Chapter 7

General discussion

The apple does not fall far from the tree. A chip of the old block. Like father like son. In his father’s footsteps. All these popular idioms and sayings express the common assumption in society that children have similarities to their parents. These can be similarities in physical appearance of parent and child but also similarities in behavior. That children and parents show similarities in criminal behavior has been shown from several multigenerational studies (e.g. Bijleveld & Wijkman, 2009; Farrington, Barnes & Lambert, 1996; Thornberry, 2009). Whether this is also the case for violent crime in particular is, however, seldom investigated. In this dissertation intergenerational patterns of violent crime were studied. The research question was twofold. First, it was examined to what extent violent crime is transmitted across three consecutive generations. Second, it was considered which mechanisms explain the intergenerational transmission of violent crime.

In order to answer these research questions, data from a sample from the Transfive study was used. The members of this sample were children (G3), grandchildren (G4) and great-grandchildren (G5) of 198 boys who were sent to a Dutch Catholic reform school between 1911 and 1914. These boys had been sent to this reform school because of concerns about their behavior, including minor delinquency, or because their parents were - according to guardian organizations - not able to take proper care of them. These 198 boys and their descendants were therefore at high risk for the development of criminal behavior. Conviction data were collected from judicial databases, demographic data were obtained from municipal administration records and data on heart rate levels were obtained from military service medical screenings. These data have been collected prospectively and sample members have been followed up until December 2007, or if prior to that, until their death or until the year they emigrated.

In this final section of this dissertation, the key results of the previous chapters are summarized, followed by a discussion of these results and a discussion of the strengths and limitations of the findings. The theoretical and practical implications of these findings are discussed next, and this section ends with a general conclusion and implications for policy.
7.1 Summary of key results

7.1.1 Intergenerational transmission of violent offending

In the third, and first empirical, chapter of this thesis it was examined to what extent crime concentrates within families and is transmitted between generations. This was done separately for violent and non-violent crimes. First, it was shown that crime tends to concentrate within families: a small percentage of families is responsible for a large proportion of crimes. This was shown for the families from the Dutch Transfive study, as well as for British families from the CSDD (Farrington et al., 1996) and American families from the PYS (Farrington, Jolliffe, Loeber, Stouthamer-Loeber & Kalb, 2001). This indicates that the concentration of crime within families is a cross-national phenomenon, at least for Western countries. Moreover, as the measurement of crime within families differs across the different studies, the concentration of crime within families is not the consequence of the used measurement of crime. It was also shown that the concentration of violent crimes within the Dutch families is larger than the concentration of non-violent crimes within these families.

Second, analyses showed that violent crime is transmitted from father to son. This intergenerational transmission of violence was found from G3-fathers to G4-sons as well as from G4-fathers to G5-sons. Less empirical evidence was found for intergenerational transmission of non-violent crimes. No significant transmission of non-violent crimes from G3-father to G4-sons was found, while the transmission of non-violent crimes from G4-fathers to G5-sons was much smaller than the transmission of violent crimes across these generations. Remarkably, intergenerational transmission from G3-grandfathers to G5-grandsons was found for non-violent crimes but not for violent crimes. However, the odds ratio that indicates the degree of transmission was relatively small and the significance of this finding disappeared when the non-violent criminal behavior of the G4-fathers was controlled for.

Finally, it was examined whether the timing of paternal violence influenced the intergenerational transmission of violent crime. The analyses showed that paternal convictions for violent crime before the birth of the son or during the son’s adulthood did not increase the son’s risk to become a violent offender. Parental violence during the son’s childhood or adolescence, on the other hand, led to a large increased risk for offspring violent offending.
7.1.2 Heart rate and the intergenerational transmission of crime

In the fourth chapter, the role of low resting heart rate levels in the intergenerational transmission of violent crime was studied among those men from the Transfive study who had been medically examined for the compulsory military service. In line with the results from the third chapter, for this subset of men again intergenerational transmission of violent crime was found, which was again larger than the intergenerational transmission of non-violent crime. The main effect of low resting heart rates on violent offending was also significant, indicating that persons with a lower resting heart rate were more likely to be convicted for a violent crime. No significant result was found for the effect of heart rate on non-violent crime.

Next, it was examined whether intergenerational transmission of low resting heart rate levels could (partly) explain the intergenerational transmission of violence. No significant transmission of heart rate levels from father to son, however, was found. The intergenerational transmission of violence could also not be explained by lowered heart rate levels of (violent) criminal’s offspring. Against expectations, experiencing paternal (violent) crime at young age did not have a significant effect on the offspring’s heart rate.

Finally, the interaction between the effects of heart rate levels and paternal crime on offspring offending was examined. In line with the 'social push' perspective, the effect of low resting heart rates on violent crime was significantly larger if the individual’s father was not criminal than when the father was a criminal. This interaction effect was not found for non-violent crimes. Moreover, some support was found for the hypothesis that a high resting heart rate protects against having a violent father, since the intergenerational transmission of violence was only significant among sons with a low resting heart rate and not for those with a high resting heart rate.

7.1.3 Parental divorce and the intergenerational transmission of crime

In the fifth chapter, the moderating influence of parental divorce on the intergenerational transmission of crime was examined. Heterogeneity within the population of offenders was taken into account in this chapter by examining the effects separately for the intergenerational transmission of violent crime and the intergenerational transmission of non-violent crime, as well as by distinguishing
between offenders who committed crimes in different periods of the life-course. The results showed that children who experienced parental divorce during their youth were more likely to be convicted for a violent crime, but that this significant effect disappeared after controlling for paternal violence. The positive relationship between parental divorce and offspring’s non-violent offending, on the other hand, remained significant after controlling for paternal non-violent offending. In line with results from the third chapter, an intergenerational transmission of violent crime was found, while the intergenerational transmission of non-violent crime was not significant for the older generations (G3-G4) and much smaller for the younger generations (G4-G5).

