of G3 males were the G2 male being divorced in the last five years up to age 48 (OR = 3.3) and if the G2 male had not been married or cohabiting with the same woman for at least five years up to age 48 (OR = 2.2). Possibly because of small numbers, none of the family risk factors significantly predicted convictions of G3 females. However, the most important family risk factors were the G2 male being divorced in the last five years up to age 32 (OR = 2.5) and if the G2 male was an authoritarian father at age 32 (OR = 2.4).

Table 5: Family risk factors (G2) for convictions of G3 males and females

Risk factor (age)	% G3 convicted (n)		Odds ratio	Confidence interval
	Absent	Present		
G3 males				
Young father	23.5 (221)	31.2 (77)	1.5	0.8–2.6
Poor supervision (32)	20.1 (174)	30.9 (55)	1.8	0.9–3.5
Authoritarian father (32)	27.2 (202)	22.5 (89)	0.8	0.4–1.4
Not married 5 years+ (32)	23.8 (227)	32.8 (64)	1.6	0.9–2.9
Divorced last 5 years (32)	23.7 (245)	37.0 (46)	1.9	1.0–3.7
Spouse assault (32)	24.0 (208)	26.8 (56)	1.2	0.6–2.3
Disrupted family (48)	20.4 (181)	33.3 (117)	1.9	1.1–3.3
Not married 5 years+ (48)	21.1 (204)	36.7 (79)	2.2	1.2–3.8
Divorced last 5 years (48)	23.4 (261)	50.0 (22)	3.3	1.4–7.9
Spouse assault (48)	26.0 (146)	27.3 (33)	1.1	0.5–2.5
G3 females				
Young father	5.0 (201)	10.9 (64)	2.3	0.9–6.4
Poor supervision (32)	7.9 (152)	1.8 (56)	0.2	0.0–1.7
Authoritarian father (32)	4.9 (184)	10.8 (74)	2.4	0.9–6.4
Not married 5 years+ (32)	5.4 (202)	10.7 (56)	2.1	0.7–5.9
Divorced last 5 years (32)	5.5 (219)	12.8 (39)	2.5	0.8–7.7
Spouse assault (32)	4.5 (179)	9.8 (51)	2.3	0.7–7.4
Disrupted family (48)	4.9 (143)	8.2 (122)	1.7	0.6–4.7
Not married 5 years+ (48)	6.9 (173)	5.2 (77)	0.7	0.2–2.4
Divorced last 5 year (48)	6.8 (221)	3.4 (29)	0.5	0.1–3.9
Spouse assault (48)	5.3 (132)	11.1 (18)	2.2	0.4–11.7

Note: Not related: Authoritarian mother 32, uninvolved father 32, inconsistent parents 32.
G2, generation 2; G3, generation 3.

Table 6 shows the most important socio-economic risk factors for the G2 males at ages 32 and 48. These were all elements of the life success measures at these ages (Farrington et al., 2006). The most important predictors of convictions of G3 males were if the G2 male was not a homeowner at age 48 (OR = 3.4) and if he was currently unemployed at age 48 (OR = 3.3). The most important predictors of convictions of G3 females were if the G2 male was currently unemployed at age 32 (OR = 5.5) and if he had been unemployed for 10 months or more during the last five years up to age 32 (OR = 4.7).

As before, a measure of family risk was developed based on the 10 family risk factors listed in Table 5. Each G3 child was scored according to the number of family risk factors (associated with the G2 male) out of 10. Similarly, a measure of socio-economic risk was developed based on the 10 socio-economic risk factors listed in Table 6.

Table 7 shows the results of successive logistic regressions predicting convictions of G3 males and females. Convictions of G2 males significantly predicted

Table 6: Socio-economic risk factors (G2) for convictions of G3 males and females

