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Citation for published version:

Jahanshahi, B, McVie, S & Murray, K 2023, 'Like mother, like child? Sex differences in the maternal transmission of offending among a Scottish cohort of pre-adolescent children', *Criminology & Criminal Justice*, vol. 23, no. 3, pp. 330-347. <https://doi.org/10.1177/17488958211056177>

Digital Object Identifier (DOI):

[10.1177/17488958211056177](https://doi.org/10.1177/17488958211056177)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Publisher's PDF, also known as Version of record

Published In:

Criminology & Criminal Justice

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Like mother, like child? Sex differences in the maternal transmission of offending among a Scottish cohort of pre-adolescent children

Criminology & Criminal Justice

1–18

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DOI: 10.1177/17488958211056177

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Abstract

That parental offending acts as a strong risk factor for offending in children is well-established within criminology. Yet, research on maternal offending is relatively limited, even though many women take on a significantly higher share of childcare responsibilities, and as such, might reasonably be expected to exert an especially strong influence on their children. In part, this lacuna might be attributed to a male-centric lens within criminology, which has tended to overlook female offending. Aimed in part at redressing this imbalance, this article investigates the maternal transmission of offending among a cohort of 12-year-olds, using self-report data from the longitudinal Growing Up in Scotland study. The analysis shows that intragenerational maternal offending acts as a significant predictor of offending among daughters, but that intergenerational offending does not. We found no significant relationship between mothers' offending and sons', who appear more vulnerable to a range of wider risk factors.

Keywords

Child offending, Growing Up in Scotland, intergenerational transmission, maternal offending

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Introduction

That parental offending acts as a strong risk factor for offending among children is well-established within criminology, with research dating back to at least the 1950s (Glueck and Glueck, 1950). Over many decades, a range of theoretical perspectives have been put forward to explain the close relationship between the behaviour of parents and that of their offspring (Besemer et al., 2017). However, most of these theories have been developed based on research on fathers and sons, with less reference to mothers and daughters; and, therefore, have not examined the problem through a sex-based or feminist lens. While there is strong evidence to suggest important sex-based differences in the transmission of offending from parents to children, with mothers playing a significant role (Besemer et al., 2017; Tzoumakis et al., 2019), and different causal mechanisms for girls and boys (Auty et al., 2017), this area of criminology remains under-developed, especially in terms of exploring the distinction between intergenerational transmission (i.e. the impact of prior parental offending) and intragenerational transmission (i.e. the impact of contemporaneous offending), and the impact on boys and girls, respectively.

Using data from the Growing Up in Scotland (GUS) study, this article examines whether there is an association between maternal offending and the behaviour of children at age 12. In doing so, we account for a range of other risk factors that are known to influence child conduct and explore the differential influence of mothers' offending on sons and daughters in the context of these wider inequalities. There are good reasons for focusing on mothers in this study, not least because they have tended to be neglected within the criminological literature. From a social learning and interactional theory point of view, mothers are (despite advances in sex equality) most likely to be the main carers for children and, therefore, provide the greatest potential influence over their behavioural development. However, our approach is also a practical necessity because GUS only collects information about offending from one parent or carer, of whom (not surprisingly) the vast majority are mothers. Nevertheless, we believe this article offers important insights into the role of maternal transmission because it distinguishes between mothers who desisted prior to the birth of the child, and mothers who offended during the lifetime of the child. By distinguishing between these two temporal periods, we contribute to theoretical debate around the reasons for intergenerational continuity of offending and offer suggestions for improvements in policy and practice.

Defining and measuring intergenerational transmission

The notion of intergenerational transmission has been broadly defined as the 'transfer of individual abilities, traits, behaviours and outcomes from parents to their children' (Lochner, 2008). Intergenerational transmission – or continuity – does not mean that something physical is transmitted, but rather that a characteristic or behavioural trait is seen in both the parent and the child (Besemer et al., 2017). Of course, for transmission to occur, the behaviour of the parent must precede that of the child. Thornberry et al. (2003) make a conceptual distinction between *intragenerational* transmission (the effect of contemporaneous parental offending on the child's behaviour) and *intergenerational* transmission (the effect of the parents' prior offending on the child's behaviour), although

there is a little research on the relative influence of each type. Some scholars have further defined intergenerational continuity such that the same behaviours must be observed across generations at the same age (e.g. Cairns et al., 1998; Huesmann et al., 1984). Nevertheless, this strict definition is not universally adhered to, as more recent studies have allowed for variation in both the nature and timing of the offending (e.g. Besemer et al., 2016; van de Weijer et al., 2014). Moreover, both approaches have merit. For example, in the study of intergenerational transmission of child maltreatment, the combination of homotypic continuity (whereby maltreatment in one generation predicts the same type of maltreatment, at the same age, in the next generation) and heterotypic continuity (whereby the type or age of the maltreatment across the generations may vary) is considered to provide an integrated framework. As Berzenski et al. (2014) state, ‘both types of continuity are appreciated and acknowledged, but appropriately distinguished such that information can be gained about persistence of form and/or function’ (p. 116).