A moderating effect of parental divorce on the intergenerational transmission of violent crime emerged. Children with a violent father were only at increased risk to become violent offenders themselves when their parents remained married during their whole youth. No significant intergenerational transmission of violent crime was found among children who experienced parental divorce during their youth. When only violently offending fathers who committed these violent crimes during the youth of their child were taken into account, the moderating influence of parental divorce on the intergenerational transmission of crime became even larger. Transmission of violence from such violent fathers on their children was four times as large when the parents remained married during the whole youth of the child than when the parents were divorced. On the other hand, intergenerational transmission from violent fathers who did not commit violent crimes during the youth of their child was not found, regardless of the marital status of the parents.

The moderating influence of parental divorce on non-violent crime was less clear. Among the older generations (G3-G4), intergenerational transmission of non-violent crime was neither found for children with married parents nor for children with divorced parents. Results for the younger generations (G4-G5), on the other hand, showed that non-violent crime was transmitted across generations when the parents were married as well as when the parents were divorced. Remarkably, this intergenerational transmission of non-violent crime was even larger when children experienced parental divorce during their youth. Another remarkable result is that intergenerational transmission of non-violent crime from G4-fathers who did not commit non-violent crimes during the youth of the child, was found when the G5-children did not experience parental divorce.
7.1.4 Concentration of sex offenses within families

In the sixth chapter it was examined whether sex offending, a specific type of violent crime, concentrates within Dutch and British families. Results from this chapter showed that sex offending does not concentrate within Dutch nor British nuclear families. In the extended families from the Transfive study, however, a significant concentration of sex offending was found. More specifically, a significant concentration of child abuse, all hands-on offenses (i.e. child abuse, rape and sexual assault) and all sex offenses (i.e. hands-off offenses and all hands-on offenses) was found within the extended families, while convictions for hands-off sex offenses or rape and sexual assault did not significantly concentrate within families. The concentration of convictions for child abuse within families, however, was shown to be the consequence of the concentration of these convictions within single offenders, since the concentration of persons convicted for child abuse was not significant within families. Persons convicted for any hands-on offense or any sex offense did concentrate significantly within families. The sex offenses clustered within families in various ways: within the same generation or between different generations, clustering of the same or different type of sex offenses, between relatives or between in-laws, and sex offenses committed at various ages.

Next, it was examined how this concentration of sex offending within families could be explained. Analyses showed that this concentration could partly be explained by the inter- and intragenerational transmission of (hands-on) sex offenses, as those with a sexually offending relative were shown to be more likely to commit a sex offense themselves. This transmission of sex offending across relatives was stronger between nuclear family members than between extended family members, although all odds ratios were high and significant. Information from court files about the relationship between perpetrator and victim showed that transmission of sex offending did not occur through victimization of a younger family member by an older family member. Some support was also found for the hypothesis that the concentration of sex offenses within families was (partly) the consequence of the intergenerational transmission of violent and serious crime. Families with multiple (hands-on) sex offenders were shown to engage in much more violent and serious crime than families with no or only a single sex offender. In addition, (hands-on) sex offenders were not significantly different from other serious offenders in terms of
the average number of serious and violent crimes. Moreover, men from nuclear families in which the father or brother was convicted for a violent crime (excluding sex crimes) were at increased risk to be a sex offender. No support was found for the hypotheses that the concentration of sex offenses within families could be explained by co-offending relatives or by female incest-victims who married sex offenders.

7.2 Discussion

This section discusses how the findings in this dissertation relate to theories and hypotheses on the intergenerational transmission of violent crime and its etiology. First, it is discussed to what extent violent crime is transmitted between three consecutive generations. Changes in the degree of intergenerational transmission of crime across generations are discussed second. Third, it is discussed which possible mechanisms behind this transmission are most supported by the empirical findings. Fourth, issues regarding the causality of the found relationships are discussed.

7.2.1 Like father like son

The first research question of this dissertation was: To what extent is violent crime transmitted across generations?

The results in all four empirical chapters showed, as expected, a significant and strong intergenerational transmission of violent crime from father to son, across the three studied generations. Among the G4-men, the risk to commit a violent crime is 2.3 times higher if they have a father who is convicted for a violent crime than when they have a non-violent father. This risk is even higher for the G5-men from the youngest generation: their risk to commit a violent crime is 3.4 times higher when they have a violent father. These odds ratios indicate a strong relationship between paternal violence and the violent behavior of their sons. No intergenerational transmission of violent crime, however, was found from grandfather to grandson.

The odds ratios found in this study are very similar to those in the Swedish population study of Frisell and colleagues (2011), in which the intergenerational transmission of violent convictions was studied, between 1973 and 2004. This study found an odds ratio of 3.5, which is only slightly higher
than the odds ratio of 3.4 for the transmission from G4-fathers to G5-sons that was found in the current study. In contrast to the findings in this dissertation, Frisell and colleagues (2011) did find empirical evidence for an intergenerational transmission of violence from grandparent to grandchild (odds ratio: 2.0 (1.9-2.0)). This might, however, be due to the fact that women were included in the analyses from the Swedish study, while women could not be included in the current study due their low conviction rates. As Frisell and colleagues (2011) showed that the intergenerational transmission of violence from grandmother to grandchild was larger (odds ratio: 3.1 (2.4-4.0)) than the overall transmission from grandparents, it can be expected that the intergenerational transmission of violence from grandfather to grandson (no odds ratio was reported) is smaller or even insignificant.

