BROKEN HOMES AND CRIME

Differential effects of parental separation, parental decease, and being born to a single parent on the criminal involvement in offspring

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Janine Henrique Kroese
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promotoren:	prof.dr. W. Bernasco prof.dr. J. Rouwendal prof.dr. A.C. Liefbroer
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CHAPTER 1

GENERAL INTRODUCTION

1 General introduction

The aim of this dissertation is to assess the effect of growing up in a single-parent family during childhood and adolescence on adolescents' involvement in delinquency. More specifically, it investigates whether different types of single-parent families have different effects, and whether these effects depend on parental involvement in crime.

In this chapter, definitions of the core concepts 'juvenile delinquency' and 'single-parent families' will be provided as well as a description of relevant developments regarding these two concepts, followed by a summary about key theories and previous empirical research. Subsequently, a detailed description of the used research methods is provided, including their advantages and limitations, followed by an overview of the chapters included in this dissertation.

1.1 Background

1.1.1 Juvenile delinquency

The first core concept of this dissertation is 'juvenile delinquency'. Juvenile delinquency is the act of participating in unlawful behavior as a minor (Siegel & Welsh, 2011). This applies to adolescents from age 12 onwards, since persons under the age of 12 cannot be prosecuted in the Netherlands. Juvenile delinquency can range from status offenses (e.g., running away from home or truancy from school) to more severe types of crime (e.g., house burglaries or murder and manslaughter). The focus in this dissertation lies on adolescents (age 12-18) who have been charged with a serious crime eligible for prosecution at least once during adolescence. This means that these adolescents received a 'procès-verbal', an official report drawn up by a police officer about a crime that they have been charged with.

According to the Juvenile Crime Monitor 2020 (Van der Laan et al., 2021), an annual report that provides an overview of juvenile crime developments in the Netherlands, 36.6 percent of the minors said they committed one or more traditional types of crimes (e.g., property crimes) and 20 percent of the minors said they committed one or more cybercrimes. The traditional types of crimes that occur most frequently are violent crimes (20.7 percent), property crimes (19.4 percent), and vandalism (13.4 percent), while weapon possession (3.3 percent) and

selling drugs (1.5 percent) occur less frequently. Of the minors who were a suspect of a crime in 2018, nearly 38 percent was a suspect of crime again within two years (Van der Laan et al., 2021). Minors rarely display delinquent behavior alone; juvenile delinquency is often committed together with peers (Carrington, 2009). Moreover, committing crimes is more prevalent for certain age categories, and this age-dependency is often referred to as the age-crime-curve (i.e., a universally found phenomenon involving a steep increase in delinquency until children reach the center years of adolescence, followed by a subsequent decrease; Moffitt, 1993). This age-crime-curve is also evident in the Netherlands, since delinquency increases from age 12 onwards, with a peak around age 18, and decreases subsequently (Van der Laan et al., 2021).

In the Netherlands, juvenile delinquency has increased since the beginning of this century, and came to a peak in the years 2005-2008 (Van der Laan & Beerthuizen, 2018). After this peak, there has been a decline in juvenile delinquency (according to police statistics, statistics on convictions, and self-report surveys; Van der Laan et al., 2021). Except for a couple of exceptions, this decline is visible for all specific types of crime, groups of perpetrators, and places in the Netherlands. Neighboring countries as well as other developed countries also showed a decline in juvenile delinquency (Van der Laan et al., 2021; Pew Research Center, 2020).

Juvenile delinquency has many negative consequences, for victims but for juvenile offenders as well. Victims of delinquency suffer injuries, losses, and other harms (Campagna & Zaykowski, 2020). Juveniles who commit delinquent acts often experience more negative outcomes later in life than those who do not commit delinquent acts, such as a lower income (Apel & Sweeten, 2010), health problems (Massoglia, 2008), a lower well-being and a higher probability of criminal involvement as an adult (Gilman et al., 2015). Therefore, it is important to investigate how the level of delinquency by juveniles could be diminished.

1.1.2 Single-parent families

The second core concept of this dissertation is ‘single-parent families’. It is important to note that no widely accepted term exists for households that include offspring and less than two biological parents. Many different terms have been used in the literature. In this dissertation, the term ‘single-parent family’ is used, but I am aware of the sensitivities regarding this type of wording. According to Statistics Netherlands, a single-parent family is a family that consists of one parent

and one or more minor children (age 0-17) that live in the same household (CBS, 2021a). This applies to family members with a legal parent-child relationship (i.e., no foster children). A single-parent family also excludes the presence and support of a spouse or adult partner who is able to share the responsibility of parenting[1]. This definition of a single-parent family is similar in other countries, such as the United States of America (Lindwall et al., 2011).

The consequences of growing up in a single-parent family have been researched extensively. Several meta-analyses showed that parental separation is associated with various negative outcomes in offspring. Examples of negative outcomes include mental health problems (Auersperg et al., 2019), poor school performance (Amato, 2001), and lower quality of interpersonal relationships (Kunz, 2001). This dissertation investigates the relationship between single-parent families and juvenile delinquency. See Section 1.3 for an overview of previous research about this relationship.

In the Netherlands, the period from the year 1870 onwards can be divided into two demographic transition periods (Van Gaalen et al., 2013; Van Gaalen & Van Roon, 2020). The First Demographic Transition (1870-1964) is a period that focused on obtaining basic needs for everyone (such as education and social security) and was strongly regulated by the norms of the state and church. A traditional family structure was the norm, consisting of a father, mother and their offspring. However, it frequently occurred that women died during childbirth (i.e., at the end of the nineteenth century, nearly a quarter of the children experienced the loss of one or two parents, often due to mothers giving birth). Often fathers remarried, thus having a stepmother was a common phenomenon. Over time, health care improved which reduced the mortality rates of mothers, the marriage percentage increased, and divorces occurred only rarely. Therefore, single-parent families became a relatively uncommon family structure at the end of the First Demographic Transition.

In the Second Demographic Transition (1965-present), the traditional family structure became less common. There was an increasing rate of unmarried cohabitation, out-of-wedlock births, divorces, and single-parent families. This led

[1] In this dissertation, this distinction between a single-parent family and a single-parent family with a stepparent living at the same address is also made. In statistical analyses, the repartnering of the single parent is included as a covariate.

again to more complex family structures; this time caused by parental divorce instead of parental decease (Van Gaalen & Van Poppel, 2009; Van Poppel et al., 2013). Therefore, the number of minor children who live with a single parent has risen substantially over the last decades in the Netherlands. Of all minor children, 11 percent lived with a single parent in 1999 and 16 percent lived with a single parent in 2019 (CBS, 2019a). The percentage of Dutch children who live with a single parent is very similar to the average percentage of children who live with a single parent in the European Union (Eurostat, 2019). The United States of America has the highest share of single parenting in the world, with 23 percent of minor children living in a single parent household (Pew Research Center, 2019).