The operationalisation of intergenerational continuity within any study is driven to a large extent by the availability of reliable and appropriate data. This is a significant challenge because, as van de Weijer et al. (2014) point out, collecting the multigenerational data needed to examine offending across at least two consecutive generations is prohibitively expensive and time-consuming. For this reason, many contemporary studies focus on administrative data such as arrests or convictions, which are easier to collect and link across families. However, such data exclude offending that does not come to the attention of the police or other justice organisations, which could play an important role in the context of intergenerational transmission.

For the purposes of this article, we conclude that studying both intergenerational and intragenerational aspects of parental offending should be considered to better inform the direction of appropriate policy responses. While examining homotypic offending is recommended by some scholars, the nature of the available data makes this prohibitive for many researchers. Moreover, there is good evidence from other fields of research that having a more pluralistic approach to understanding the nature of intergenerational transmission is of theoretical benefit. Added to which, recent major reductions in youth offending (Griffiths and Norris, 2020) may well have created a transformation in the patterns, nature and timing of offending between recent generations, which may lessen the value of a strict homotypic approach.

Theoretical and research context

The existence of a link between parent and child offending is well-established and, since around the 1980s, a range of criminological theories have been developed to explain this relationship. Taking a broad overview, there are four main theoretical perspectives discussed in the literature (see Besemer et al., 2017) summarised here:

1. *Social learning*. Drawing on the social learning theories of Akers (1973) and Bandura (1965), it is hypothesised that children learn attitudes and behaviours through verbal and physical interactions with their parents and, therefore, develop similar attitudes and behaviours. Evidence of direct imitation of parental offending (e.g. through co-offending) is rare, however. Farrington et al. (2001) note that

‘a father’s convictions that occurred before a boy’s birth were just as strongly associated with the boy’s offending as a father’s convictions during the boy’s juvenile years, again casting doubt on the importance of direct criminal influence’ (p. 593). In other words, the parental role is theorised based on intergenerational reinforcement, rather than intragenerational coaching.

2. *Criminogenic environment.* These theories propose that offending is transmitted as a result of intergenerational continuities in exposure to the same cluster of risk factors. As Farrington (2011) observes, 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’ (p. 132). Like social learning theories, this perspective does not assume direct causal transmission of offending from parent to child, but rather that the risk of offending is increased by exposure to the same constellation of risk factors and inequalities (including poverty, unstable neighbourhoods, and poor parenting practices).
3. *Criminal justice bias.* Drawing on notions of symbolic interactionism and Becker’s (1963) labelling theory, these theories of intergenerational continuity argue that biased decision making and systemic processes within justice organisations (such as the police and courts) lead to the disproportionate targeting of individuals from known criminal families. There is strong evidence from the Cambridge Study in Delinquent Development that parental conviction increased the risk of child conviction, even after the child’s behaviour was accounted for Besemer et al. (2013). While it could be argued that these theories also discount the direct effect of parental offending on the child, it is unlikely to be plausible that official bias against parents is the only or main mechanism by which children commit crime. It is more likely that labelling effects are simply stronger for children who already have other factors that put them at risk of intergenerational transmission.
4. *Genetic predisposition.* An increasing focus on epigenetics has led to a series of studies that propose offending is underpinned by physiological processes, such as high testosterone levels and lower resting heart rate. The examination of genetic and environmental mechanisms (e.g. through twin studies like that of D’Onofrio et al., 2007) provides good evidence for the possibility of genetic transference of criminal, anti-social and aggressive behaviours. The concept of assortative mating has been proposed as a catalyst for intergenerational continuity through interpersonal homophily, whereby adult offenders seek like partners and, thus, genetically expose their children to a higher risk of delinquency (Tzoumakis et al., 2019). Although, there may be interesting sex differences here; for example, Auty et al. (2017) found that the impact of mothers’ offending on sons was likely to occur through assortative mating, but not that of daughters.

While these four theoretical perspectives are not exhaustive, they do provide a useful framework by which to understand the most common hypotheses of intergenerational offending. However, on the important question of whether the effect of mothers is likely to differ from that of fathers, the research is ‘surprisingly limited’ (Besemer et al., 2016:

436), with existing theories predominantly based on studies of offending among fathers and sons (Flynn et al., 2017; Tzoumakis et al., 2020). This contrasts sharply with other disciplinary areas, such as child psychology and development, in which theories are dominated by studies examining the influence of mothers (Detweiler et al., 2010). This gap within criminology is surprising because despite changing patterns of female employment and increasing participation in the labour market, mothers continue to take on a significantly higher share of childcare responsibilities compared to fathers (Dotti Sani and Treas, 2016). Therefore, we might reasonably expect criminological theories to reflect some of the mechanisms and processes underpinning maternal transmission of offending, especially in relation to normative values and behaviours. Yet, with limited reference to research on mothers and daughters, and without a sex-based or feminist lens, it is impossible to be certain that such theories fully reflect the complexities of a mother's influence over her child's behaviour.