Related to the intergenerational transmission of violent crime, a concentration of violent crime within families was found. Five percent of the families is responsible for more than half of all convictions for violent crimes; ten percent of the families is responsible for more than 70 percent of the violent crimes; and all violent crimes in the sample were committed by about a quarter of the families. A small proportion of families within the sample is thus responsible for a relatively large share of all violent crimes committed by all participants in the sample.

For various reasons it was assumed that violent crimes would concentrate and be intergenerationally transmitted within families to a larger extent than non-violent crimes. Results showed that this indeed is the case. The intergenerational transmission of non-violent crime was not even always significant and about half as strong as the intergenerational transmission of violent crime. In addition, the concentration of non-violent crime within families was smaller than the concentration of violent crime.

Hands-on sex offenses, a specific type of violent offenses, are also transmitted between both nuclear family members (i.e. fathers and brothers) and extended family members. All generations taken together, the risk to commit a hands-on sex offense is about 8.7 times higher for participants who have a family member who is convicted for a hands-on sex offense compared to participants without sex offending family members. The finding that this specific type of violent crime is transmitted between generations to a larger extent than all violent
crimes might indicate that specific intergenerational transmission of violence is stronger than versatile intergenerational transmission of violence. This is in concordance with findings of Frisell and colleagues (2011) who also found much stronger intergenerational transmission of specific violent crimes, such as homicide, kidnapping, robbery and assault.

7.2.2 A growing problem?

Due to the fact that conviction data on three consecutive generations and a long follow-up period are used in this dissertation, it is possible to examine whether the degree of intergenerational transmission of violent crime changes over time. Interestingly, the results suggest that the intergenerational transmission of violent crime is increasing across generations. In Chapter 3, it was shown that G4-sons are 2.3 times more likely to become violent offenders if their father is ever convicted for a violent crime, while this odds ratio increased to 3.4 among G5-sons. Similar differences in the intergenerational transmission of violent crime were also found in Chapter 5, both among families with divorced and married parents. Only inter- and intragenerational transmission of sex offending, as shown in Chapter 6, was shown to be smaller and insignificant for the youngest generation. This, however, may have resulted from the fact that the G5 were relatively young at the time of data collection, while many sex offenses are also committed at older ages. The intergenerational transmission of non-violent crime seems to increase across generations as well, although the differences are smaller.

This increasing strength of intergenerational transmission of crime across generations is remarkable given the fact that Dutch society became more mobile and open during the twentieth century: intergenerational mobility of occupational status, social class (Ganzeboom & Luijkkx, 1995) and education (Ganzeboom & de Graaf, 1989) increased. A child’s future thus became less determined by his social origins, and younger generations had more opportunities than before. One would expect that a more mobile and open society would also increase opportunities for children from criminal parents to stay out their parents’ footsteps. That the contrary is found in this dissertation could be the consequence of period, cohort or age effects.

Period effects might be at work when changes in Dutch society over time are the cause of the increasing intergenerational transmission of crime. This
might be a consequence of prosecution trends in the Netherlands. After World War II conviction rates in the Netherlands stayed relatively low until the mid 1960s, when they started to increase. At the beginning of the 21st century, conviction rates were about twice as high as during the 1960s (Statistics Netherlands, 2013). As a consequence of the relatively low conviction rates during the 1950s, 1960s and 1970s, the G3 and G4 in the sample might have been less likely to incur a conviction for the crimes they committed, especially for crimes committed at a young age. Consequently, the intergenerational transmission between the G3 and G4 might be underestimated. The strong intergenerational transmission between the G4 and G5 could also be the consequence of these prosecution trends. Those G4 who were convicted, probably committed more serious crimes at young age – when the odds to get prosecuted was low – or (still) committed crimes at later age, increasing the risk to expose their child to this crime. The G5 with criminal parents, therefore, might have an additional increased risk to become criminal themselves, as their parents committed more serious crimes or crimes during the life of the child.

Cohort effects could also have increased the intergenerational transmission of crime, if persons born in a certain time-period (i.e. a cohort) are at increased risk to pass their criminal behavior on to their children. Sociological theories argue that influences during the formative years, the period of physical and psychological development between puberty and adulthood, develop one’s character and have effects during the entire life-course (e.g. Inglehart, 1971; 1990). The G4 in the Transfive study grew up in a period in which conviction rates were low, and criminal behavior was thus not often punished. Consequently, the G4, both those with and without criminal parents, might have developed less disapproving attitudes towards criminal behavior compared to other cohorts, attitudes that they likely transmitted to their children. These attitudes might lead to more criminal behavior and convictions later in life when conviction rates increased again. Since this also increases the odds of G4-children from non-criminal parents to be convicted, the G4-children will be less similar to their G3-parents and the intergenerational transmission of crime will be less strong between these generations.

Moreover, the G3 in the Transfive study were born, on average, in 1932 and many of them experienced World War II during their formative years. Growing up during these traumatizing years of oppression, fear and hunger is in
stark contrast to the periods of optimism, increasing wealth and social security in which the G4 and G5 grew up. As a consequence, the men from the fourth and fifth generations might be more similar to each other than to the men from the third generation. This similarity between the G4 and G5 might also be reflected in more similarity in violent behavior and could thus explain why the intergenerational transmission of violent crime increased across generations.