There are several events that could lead to the start of a single-parent family. First, the parents could choose to separate. This can vary from an amicable separation to a high-conflict divorce. Parental separation is currently the most common reason initiating the start of a single-parent family. In the Netherlands, over 53,000 children experienced a parental separation in 2016 (CBS, 2018a). Second, one of the parents could pass away, which can have several causes, such as a short-term or long-term illness, a suicide, or a murder. In the Netherlands, in any given year, 6,400 children lose one or both biological parents (CBS, 2013). Third, the children could grow up in a single-parent family from the start. A wide range of events could lead to this type of single-parent family, from a teenage pregnancy without the father knowing, to an older single mother by choice, to a single father whose wife passed away while giving birth. Of all babies born in the Netherlands, six percent never lived with both biological parents in 1999 and nine percent never lived with both biological parents in 2019 (CBS, 2019a).

Next to dividing single-parent families into these three categories (i.e., single-parent families due to parental separation, parental decease, and being born to a single parent), there are also other factors that could play a role in the relation between single-parent families and delinquency. The first factor is the sex of the single parent. The most common type of single-parent family arrangement is a family headed by a mother with her children. In the Netherlands, 89 percent of the offspring is registered at the mother's address (CBS, 2019a), yet 27 percent of the ex-couples started a co-parenting agreement (i.e., a 50/50 custody arrangement in which the offspring spends an equal amount of time in both parents' houses). Moreover, 16 percent of the single-mother families live in poverty compared to 7.5 percent of the single-father families (Hoff et al., 2018).

The second factor is the possibility that the single parent finds a new partner. In 2017 (Van Gaalen & Van Roon, 2020), 28 percent of the offspring who experienced a divorce had one stepparent (i.e., one of their parents had repartnered) and seven percent of the children who experienced a divorce had two stepparents (i.e., both parents had repartnered). Of the offspring with at least one stepparent, 10.7 percent had no half-siblings or step-siblings, 65.9 percent had half-siblings, 14.5 percent had step-siblings, and 8.9 percent had half-siblings and step-siblings.

1.2 Theories

1.2.1 Single-parent families and juvenile delinquency

Multiple criminological theories have a bearing on the causal relationship between growing up in a single-parent family and the involvement in juvenile delinquency. Except for the family crisis model, these criminological theories do not differentiate between the type of single-parent family the offspring grows up in.

First, in Hirschi's first version of social control theory (Hirschi, 1969), he proposed that adolescents engage in crime because they 1) lack strong affective attachments to their parents, 2) lack a development of a 'stake in conformity' that increases commitment to conventional norms (i.e., all could be tempted into delinquency, but most refuse because they consider that they have too much to lose), 3) do not engage in conventional activities, and 4) lack a belief that conventional norms deserve respect. Hirschi argued that attachment between a parent and their offspring is crucial, and that the strength of this relationship is the most important factor in the prevention of criminal behavior. This implies that offspring who experienced the start of a single-parent family are more likely to display criminal behavior because they might have developed a weaker attachment to one or both parents. Next to this, because this theory states that attachment between a parent and their offspring is crucial, this theory also suggests that offspring in a two-parent family with a weak attachment to its parents might show more criminal behavior than offspring in a single-parent family with a strong attachment to its parents.

Second, in the social control/parental absence model (Gottfredson & Hirschi, 1990), Hirschi adjusted his position. This model proposes that single-parent families are social settings that obstruct the establishment of conformity because one of the parents is absent, and therefore constitutes a social setting that is

unable to provide proper control, supervision, and socialization of the offspring. This means that parental absence due to a disruption causes substantial problems that are rarely resolved by increased attachment, resulting in a higher likelihood for offspring to engage in criminal behavior.

Third, the economic strain model proposes that a lack of economic resources may mediate the effects of single-parent families on their offspring's criminal behavior (see Amato & Keith, 1991; Biblarz & Raftery, 1999). For instance, reduced income may force single-parent families to move to lower-income neighborhoods, exposing the offspring to potentially higher levels of peer delinquency than in higher-income neighborhoods (Damm & Dustmann, 2014), and single parents may not have adequate resources for extracurricular activities and other opportunities that might keep offspring away from criminal behavior.

Fourth, the family crisis model focuses on the processes involved in family disruptions (see Mack et al., 2007), and is the only theory that specifically differentiates between different types of single-parent families. This model suggests that psychological distress, emotional resentment, and social tension are more often related to parental separation than to parental death. Moreover, experiencing a crisis event often increases the likelihood for offspring to display antisocial behavior. Therefore, offspring who experience a parental separation may feel resentment toward their parents that will, in consequence, increase the likelihood of reduced family attachment and increased engagement in juvenile delinquency. In contrast, parental death is a traumatic event that produces anxiety, emotional distress, and depression, but does not usually involve the same level of emotional resentment as in families that experience a parental separation. Therefore, offspring in families with two biological parents and offspring born to a single parent are expected to display less criminal behavior, as they did not experience a family disruption crisis.

1.2.2 Intergenerational transmission of crime combined with a parental separation

As mentioned above, several theories suggest that growing up in a single-parent family is related to a higher likelihood to engage in juvenile delinquency. These theories all assume that the presence of both parents is beneficial for their offspring. However, do situations exist where a parental disruption might be beneficial for the children? This may be the case for the 'intergenerational transmission of crime'.

Intergenerational transmission implies that some characteristic or behavior is seen in the parent as well as the offspring (Liefbroer, 2005). One of these behaviors is the transmission of criminal behavior from one generation to the next. A meta-analysis (Besemer et al., 2017) confirmed the phenomenon of intergenerational transmission of crime, suggesting a relation between the criminal behavior of the parents and offspring's criminal behavior.

Since parental crime as well as growing up in a single-parent family are related to a higher risk on offspring's criminal behavior, it is interesting to see how experiencing both parental events influence offspring's criminal behavior. If a parent engages in criminal behavior and the parents separate, this situation might be 1) beneficial for the offspring when they can 'escape' the transmission of the criminal behavior, because they are less likely to learn or imitate the criminal behavior of that parent due to the parental divorce (i.e., a protective effect), or 2) detrimental for the offspring, since both parental crime and experiencing the start of a single-parent family separately are related to a higher likelihood to engage in crime and this could be intensified due to a combination of these life events (i.e., a cumulative effect).

Farrington et al. (2001) presented six possible explanations for the intergenerational transmission of crime, and one of these explanations may help clarify the relation between intergenerational transmission of criminal behavior and parental separation. This explanation states that family members may directly and mutually influence each other due to social learning mechanisms. For instance, offspring may imitate the criminal behavior of their parents. However, when the parent who engages in criminal behavior moves out of the house after a parental separation, it is possible that the offspring sees that parent less often. Therefore, based on this explanation of Farrington et al. (2001), a parental separation may decrease the intergenerational transmission of crime between parent and their offspring.