A lack of female focused intergenerational theory may be symptomatic of a tendency within criminology to focus on male offending and overlook the behaviour of women and girls; as Heidensohn (1996) dryly noted 25 years ago, 'women offenders remain elusive' (p. 162). While the number of intergenerational studies that incorporate women and girls has increased, there is still a research gap (see Besemer et al., 2017). Auty et al. (2017) provide numerous reasons for considering why the mechanisms of transmission may differ for mothers and fathers, not least of which are the enduring sex differences in the prevalence, frequency and gravity of offending. Women are also less likely to commit serious and/or violent offences (Piquero and Chung, 2001), and more likely to desist at an earlier age (Junger-Tas et al., 2003), both of which may impact on transmission processes. While the pool of parents with an offending history is likely to be male dominated, it remains the case that many women and girls do offend, moreover some evidence suggests that the offending gap between men and women has lessened (Cauffman, 2008). In other words, prior maternal offending matters and is deserving of further scrutiny.

What research exists suggests that maternal offending does play a significant role in influencing child behaviour, especially with regard to daughters. In a systematic review of international studies, Besemer et al. (2017) estimated that the pooled odds of offending were 2.58 times greater among children with offending mothers, compared to 2.19 for children with offending fathers. They also identified cross-sex differences, with intergenerational transmission being strongest from mothers to daughters (odds ratio=3.15) and weakest from fathers to sons (odds ratio=2.14). Auty et al. (2017) also found that the strongest intergenerational connection was between mothers and daughters (odds ratio=5.16), although this effect was mediated by other psychosocial risk factors, particularly an unstable home environment characterised by conflict. Other studies have found contradictory results, however. For example, Besemer et al. (2016) reported weak transmission effects from mothers to daughters; while Connolly et al. (2018) found that maternal offending was more closely associated with sons' than daughters' offending typologies.

In terms of explaining the intergenerational effect of maternal offending, there is a lack of theory that accounts for the influence of sex. Some scholars that identify a positive relationship between the offending of mothers and children offer no theoretical insights (e.g. Laurens et al., 2016). Others attempt to explain maternal influences on

offending using general life-course or developmental theories (Connolly et al., 2018; Zhao et al., 2020). Most have tended to focus on the existing intergenerational theories, described earlier, that are derived largely from studies of men (Besemer et al., 2017; Tzoumakis et al., 2019). Auty et al. (2017) provide one of the most detailed studies of sex-specific mechanisms in intergenerational offending and conclude that maternal offending has different causal mechanisms for male and female offspring. For sons, they propose that assortative mating is most likely to explain the mother's influence; whereas, for daughters, they draw on social learning and interactional theory to suggest that 'the transmission of criminal behaviour from mothers was explained by harsh discipline, which may involve a modelling process between mother and daughter' (Auty et al. 2017: 231).

The proposition that mother–daughter offending is determined by a modelling process raises an important question about whether this is determined by intergenerational or intragenerational transmission (Thornberry et al., 2003). Using convictions data for the Cambridge Study in Delinquent Development, Farrington et al. (2001) found that intergenerational offending between fathers and sons was explained by the simple existence of convictions, and not when they were accrued. However, to the best of our knowledge, no research has explored whether the same is true for mothers and daughters. Given the common status of mothers as the primary or (in the case of parental separation) sole carer for children, it is not unreasonable to suppose that intragenerational offending may have a greater impact on such modelling processes (especially compared to that of fathers in the 1960s). Moreover, this would be consistent with a growing body of feminist research on the experiences of women who offend and the negative influence of mothers' justice system contact, especially imprisonment, on children (e.g. Baldwin and Epstein, 2017; Minson, 2015). Overall, then, there is room for the development of research and theory on the influence of maternal offending on their children's behaviour.

As Auty et al. (2017) demonstrate, it is important to examine the influence of maternal offending in the context of other potential risk factors. Since the 1990s, many factors have been identified as predictors of child offending. Not surprisingly, familial factors are known to have a strong influence. Weak parent–child relationships (Johnson et al., 2011) and poor parental supervision (Flanagan et al., 2019) are both well known to increase the risk of offending, especially in early childhood. The negative impact of harsh and coercive parenting is also increasingly recognised through an evolving body of research on adverse childhood experiences (ACEs). Focusing on the impact of child abuse, neglect and household dysfunction, several studies have identified strong links between ACEs and offending in childhood (e.g. Baglivio et al., 2015; Jahanshahi et al., 2021). There are also well-established links between structural inequality and child offending, with family poverty and neighbourhood deprivation both identified as relevant factors (Farrington, 1995). There are clearly many other factors which might impact on offending in childhood; however, in the context of understanding the impact of maternal offending, it seems pertinent to focus on those that might be related, either directly or indirectly, to the role of the mother as primary caregiver.