Finally, an age effect might explain the increasing intergenerational transmission of crime, since the G5-children were younger at the moment of data collection than the G4-children. Sampson and Laub’s (1993) age-graded social control theory assumes that ties to the parents are especially important in explaining criminal behavior early in life, while ties to romantic partners and jobs are important in explaining criminal behavior during adulthood. Because the G5-children were relatively young when data was collected, their criminal behavior might be explained to a larger extent by the criminal behavior of their parents. The G4-children, on the other hand, were much older at the moment of data collection and other factors than the criminal behavior of their parents (e.g. romantic partners or employment) might have had a greater influence on their criminal behavior. Consequently, younger participants (i.e. the G5-children) might be more similar to their parents than older participants (i.e. the G4-children). In order to test the existence of this possible age effect, an additional analysis was done (not shown in Chapter 3) in which the intergenerational transmission of violence from G3-fathers to G4-sons was measured, while only including violent crimes of G4-sons committed before the age of 28 (i.e. the average age of the G5-sons at the moment of data collection). The odds ratio found in this additional analysis, however, was smaller than the odds ratio found in Chapter 3. This indicates that the intergenerational transmission of violent crime increases even more across generations if age effects are controlled for.

7.2.3 Underlying mechanisms

Intergenerational transmission of violent crime is expected based on several criminological theories. These theories, however, explain the intergenerational transmission of crime with different mechanisms. Therefore, the second research question was: Which mechanisms explain the intergenerational transmission of violent crime?
Although the analyses in this dissertation, due to data limitations, could not directly test all mechanisms Farrington (2011) distinguished, the results give an indication which mechanisms are most likely to explain the intergenerational transmission of violence. Exposure to the violent crime of the father during the child’s youth seems to play an important role for at least three reasons. First, the intergenerational transmission of violent crime is moderated by timing of paternal violence and by parental divorce. Intergenerational transmission of violent crime was only found when exposure to the paternal violence was possible (i.e. if the father committed violent crimes during the youth of the child) or more likely (i.e. if the violent father was married with the mother during the child’s whole youth). No intergenerational transmission of violent crime was found, on the other hand, if exposure to the paternal violence was impossible (i.e. if the father only committed violent crimes before the birth of the child) or less (likely) (i.e. if the father only committed violent crimes during the child’s adulthood or when the violent father and the mother were divorced during the child’s youth). Second, no intergenerational transmission of violence was found from grandfather to grandson, and inter- and intragenerational transmission of sex offenses was found to be stronger between nuclear family members, than between extended family members. This could indicate an influence of exposure to the paternal offenses, since children are more likely to be exposed to the criminal behavior of their nuclear family members than to the criminal behavior of their extended family members. Third, it can be assumed that children are more likely to be exposed to their parents’ violent crime than to their parents’ non-violent crime since research showed that children are present in about half of the cases of domestic violence (Fantuzzo & Fusco, 2007) and that violent offenses such as assault are more often committed in the residential area of the offender than some non-violent crimes (Bernasco, 2010). The finding that the intergenerational transmission of violent crime is larger than the intergenerational transmission of non-violent crime, therefore, supports that exposure to the parental crime is an important factor in the intergenerational transmission of crime.

These indications, i.e. that exposure to the paternal violence plays an important role in the intergenerational transmission of violent crime, are most in

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21 By itself, this could also indicate an influence of genetic mechanisms since nuclear family members share more genes than extended family members.
line with social learning mechanisms (e.g. Burgess & Akers, 1966; Sutherland, 1947; Tarde, 1903). Tarde’s (1903) laws of imitation assume that people imitate those with whom they have the closest contact (e.g. parents) and that inferior individuals (e.g. children) learn from superior individuals (e.g. parents). As this theory, thus, assumes that (violent) crime is imitated from parents, exposure to paternal violence is necessary to learn this behavior. Differential association theory (Sutherland, 1947) emphasizes that behavior is not simply imitated but rather learned in interaction as definitions of legal codes as favorable or unfavorable are passed on in intimate groups (e.g. nuclear families). Being (repeatedly) exposed to the violent behavior of the father can be interpreted by the child as a strong signal, favorable to violent behavior. Conversely, conviction of the parent for his offences would also emit a strong signal, and demonstrate the negative consequences of such behavior. However, at this point strong statements about the causal mechanisms cannot be made due to the limitations of the data and the non-experimental research design. It is, for example, not known whether or not the children in the dataset have actually been exposed to, or perhaps victimized by, the violent or criminal behavior of their parents. Results from the sixth chapter, though, show that for one type of violent offending, namely sex offending, such victimization does not play a role: victimization of a younger family member by an older family member is not necessary for the transmission of sex offenses to occur.

Second, the results are not in line with static criminological theories such as Gottfredson and Hirschi’s (1990) general theory of crime, or with biological theories that assume that every individual, at an early age, has developed a certain probability to engage in criminal and violent behavior, which is not influenced by subsequent life events. The findings that the intergenerational transmission of violence is moderated by parental divorce and by paternal violent crimes committed during the youth of the child, indicate that an individual's likelihood to commit (violent) crimes is not stable but instead influenced by life events. Results are therefore more in line with dynamic criminological theories that presume that an individual’s probability to engage in violent behavior changes over the life-course under the influence of dynamic factors.