1.3 Previous research

1.3.1 Single-parent families and juvenile delinquency

Prior literature reviews consistently show positive associations between single-parent families and juvenile delinquency. However, these literature reviews

show several limitations. First, these reviews are rather outdated. One example is the meta-analysis of Wells and Rankin (1991) on the effects of broken homes on delinquency. As seen in Section 1.1.1 and 1.1.2, changes have occurred with regard to single-parent families and juvenile delinquency in the last couple of decades, which may lead to different results if this topic is investigated in this time period. Second, some literature reviews are very broad. For example, some only focus on parental attachment (Savage, 2014) or offspring's well-being in general (Rodgers, 1996). Therefore, these reviews do not provide specific information about single-parent families and juvenile delinquency (e.g., it is possible that parental attachment is strong in single-parent families and that the offspring's well-being is low without, consequently, engaging in juvenile delinquency). Third, several reviews are too limited in scope. For instance, these only focus on parental divorce (Price & Kunz, 2003) or offspring's status offenses (Buehler et al., 1997). However, little is known about whether the effects on the offspring depend on how single-parent families were constituted (by parental separation, parental decease, or being born to a single parent) and whether this also affects offspring with regard to more serious types of crimes.

Due to these three limitations, it is necessary to 1) obtain a full overview of the existing literature about single-parent families and juvenile delinquency (see Chapter 2: Kroese et al., 2021), as well as 2) conduct more empirical studies about single-parent families and juvenile delinquency and whether the relation is dependent on how single-parent families were constituted (see Chapter 3 and 4).

1.3.2 Intergenerational transmission of crime combined with a parental separation

Several studies have tried to investigate the intergenerational transmission of crime in conjunction with a parental separation. Although all these studies have found evidence that suggests a parental separation may diminish the intergenerational transmission of crime (Blazei et al., 2008; Jaffee et al., 2003; Thornberry et al., 2009; Van de Rakt et al., 2010), it is important to note that three of the four studies mentioned above are looking at the broader category of antisocial behavior instead of having a sole focus on adjudicated crime. Moreover, I know of only one study that distinguishes between types of crime in conjunction with parental separation. Van de Weijer et al. (2015) showed that among children of violent fathers that experienced a parental separation during

their youth, violent offending was not transmitted. However, the intergenerational transmission of non-violent criminal behavior was stronger if the parents were separated. Therefore, more research is needed to examine the effects of a parental separation on the intergenerational transmission of crime, including a distinction between types of crime (see Chapter 5).

1.4 Research methods and data

In this dissertation, the effect of different types of single-parent families during childhood and adolescence on the involvement in adolescent delinquency will be investigated. The combination with intergenerational transmission of crime and parental separation will be assessed as well. This dissertation utilizes two research methods and two types of data, including 1) a systematic review based on empirical literature and 2) empirical studies based on Dutch population register data provided by Statistics Netherlands. See Table 1 for an overview of the studies in this dissertation.

1.4.1 Systematic review based on empirical literature

In the first study of this dissertation, the research method is a systematic review. Cochrane (2021) provides the following definition of systematic reviews: "A systematic review attempts to identify, appraise, and synthesize all the empirical evidence that meets prespecified eligibility criteria to answer a specific research question". Traditional literature reviews rely strongly on the author's knowledge and experience, and, therefore, often provide a limited presentation of a topic and are more difficult to reproduce (Aromataris & Pearson, 2014). Rigorous methods (e.g., inclusion and exclusion criteria that determine the eligibility of studies and a comprehensive systematic search to identify all relevant studies) distinguish systematic reviews from traditional reviews.

As mentioned in Section 1.3.1, other systematic reviews and meta-analyses about the topic of single-parent families and juvenile delinquency are rather outdated, limited in scope, or very broad. Moreover, little is known about whether the effects depend on how single-parent families were constituted. This means that an up-to-date overview of the literature on this topic is lacking. By conducting a systematic review about single-parent families and juvenile delinquency, a full overview of the empirical literature about this topic will be provided.

Table 1

An Overview of the Studies in this Dissertation

Study	Independent variable	Dependent variable	Used method	Source	N
1	Parental separation, parental decease, or being born to a single parent	Adolescent delinquency	Systematic review	Empirical literature	48 studies
2	Parental separation, parental decease, or being born to a single parent	Adolescent delinquency	Logistic regression models	Microdata from Statistics Netherlands	1,295,681 – 1,295,683 adolescents (differs per research question)
3	Parental separation or parental decease during adolescence	Adolescent delinquency, including time effects	Fixed-effects panel models and logistic regression analyses	Microdata from Statistics Netherlands	95,219 adolescents
4	Parental crime and parental separation during adolescence	Three types of delinquency during adolescence	Fixed-effects panel models and logistic regression analyses	Microdata from Statistics Netherlands	28,058 – 49,512 adolescents (differs per research question)

Both systematic reviews and meta-analyses generate results by combining and analyzing data from different studies conducted on similar research topics (Ahn & Kang, 2018). A meta-analysis diverges from a systematic review in that it uses statistical methods to combine estimates from all eligible studies into a pooled estimate (Kang, 2015). A systematic review will be conducted instead of a meta-analysis, because the selected studies show too much heterogeneity with regard to the outcome variable (e.g. incarcerated or not, item scales about different types of crime). This results in constructs with different measurement levels that cannot be reliably compared and would potentially give rise to inaccurate or even misleading findings.

1.4.2 Empirical studies based on Microdata from Statistics Netherlands

The other three studies in this dissertation will be empirical studies using Dutch population data. The data of these three chapters will be analyzed by means of logistic regression analyses (Chapter 3) and fixed-effects panel models combined with logistic regression analyses (Chapter 4 and 5). In Chapter 2, logistic regression analyses will be performed, because the dependent variable is a dichotomous measure (i.e., whether or not the child has conducted adolescent delinquency between 12 and 18 years old). The use of fixed effects panel models will not be possible in this chapter, because the independent variable (i.e., experiencing the start of a single-parent family before adolescence) and the dependent variable (i.e., engaging in adolescent delinquency) are measured during different age categories. Chapter 4 and 5 will combine fixed-effects panel models and logistic regression analyses. Again, the dependent variable is a dichotomous measure for each year of age (i.e., whether or not the child has conducted adolescent delinquency between 12 and 18 years old). Moreover, due to the availability of longitudinal population register data, it is possible to estimate fixed effects panel models. Fixed effects panel models can provide stronger evidence for causal effects than alternative models (Allison, 2009). A fixed effects panel model examines only within-individual change (e.g., family structure, family income, criminal behavior) and controls for all observed and unobserved stable individual characteristics (e.g., sex, country of birth). By controlling for both observed and unobserved differences between individuals, the fixed effects panel model is very useful to control for time-constant selection bias. In addition, it is possible to control for time-varying variables that may influence the relation between parental crime,

non-standard families, and adolescent crime. A disadvantage of the fixed effects model is that the effect of stable background characteristics cannot be estimated, because the model controls for these characteristics.