Aims and research questions

This article aims to explore whether maternal offending influences the risk of offending among a contemporaneous cohort of children at age 12, distinguishing between intergenerational offending (which stopped before the child was born) and intragenerational offending (which occurred after the child was born). We also take account of a range of other risk factors that are known to influence child conduct and explore the differential influence of mothers' offending on the behaviour of sons and daughters.

The article takes an exploratory approach, rather than testing particular hypotheses; however, given that the existing research evidence appears more weighted to same-sex effects, we anticipate that any transmission effects are more likely to be evidenced in daughters than sons. The article is structured around the following three research questions:

1. Does maternal history of offending increase the likelihood of childhood offending when taking account of a range of other potential risk factors?
2. Is the effect on childhood offending stronger for intergenerational or intragenerational maternal offending?
3. Is the association between mother and child offending the same for sons and daughters?

Research design, data and methodology

To test our research questions, we employed a quantitative study design using self-report data from the nationally representative GUS study. This birth cohort includes 5217 children who were born in Scotland in 2005 or 2006 and followed-up over nine sweeps (annually to age 6, then every 2 years to age 12). Data were principally collected through face-to-face interviews with one adult respondent in the household, and (from age 8) the study child. At sweep 9, most households (93%) consisted of two parents. Of the main adult respondents, 97% were female, and virtually all were natural mothers. The study is commissioned by the Scottish Government to provide information to support public policymaking, and covers a wide range of topics including social, cognitive and behavioural development; general health; educational attainment; parenting and childcare; socio-economic factors; and, for the first time at sweep 9, child and parent offending.

While our outcome of interest (child offending) was measured at age 12, we used data collected from age 6 onward (sweeps 6–9) to account for the longer term impact of early childhood experiences. As with all cohort studies, the GUS cohort has suffered from attrition, with the original cohort diminished to 60% by sweep 8, unevenly spread across sub-groups. At sweep 9, the survey recruited a booster sample of 502 children to address non-response; however, these cases are excluded from our analysis due to lack of longitudinal data. We also excluded cases where the adult respondent was male and where a household did not participate in all sweeps of interest. This resulted in a sample of 2517, which is weighted (using longitudinal weights) to address attrition and sub-group under-representation.

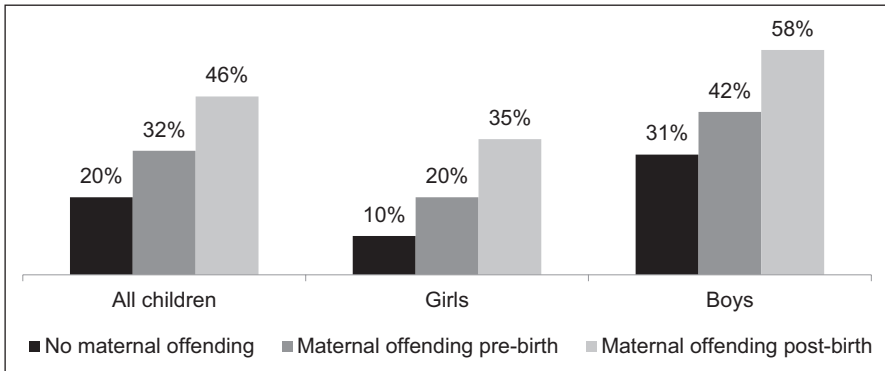


Figure 1. Prevalence of child offending by mother's offending, by sex.
Source: Growing Up in Scotland Survey, sweep 9 (N = 1961).

Variable description and descriptive analysis

Dependent variable: Child offending

Our dependent variable is a binary measure of self-reported childhood offending at age 12. When asked about nine different types of offending or anti-social behaviour, 26% of 12-year-olds reported committing at least one offence from a list including assault, public disorder, shoplifting, vandalism and household theft. Prevalence varied significantly by sex, with 34% of boys reporting at least one offence, compared to 18% of girls.

Maternal offending

Our key independent variable of maternal offending is based on retrospective self-reports of involvement in six of the items used in the child's questionnaire. Overall, 16% of mothers stated that they had ever committed an offence, although as noted earlier, this could be subject to under-reporting which is typical in retrospective surveys and more common among women than men.

To determine inter- versus intra-generational transmission, mothers who reported any offence were asked how old they were when this last happened. Overall, 13% of all mothers stated that they had been involved in offending but ceased prior to the birth of the child, while 2% reported that they had offended during the child's lifetime.