The moderating influence of parental divorce and the timing of paternal violence also suggests that the intergenerational transmission of crime cannot be completely accounted for by genetic mechanisms. Nevertheless, the role of
genetics cannot be ruled out. The finding that resting heart rate levels moderate the intergenerational transmission of crime is an indication that biological factors influence this transmission, and that biological risk factors (e.g. a low resting heart rate) interact with psychosocial risk factors (e.g. a violent father) in explaining violent development. Biosocial criminologists emphasize that neither biological factors nor psychosocial factors can explain criminal behavior on their own, but that both types of factors interact with each other. Caspi and colleagues (2002) for example showed that many maltreated boys grow up to develop antisocial behavior, but only if these boys have the low-activity form of the MAO-A gene (see Kim-Cohen et al., 2006 for a meta-analysis on replications of this study). A similar biosocial interaction could exist in the current sample, as most children of violent fathers might be genetically predisposed to behave violently but only become actual violent offenders if they are exposed to their father’s violent behavior. Due to data limitations this could not be tested in this dissertation, but it is an interesting and important topic for future research.

Another mechanism, distinguished by Farrington (2011), suggested that the intergenerational transmission of crime is the consequence of criminal parents exposing their children to risk factors for criminal behavior, such as parental divorce, low resting heart rates and young parenthood. Although this mechanism is not tested directly, the results of this dissertation suggest that intergenerational transmission of violent crime is not caused by violent parents more divorcing than non-violent parents. Analyses in which parental divorce and parental violence are included in the same model show that the effect of paternal violence on offspring violence remained strong and significant. This finding indicates that the intergenerational transmission of violent crime cannot solely be explained by a higher likelihood of parental divorce among violent parents. Moreover, some studies suggested that children of criminal parents would have lower heart rates due to the stress they experience in early life. The intergenerational transmission of violent crime could therefore also be mediated by the low resting heart rate of children. Evidence for this hypothesis was not found in the current study, since children from violent parents were not shown to have different heart rates than children from non-violent or non-criminal parents. Finally, the intergenerational transmission of violence was not mediated by young fatherhood. Children of young fathers would have had an older age at the moment of data collection compared to children of men who became father at a more usual age. In Chapter 5, odds ratios indicating the intergenerational transmission of violent crime were
calculated while controlling for the age at data collection. These odds ratios were even higher compared to the same odds ratios in Chapter 3. This finding suggests that violent fathers do not have violent sons solely because they become a father at a young age. However, there may be many more possible risk factors for violent behavior to which violent parents can expose their children which are not taken into account in the analyses in this dissertation (e.g. inadequate parenting styles, or living in deprived neighborhoods). Therefore, exposure to risk factors as a (partial) explanation of intergenerational transmission of violent crime, cannot be ruled out.

7.2.4 Causality

Though a relationship between paternal violence and offspring violence was found in this dissertation, this does not necessarily indicate that there is a causal effect of paternal violence on offspring violence. In order to make causal inferences, an experimental study design in which participants are randomly assigned to an experimental or control group, would be necessary. Obviously, children cannot be assigned to violent or non-violent parents, and therefore observational data have to be used. As a consequence of the use of such data, there are three reasons why the effects found may not be causal. First, there may be confounding factors that have an influence on the violent behavior of the father and on the violent behavior of the child, such as the neighborhoods in which the family lives. Fergusson and colleagues (2006), for example, showed that most associations between childhood exposure to interparental violence and subsequent violent behavior were reduced to statistical non-significance after controlling for potentially confounding risk factors. Second, there may be a reciprocal relationship between paternal violence and offspring violence, since paternal violence could not only lead to offspring violence, but offspring violence could also have an influence on parental violence. Third, measurement error in the independent variable might be related to the score on the dependent variable: the underestimation of the true offending behavior of the father – due to the use of conviction data - might be related to the conviction rate of the child if an official bias towards known criminal families exists.

In the analyses, a possible reciprocal relationship was controlled for by excluding the cases in which the son committed a violent crime before his father did. The dataset had measurements on only a limited number of possible
confounders, so that it was impossible to control for other theoretically plausible confounders such as parenting styles, poverty, and abuse. Moreover, only conviction data was available, and therefore it was impossible to control for a possible influence of measurement error in these data. A causal effect of paternal violence on offspring violence should therefore not readily be assumed, and the results in this dissertation should be interpreted with some caution.

7.3 Strengths and limitations of the Transfive Study

In this dissertation, data from the Transfive Study is used to study the intergenerational transmission of violent crime. Due to the research design, the Transfive Study has many advantages to study the intergenerational transmission of (violent) crime compared to other existing multigenerational studies. However, data of the Transfive Study is like any study also limited in some ways. In this section the strengths and limitations of the Transfive Study are discussed.

7.3.1 Strengths

A first strength of the Transfive study is the prospective multigenerational study design. Compared to retrospective studies that only measure offending rates of children with violent or criminal parents, a prospective study design including both violent and non-violent parents and children makes it possible to estimate the degree of intergenerational transmission of violent crime more precisely.

Second, compared to most other prospective multigenerational studies, the Transfive study has a large sample size so that its statistical power is higher. In addition, the long follow-up period of the Transfive study enables the study of participants’ criminal behavior well into adulthood an even old age. This is especially important because the focus of this dissertation is on violent crime. As shown in Table 3.1a and 3.1b in Chapter 3, a large proportion of the violent offenders are first convicted for a violent crime at a relatively old age (i.e. after age 28 or age 46\(^{22}\)). Van Koppen and colleagues (2010) even showed that a substantial proportion of all Dutch offenders who were convicted in 1997, were first convicted during adulthood. Other multigenerational studies often have a limited follow-up period, and therefore might not capture the actual life-time offending rates of their participants.

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\(^{22}\) These were the ages of the G5 and G4, respectively, at the moment of data collection.
The fact that three consecutive generations are studied, compared to two generations in most other studies, is also a strength since this makes it possible to investigate the intergenerational transmission of violence over multiple time periods. Moreover, the use of data on participants from more than two generations enables to trace extended family members, such as grandparents, uncles, aunts, nephews and nieces. As shown in Chapter 6, criminal behavior of extended family members is associated with participants’ own criminal behavior as well.