These three studies use Dutch population register data, named Microdata, from Statistics Netherlands (Centraal Bureau voor de Statistiek). Statistics Netherlands commenced offering access to Microdata in 1994. Microdata are linkable data at the level of individuals, companies, and addresses which can be made available to, amongst others, Dutch universities and scientific organizations under strict conditions for statistical research (CBS, 2021b). These data contain (generally longitudinal) data on the entire registered population of the Netherlands. The availability of these microdata sets with longitudinal data on the entire population of a country on a wide range of topics is quite unique. Only the Nordic countries are known to have such an elaborate dataset as well (e.g., Statistics Sweden and Statistics Denmark; Trivellato, 2019).

A disadvantage of using population register data is that several possibly interesting confounding variables cannot be included in analyses, due to the absence of specific variables or due to the lack of precision and completeness of the measured variables in the population register data. Examples of variables that would have been added in case they would have been available are 1) the number and the severity of conflicts between the parents before the parental disruption occurred and, in case of the families disrupted by a parental separation, conflicts after the parental separation as well, and 2) the frequency and quality of contact between the offspring and their parent(s) after the parental disruption (including whether a co-parenting arrangement is in place). These variables could have provided information on the mechanisms that could explain the relation between single-parent families and adolescent delinquency. Unfortunately, these variables are not available, yet there is an adequate number of variables in the Microdata from Statistics Netherlands to answer the research questions in this dissertation.

The information for the microdata sets are derived from the population register and other sources, such as the 'Dutch Tax and Customs Administration' and the 'Dutch National Police'. These microdata sets provide information about, for instance, parental crime, marriage status, juvenile delinquency, and household income. After choosing the appropriate microdata sets, researchers can access and analyze these sets in the secure environment of Statistics Netherlands. The microdata sets can be linked, in this case at the household level, through the use

of anonymous linkage keys. When the empirical analyses are completed, the results can be exported from the secure environment after a check conducted by Statistics Netherlands, who verify that these results do not contain any disclosure risk. This check minimizes the risk of spreading information that can be traced back to an individual or company (e.g., when the *N* in a table cell is too low).

1.5 Outline dissertation

The aim of this dissertation is to assess the effect of growing up in a single-parent family during childhood and adolescence on adolescents' involvement in delinquency. More specifically, it investigates whether different types of single-parent families have different effects, and whether these effects depend on involvement in crime of parents.

Chapter 2 provides an overview of the theories and existing literature with respect to growing up in a single-parent family and the criminal involvement of adolescent offspring. Additionally, this chapter gives an overview of the existing literature on whether this relation is determined by how single-parent families were constituted, by making a distinction between parental separation, parental decease, and being born to a single parent.

Chapter 3 assesses the relation between growing up in a single-parent family before age 12 and the likelihood to engage in juvenile delinquency during adolescence. Three different types of single-parent families will be taken into consideration, including parental separation, parental decease, and being born to a single parent.

Chapter 4 examines the effects of living in a single-parent family as an adolescent due to parental separation or due to parental decease on the likelihood to engage in adolescent delinquency. In addition, anticipatory and (short-term as well as long-term) delayed effects of parental separation or parental death on delinquency will be taken into account.

Chapter 5 investigates the effect of parental separation on the intergenerational transmission of crime, to assess whether a parental separation can help to break the vicious cycle of crime in families. The investigated types of crime include property crimes, destruction and crimes against public order and authority, and violent and sexual crimes.

Chapter 6 presents the general discussion of this dissertation. This chapter includes an overview of the findings and argues how these findings enhance existing theories and previous research. Furthermore, the strengths and limitations of this dissertation are discussed, as well as implications for policy and practice and suggestions for future research.

CHAPTER 2

GROWING UP IN SINGLE-PARENT FAMILIES AND THE CRIMINAL INVOLVEMENT OF ADOLESCENTS: A SYSTEMATIC REVIEW

Janique Kroese, Wim Bernasco, Aart C. Liefbroer, and Jan Rouwendal

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2.1 Abstract

Many studies have investigated the relation between growing up in single-parent families and crime. However, an up-to-date overview of the literature on this topic is lacking. To fill this gap, this article reviews the empirical literature regarding the effects of being raised in a single-parent family on criminal behavior of adolescent offspring, and additionally focuses on whether the effects depend on how single-parent families were constituted (by parental divorce or separation, by parental decease, or by being born to a single parent). A systematic search in five electronic databases (Web of Science, PsycINFO, Scopus, SocINDEX, and EconLit) is conducted to identify empirical studies on this topic, resulting in 48 studies that conform to a range of substantive and methodological selection criteria. The results suggest that growing up in single-parent families is associated with an elevated risk of involvement in crime by adolescents and that more research is needed to determine the effects of the different constituting events of single-parent families.

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2.2 Introduction

Many children grow up in a single-parent family, meaning that often children grow up in a family with only one biological parent present. The percentage of single-parent families has been consistently high over the past few decades in western countries. In the European Union and the United States, respectively 15 percent and 27 percent of the children grow up in a single-parent family (Eurostat, 2016; Vespa, Lewis, & Kreider, 2013). Growing up in a single-parent family results from parental divorce or separation, from parental decease, or from being born to a single parent. Although the proportion of single-parent families seems to remain quite stable, a clear shift is visible in the causes of single parenthood. Over the last decades, single-parent families have increasingly been constituted by parental divorce or separation and by births to unattached women, and decreasingly by parental decease (Ambert, 2006).

Since it appears that the rate of single parenthood will not decrease in the coming years, it is important to carefully consider the consequences of growing up in a single-parent family. Research suggests, amongst others, that growing up in a single-parent family has negative effects on children's emotional well-being, cognitive development, and school performance (e.g. Bradley & Corwyn, 2002; Chapple, 2013; De Lange et al., 2014; DiPrete & Eirich, 2006; McLanahan & Sandefur, 1994). Moreover, research suggests that children in different types of single-parent families show different types of poor school adjustment (i.e. children from divorced parents have significantly more acting-out problems than children from deceased parents or controls, and the children with histories of parental death show a higher level of shyness and anxiety than the other children; Felner et al., 1981a). Furthermore, divorce in particular is significantly related to increased levels of family stressors for children (Felner et al., 1981b). Thus, many studies demonstrate that growing up in a single-parent family entails risks that jeopardize adolescents' future life chances. Involvement in criminal behavior is another important risk factor for adolescents' future life chances. Involvement in crime during adolescence is associated with negative life outcomes such as lower income, worse health outcome, lower well-being, and a higher probability of adult crime involvement (Apel & Sweeten, 2010; Gilman et al., 2015; Massoglia, 2008). Since the monetized social burden of juvenile crime is also substantial (Welsh et al., 2008), attention to the relationship between growing up in single-parent families and criminal involvement of adolescents is warranted.