Figure 1 shows the prevalence of offending among 12-year-olds by mother's self-reported offending. A fifth of children with non-offending mothers reported offending by age 12; however, this increased to a third for those whose mothers reported prior offending before the child was born, and to almost a half for those whose mothers had offended after the child was born. When disaggregated by sex, the same general pattern emerged for boys and girls; although prevalence of offending was significantly higher across all three maternal offending categories for boys. Nevertheless, the offending gap between boys and girls did reduce across the three categories. For example, boys with non-offending mothers were three times more likely than girls to offend by age 12; but the

difference reduced to two times for those whose mothers last offended pre-birth, and reduced again to 1.7 times for those whose mothers had offended since they were born. All these differences are statistically significant ($p \leq .001$).

Parent–child relationship

At age 12, children answered six questions about their relationship with their mother and father. To measure the strength of the parent/child relationship, we constructed a scale variable (from good to poor), based on the child's attitudes towards both parents (given strong collinearity between attitudes towards mothers and fathers). Most children reported a positive relationship, with 71% falling within the upper quartile of the scale, 22% within the second quartile, and 7% within the lower two quartiles (based on a standardised variable with a mean of 0 and standard deviation of 1). The average strength of parent–child relationships varied significantly ($p < .001$) between children who reported offending ($mean = 38.5$) and those who did not ($mean = 42.0$), indicating poorer quality relationships among the offending group.

Parental supervision

The children also answered four questions about parental supervision at age 12. Again, we used these responses to construct a scale variable (from high to low). Most children reported high levels of supervision, with 80.5% falling within the upper quartile, 17.4% within the second quartile, and just 2.1% within the lower two quartiles (based on a standardised variable with a mean of 0 and standard deviation of 1). The average parental supervision score varied significantly ($p < .001$) between children who reported offending ($mean = 6.4$) and those who did not ($mean = 5.6$), indicating lower levels of parental supervision among the offending group.

Adverse childhood experiences

Drawing on previous research using GUS data (Jahanshahi et al., 2021), we included four ACE measures in the analysis: *parental maltreatment* (corporal punishment/smacking, lack of love and support), *household dysfunction* (family mental health problems, parental conflict, family drug/alcohol abuse, domestic violence), *family trauma* (death and/or serious illness of a parent/sibling, separation), and *family offending* (a parent in prison and/or a parent/sibling has been in serious trouble with the police). Prevalence of offending was far higher among children who had experienced family offending (37%) than those who had not (22%). Children who experienced parental maltreatment (28.5%) or family trauma (26.2%) were also more likely to report offending than those who did not (20.2% and 21.6%, respectively). These findings were statistically significantly ($p < .001$). Offending among children who had experienced household dysfunction, while slightly higher, did not differ significantly from those who had not (25.5% vs 22.0%, respectively).

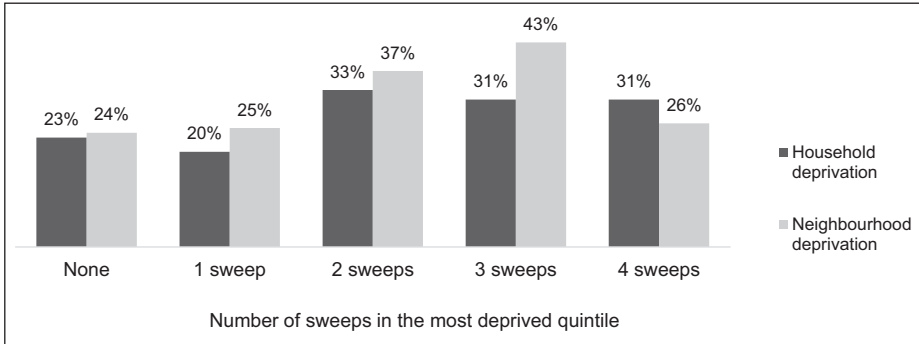


Figure 2. Prevalence of child offending by household poverty and neighbourhood deprivation. Source: Growing Up in Scotland Survey, sweeps 6–9 ($N = 1961$).

Household and neighbourhood deprivation

Again, drawing on Jahanshahi et al. (2021), we included two measures of deprivation to determine whether growing up in poverty diminished any effect of maternal offending. Both measures are ordinal and based on data collected between sweeps 6 and 9. Household deprivation indicates the number of sweeps (from 0 to 4) that the child's parents were unemployed and/or the household was in the lowest equivalised income quintile. Neighbourhood deprivation indicates the number of sweeps (from 0 to 4) that the child was resident in a neighbourhood within the highest quintile of the Scottish Index of Multiple Deprivation (SIMD), that is, the 20% most deprived. Just below 1 in 10 had experienced persistent household poverty (8.0%) or neighbourhood deprivation (7.6%).

