Understanding the Intergenerational Transmission of Criminal Justice Involvement: a Multi‑birth‑Cohort Study in Singapore

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Abstract
This study aimed to ascertain the impact of parent’s criminal justice involvement on offspring’s contact with the criminal justice system in Singapore. It further analyzed how various aspects of parent’s criminal justice involvement influence the extent of the intergenerational transmission. Linked administrative data of five full birth cohorts (1965, 1970, 1975, 1980, 1985; N=93,829) and their children were analyzed (Nchildren=183,015). Restricted mean survival time (RMST) analyses were conducted, and results suggested that children whose parent had contact with the criminal justice system had fewer crime-free years compared to children whose parent did not have any criminal justice contact. In addition, the impact of paternal and maternal involvement with the criminal justice system was greater on daughters than sons; the impact of custodial sentences was greater than that of noncustodial sentences; and it was also found that a higher frequency of parent’s criminal justice involvement increased the likelihood of children’s contact with the criminal justice system. Intergenerational transmission of criminal justice involvement was observed in Singapore, and so the findings highlighted the importance of supporting families of offenders to disrupt the negative cycle of offending behavior.

Keywords Birth cohort analysis · Intergenerational transmission · Parental criminal justice contact · Restricted mean survival time

Introduction
Intergenerational transmission has been regarded as characteristic or behavior that is present in both the parent and the child (Liefbroer, 2005). Deviant activities are often passed from parents to children, and it is well documented that criminal behavior runs in the family (e.g., Farrington et al., 2001; Murray et al., 2012). Theories from the perspectives of
socialization, strain, labeling, and life course criminology could explain the similarities in antisocial or criminal behavior between parents and children. Empirical research has provided supporting evidence about the intergenerational transmission of criminal behavior in the Western context (e.g., Besemer et al., 2011; Bijleveld & Wijkman, 2009; Kendler et al., 2015), but limited research has been conducted in the non-Western context.

Asian countries may have lower crime rates, which could be linked to cultural factors (Nivette, 2011). In addition, familial bonding and parenting styles may vary across culture (Kotlaja, 2020), which could lead to differences in the development of criminal attitudes and behaviors and differential impacts of parental criminal justice involvement on children. Therefore, it would be useful to examine the intergenerational transmission of criminal justice involvement as well as how various aspects of parent’s criminal justice involvement influence the extent of the intergenerational transmission in the non-Western context. It would advance our understanding about the degree of risk to which children face if they are born to parents or families with contact to the criminal justice system. Importantly, such information can be used to inform policy and intervention design and to identify suitable participants for intervention and prevention programs in a culturally sensitive manner.

**Existing Research on Intergenerational Transmission of Criminal Justice Involvement**

The intergenerational transmission of criminal justice involvement could be explained by theories from different perspectives. The socialization theories focus on the process of social learning and the formation of positive relations and attachment to others (Akers, 1998; Sampson & Laub, 1993). The strain theories posit that stressors and disadvantages push individuals into criminal offending (Agnew, 1992). The labeling perspective proposes that children exposed to parental incarceration receive labels, which restrict opportunities (Matsueda, 1992). Additionally, the life course perspective argues that lives are linked and interdependent, that is, an individual’s trajectory is influenced by events and life transitions of people around him or her (Elder, 1998). Furthermore, an integrated systemic social exclusion framework has been developed to account for factors from multiple domains including education, economic, and family (Foster & Hagan).

A significant body of empirical research examined the link between parental and child criminal behavior or criminal justice involvement, using self-reported or official crime data (see Table 1 for a review). In particular, there were a few studies that used large-scale, population-based data to examine the extent of the intergenerational transmission in one country or region. For instance, using data of individuals born between 1960 and 1990 ($N=3,257,987$), Kendler and colleagues (2015) found that parental criminal behavior had significant impact on offspring’s criminal behavior in Sweden, regardless of family types and offense types (i.e., violent, property, and white-collar offenses).

Among the 39 published studies reviewed in Table 1, most provided supporting evidence about the intergenerational transmission of criminal justice involvement, except those four studies that did not find any significant impact of parental criminal justice involvement on children after controlling for broader social context such as parenting and peer relation. In addition, a meta-analysis synthesized the results for approximately three million children and indicated that children of criminal parents were about 2.4 times more likely to exhibit criminal behavior as compared to children of noncriminal parents (Besemer et al., 2017). Overall, existing literature showed that the degree of the intergenerational transmission of criminal behavior or criminal justice involvement was
| Authors            | Year of publication | Country          | Northchildren/youngest generation | Methods                                                                 | Intergenerational transmission of criminal justice involvement |
|--------------------|---------------------|------------------|-----------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------|
| Aaron and Dallaire | 2010                | USA              | 874                               | Administrative data and survey, quantitative                            | Not statistically significant                                     |
| Ang and Huan       | 2008                | Singapore        | 771                               | Administrative data, quantitative                                       | $OR = 2.28$                                                      |
| Auty et al         | 2015                | UK               | 527                               | Administrative data and survey, quantitative                            | $OR = 2.98–5.16$                                                 |
| Beaver             | 2013                | USA              | 15,701                            | Survey, quantitative                                                    | $OR = 2.32–4.49$                                                 |
| Besemer et al      | 2016                | Sweden           | 2,844                             | Administrative data, quantitative                                       | $OR = 3.3–3.6$                                                   |
| Besemer et al      | 2011                | UK and the Netherlands (NL) | UK: 1184; NL: 804 | Administrative data, quantitative                                       | $\beta = 0.58$ for UK and not statistically significant for NL $OR = 1.34–3.53$ |
| Bijleveld and Wijkman | 2009              | NL               | 1971                              | Administrative data, quantitative                                       | $OR = 3.6$                                                      |
| Billings           | 2018                | USA              | 9476                              | Administrative data, quantitative                                       | $\beta = 0.056–0.113$                                            |
| Chavira et al      | 2018                | USA              | 554                               | Survey, quantitative                                                    | Not statistically significant                                     |
| Dannerbeck         | 2005                | USA              | 1112                              | Administrative data, quantitative                                       | Higher proportion of youth with parental incarceration (54%) who had a first referral to juvenile authorities at 12 years or below, compared to youth without (36%) $\beta = 0.003–0.055$ |
| Dobbie et al       | 2018                | Sweden           | 55,324                            | Administrative data, quantitative                                       | $\beta = 0.003–0.055$                                            |
| Farrington et al   | 2015                | UK               | 344                               | Administrative data and survey, quantitative                             | $OR = 2.06–2.82$                                                |
| Farrington et al   | 2009                | UK               | 563                               | Administrative data and survey, quantitative                             | $OR = 2.0–3.5$                                                  |
Table 1 (continued)