Prior literature reviews consistently show positive relations between single-parent families and crime. However, these literature reviews are either rather outdated (Wells & Rankin, 1991), limited in scope by only focusing on divorce (Price & Kunz, 2003) or status offenses (Buehler et al., 1997), or very broad by focusing on parental attachment (Savage, 2014) or well-being in general (Rodgers, 1996). This means that the effects of growing up in a single-parent family on serious delinquency by adolescents thus far have not been investigated in a literature review. This is unfortunate, because adolescents tend to show more delinquent behavior than both younger children and adults (i.e. age-crime-curve; Moffitt, 1993). Moreover, adolescents have more contact with their parents than adults because they often live with their parent(s), increasing their exposure to the direct effects of this particular family structure.

2.2.1 Theoretical background

A number of theoretical models have been proposed to explain the relation between single-parent families and a range of youth outcomes, including crime.

First, *social control theory* suggests that adolescents participate in crime because they (1) lack strong affective attachments to their parents, (2) lack a development of a stake in conformity that increases commitment to conventional norms, (3) do not engage in conventional activities, and (4) do not develop a belief that conventional norms deserve respect (Hirschi, 1969). Hirschi originally argued that the strength of the attachment of the children to their parents is the most important factor in increasing or decreasing the chances of children showing criminal behavior. For instance, weaker attachment bonds to their parents might stimulate children to spend more time in criminogenic settings instead of with their parents. This could imply that children in single-parent families might show more delinquency because they possibly have a less strong attachment to one or both parents. However, this theory also states that a child in a two-parent family with weak attachments to its parents might show more delinquency than a child in a single-parent family with strong attachments to its parents.

Second, Hirschi revised his position in the *social control/parental absence model* (fitting within *self-control theory*) that single-parent families may be just as effective in producing positive child outcomes as two-parent families. This model proposes that single-parent families are, by their very nature, social settings that

hamper the establishment of conformity because one of the parents is absent, and therefore unable to provide proper control, supervision, and socialization of the child. This deficit would result in a higher likelihood of engagement in criminal behavior (Gottfredson & Hirschi, 1990). In this revised version of social control theory, Gottfredson and Hirschi suggest that strong levels of attachment are difficult to maintain when one of the parents is absent. They also stress that the multiple demands single parents have to cope with make it more difficult for them to spend time with their children, increasing the opportunities for the children to engage in negative behaviors, such as criminal activities.

Third, the *economic strain model* focuses on how the lack of resources may mediate the effects that single-parent families have on adolescent criminal behavior (see Amato & Keith, 1991; Biblarz & Raftery, 1999). For instance, single parents may not have sufficient resources for extracurricular activities and other opportunities that help children to focus on positive activities instead of criminal behaviors. Furthermore, reduced income may force single-parent families to move to lower-income neighborhoods, exposing the children to potentially contagious higher levels of peer delinquency than in higher-income neighborhoods (Damm & Dustmann, 2014).

Fourth, the *family crisis model* focuses on the processes involved in family disruptions rather than on the family structure itself (see Biblarz & Raftery, 1999; Chen & Kaplan, 1997; Felner et al., 1981a; Wells & Rankin, 1986). This model suggests that family disruptions are important determining factors of the well-being of the children. For instance, the family crisis model suggests that experiencing a parental divorce or separation causes psychological distress, emotional resentment, and social tension in children. The emotional resentment of the children towards their parents may decrease the level of family attachment and increase the children's criminal behavior. In contrast, the model suggests that experiencing parental death causes anxiety, emotional distress, and depression. This event of losing a parent generally does not involve the same level of emotional resentment as parental divorce or separation (Felner et al., 1981a). Therefore, this model suggests that children are more likely to display criminal behavior in response to parental divorce or separation than in response to parental death. Children in two-parent families and children born to a single parent are expected to show less criminal behavior, because these children do not experience a family disruption crisis.

While most theoretical frameworks suggest that adolescents in single-parent families (in particular single-parent families that result from parental divorce or separation) are more likely to get involved in criminal behavior, up to this moment we lack a systematic overview of empirical evidence. In particular, it is not clear (1) whether there is a relation between growing up in a single-parent family and crime by adolescents, and (2) whether there is a different effect for different constituting events of single-parent families: parental divorce or separation, parental decease, or being born to a single-parent family. Since an overview of the relation between (different types of) single-parent families and crime of adolescents is lacking, we perform a systematic review to fill this knowledge gap.

2.3 Method

2.3.1 Search strategy

A systematic database search was conducted to find studies on the relation between being raised in a single-parent family and criminal involvement of adolescents. The electronic databases Scopus, Web of Science, PsycINFO, SocINDEX, and EconLit were used to give a full overview of the existing research from different research fields. The search string consisted of keywords related to (1) single-parent families or the constituting event of single parenthood itself (divorce/separation, decease, and out-of-wedlock birth); (2) parents; (3) adolescents; and (4) crime. By way of example, the Appendix includes the full search-string used in Scopus, including synonyms and spelling variations. The systematic search took place on January 9, 2018, and was updated on October 29, 2018.

To be included in the systematic review studies sequentially had to meet the following criteria:

1) Full-text. The full-texts of the studies have to be available on the internet.

2) Language. The studies have to be written in English, German, French, or Dutch, to ensure that we are able to read the studies.

3) Empirical studies. The studies have to be empirical studies. Conference abstracts, editorials, books, article reviews, or literature reviews are excluded from the systematic review.

4) Quantitative relation. The relation between growing up in a single-parent family and the criminal involvement of adolescents has to be presented in a quantitative way.

5) Study population. The age range of the adolescents is between 10 and 17 years. A lower age limit starting at age 6 is allowed when children up to at least the age of 13 are included in the study population. A higher upper age limit of age 21 is allowed when children starting at minimally age 14 are included in the study population. Studies including a broader age range than between 10 and 17 are accepted, as long as a group in this specific age range is also tested separately.

6) Outcome measure. The outcome measure has to include criminal involvement of adolescents (e.g. stealing, using illegal drugs, being physically cruel to people). This means that (1) the study population clearly has to have a criminal record (e.g. because the studied group is a prison sample) or that (2) in the questionnaire assessing the outcome measure, at least 50% of items have to address criminal behavior instead of merely juvenile delinquency items (e.g. truancy, smoking cigarettes). When there are two or more sets of items about different types of criminal behavior in the same study, the items of the sets are cumulated and it is checked whether at least 50% of the items concern criminal behavior. In these instances, the publication must include a list of the items to be able to check the items into more detail. For example, if 0 out of 7 items about status offenses, 6 out of 7 items about property offenses, and 6 out of 7 items about violent offenses include criminal behavior, we include (≈57%) the study in the systematic review.