The use of conviction data from judicial records and demographic data from municipal administration records can also be considered as a strength. Such official data are not subject to reporter bias or socially desirable self-reports. Problems related to drop-out of participants or non-response are also avoided by using these official data.

7.3.2 Limitations

Official judicial information

At the same time, the use of official judicial information as measurement of offending behavior is also an important limitation of the Transfive Study. First of all, since the age of legal responsibility is 12 years, no information on crime before this age is available. As a consequence, it is unknown whether sample members show antisocial or criminal behavior during (early) childhood. The number of offenses committed after the age of 12 is also underestimated by the use of official judicial information, since these data only reflect a small proportion of the actually committed crimes. This possibly has consequences for the results that are found in this dissertation. The intergenerational transmission of violent crime might be overestimated if there is an official bias towards known violent families (Besemer, Farrington & Bijleveld, 2013). In that case, children of violent parents are monitored more intensively by law enforcement bodies and are therefore at increased risk to be convicted for the (violent) crimes they commit.

The underestimation of the actual number of violent offenses through the use of official judicial information also leads to a relatively low number of violent offenders in the dataset, while those who are registered as violent offenders are convicted for relatively few violent offenses. Despite the large
sample size and the high-risk character of the sample, the number of violent offenders, and consequently the statistical power, is still low. Especially when the sample is split up between generations and between categories of the moderating variables, the number of violent offenders within groups becomes low and the confidence intervals of odds ratios become larger. In quite a number of instances, when comparing odds ratios, it was hard to find significant differences due to these large confidence intervals, even though the differences between the effect sizes remained substantial.

Although the proportion of convicted women in the population is increasing in the Netherlands (e.g. Slotboom, Hoeve, Ezinga & van der Helm, 2013), the number of women convicted for violent crimes remains rather low, even in the large and high-risk sample of the Transfive Study. Therefore, women had to be excluded from most analyses and it remains unclear to what extent violent crime is transmitted from father to daughter, from mother to daughter and from mother to son. Given the finding that exposure to the violent behavior of the parent plays such an important role in the intergenerational transmission of violence, it would have been especially interesting to study the transmission from mother to children. Mothers usually spend more of their time at home or with their children than fathers do, and in case of parental divorce children remain with their mother in most cases. Children are thus likely to be exposed more to the behavior of their mother than to the behavior of their father. Violent behavior of the mother could therefore be expected to have even stronger consequences for her children than violent behavior of the father.

_Lack of in-depth measurements_

Although, as outlined above, the use of official data is a strength of the dataset, the large dataset that spans numerous generations is in a sense 'flat' as it lacks in-depth measurements of lots of relevant risk factors for the development of criminal or violent behavior. As a consequence, a number of mechanisms behind the intergenerational transmission of crime could not be tested directly. Similarly, only a few control variables could be included in the analyses. Given that non-experimental data is used, the influence of numerous other possible confounders cannot be ruled out, and causality of the relationship between parental violence and offspring violence cannot be assumed.
**Generalizability**

A final limitation concerns the generalizability of the results. All individuals that are analyzed in this dissertation are descendants of 198 men who were placed in a Dutch Catholic reform school during their youth because of concerns about their character and problematic behavior or because their parents were assumed unable to take care of them. These 198 men constituted a relatively homogeneous low social class segment of the Dutch population at the beginning of the twentieth century. They, and their descendants, are at elevated risk for criminal and violent behavior. Although this high-risk character has the advantage that it increases the number of criminal and violent participants that can be studied, it remains unsure whether the same results would be found among a sample from the general population.

A second concern about the external validity of the results is that the sample members are predominantly ethnic Dutch Catholics. It remains, therefore, unknown whether (violent) crime is also transmitted intergenerationally within Dutch families with another religious denomination or within families from other ethnic groups. Given the fact that some ethnic minorities in the Netherlands (e.g. Antilleans, Moroccans, Surinamese and Turks) are disproportionately engaged in crime (Statistics Netherlands, 2013), it is important to gain more knowledge about the intergenerational transmission of criminal behavior among these ethnic groups.

Third, the generalizability of the results is limited since mainly data from the Dutch Transfive Study is used. Available cross-national comparisons, however, showed that the results are mainly the same among the countries studied: the concentration of crime within families is shown to be similar for the Dutch families from the Transfive Study, the British families from the CSDD and the American families from the PYS, while concentration of sex offenses within nuclear families was neither found in the Transfive Study nor the CSDD. Besemer (2012) also found similar patterns of intergenerational specialization and intergenerational transmission of offending trajectories (Besemer & Farrington, 2012) in the samples from the CSDD and the Transfive Study. Nevertheless, it would be interesting to see whether all results in this dissertation could be replicated with samples from countries with another penal system and a different type of welfare state. This would show how such country characteristics...
affect the intergenerational transmission of violence. Moreover, given that the intergenerational transmission of crime has mainly been studied with longitudinal multigenerational studies from Western countries (i.e. England, the Netherlands, United States and Scandinavian countries), it remains unknown to what extent (violent) crime is transmitted across generations in other parts of the world.

Finally, in most analyses only male sample members could be included due to data limitations. Women were excluded in most analyses concerning violent offending due to low prevalence rates of violent crime among women, while they were excluded from the analyses on the influence of heart rates because they were not medically examined by the Dutch army. Consequently, most of the current results cannot be generalized to females.