| Authors                   | Year of publication | Country     | $N_{\text{children/youngest generation}}$ | Methods                                                                 | Intergenerational transmission of criminal justice involvement |
|---------------------------|---------------------|-------------|------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------|
| Farrington et al          | 2001                | USA         | 1395                                     | Survey, quantitative                                                  | $OR = 1.4–4.7$                                                  |
| Frisell et al             | 2011                | Sweden      | 11,878,407                               | Administrative data, quantitative                                     | $OR = 3.5$                                                      |
| Fergusson et al           | 2000                | New Zealand | 936                                      | Administrative data and survey, quantitative                            | 34.6% of chronic offenders and 23.7% of adolescent onset offenders had parental history of offending compared to 7.5% for nonoffenders |
| Giordano et al            | 2018                | USA         | 1021                                     | Survey and interview, mixed methods                                   | Not statistically significant                                    |
| Hjalmarsson and Lindquist| 2013                | Sweden      | 316,808                                  | Administrative data, quantitative                                     | $\beta = 0.07–0.17$ for violent offense, $0.10–0.15$ for property offense, and $0.09–0.11$ for other offense |
| Hjalmarsson and Lindquist| 2012                | Sweden      | 15,117                                   | Administrative data, quantitative                                     | $OR = 1.86–4.10$                                                |
| Huebner and Gustafson     | 2007                | USA         | 1697                                     | Survey, quantitative                                                  | $OR = 2.97–4.00$                                                |
| Junger et al              | 2013                | NL          | 1681                                     | Administrative data, quantitative                                     | About 25% the families were responsible for all crime suspects   |
| Kendler et al             | 2015                | Sweden      | 2,411,227                                | Administrative data, quantitative                                     | $HR = 1.28–1.95$                                                |
| Kinner et al              | 2007                | Australia   | 2399                                     | Administrative data and survey, quantitative                            | $Cohen’s d = 0.32$                                              |
| Kjellstrand and Eddy      | 2011                | USA         | 655                                      | Administrative data and survey, quantitative                            | $OR = 2.8–7.1$                                                  |
| Murray and Farrington     | 2005                | UK          | 405                                      | Administrative data and survey, quantitative                            |                                                                  |


| Authors                | Year of publication | Country            | \(N_{\text{children/youngest generation}}\) | Methods                                      | Intergenerational transmission of criminal justice involvement |
|-----------------------|---------------------|--------------------|---------------------------------------------|----------------------------------------------|---------------------------------------------------------------|
| Murray et al          | 2012                | USA                | 1009                                        | Survey and administrative data, quantitative | \(\beta = 0.59\)                                             |
| Murray et al          | 2007                | Sweden and UK      | 15,117; UK: 411                             | Administrative data, quantitative            | \(OR = 1.4–3.3\) for Sweden and 3.2–6.0 for UK              |
| Porter and King       | 2014                | USA                | 12,172                                      | Survey, quantitative                         | Not statistically significant                                    |
| Putkonen et al        | 2007                | Finland            | 231                                         | Administrative data, quantitative            | \(OR = 17.4–24.2\)                                           |
| Ramakers et al        | 2011                | NL                 | 562                                         | Administrative data, quantitative            | \(OR = 1.59–2.19\)                                           |
| Roettger and Swisher  | 2011                | USA                | 6602                                        | Survey, quantitative                         | \(OR = 2.03–2.36\)                                           |
| Swisher and Roettger  | 2012                | USA                | 14,186                                      | Survey, quantitative                         | \(\beta = 1.04–1.29\)                                         |
| Tasca et al           | 2011                | USA                | 356                                         | Administrative data, mixed methods           | \(OR = 2.41\) for maternal incarceration (not statistically significant for paternal incarceration) |
| Trice and Brewster    | 2004                | USA                | 58                                          | Survey, quantitative                         | Higher proportion of children of incarcerated mothers were arrested (34%), compared to their peers (15%) |
| Tzoumakis et al       | 2020                | Australia          | 71,661                                      | Administrative data and survey, quantitative | \(OR = 2.88–5.24\)                                           |
| van de Rakt et al     | 2012                | NL                 | 5981                                        | Administrative data, quantitative            | \(OR = 1.23\)                                               |
| van de Rakt et al     | 2008                | NL                 | 8085                                        | Administrative data, quantitative            | Children of fathers who were “high-rate persistent” had higher chance of being chronic offenders (4.7%) than children of nonconvicted fathers (0.1%) |
| Authors          | Year of publication | Country          | $N_{\text{children/youngest generation}}$ | Methods                        | Intergenerational transmission of criminal justice involvement |
|------------------|---------------------|------------------|------------------------------------------|--------------------------------|---------------------------------------------------------------|
| Van de Weijer et al | 2017               | NL, UK, and USA  | NL: 1102; UK: 1385; USA: 295             | Administrative data, quantitative | $OR = 2.80$ for the Netherland, $3.16$ for UK, and $3.42$ for USA |
| Will et al       | 2014               | USA              | 418                                      | Survey, quantitative            | $OR = 4.35$, $3.03$, and $3.02$ for violent, nonviolent, and drug offenses |
substantial, with the majority coming from the Western countries (e.g., the Netherlands, Sweden, UK, and USA).