7) Exposure measure. The adolescents have to be raised in a single-parent family, meaning that children grow up in a family with only one biological parent present. If the study only looks at single-parent families in general (i.e. no distinction between single-parent families with and without an additional caregiver, such as a stepparent), the study is included as well. No lower limit to the amount of time adolescents have spent in a single-parent family is imposed.

8) Study design. The study could either be designed as a (longitudinal) cohort study (used to study incidence, causes, and prognosis), a cross-sectional study (used to determine prevalence), or a case–control study (used to compare groups retrospectively), including control groups.

9) Correct relation. The study has to assess the relation between growing up in a single-parent family and the criminal involvement of adolescents.

10) Aggregation level. The constructs have to be measured at the individual level instead of at a supra-individual level (e.g. municipalities), to ensure that the actual relation is measured at the appropriate level of analysis and to prevent

aggregation bias, which can lead to the 'ecological fallacy', the conclusion that what is true for the group must be true for the subgroup or individual (Robinson, 1950).

After duplicates were removed, studies were independently screened for eligibility by two researchers. First, titles and abstracts were scanned to check whether studies seemed to match the topic of the systematic review. The two researchers (the first author and a research assistant) discussed the results and in case of disagreements tried to reach consensus. If consensus could not be reached, the final decision was made by a third researcher (the second author). In case of doubt, the full-text of studies was retrieved. Second, the full-text of the studies were scanned to check whether studies met the eligibility criteria, and if not, what the reason for exclusion was, in the order of the criteria mentioned earlier. Disagreements were again discussed between the two researchers (the first author and a research assistant) and if no consensus could be reached, a third researcher made the final decision (the second author). In the case of the Dutch, German, and French studies, the process of study screening was comparable. However, one of the original researchers (the first author) screened these studies together with two different researchers (the second author screened the Dutch and German studies and the third author screened the French studies). Cross-references of the included studies were also screened, which means that reference lists of the included studies were checked to identify additional relevant studies, and these studies were also included if they met the above-mentioned criteria.

We conducted a systematic review instead of a meta-analysis because the selected studies show too much heterogeneity with regard to the outcome variable (e.g. incarcerated or not, item scales about different types of crime), resulting in constructs with different measurement levels that cannot be reliably compared and would potentially give rise to inaccurate or even misleading findings.

Figure 1 presents a flow chart of the study selection process. The database search identified 3,102 studies, of which 45 studies were included (containing 3 extra studies because 3 of the 42 articles included 2 studies). By means of cross-referencing, 3 more studies were included in the systematic review. From these 48 studies, relevant data were extracted with regard to study design, study population, sample size, assessment of exposure and outcome, and statistical analysis. A full list of all included studies and their main features is presented in Table 1.

2.4 Results

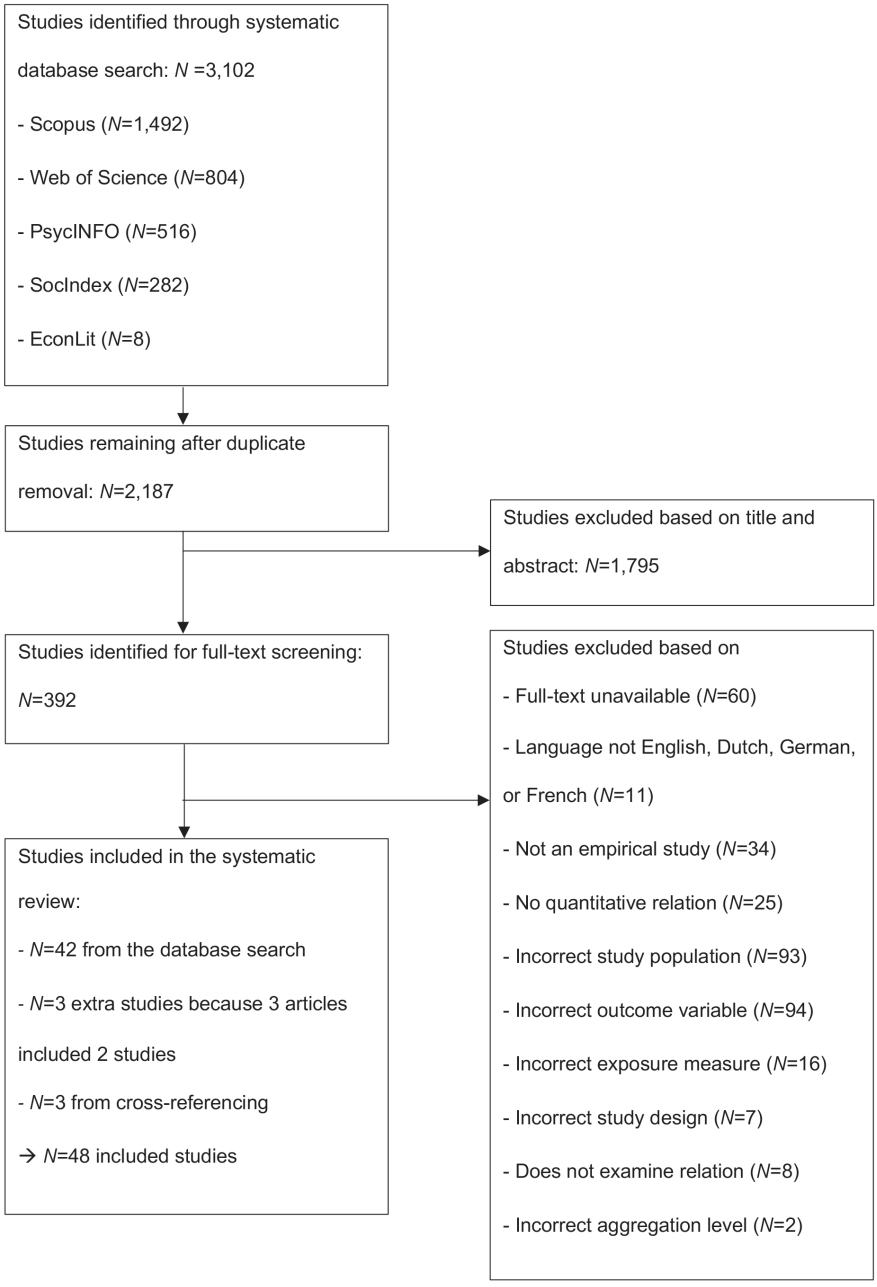


Figure 1. Flow chart of the study selection process.