7.4 Suggestions for future research

7.4.1 Direct measurements of exposure

First of all, the results of this study suggest that exposure to the behavior of violent fathers plays an important role in explaining the intergenerational transmission of violent behavior in their sons. Direct measurements of exposure to violent behavior (of the parents) are, however, not available. The residential addresses of all participants of the Transfive Study, however, have become available since the start of the current study from the municipal administration records (GBA). Using these address data would make it possible to examine whether the child lived in the same house as the parents during the parental crime. Moreover, the distance between the home of the child and non-residential parents, and the influence of this distance on the transmission of offending, can be estimated. The data on the residential addresses is, however, only available from 1994 onwards. Consequently, only for the birth cohorts of 1994 and 1995 the complete residential history of a child and its parents during the whole youth of the child (i.e. from birth to age 18) is currently available. In the upcoming years, the number of participants with complete residential histories will increase and combining these address data with conviction data would make it possible to study the effects of living with, or close to, a criminal parent. These data on residential addresses, however, still do not provide direct measurements of exposure to (parental) violence. It would be a large contribution to the existing multigenerational studies if such measurements could be added to the data.
7.4.2 Biological influences

Evidence for a biological base of criminal and violent behavior has been found in numerous adoption and twin studies (e.g., Rhee & Waldman, 2002), and the results of this dissertation do not rule out genetic influences. Prospective multigenerational studies such as the CSDD, PYS, RYDS, CCLS and Transfive Study, however, pay relatively little attention to genetic risk factors. It would be a large contribution to the existing multigenerational research if these studies could include additional measurements of biological risk factors or data on the DNA of sample members. DNA collections from study participants of the RYDS, for example, started in October 2008 (Thornberry, 2009). This enables future research to study influences of biological risk factors and biosocial interactions on criminal behavior and to more directly test the influence that genetic processes have in the intergenerational transmission of (violent) crime.

7.4.3 Qualitative approach

Quantitative research with large-scale prospective multigenerational studies is well suited to measure the degree of intergenerational transmission of violence and to study the impact of moderating and mediating factors. A more qualitative approach, however, might also be helpful to better understand the mechanisms that cause the intergenerational transmission of violent crime. The qualitative study of the children of the Ohio Life Course Study respondents by Giordano (2010) showed that in-depth interviews can provide more detailed insights in the specific processes that underlie the intergenerational transmission of crime. Such details are often not captured by variables in quantitative research as these give a reductionist view of complex reality. It would therefore be desirable for prospective longitudinal studies to conduct in-depth interviews with both violent and non-violent parents and children in order to obtain more knowledge on the processes that lead to continuity and discontinuity of violent crime across generations.

7.4.4 Moderating factors

The results of the current study show that several factors moderate the intergenerational transmission of violent crime. These findings provide more insight in the mechanisms behind this transmission and show which groups are specifically at risk to continue the cycle of violence. There are, however, many
more potential moderating factors that are not taken into account in the current study. As it is shown that parental divorce moderates the intergenerational transmission of violent crime, one could think of other factors that decrease exposure to the violent parent(s), such as parental death, parental imprisonment, conscription, international employment and moving patterns. Moreover, since a moderating influence of low resting heart rates on the intergenerational transmission of violent crime was found, it would also be interesting to test whether a similar biosocial interaction is found for other biological correlates of crime, such as testosterone, mesomorphy, skin conductivity or cortisol (e.g. Ellis, 2005).

Studying these, and other, moderating factors might also show which additional factors lead to intergenerational discontinuity of violent crime, and thus the break of the cycle of violence. Information on factors that preclude the intergenerational transmission of violence might provide insights on which interventions would be most effective in stopping the cycle of violence.

7.4.5 Differentiation between types of crime

This dissertation further illustrated the importance of making a distinction between different types of crime. Results showed a larger degree of intergenerational transmission of violent crime and suggest that social learning mechanisms might apply more strongly for the transmission of violent crime than for the transmission of non-violent crime. It would therefore be desirable if future research on the intergenerational transmission of crime also focuses on other subtypes of crime (e.g. property crime, organized crime, white collar crime, cybercrime), in order to estimate the degree of transmission and the underlying mechanisms of these subtypes of crimes. Social learning mechanisms, for example, might explain the intergenerational transmission of other subtypes of crime to a lesser extent, since certain types of parental crime are less visible for the child as they are committed at work (e.g. white collar crime) or in a digital world (e.g. cybercrime). Consequently it is less likely that the child is exposed to these types of parental crime and it is less likely that favorable definitions towards these types of crimes are passed on from father to child.

In addition, the findings of this dissertation also showed that risk factors for criminal behavior (i.e. parental divorce, resting heart rate levels) did not have the same effect on violent crime as they had on non-violent crime. Had crime in
general been used as dependent variable, the complete picture may have been obscured. Therefore it is for future research on causes and consequences of crime recommendable to make a distinction between different types of crime.

7.4.6 Females and ethnic minorities

As mentioned before, women were excluded from most analyses because of scarcity of females convicted for violent crime and missing data on women’s heart rate levels. Results can therefore not be generalized to women. As research suggests that women’s and girls’ share in the total amount of crimes committed is increasing (e.g. Slotboom et al., 2013), it becomes more urgent to gain knowledge about the intergenerational transmission of crime among women. It would be interesting topics for future research to study whether intergenerational transmission of violent crime is larger between family members of the same sex and whether the underlying mechanisms are the same for women as for men. Using self-reported measures of offending might help to increase the number of violent women in multigenerational studies. Population studies would also be more suitable to study the intergenerational transmission of violent crime among women. Frisell and colleagues (2011) showed that the transmission of violent crime was much larger if both relatives were female. It would be interesting to see if this finding could also be replicated in other countries.