**Gender-Specific Intergenerational Transmission of Criminal Justice Involvement**

There have been a small but increasing number of studies looking into the differential impacts of paternal and maternal criminal justice involvement on children. Foster and Hagan (2015) summarized existing hypotheses that compared the impact of paternal and maternal incarceration, including intergenerational stress, maternal salience, paternal salience, and gendered loss hypotheses. A significant body of research provided empirical evidence for the impact of paternal or maternal criminal justice involvement on children, separately. The impact of paternal conviction or incarceration on children’s offending behavior was well-documented (e.g., Ang & Huan, 2008; Hjalmarsson & Lindquist, 2012; van de Rakt et al., 2012), whereas fewer studies focused on maternal criminal justice contact (Huebner & Gustafson, 2007; Trice & Brewster, 2004). A few comparative studies found that maternal incarceration was more disruptive for children and linked to higher odds of mental health concerns (Tasca et al., 2014) and sex-risk behavior (Nebbitt et al., 2013). On the contrary, some studies found stronger impact of paternal incarceration on children’s well-being (Turney & Wildeman, 2015; Wildeman & Turney, 2014). Additionally, Foster and Hagan (2013) supported that the gendered loss hypothesis, that is, maternal incarceration, would be associated with internalized problem, whereas paternal incarceration would be associated with externalizing problem.

There were also studies comparing the intergenerational transmission of criminal justice involvement across different parent–child dyads, which yielded inconsistent findings. Farrington and colleagues (2001) found that father’s conviction history was the most important factor predicting son’s delinquency, based on a sample of 1395 boys and their relatives, whereas another three-generation study found that the intergenerational transmission was stronger from mothers than fathers and to daughters than sons (Besemer et al., 2016). Similarly, a Swedish population study (N = 12,563,581) suggested that the intergenerational associations of violent crime were higher among female-female pairs, for instance, the odds ratio was 6.3 for the association between mothers and daughters as compared to 3.5 for that between parents and children in general (Frisell et al., 2011). Tzoumakis et al. (2020) showed that parental offending behavior had greater impact on daughters than sons, regardless of the criminal parent’s gender in a sample of 71,661 Australian children. On the contrary, Besemer et al. (2011) found that parental incarceration only had significant impact on sons, based on a sample of 1184 children in the UK.

Research also revealed that there could be gender-specific mechanisms for the intergenerational transmission. For instance, Thornberry and colleagues (2003) suggested that paternal delinquency had a strong direct link to children’s antisocial behavior, whereas the impact of maternal delinquency on children was mediated by parenting behavior and financial stress to a greater extent. Auty et al. (2017) found that both paternal and maternal convictions had direct effect on the convictions of their sons and indirect effect via the mediation of paternal drug use. Additionally, the effect of paternal conviction on daughters was mediated by cohabitation problems, whereas the effect of maternal conviction was mediated by harsh parenting.
Type of Judicial Outcome of Parent’s Criminal Justice Involvement

It is well documented that parental arrest and incarceration influence children’s outcomes in different ways. Witness of parental arrest might be traumatic for children (Phillips & Zhao, 2010). Trial in court could also provoke anxiety for families and children (Fishman, 1983). On the other hand, parental incarceration was found to be associated with multiple stressors for children, such as financial difficulties, disruption in placement, care and school arrangements, and stigma (Arditti, 2012; Geller et al., 2011; Saunders & Barry, 2013; Sroufe, 1988). As a result, children with incarcerated parents could exhibit internalizing problems (e.g., depression and anxiety), as well as externalizing behaviors (e.g., anger and aggression) (Bloom & Steinhart, 1993; Boswell & Wedge, 2001; Johnston, 1995; Murray, 2005; Sharp & Marcus-Mendoza, 2001).

Most existing literature examined the impact of parental conviction in general, without separating the effects of conviction from the effects of incarceration (e.g., Bijleveld & Wijkman, 2009; Kendler et al., 2015). Some studies focused on the impact of parental incarceration alone (e.g., Huebner & Gustafson, 2007; van de Rakt et al., 2012). However, relatively few studies examined the impact of noncustodial sentences and generated inconsistent findings. Murray et al. (2007) indicated that parental incarceration was a stronger predictor than parental conviction without incarceration for offspring’s criminal behavior in Sweden. However, Murray et al. (2012) found that parental conviction without incarceration was not significantly associated with children’s likelihood of committing theft or using marijuana.

Frequency of Parent’s Criminal Justice Involvement

The frequency of parent’s contact with the criminal justice system and its influence on children have also been investigated by existing studies. Most of them provided supportive evidence for the dose–response relationship in the UK (Besemer, 2014), Sweden (Murray et al., 2007), and the Netherlands (Nijhof et al., 2009). Additionally, Van de Rakt et al. (2008) found that for fathers with persistent criminal trajectory, their children were more likely to have delinquent behavior. Nonetheless, West and Farrington (1977) found that there was little difference in the conviction rate of sons between fathers with one conviction and fathers with two or more convictions.

In summary, previous research has examined the association between parental and child criminal justice involvement in general and the differential impact of various aspects of parental criminality. Nonetheless, most of these studies were conducted in the Western context. The intergenerational transmission of criminal justice involvement has not been fully examined in the non-Western context.

The Singaporean Context

As an independent island-state in Southeast Asia, Singapore has been known as one of the safest cities in the world (The Economist Intelligence Unit, 2019). With a total population of 5.71 million (Singapore Department of Statistics, 2019), Singapore reported a total of 35,209 crime cases in 2019 (Singapore Police Force, 2020). The low crime rate
in Singapore may affect the extent of intergenerational transmission of criminal justice involvement.

In many Asian countries, family ties are relatively strong, and people attach important value to family. For instance, in Singapore, the majority agree that they have a close-knit family (Ministry of Social & Family Development, 2015). Therefore, disruptions in the family, such as parental incarceration, may have detrimental impact on family members, including the next generation. On the other hand, a survey revealed that about 80% of Singaporeans maintained close ties with relatives outside of their immediate family and had relatives to call on for help (Ministry of Social & Family Development, 2016). Such support from the extended family members may mitigate the negative consequences of parental criminal justice involvement on children. In summary, with low crime rate and strong family relationship, Singapore would be a suitable test ground for the intergenerational transmission of criminal justice involvement in the Asian context.