Table 1

Overview of the studies included in the systematic review

Author (year)	*N*	Country	Design	Results	Only bivariate analyses
Adlaf and Ivis (1997)	964	USA	CS	0	*
Banyard, Cross, and Modecki (2006)	980	USA	CS	+	
Brown (2006)	11,201	USA	CS	+	
Brown (2006)	11,201	USA	C	0	
Bryant et al. (1995)	180	USA	CS	0	
Champion, Wagoner, Song, Brown, and Wolfson (2008)	13,422	USA	CS	+	
Chilton and Markle (1972)	8,944	USA	CC	+	*
Conseur, Rivara, Barnoski, and Emanuel (1997)	51,960	USA	C	+	
Coughlin and Vuchinich (1996)	194	USA	C	0	
Crawford and Novak (2008)	10,704	USA	C	+	
Demuth and Brown (2004)	16,304	USA	C	0	
Erdelja et al. (2013)	200	Croatia	CC	+	
Foster, Nagin, Hagan, Angold, and Costello (2010)	1,319	USA	C	0	
Gibson (1969)	411	UK	C	+	*
Goldstein (1984)	6,768	USA	CS	+	*
Gregory (1965)	11,329	USA	C	+	*
Hay, Fortson, Hollist, Altheimer, and Schaible (2006)	1,423	USA	C	+	*
Hoffmann (2002)	11,749	USA	CS	+	
Hoffmann (2002)	11,749	USA	C	+	
Hollist and McBroom (2006)	15,455	USA	C	+	
Isir, Tokdemir, Küçüker, and Dulger (2007)	232	Turkey	CC	+	*
Juby and Farrington (2001)	411	UK	C	+	
Keller, Catalano, Haggerty, and Fleming (2002)	67	USA	C	0	
Kierkus and Hewitt (2009)	3,499	USA	CS	+	
Knoester and Haynie (2005)	16,910	USA	CS	+	
Laub and Sampson (1988)	1,000	USA	CC	0	
Leiber, Mack, and Featherstone (2009)	9,636	USA	CS	0	
Mack, Leiber, Featherstone, and Monserud (2007)	9,636	USA	CS	0	
Margari et al. (2015)	93	Italy	CC	+	*
Mützell (1995a)	527	Sweden	CC	+	*
Mützell (1995b)	528	Sweden	CC	+	*
Neumann, Barker, Koot, and Maughan (2010)	4,597	UK	C	+	

Offord, Abrams, Allen, and Poushinsky (1979)	118	Canada	CC	+	*
Offord, Allen, and Abrams (1978)	146	Canada	CC	+	*
Pagani, Boulerice, Vitaro, and Tremblay (1999)	497	Canada	C	+	
Pagani, Tremblay, Vitaro, Kerr, and McDuff (1998)	427	Canada	C	0	*
Pedersen (2000)	2,436	Norway	C	+	
Pitt-Aikens and McKinnon (2000)	120	UK	CC	+	*
Rankin (1983)	2,242	USA	CS	0	*
Rebellon (2002)	1,725	USA	CS	+	
Rebellon (2002)	1,725	USA	C	+	
Salts, Lindholm, Goddard, and Duncan (1995)	1,192	USA	CS	0	
Smith and Walters (1978)	330	USA	CC	+	*
Spohn and Kurtz (2011)	4,023	USA	CS	+	
Vanassche, Sodermans, Matthijs, and Swicegood (2014)	1,688	Belgium	CS	+	
Voorhis, Cullen, Mathers, and Garner (1988)	152	USA	CS	0	
Wubishet and van Leuween (2016)	179	Ethiopia	CC	+	
Zimmerman, Salem, and Maton (1995)	254	USA	CS	0	*

C = cohort study, CS = cross-sectional study, CC = case-control study

+ = positive relation, - = negative relation, 0 = no statistically significant relation

The 48 included studies covered information on 36 distinct datasets. All studies were written in English. The oldest studies covered the period from 1939 to 1948 and the newest studies the period from 2012 to 2014. The data were obtained by (a combination of) self-report by the adolescent, other-report by a parent/guardian, from census data, from criminal records, or from official institutions. As described in Table 2, the 48 studies contained 18 studies based on a longitudinal cohort design, 18 studies based on a cross-sectional design, and 12 studies based on a case–control design. Respectively 36 and 11 of the 48 included studies were conducted in North America and Europe; only one study was conducted in a non-western country. One study only included girls, 14 studies only included boys, 30 studies included girls and boys, and three studies did not describe the sex distribution of the sample.

There was homogeneity regarding the exposure measure, which means that 'single-parent family' is often measured in the same way. Most studies made a general comparison between adolescents from intact and non-intact families[2]. However, there was considerable heterogeneity with regard to the outcome variable. Adolescents' engagement in criminal behavior was assessed via different measurement tools, including different types of crime over varying age ranges. Often composite measures of crime were used, making it impossible to assess associations with different types of crime.

To answer the first research question, we examined in general whether a relation exists between growing up in a single-parent family and crime by adolescents. The assessment of the data showed that 34 studies reported a statistically significant positive relation between single-parent families and crime (i.e. growing up in a single-parent family is related to a higher level of crime by adolescents), while 14 studies showed no statistically significant relation. No studies reported a statistically significant negative relation. The assessment of the data without other covariates (i.e. the studies that performed bivariate analyses) showed that 27 studies reported a positive relation between single-parent families and crime, 4 showed no statistically significant relation, 0 studies showed a negative relation, while 17 studies did not report results without covariates. The assessment of the data including the covariates (i.e. the studies that performed multivariate analyses) showed that 21 studies reported a positive relation between single-parent families and crime, 10 showed no statistically significant relation, 0 studies showed a negative relation, and 17 studies did not report results including covariates.

To examine whether specific characteristics of the studies can explain the different outcomes of the studies, the studies were checked in more detail (see Table 2 for a comparison between the studies with and without a statistically significant positive relation). In Europe, all studies showed a statistically significant positive relation, while in North America, results were mixed. Regarding the design

[2] Some studies made additional distinctions, e.g. by including stepparents. Of the 48 included studies, 26 studies did not report on including or excluding single-parent families with an additional caregiver. In the remaining 22 studies, we checked whether adolescents in single-parent families and the adolescents in single-parent families including an additional caregiver differed with regard to their level of criminal behavior. Seven studies showed no differences between the two types of single-parent families, and the other studies showed mixed results.

Table 2

Comparison between studies with and without statistically significant positive results

Variable	Variable labels	*N* studies	% of studies with statistically significant positive results
Continent	North America	36	61.11
	Europe	11	100.00
	Other	1	100.00
Study design	Cohort	18	72.22
	Cross-sectional	18	55.56
	Case-control	12	91.67
Year(s) of data collection	Before 2000	32	71.88
	2000 and later	5	100.00
	Unknown	11	54.55
Sex	Boys	14	71.43
	Girls	1	100.00
	Mixed	30	66.67
	Unknown	3	100.00
Sample size	0 - 499	17	70.95
	500 - 999	4	75.00
	1000 or more	27	70.37
Total		48	70.83

of the study, most studies with a case–control design showed a statistically significant positive relation. This was true to a lesser extent for studies with a cohort design. Studies with a cross-sectional design showed the lowest percentage of statistically significant positive relations. Studies with datasets from the year 2000 and later showed statistically significant positive relations only, whereas studies before the year 2000 also showed some non-significant relations. The sex distribution of the sample did not affect the results. Studies that only focused on boys and studies that had a mixed-sex sample showed approximately the same amount of significant and non-significant results (the studies with only girls or a missing sex distribution, did not include enough studies to be able to draw comparative conclusions). The percentage of studies with statistically significant positive relations were evenly distributed across the different categories of sample sizes, meaning that the sample size of a study did not seem to affect the results.