Results could not be generalized to ethnic minorities in the Netherlands (e.g. Antilleans, Moroccans, Surinamese and Turks) either, since these group were underrepresented or even absent in the predominantly ethnic Dutch sample of the Transfive study. Cultural differences and differences in family formation between these ethnic minorities and the ethnic Dutch population might influence the intergenerational transmission of crime and its underlying mechanisms, among these ethnic minorities. Antillean and Surinamese families, for example, are characterized with relatively high rates of single mothers (Statistics Netherlands, 2013). Social learning mechanisms might therefore explain the intergenerational transmission of violence among Antillean and Surinamese men to a lesser extent than among ethnic Dutch men. Moreover, ethnic minorities more often live in deprived neighborhoods and have higher unemployment rates than ethnic Dutch citizens (Statistics Netherlands, 2013). Consequently, intergenerational transmission of crime among these ethnic minorities might be
more likely to be the consequence of a cycle of deprivation, as these risk factors lead to criminal behavior in multiple generations.

In order to study the intergenerational transmission of crime among ethnic minorities data from the CCLS might be useful since Blokland (2005) reported that 13.3 percent of the 5,164 individuals in the CLSS-sample was born outside the Netherlands. The majority of them was Surinamese, reflecting the composition of the Dutch immigrant population in 1977. Population studies, again, might also be suitable to study the intergenerational transmission among ethnic minorities as well. Junger and colleagues (2013), for example, report that about one quarter of the population in the Dutch city they study, was of non-Dutch origin. Since they studied over 1600 families, their data include about 400 families of non-Dutch descent which makes it possible to compare intergenerational transmission of crime between ethnic Dutch families and families from ethnic minorities. The Generation R study (Jaddoe et al., 2007) might also be promising for studying intergenerational patterns among ethnic minorities in the future, since this study prospectively follows 10,000 children and their parents from Rotterdam, a city in which ethnic minorities constitute a large proportion of the population.

7.4.7 Intergenerational transmission of victimization

Finally, another interesting approach to study the intergenerational transmission of crime would be to study the transmission of victimization across generations rather than the transmission of perpetration. Little research has yet focused on the intergenerational transmission of victimization, while studies that did address this topic, focused mainly on sexual abuse and the maltreatment of children (e.g. Avery, Hutchinson & Whitaker, 2002; Faller, 1989; Testa, Hoffman & Livingston, 2011). Intergenerational transmission of victimization of other crimes, however, can also be expected to be based on some of the same mechanisms that predict the intergenerational transmission of the perpetration of crime. Genetic mechanisms might be at work as suggested by a twin study by Beaver and colleagues (2009) who found that about 40 percent of the variance in adolescent victimization could be explained by genetic factors. Moreover, personality characteristics that have been shown to be associated with the risk to be victimized, such as low self-control (e.g. Schreck, 1999), are heritable to some extent (Wright & Beaver, 2005). Social learning mechanisms could also lead to
an intergenerational transmission of victimization if children imitate and learn behaviors that increase the risk of victimization of their parents. Moreover, intergenerational transmission of victimization might be the consequence of intergenerational transmission of risk factors related to victimization, such as living in bad neighborhoods or criminal behavior. For policy purposes this topic would be very relevant because it provides insights into which persons are most at risk to be victimized. Preventive measures can then be targeted on those people in order to make them more aware of the risks of their behavior.

7.5 Implications for policy

The findings in this dissertation show an increasing degree of intergenerational transmission of violent crime, even in a society that has become more open and mobile (e.g. Ganzeboom & de Graaf, 1989; Ganzeboom & Luijkx, 1995). This indicates that it becomes increasingly important to intervene in violent families in order to stop the cycle of violence.

The results of this dissertation suggest that exposure to the violent behavior of the father and social learning mechanisms play an important role in the intergenerational transmission of violent crime. Therefore, it would be recommendable that interventions are specifically targeted to children who live with a violent father. Such families could be monitored by child protective services and welfare agencies. This increases the possibility to detect problematic family situations and offspring’s problem behavior in an early stage, and to allow for family-based support and interventions. Parents might be trained in their parenting skills and strategies in order to monitor their children and recognize and respond to children’s problem behavior more effectively.

7.6 General conclusion

Criminal families have been the subject of research since the late nineteenth century, when Richard Dugdale (1877) published his study on the Jukes family. Two centuries later, this dissertation focuses on the subject of criminal families as well. Similar to Dugdale’s study, multiple consecutive generations with Dutch origins are studied. The conclusion of this dissertation - while based on reliable data for a large sample in a strong prospective design - is similar to that of Dugdale. Violent crime concentrates within families and is transmitted across generations. Having a violent father makes sons much more likely to become
violent offenders as well. This study showed in addition that both concentration and intergenerational transmission are larger for violent than for non-violent crime. Sex offenses, a specific type of violent crime, are shown to concentrate within families as well, and are transmitted between both nuclear and extended family members.

In contrast to the study of Dugdale, of which the findings were often interpreted as evidence for a genetic foundation of crime, this study finds more support for social learning mechanisms. Intergenerational transmission of violent crime is only found if the father commits his violent crimes during the youth of the child and when the parents of the child remain married during its youth. The moderating influence of a low resting heart rate, however, indicates that biological factors and biosocial interaction have an influence on the intergenerational transmission of violent crime as well. Although the results in this dissertation contribute to the existing literature on the intergenerational transmission of violent crime in several ways and provide some indications on which factors lead to this transmission, more research is needed to examine the exact mechanisms that are responsible for the fact that violence is transmitted from one generation to the other.
References


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