There are a few studies examining the impact of parental criminal justice involvement on children. Using data from probation reports, Ang and Huan (2008; N = 772) found that youth offenders with reported father criminality had higher likelihood of recidivism than those without. In another study of 3744 youth offenders, Chng and colleagues (2016) found that 9% of youth offenders’ fathers had a conviction history and 3% had mothers who were previously convicted. However, such studies which focused on analyzing offending populations are inherently biased as individuals who were exposed to parental criminality but did not offend were excluded.

Analyses of the population data could ensure that there is no selection bias towards certain groups as it includes all individuals across all income brackets and educational levels. Apart from the Swedish studies (i.e., Frisell et al., 2011; Kendler et al., 2015), there is a lack of population-based studies that examined the intergenerational transmission, especially in the non-Western context. Moreover, these Swedish studies examined the intergenerational transmission of certain types of crime (e.g., violent, property, and white-collar offenses) instead of including all types of offending behavior. Adopting a more expansive definition of criminal offending (i.e., all types of offenses) could contribute to a more comprehensive understanding about the link between parental and child criminality.

The Present Study

The primary objective of this study was to ascertain the extent of the intergenerational transmission of criminal justice involvement in Singapore, using administrative data of five birth cohorts, provided by official sources. Specifically, the study sought to answer the following research questions:

RQ1: What is the association between parental criminal justice involvement and the likelihood of children’s contact with the criminal justice system?
RQ2: What is the impact of paternal and maternal criminal justice involvement on the likelihood of sons’ and daughters’ contact with the criminal justice system, respectively?
RQ3: How do parental custodial and noncustodial sentences affect the children’s contact with the criminal justice system?
RQ4: How does the frequency of parental criminal justice involvement affect the extent of the intergenerational transmission?
Method

Data

This study is part of the Intergenerational Transmission of Criminality and Social Disadvantages (INTRACS) research program. The INTRACS study consisted of 242,620 individuals born in the 1965, 1970, 1975, 1980, and 1985 birth cohorts. Specifically, the “parent” generation of this study comprised of individuals born in the five birth cohorts and had children who were aged 7 years and above at the start of study (N=93,829). Among them, there were 41,683 fathers and 52,146 mothers. The “child” generation comprised of individuals born to the “parent” generation (N=183,015); of which, 94,108 were sons and 88,907 were daughters.

Official conviction records in Singapore between January 1, 1965 and December 31, 2018 were obtained for the five birth cohorts and their children. In other words, the tracking period started on the child’s seventh birth and ended either at the time of the child’s offense or December 31, 2018, whichever came first. Data covered both juvenile and adult justice system, custodial and noncustodial sentences, and all types of convictions.

Variables

Child Criminal Justice Involvement

The dependent variable of the study was child criminal justice involvement. A binary variable was generated based on the official conviction records to indicate whether a child had contact with the criminal justice system, with “1” indicating yes and “0” otherwise. The dates for when the “child” generation was charged were also collected.

Parental Criminal Justice Involvement

Information about whether a parent had any contact with the criminal justice system was obtained. This independent variable was coded as a binary variable (i.e., 1 = yes and 0 = no). Note that only parental contact with the criminal justice system prior to their children’s contact with the criminal justice system was taken into consideration.

Demographics

Information about the birth dates and gender of the parents in the five birth cohorts as well as their children were collected from administrative records. Birth dates of the parent were used to identify their birth cohorts, and birth dates of children were used to calculate the time to the event (i.e., criminal justice contact). Gender information was used to generate

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1 According to the Children’s and Youth Persons Act in Singapore when the research was conducted, the age of criminal responsibility is 7 years. That is, children below this age are regarded as being incapable of breaking the law. Therefore, children aged below 7 years by the end of the study period and their parents were excluded from this study. The age of criminal responsibility was revised to 10 years old in 2019. However, given that the number of individuals who committed offenses between the ages of 7 and 10 is extremely low, this legislative change is not expected to have any material impact on the current analysis.
the four parent–child dyads (i.e., fathers and sons, fathers and daughters, mothers and sons, and mothers and daughters).

**Judicial Outcome**

Information about custodial history was extracted from the official conviction records to capture sentence outcomes, which was included in the analysis as an independent variable. For parents who had contact with the criminal justice system, they were further categorized into two groups—“without custodial history” and “with custodial history.”

**Offense Frequency**

Another independent variable was the number of contacts with the criminal justice system tabulated for the “parent” generation as of the time of data collection. In the present analyses, any individuals with more than one contact with the criminal justice system was classified as a “repeat offender.” For parents with conviction records, a binary variable was computed to indicate the frequency of parental criminal justice involvement (i.e., 0 = one-off offender and 1 = repeat offender). Descriptive statistics of the variables were reported in Table 2.

**Plan of Analyses**

Descriptive statistics of the average age of children’s first contact with the criminal justice system were analyzed and compared between those whose parent had criminal justice involvement and those whose parent did not. Restricted mean survival time (RMST) analyses were then conducted to examine how the various aspects of parent’s criminal justice involvement (i.e., gender, type of custodial order, and frequency of offense) affected offspring’s criminal justice involvement.

RMST analysis is most commonly used in medical research (Calkins et al., 2018; Conner et al., 2019; Kim et al., 2021; Perego et al., 2020) as an alternative to Cox regression and with it, the routinely estimated hazard ratio. The restricted mean survival refers to the calculation of the mean survival time from time point 0 to a prescribed endpoint and is defined by Hasegawa et al. (2020) as “the expected value of time to event limited to a specific point corresponding to the area under the survival curve up to the specific time point.” As the RMST value provides the absolute survival time of each arm within the trial, the ensuing RMST difference, which is the restricted mean time lost (RMTL), can therefore be regarded as both a relative and absolute measure (Royston & Parmar, 2013). Through calculating the RMST and the RMTL, it is possible to quantify the different lengths of time for the two arms of the trial to reach a pre-defined clinical endpoint, such as mortality. In the present context, instead of time to mortality, the time to first offense among children, with exposure to varying aspects of parental criminal justice involvement, is the prescribed endpoint.