Figure 2 shows a significant relationship between child offending and both persistent household poverty ($p \leq .05$) and neighbourhood deprivation ($p \leq .01$). Around one third of children who were living in poverty at two or more sweeps reported offending at age 12, compared to less than a quarter of those in poverty at one or no sweeps. Likewise, the prevalence of child offending was higher among those living in deprived neighbourhoods, especially over two (37%) or three (43%) sweeps, although it did fall back to 26% for those living in deprivation across all four sweeps (which may be due to the heavily skewed distribution of the measure).

Other control variables

Our analysis also includes several other control variables that are known associates of childhood offending and were measured in the GUS study. This includes demographic variables (sex and ethnicity), measures reflecting the child's general development (general health, standardised listening scores and additional support needs) and measures relating to the mother's background (level of maternal education, single parent status and whether she was a teenage mother). Due to space constraints, we only report the significant control variables and do not discuss these measures in detail in the article.

Modelling approach and results

To test the effect of maternal offending on childhood offending, we used a logit regression model, which tests how the response probability of the dependent variable changes when the independent variables are introduced. The coefficients indicate the partial effects of each independent variable on the response probability. The results are presented as Odds Ratios (ORs) which show the odds that a given factor will predict childhood offending at age 12 compared to its reference category (for binary variables) and increased probability of child offending for a one standard deviation increase on a standardised scale (for scale variables). While there is no definitive agreement on the relative importance of ORs (which cannot always be compared easily across independent variables, especially for categorical and scale variables), we follow the approach of Farrington et al. (2016) who suggest that ORs of 2.0 or more are suggestive of a strong effect.

Our overarching objective is to examine the relationship between maternal offending and child offending after controlling for the potential effects of a range of other risk factors. We do not aim to investigate the importance and validity of these relationships through causal mediation analysis (the approach taken by Auty et al., 2017), although this would be a fruitful avenue for future analysis. For the sake of parsimony, we only present the results of the fully fitted models here. Model 1 includes all children and addresses research questions 1 and 2; while models 2 and 3 present the same analysis for girls and boys, respectively.

Table 1 presents the results of the three fully fitted regression models. Model 1 addresses our first and second research questions, namely, does maternal history of offending increase the likelihood of childhood offending when taking account of a range of other potential risk factors, and (if so) is the effect stronger for intergenerational or intragenerational maternal offending? We found a significantly ($p < .001$) increased likelihood of offending among children whose mothers reported offending, but only for those whose mother committed her last offence after the child was born. The OR for intragenerational transmission of offending was 4.1, which is somewhat higher than the effect size found in other studies (e.g. Besemer et al., 2017). When accounting for intragenerational transmission, we found no evidence of intergenerational transmission (although we acknowledge that our data do not allow us to account for homotypic behaviour). Nevertheless, the finding that proximal offending may be more influential on childhood behaviour than a mother's past transgressions is important, given that prior research has tended to focus on intergenerational effects.

The strength of the OR is even more marked when we consider that it has been adjusted to control for a range of other important risk factors, including measures of parental relationships and supervision, adverse childhood experiences, family poverty and neighbourhood deprivation. Only two potential criminogenic risks were significant in the fully fitted model: the child's assessment of quality of parent-child relationships, and the child's reported level of parental supervision. In the presence of the maternal offending variables and other controls, both measures have only a moderate effect size, but they do suggest that offending is increased among children with weaker parental relationships and lower levels of supervision. We did not, however, find that offending

Table 1. Intergenerational transmission of maternal offending.

	Model 1 All children	Model 2 Girls only	Model 3 Boys only
Mother offended pre-birth	1.542 (0.524)	1.651 (0.525)	1.292 (0.276)
Mother offended post-birth	4.112** (2.242)	4.671** (2.692)	2.154 (1.135)
Parent or child relations (good to poor)	1.528*** (0.106)	1.760*** (0.183)	1.443*** (0.117)
Parental supervision (high to low)	1.373*** (0.096)	1.153 (0.176)	1.514*** (0.114)
ACE1: Family justice contact	1.542 (0.556)	1.156 (0.757)	1.764 (0.862)
ACE2: Household dysfunction	1.140 (0.171)	1.055 (0.279)	1.230 (0.231)
ACE3: Parental maltreatment	1.209 (0.141)	1.092 (0.259)	1.306* (0.177)
ACE4: Family trauma	1.253 (0.235)	1.769 (0.522)	0.958 (0.217)
Neighbourhood deprivation	1.111 (0.069)	1.148 (0.123)	1.075 (0.082)
Household poverty	1.089 (0.077)	0.945 (0.120)	1.185 (0.104)
Child sex (male = 1, female = 0)	4.155*** (0.671)	NA	NA
Mother offended pre-birth × sex	0.851 (0.341)	NA	NA
Mother offended post-birth × sex	0.531 (0.399)	NA	NA
Child general health (good to poor)	1.463 (0.384)	0.447 (0.272)	2.027* (0.646)
Child cognitive score (high to low)	1.121 (0.085)	0.949 (0.122)	1.221* (0.114)
Constant	0.049*** (0.030)	0.295 (0.333)	0.108*** (0.073)
Observations	1961	964	977

ACE: adverse childhood experiences; NA: not applicable.