Risk factor (age)	% G3 convicted (n)		Odds ratio	Confidence interval
	Absent	Present		
G3 males				
Unemployed (32)	23.8 (252)	31.4 (35)	1.5	0.7–3.2
Unemployed 10 months+ (32)	21.5 (242)	43.2 (44)	2.8	1.4–5.4
Low SES (32)	22.1 (226)	34.4 (61)	1.8	0.8–3.4
Low pay (32)	19.0 (195)	36.5 (52)	2.5	1.3–4.8
Not home owner (32)	15.7 (140)	35.1 (151)	2.9	1.6–5.1
Unemployed (48)	23.1 (255)	50.0 (14)	3.3	0.8–9.9
Unemployed 10 months+ (48)	22.1 (235)	45.5 (22)	2.9	1.2–7.2
Low SES (48)	23.9 (218)	30.0 (60)	1.4	0.7–2.6
Low pay (48)	24.7 (235)	29.2 (48)	1.3	0.6–2.5
Not home owner (48)	17.2 (186)	41.2 (97)	3.4	1.9–5.9
G3 females				
Unemployed (32)	4.5 (224)	20.6 (34)	5.5	2.0–15.8
Unemployed 10 months+ (32)	4.3 (210)	17.4 (46)	4.7	1.7–13.0
Low SES (32)	6.0 (201)	8.8 (57)	1.5	0.5–4.5
Low pay (32)	3.8 (182)	7.7 (39)	2.1	0.5–8.4
Not home owner (32)	5.9 (119)	7.2 (139)	1.2	0.5–3.4
Unemployed (48)	5.8 (224)	10.0 (10)	1.8	0.2–15.3
Unemployed 10 months+ (48)	4.5 (200)	16.7 (24)	4.2	1.2–15.0
Low SES (48)	5.2 (193)	10.0 (50)	2.0	0.7–6.2
Low pay (48)	5.6 (214)	11.1 (36)	2.1	0.6–6.9
Not home owner (48)	4.5 (155)	9.5 (95)	2.2	0.8–6.2

G2, generation 2; G3, generation 3; SES, socio-economic status.

Table 7: Logistic regression for convictions of G3 males and females

Risk score	Wald statistic	<i>p</i>
G3 males		
(1) Convicted G2 male	17.83	0.0001
(2) Convicted G2 male	11.13	0.0009
Family factors	0.78	ns
Socio-economic factors	9.05	0.003
G3 females		
(1) Convicted G2 male	1.69	ns
(2) Convicted G2 male	0.15	ns
Family factors	0.17	ns
Socio-economic factors	5.23	0.022

Note: The Wald statistic is distributed as chi-squared with 1 *df*.
G2, generation 2; G3, generation 3; ns = not significant.

convictions of G3 males (Wald statistic = 17.83). When the family and socio-economic risk scores were added to the equation, the significance of convictions of G2 males decreased (Wald statistic = 11.13). Only the socio-economic risk score significantly predicted convictions of G3 males.

Possibly because of small numbers, convictions of G2 males did not significantly predict convictions of G3 females. However, socio-economic risk did predict convictions of G3 females.

Conclusions

This research undoubtedly has limitations. In particular, the number of G3 females who were convicted was small, although this number will increase in future years. It was not possible to investigate the importance of genetic transmission. The measurements in different generations were not very comparable; for example, the information about G1 family factors was extensive and came mainly from G1 females, but the information about G2 family factors was much less extensive and came mainly from G2 males. The G3 males and females spanned a wide age range (from 19 to 35 years) at the time of the criminal record searches. Unlike the relationships between G1 and G2, the relationships between G2 and G3 were not strictly predictive. Also, because of the large number of G3 siblings, there were more dependencies in the G2–G3 comparisons than in the G1–G2 comparisons. Despite these limitations, this research has considerable strengths in having both interview and record data on hundreds of people in three successive generations.

Future research should include the G2 female partners and the G2 brothers and sisters, in order to study gender differences in transmission more effectively. Future research should also make more use of the interview data, for example, in studying the intergenerational transmission of self-reported offending and of risk factors. Future research should also investigate the intergenerational transmission of criminal career features such as the age of onset, the number of convictions, the duration of the career and whether or not a person was imprisoned. Future research should also aim to test the alternative hypotheses about intergenerational transmission that were set out by Farrington et al. (2001), for example, by investigating G2 convictions before and after the birth of G3, or by investigating co-offending of G2 and G3 males.

We conclude that there was a similar degree of intergenerational transmission of convictions from G1 males to G2 males (OR = 3.5) and from G2 males to G3 males (OR = 3.2). Surprisingly, having two criminal G1 parents was not worse than having one, in relation to convictions of G2 males. As expected, the degree of intergenerational transmission from G1 females to G2 males (OR = 2.3) and from G2 males to G3 females (OR = 2.0) was less. There was little evidence of intergenerational transmission from G1 to G3, except from grandmothers to

granddaughters (OR = 2.5). The degree of intergenerational transmission decreased after controlling for family, socio-economic and individual risk factors, suggesting that these factors may be links in the chain between parent and child offending. However, the father's convictions still predicted the son's convictions even after controlling for these risk factors.

A key policy implication is that it is important to take steps to reduce the intergenerational transmission of offending. This research suggests important intervention targets such as poor parental supervision and disrupted families. By reducing family and other risk factors, intergenerational transmission can be reduced. Despite the challenges and difficulties of research on intergenerational transmission, we believe that the present study represents an important step forwards.

Acknowledgements

We are very grateful to the Home Office and to the Department of Health for funding the study. The interviews with study males were approved by the Ethics Committee of the Institute of Psychiatry, and we are very grateful to Professor John Gunn for his assistance with this.

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