The concept of RMST and RMTL is further explained in Fig. 1. For children exposed to parental criminality, area A represents their restricted mean survival time, and area B represents the restricted mean time they lost during the follow-up period of as specified in the figure. As can be seen, area A for children who were exposed to parental criminality is smaller than area A’ in children who were not exposed to parental criminality, which indicates that children who were exposed to parental criminality

[Fig. 1] The concept of RMST and RMTL
have fewer crime-free years to children who were not exposed to parental criminality. Correspondingly, for children who were exposed to parental criminality, area $B$, which presents the restricted mean time lost by them, is therefore larger in area compared to area $B'$. Though the use of hazard ratios as a summary measure is common in criminological research, the application of RMST and RMTL to criminology research should not be ruled out. For instance, such analysis puts forward an alternative indicator of differences among different groups (i.e., the reduction of time measured in years before a child’s contact with the criminal justice system), which could be easier to understand and interpret as compared to hazard ratios (Pak et al., 2017; Uno et al., 2014). In addition, the RMST and RMTL could address the limitation of HR, particularly the challenge in interpreting HR when the hazards are not proportional (Hernán, 2010; Saad et al., 2017).

Table 2  Descriptive statistics for the “parent” and “child” generation

| Parent generation                      |     |     |
|---------------------------------------|-----|-----|
| **Variables**                         | n   | %   |
| Birth cohort                          |     |     |
| 1965                                  | 34,315 | 36.6% |
| 1970                                  | 26,702 | 28.5% |
| 1975                                  | 19,107 | 20.4% |
| 1980                                  | 10,741 | 11.4% |
| 1985                                  | 2964  | 3.2% |
| Gender                                |     |     |
| Male                                  | 41,683 | 44.4% |
| Female                                | 52,146 | 55.6% |
| Criminal justice involvement          |     |     |
| Overall                               | 11,079 | 11.8% |
| Male                                  | 8502  | 20.4% |
| Female                                | 2577  | 4.9% |
| Judicial outcome                      |     |     |
| With custodial history                | 5323 | 5.7% |
| Without custodial history             | 5756 | 6.1% |
| Offense frequency                     |     |     |
| One-off offender                      | 3646 | 3.9% |
| Repeat offender                       | 7433 | 7.9% |

| Child generation                      |     |     |
|---------------------------------------|-----|-----|
| **Variables**                         | n   | %   |
| Birth cohort                          |     |     |
| 1965                                  | 74,495 | 40.7% |
| 1970                                  | 53,431 | 29.2% |
| 1975                                  | 34,294 | 18.7% |
| 1980                                  | 16,492 | 9.0% |
| 1985                                  | 4303  | 2.4% |
| Gender                                |     |     |
| Male                                  | 94,108 | 51.4% |
| Female                                | 88,907 | 48.6% |
| Criminal justice involvement          |     |     |
| Overall                               | 4063 | 2.2% |
| Male                                  | 3255 | 3.5% |
| Female                                | 808  | 0.9% |

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Results

General Association Between Parent’s and Child’s Criminal Justice Involvement

First, we examined the overall impact of parental criminal justice involvement on children. The descriptive statistics showed that children whose parent had criminal justice involvement had contact with the criminal justice system at an earlier age ($M = 17.99$, $Mdn = 17.35$, $SD = 3.52$), as compared to children whose parent did not have any criminal justice involvement ($M = 18.60$, $Mdn = 17.84$, $SD = 3.76$).

As reported in Table 3, RMST analysis indicated that for children with parental contact to the criminal justice system, the mean survival time for this group was 36.12 years as opposed to the mean survival time of 37.64 years for children without. Within the 38.96-year follow-up period, the mean crime-free years for children whose parent had criminal justice involvement was 2.84 years fewer compared to 1.20 years fewer for children whose parent did not have any criminal justice involvement. In other words, parent’s criminal justice involvement resulted in a 1.64-year (95% CI = [1.44–1.84], $p < 0.001$) reduction of the mean crime-free years for offspring. This indicated that on average, children with parental exposure to the criminal justice system had contact with the criminal justice system earlier than children without. Furthermore, as seen in Fig. 1, it was observed that for children whose parent had criminal justice involvement, their decrease in survival probability not only started earlier, but their survival probability also saw a steeper decline during the late teenage years and early adulthood when compared to their counterparts whose parent did not have any criminal justice involvement.