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

was elevated among those who experienced different types of ACEs, including having family members with justice contact (which had a particularly strong relationship in the descriptive analysis) nor parental maltreatment (which was previously found to be a strong risk factor for childhood offending by Jahanshahi et al., 2021). We also found no significant effect of either persistent household poverty or neighbourhood deprivation, which is surprising given the strong evidence in the literature linking childhood offending to these factors (Farrington, 2011).

The only other variable that we found to be significant in Model 1 was the sex of the child. With a strong OR of 4.2, boys were far more likely to report involvement in offending at age 12 than girls, even in the presence of maternal offending and the other risk factors. We also tested for an interaction effect between child sex and the mother's offending history both pre- and post-birth; however, neither of these interactions were significant. This might plausibly be attributed to constraints placed on the pooled sample, whereby the co-efficient estimates are made equivalent across sex or cancelled out. Nevertheless, given that the bulk of the literature on maternal transmission of offending suggests a strong same-sex bias, we also conducted separate analysis by sex, thus allowing the intercept and slope coefficients to differ within each sample. This addresses our third research question: does maternal offending have the same effect on the behaviour of daughters and sons? The results are shown in Models 2 and 3, respectively.

Looking at the analysis disaggregated by sex reveals a very different relationship between maternal offending and offending for boys and girls, and suggests that the behaviour of mothers has far less of a direct influence on boys' offending than girls'. Model 2 shows only two variables were significantly associated with the behaviour of girls: mother's offending post-birth, which had a very strong effect, and parent-child relationships, which had a moderate effect. The absence of any other significant variables suggests that girls who are offending by the age of 12 are significantly influenced by the more recent behaviour of their mothers, either directly or indirectly. Although we cannot test the causal mechanisms by which this occurs, the growing literature on the lack of support for, and poor or discriminatory treatment of, mothers who offend point to some strong lines of enquiry (Farmer, 2019; Minson, 2015; O'Malley and Devaney, 2016).

Model 3 paints a different picture for boys offending behaviour. Neither of our maternal offending variables were significant in the context of the fully fitted model for boys; although the OR for mother's offending post-birth was 2.2 which, with a larger sample, would likely have been significant. There is a weak to moderate, but significant, relationship between the two parenting variables – quality of relationships and supervision – and offending among boys. We also found that parental maltreatment had a weak effect on boys' offending. Two of our control variables – child general health and cognitive ability – were also significant in the context of the boys' model. These findings suggest that, compared to girls, boys' involvement in offending may be influenced by a wider range of factors relating to weak social bonds, unstable family dynamics, inadequate or abusive child rearing practices and attenuated child development. Any direct or indirect influence of maternal transmission is not evident in the context of Model 3.

It is, of course, possible that there are other factors associated with offending among pre-adolescent girls and boys that we have not controlled for here (including the role of fathers). Our aim was not to test theory or identify an exhaustive list of risk factors. Nevertheless, our results do suggest that, even in the presence of other well-known criminogenic factors, the propensity to offend among 12-year-old girls is more strongly influenced by the behaviour of their mothers than that of boys.

Discussion

This article set out to examine whether there was evidence in support of maternal transmission of offending among a cohort of pre-adolescent children from a Scottish cohort

study. In doing so, it accounted for a range of other risk factors that are known to influence anti-social behaviour and tested for relationships between mother and child offending separately for boys and girls. Importantly, it also took advantage of the study design to examine whether intergenerational or intragenerational offending by the mother was most closely aligned with the behaviour of the child.

Overall, we found strong evidence to support the transmission of offending between mothers and children, but only when maternal offending occurred after the child was born and only in the case of daughters. Taking account of contemporaneous family functioning, experiences of childhood adversity, poverty and a range of other risk factors, we found no evidence to support the hypothesis that a mother's involvement in offending (either before or after the child's birth) was likely to influence offending among sons. Indeed, the only common risk factor between boys and girls was the quality of the parent-child relationship, which is consistent with the work of Thornberry et al. (2003). We did, however, identify a broader range of risk factors that were associated with offending among boys. This is also consistent with research that shows risk factors for offending differ by sex (Moffitt et al., 2001), and suggests that boys' offending is influenced by a wider range of familial and personal vulnerabilities than girls'.