Additionally, RMST analyses were performed for the five birth cohorts separately. As shown in Table 3, in general, the association between parental and child criminal justice involvement was observed across the five birth cohorts spanning the 20 years between
| Analysis                                                                 | Treatment                                      | $n_{children}$ | T (years) | RMST    | SE     | 95% CI   | RMSL    | SE     | 95% CI   | ΔRMST   | 95% CI   | p value |
|-------------------------------------------------------------------------|-----------------------------------------------|----------------|-----------|---------|--------|----------|---------|--------|----------|---------|----------|---------|
| Overall                                                                 | With parental criminal justice contact        | 22,646         | 38.96     | 36.12   | 0.09   | 35.94-36.30  | 2.84     | 0.09   | 2.66-3.02 | 1.64    | 1.44-1.84 | <.001   |
|                                                                        | Without parental criminal justice contact     | 160,369        | 37.64     | 0.04    | 37.68-37.85 | 1.20     | 0.04   | 1.11-1.28 | 1.28    |           |         |
| 1965 Cohort                                                             | With parental criminal justice contact        | 9688           | 38.96     | 0.10    | 36.01-36.42 | 2.74     | 0.10   | 2.54-2.95 | 1.56    | 1.34-1.78 | <.001   |
|                                                                        | Without parental criminal justice contact     | 64,807         | 37.77     | 0.04    | 37.68-37.86 | 1.19     | 0.04   | 1.10-1.28 | 1.28    |           |         |
| 1970 Cohort                                                             | With parental criminal justice contact        | 5513           | 33.46     | 0.13    | 31.30-31.82 | 1.90     | 0.13   | 1.64-2.16 | 1.05    | 0.70-1.39 | <.001   |
|                                                                        | Without parental criminal justice contact     | 47,918         | 32.61     | 0.12    | 32.38-32.83 | 0.86     | 0.12   | 0.63-1.08 |         |           |         |
| 1975 Cohort                                                             | With parental criminal justice contact        | 3853           | 28.13     | 0.13    | 26.43-26.95 | 1.44     | 0.13   | 1.18-1.70 | 0.78    | 0.46-1.10 | <.001   |
|                                                                        | Without parental criminal justice contact     | 30,441         | 27.47     | 0.10    | 27.28-27.66 | 0.66     | 0.10   | 0.47-0.85 |         |           |         |
| 1980 Cohort                                                             | With parental criminal justice contact        | 2502           | 22.96     | 0.14    | 21.98-22.52 | 0.71     | 0.14   | 0.44-0.98 | 0.37    | 0.07-0.67 | <.05    |
|                                                                        | Without parental criminal justice contact     | 13,990         | 22.62     | 0.07    | 22.49-22.75 | 0.34     | 0.07   | 0.21-0.47 |         |           |         |
| 1985 Cohort                                                             | With parental criminal justice contact        | 1090           | 19.12     | 0.36    | 17.81-19.24 | 0.59     | 0.36   | -0.12-1.30 | 0.46    | -1.19-2.27 | >.05    |
|                                                                        | Without parental criminal justice contact     | 3213           | 18.98     | 0.09    | 18.82-19.15 | 0.13     | 0.09   | -0.04-0.30 |         |           |         |
| Paternal criminal justice contact                                       | With paternal criminal justice contact        | 16,967         | 36.27     | 0.10    | 33.80-34.20 | 2.27     | 0.10   | 2.07-2.48 | 1.55    | 1.33-1.78 | <.001   |
|                                                                        | Without paternal criminal justice contact     | 166,048        | 35.55     | 0.05    | 35.45-35.65 | 0.72     | 0.05   | 0.62-0.82 |         |           |         |
Table 3 (continued)

| Analysis                              | Treatment                                      | $n_{children}$ | T (years) | RMST  | SE   | 95% CI  | RMSL  | SE   | 95% CI  | ΔRMST  | 95% CI  | $p$ value |
|---------------------------------------|-----------------------------------------------|----------------|-----------|-------|------|---------|-------|------|---------|--------|---------|-----------|
| Maternal criminal justice contact     | With maternal criminal justice contact        | 5679           | 38.96     | 35.59 | 0.16 | 35.29   | 35.89 | 3.37 | 0.16    | 3.07   | 3.67    | 2.08      | <.001     |
|                                       | Without maternal criminal justice contact     | 177,336        | 37.67     | 0.05  | 37.58| 37.76   | 1.29  | 0.05 | 1.20    | 1.38   |         |           |
| Sons                                  | With paternal criminal justice contact        | 8704           | 36.27     | 32.85 | 0.17 | 32.52   | 33.19 | 3.42 | 0.17    | 3.08   | 3.75    | 2.95      | <.001     |
|                                       | Without paternal criminal justice contact     | 85,404         | 35.11     | 0.10  | 34.92| 35.31   | 1.16  | 0.10 | 0.96    | 1.35   |         |           |
|                                       | With maternal criminal justice contact        | 2890           | 37.54     | 33.06 | 0.23 | 32.60   | 33.52 | 4.48 | 0.23    | 4.02   | 4.94    | 2.42      | <.001     |
|                                       | Without maternal criminal justice contact     | 91,218         | 35.69     | 0.07  | 35.55| 35.83   | 1.85  | 0.07 | 1.71    | 1.99   |         |           |
| Daughters                             | With paternal criminal justice contact        | 8263           | 35.71     | 34.69 | 0.10 | 34.50   | 35.88 | 1.02 | 0.10    | 0.83   | 1.21    | 4.06      | <.001     |
|                                       | Without paternal criminal justice contact     | 80,644         | 35.46     | 0.03  | 35.39| 35.53   | 0.25  | 0.03 | 0.18    | 0.32   |         |           |
|                                       | With maternal criminal justice contact        | 2789           | 38.16     | 36.36 | 0.16 | 36.05   | 36.67 | 1.80 | 0.16    | 1.49   | 2.12    | 3.80      | <.001     |
|                                       | Without maternal criminal justice contact     | 86,118         | 37.69     | 0.03  | 37.62| 37.76   | 0.47  | 0.03 | 0.41    | 0.54   |         |           |
| Custodial history                     | With custodial history                         | 10,874         | 38.96     | 35.49 | 0.13 | 35.24   | 35.75 | 3.46 | 0.13    | 3.21   | 3.72    | 2.19      | <.001     |
|                                       | Without custodial history                      | 11,772         | 37.68     | 0.04  | 37.60| 37.76   | 1.28  | 0.04 | 1.20    | 1.36   |         |           |
| Frequency                             | Repeat offender                                | 15,175         | 38.96     | 35.75 | 0.12 | 35.51   | 35.98 | 3.21 | 0.12    | 2.98   | 3.45    | 1.97      | <.001     |
|                                       | One-off offender                               | 7471           | 37.72     | 0.04  | 37.64| 37.80   | 1.24  | 0.04 | 1.16    | 1.32   |         |           |
1965 and 1985, although care needs to be taken when interpreting the results for the children born to the 1985 cohort.²

**Gender-Specific Intergenerational Transmission**

Next, gender differences in the intergenerational transmission of criminal justice involvement were investigated. First, descriptive statistics showed that on average, children with exposure to maternal criminal justice involvement had contact with the criminal justice system at an earlier age ($M = 17.87$, $Mdn = 17.23$, $SD = 3.56$) as compared to children with exposure to paternal criminal justice involvement ($M = 18.06$, $Mdn = 17.43$, $SD = 3.50$).

Given that the first set of analysis indicated that exposure to parental criminal justice involvement resulted in greater number of crime-free years lost during the follow-up period of 38.96 years, this present analysis sought to quantify the different impact of paternal and maternal criminal justice involvement on crime-free years lost by the children generation. As reported in Table 3, for children who were exposed to paternal criminal justice involvement, their mean survival was 34.00 years and they lost 2.27 years. In contrast, for children who were not exposed to paternal criminal justice involvement, their mean survival time was 35.55 years, and they lost 0.72 years. In other words, the absolute deficit attributed to exposure to paternal criminal justice involvement was 1.55 years (95% CI = [1.33–1.78]), $p < 0.001$). A similar pattern was observed for the impact of maternal criminal justice involvement. The absolute deficit attributed to maternal criminal justice involvement was 2.08 years (95% CI = [1.77–2.40], $p < 0.001$).

Further analyses were conducted to understand the extent of intergenerational transmission of criminal justice involvement among the four parent–child dyads (i.e., fathers and sons, fathers and daughters, mothers and sons, and mothers and daughters). The descriptive statistics reported in Table 4 suggested that, in general, children with exposure to paternal or maternal criminal justice involvement had fewer crime-free years as compared to children without any exposure to parental criminal justice involvement.

In addition, four sets of RMST analyses were conducted for the four parent–child dyads separately. As reported in Table 3, results indicated that both sons and daughters who were exposed to parental criminal justice involvement (be it paternal or

|                  | Son                        | Daughter                   |
|------------------|----------------------------|----------------------------|
|                  | $M$ | $SD$ | $M$ | $SD$ |
| Father had contact with the criminal justice system | 17.97 years | 3.44 | 18.40 years | 3.71 |
| Father did not have contact with the criminal justice system | 18.01 years | 3.24 | 18.57 years | 3.73 |
| Mother had contact with the criminal justice system | 17.75 years | 3.60 | 18.17 years | 3.44 |
| Mother did not have contact with the criminal justice system | 18.71 years | 3.80 | 18.80 years | 4.06 |

² The analyses for 1985 cohort did not reach significance at $p = .05$ level, but it was in the right direction. This is likely due to their children still being relatively younger ($Mean$ age = 10.18 years, $Median$ age = 9.67, $SD$ = 2.41) and did not have the commensurate length of exposure or opportunity for criminal activities as compared with other children of other primary cohorts. Hence, the prevalence for involvement in criminal justice system was lower (0.2%).
maternal criminal justice involvement) had fewer crime-free years compared to their counterparts with no exposure to either paternal or maternal criminal justice involvement. For sons who were exposed to paternal criminal justice involvement, the number of crime-free years lost was 2.95 times as large as compared to those who were not (95% CI = [2.43–3.65], \( p < 0.001 \)). For daughters who were exposed to paternal criminal justice involvement, the number of crime-free years lost was 4.06 times as large as compared to those who were not exposed to paternal criminal justice involvement (95% CI = [2.92–5.64], \( p < 0.001 \)), a magnitude that was larger than the relative mean time lost by sons who were exposed to paternal criminal justice involvement.

Regarding the impact of maternal criminal justice involvement, the results showed that the number of crime-free years lost by sons who were exposed to maternal criminal justice involvement versus sons who were not was 2.42 times as large (95% CI = [2.13–2.75], \( p < 0.001 \)). On the other hand, the number of crime-free years lost for daughters who were exposed to maternal criminal justice involvement versus daughters who were not exposed to maternal criminal justice involvement was 3.80 times as large (95% CI = [3.05–4.75], \( p < 0.001 \)), which is larger than the relative mean time lost for sons who were exposed to maternal criminal justice involvement.

### Impact of Parents’ Custodial History

The difference in the impact of parents’ custodial and noncustodial sentences on children’s criminality was analyzed. For children whose parents had custodial history, they had contact with the criminal justice system at an earlier age on average (\( M = 17.78 \), \( Mdn = 17.22 \), \( SD = 3.45 \)), as compared to children whose parent had contact with the criminal justice system but no custodial history (\( M = 18.32 \), \( Mdn = 17.70 \), \( SD = 3.60 \)). Results of the RMST analysis further revealed that parental custodial experience accounted for a difference of 2.19 crime-free years (95% CI = [1.92–2.46], \( p < 0.001 \)), as reported in Table 3. This indicated a greater impact of parental custodial experiences on their children.

### Frequency of Parental Criminal Justice Involvement

Regarding the frequency of offenses, descriptive statistics showed that on average, children whose parents had more than one conviction were involved with the criminal justice system at an earlier age (\( M = 17.93 \), \( Mdn = 17.33 \), \( SD = 3.57 \)) when compared with children whose parents had only one conviction (\( M = 18.19 \), \( Mdn = 17.37 \), \( SD = 3.36 \)).

Given that earlier analysis has shown that parental criminal justice involvement contributed to a reduction in the number of crime-free years, the present analysis focuses on the differential impact one-off criminal justice involvement and repeated criminal justice involvement among parents had on children. For children who were exposed to repeated parental criminal justice involvement, the number of crime-free years lost was 1.97 times as large as compared to those who were exposed to one-off parental criminal justice involvement (95% CI = [1.73–2.22], \( p < 0.001 \)). The greater impact of repeated parental criminal justice involvement suggested that there could be a dose–response relationship.
Discussion

Main Findings

In summary, this study provided empirical evidence on the intergenerational transmission of criminal justice involvement using population-based administrative data in Singapore (i.e., five full birth cohorts). Data that were used in this study were representative of Singapore’s demographic patterns and included all individuals across all income brackets and educational levels. Hence, it was not biased towards certain groups within the population. Moreover, the birth cohort study design provided an in-built comparison group that has experienced the same social, political, and cultural developments, which then indirectly controlled for the effects of unobserved variables.

To answer RQ 1, this study found that children exposed to parental criminal justice involvement were more likely to have contact with the criminal justice system themselves. Furthermore, a consistent pattern of intergenerational transmission of criminal justice involvement across the five birth cohorts was observed in general. More importantly, by adopting a more expansive definition of criminal justice involvement (i.e., all types of offenses), and not be limited to violent, property, and white-collar offenses (e.g., Kendler et al., 2015), the findings from this study put forward strong evidence of the link between parental and child criminal justice involvement, which is in line with prior empirical studies and supports the criminological theories relating to the intergenerational transmission. Particularly, the findings implied that parental criminal justice involvement could be a key life event that affects children’s outcomes and trajectories, which is consistent with what has been suggested by the life course theory (Elder, 1998). Further research would be required to understand more about the mechanisms for the intergenerational transmission to reveal whether strain, labeling, or socialization theories could offer stronger explanations for the impact of parental criminal justice involvement in the Singaporean context.