Our findings regarding the transmission of offending from mothers to daughters are consistent with other studies, such as Auty et al. (2017) and Tzoumakis et al. (2020), both of whom identified stronger same-sex effects, which might be attributed in part to learnt gender roles. The lack of association between girls' offending and the wider constellation of risk factors identified in other studies, such as growing up in poverty or other aspects of family dysfunction, could suggest that girls are more resistant to criminogenic environments than boys (an area of research that is highly under-developed according to Flynn et al., 2017). While out with the scope of this article, this might relate to gendered behavioural expectations learnt in childhood. For example, girls are more likely to internalise feelings such as stress or anxiety, whereas boys are more likely to externalise problems and engage in disruptive behaviour (Dulmus and Hilarksi, 2006).

While our data did not allow causal mechanisms to be determined, the fact that we found intragenerational offending to be more powerful than prior behaviour highlights the importance of understanding the life-course of women who offend, especially after they become mothers. Life-course (mainly quantitative) studies have tended to apply male-dominated theoretical perspectives to female offending; however, applying a sex-based or feminist lens may yield deeper insights. There is a burgeoning literature (mainly qualitative) on female offenders and the impact of justice system contact, especially imprisonment, on the outcomes of their children. For example, Minson (2015) argues that rising sentencing rates among female offenders are harmful to children, in terms of relationships and attachment, and increases their likelihood of offending. Similarly, Baldwin and Epstein (2017) highlight the turbulent effect of even short sentences for mothers on family life, which is exacerbated by a paucity of services to support offending mothers, such as mental health counselling and financial assistance. However, there is an absence of discussion about intragenerational transmission processes or cross-over effects within this feminist literature. At present, these two important areas of research are siloed, which constrains the possibility for theory development. A more

integrated approach to research development, including both quantitative and qualitative research, would be advantageous here.

Our study is limited in several ways and so caution must be drawn in interpreting the results. First, we could not take account of paternal offending because the primary caregiver in the GUS study was almost always the mother. As others have demonstrated, understanding the mechanisms of intergenerational transmission requires data on the offending histories of both parents (Auty et al., 2017; Tzoumakis et al., 2019). Second, our data on mothers' offending, while self-reported, were based on retrospective accounts in adulthood and did not provide sufficient detail to examine *homotypic* behavioural continuity, that is the strength of association between offending in mothers and children at age 12 (Huesmann et al., 1984); although it did allow us to explore *heterotypic* continuity. Third, there is a strong likelihood that some mothers may have under-reported prior offending, either through recall error or reluctance to report previous events, as this is common in retrospective self-reports, especially among women (Jolliffe and Farrington, 2014). Nevertheless, we believe that using self-reported offending data, collected independently from mothers and children, together with a rich array of contextual variables, has generated important insights on the temporal and sex-based nature of maternal transmission of offending.

Conclusion

Our findings underscore the need for further work, both quantitative and qualitative, on the causal processes and mechanisms of intergenerational transmission of offending in general, and the role of mothers, in particular, for both boys and girls. From a policy perspective, the needs of female offenders were recently highlighted by the Farmer Review (2019: 4) which stated that 'relationships are women's most prevalent 'criminogenic' need'. (2019: 4). Indeed, improving family relationships has been identified as key to helping women to undertake their parenting role (O'Malley and Devaney, 2016). However, we need to know much more about the dynamics of familial relationships, and the role of maternal offending within those, to develop effective policy interventions. For example, to what extent are the 'modelling processes' identified by Auty et al. (2017) influenced by the behaviour of the mother as opposed to the effects of the societal and justice system response to her offending? And where does the burden of responsibility lie within the wider context of societal, political, and legal regimes? As Minson (2020) notes, understanding and addressing the dynamics of maternal offending is not just about improving outcomes for children, it is a matter of human rights.

These issues are of particular salience in Scotland, where this study was conducted. Based on a welfare system since the 1960s, youth offending in Scotland is viewed through the lens of both needs and deeds within the non-adversarial Children's Hearing System. This welfarist ethos has been strengthened by a number of policy and legislative developments, including the Getting It Right For Every Child (GIRFEC) framework in 2006; the Whole Systems Approach to dealing with children who offend, premised on early and effective intervention, in 2011; the Age of Criminal Responsibility (Scotland) Act 2019, which increased the minimum age of prosecution from 8 to 12; and more recently, a Bill to incorporate the UN Convention on the Rights of the Child into domestic law (which has

been partly challenged by the UK Government). Nevertheless, according to its Gender Equality Index (Scottish Government, 2020: S1), ‘Scotland has some way to go before full equality by sex and gender is reached’ so it seems unlikely that the transmission of offending from mothers to daughters will be resolved any time soon.


Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was funded by the Economic and Social Research Council (Understanding Inequalities ES/P009301/1).

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