Regarding RQ2, findings revealed gender differences in the extent of the intergenerational transmission of criminal justice involvement, implying that the effects of maternal and paternal criminal justice involvement on children may be mediated through different pathways (Auty et al., 2017; Thornberry et al., 2003). More nuanced analysis of the four parent–child dyads revealed that both maternal and paternal criminal justice involvement had greater impact on daughters than sons in Singapore, which was consistent with the Australian study (Tzoumakis et al., 2020). The findings suggest that daughters might be more sensitive to parent’s criminal justice involvement than sons.

This study also compared the impact of custodial and noncustodial sentences on child criminal justice contact (RQ3). Present findings indicated that parental custodial sentences had a more detrimental impact on children than noncustodial sentences, which was consistent with prior research in the Western context (Murray et al., 2007). Possible explanations could be socioeconomic stress and parent–child separation due to parental incarceration (e.g., Arditti, 2012; Geller et al., 2011; Saunders & Barry, 2013). Nonetheless, for parents who had noncustodial criminal history, their children also had higher likelihood of having contact with the criminal justice system themselves, compared to parents with no criminal history, suggesting the influence of the arrest and conviction of parents on children (Fishman, 1983; Phillips & Zhao, 2010).

To address RQ4, this study found that higher frequency of parental criminal justice involvement decreased the number of crime-free years experienced by children. It therefore demonstrated the presence of a dose–response relationship, that is, an increase in the
likelihood of disruptions to family life would lead to more significant impact on a child’s development of bonds and attachment with their parents, which have been found to affect their subsequent trajectories (e.g., Besemer, 2014; Murray et al., 2007).

**Implications**

In summary, this large-scale study, which is one of the first to focus on the non-Western context, has provided supporting evidence about the intergenerational transmission of criminal justice involvement in Singapore, which might offer useful information for policy development related to rehabilitation service in the Asian context. For instance, the current research indicated that children who were exposed to parental criminal justice involvement not only experienced contact with the criminal justice system themselves at a faster cadence, but that the effects of parental criminal justice involvement were especially pronounced during the late teenage and early adulthood period as seen in Fig. 1. Hence, this study’s findings highlighted the importance of breaking the negative cycle of offending through upstream intervention supporting the families of offenders and helping ex-offenders reintegrate into the society. For instance, it would be useful for the services related to early childhood development to help children cope with parental conviction, develop resilience, and build positive parent–child relationship.

Particularly, there were gender differences in the extent of such intergenerational association. In this sense, it may be useful to be sensitive and responsive to the gender differences in the provision of rehabilitation services to offenders and their families. For example, it may be beneficial to adopt a gendered approach by providing more intensive support to offenders’ daughters to address their risk and needs.

Moreover, given that both parental incarceration and parental conviction without incarceration impacted on children, upstream efforts which aim to break the negative cycle of intergenerational transmission of criminal justice involvement may need to provide support to all children with exposure to parental criminal justice involvement, and not just limited to those whose parents have experienced custodial sentences. However, the level of intensity and frequency of such services could be calibrated based on the judicial outcomes and level of need as exhibited by the children and families of these offenders. In addition, this study revealed the role played by the frequency of parental criminal justice involvement, and so children whose parents committed multiple offenses may benefit from more intensive and earlier intervention.

**Limitations**

Despite the large-scale nature of this study, it was limited in some ways. First, the findings of this study revealed association between parental and child criminal justice involvement but did not indicate a causal relationship. Given that this study only had data on demographics and criminal justice involvement, and administrative data of other factors (e.g., parental socioeconomic status, physical and mental health stressors) were not readily available, this study was not able to examine the mechanism of this intergenerational association of criminal justice involvement. Future analysis could be improved by incorporating additional variables to reveal a more holistic picture about how parental criminal justice involvement could result in a higher likelihood of child’s contact with criminal justice system themselves and through which mechanism. This could better inform policy and intervention to break the negative cycle of intergenerational transmission.
Second, this study examined the impact on child criminal justice involvement of one parent’s history of criminal justice involvement. Data of the spouses of the individuals from the birth cohorts were not used in this study as it was not known which spouse the children were tied to for individuals with multiple marriages. In this case, whether the spouses had contact with the criminal justice system was not captured, which may lead to under-reporting of parental criminal justice involvement. It would be beneficial for future research to include criminal records of both parents for each child to improve the accuracy of the estimation about the effect of parental criminal justice involvement on children.

Third, the present study relied only on official criminal records as the definitive measure of criminal behavior. Such records only capture information pertaining to activities that have been officially documented and adjudicated by the State. However, it is not in dispute that not all criminal activities are known to the State. In this case, the prevalence of criminal behaviors for the birth cohorts and their children could be under-reported in this study. It would be rewarding for future research to incorporate self-reported crime or crime reported by other informants such as spouses, parents, or siblings.

Fourth, as this study relied on official administrative data, the level of detail was quite limited. For instance, the motivations for committing an offense, population data pertaining to attitudes towards criminal behavior, parenting styles, quality of family functioning, and peer relationship were not available. Future studies could include such data to conduct closer analysis and address the underlying mechanism for which the various aspects of parental criminal justice involvement impact on children in different ways.

Conclusion

This study has provided empirical evidence to support the existence of the intergenerational transmission of criminal justice involvement using population-based administrative data in Singapore. Parental criminal justice involvement increased the likelihood of child’s contact with the criminal justice system, and such impact was more salient to certain subgroups. Findings could be useful to inform upstream intervention related to offenders and their families. The rehabilitation service may need to be responsive to the differential impacts of various aspects of parental criminal justice involvement on children to disrupt the perpetuation of this negative cycle.

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Declarations

Conflict of Interest The authors declare no competing interests.

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