Moreover, we checked whether the covariates parental resources, parental attachment, and parental resentment (in line with the four theoretical models

explaining the relation between (the different types of) single-parent families and crime) were considered in the 31 studies that included multivariate analyses. In respectively 77 and 84% of the studies indicators of parental resources and parental attachment were included. Parental resentment was not considered in any study.

To answer the second research question, we checked whether the likelihood of criminal behavior differed between the three different constituting events of single-parent families (i.e. parental divorce or separation, parental decease, or being born to a single-parent family). It turned out that hardly any studies on differences in criminal behavior by type of single-parent families have been conducted. Only one study reported on the issue. Based on reports on juvenile convictions, Juby and Farrington (2001) found that families disrupted by disharmony (i.e. divorce or separation) were more criminogenic than families disrupted by parental death. However, no statistically significant results between these two types of single-parent families were found when delinquency was self-reported.

2.5 Discussion

This systematic review provides an overview of 48 empirical studies on single-parent families and crime of adolescents. Two general conclusions can be drawn. First, the results suggest that growing up in a single-parent family and adolescent involvement in crime are related since a large majority of the studies shows a positive relation between single-parent families and the level of crime. Second, since only one study reports on the effects of the different constituting events of single-parent families on crime, it is clear that more research is needed.

With respect to the first research question, the results of the systematic review strongly suggest the existence of a positive association between growing up in a single-parent family and crime by adolescents. This is in accordance with previous literature reviews conducted a couple of decades ago (e.g. Wells & Rankin, 1991), or that were more limited or broader in scope (e.g. Price & Kunz, 2003; Savage, 2014). The majority of the studies containing multivariate analyses also controlled for parental resources and parental attachment, but adding these constructs did not alter the results. This implies that the social control theory, the social control/parental absence model, and the economic strain model cannot (fully) explain the results of this review.

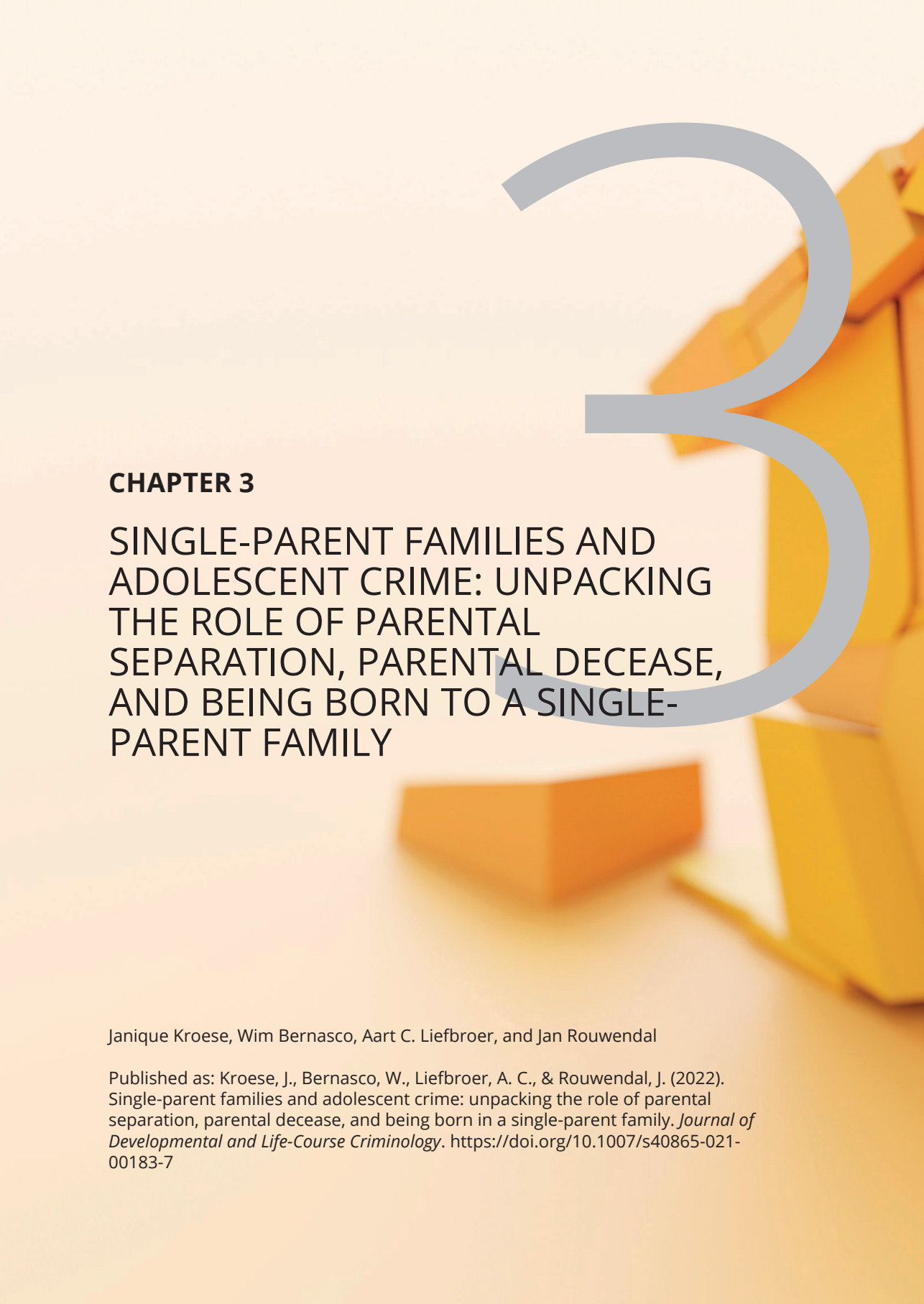
The second research question involved the different constituting events of single parenthood. Juby and Farrington (2001) showed that reports on juvenile convictions suggest that the adolescents in families disrupted by divorce/ separation displayed higher levels of crime than adolescents in families disrupted by parental decease. This finding is in line with expectations from the family crisis model (although parental resentment was not included as a control variable in the analyses, so it cannot be checked whether resentment toward the parents after the divorce is a relevant factor increasing crime). However, no relationships were found in this study when delinquency was self-reported. Since there is only one study on this topic and this study also shows contradictory results, it is important to investigate this issue in more detail in future research.

This systematic review also has revealed some limitations of the included literature. First, almost all adolescent behavioral data were self-reported. These data are likely to involve underestimation of true levels of crime because of social desirability. Second, in almost 30% of the studies, only boys were included as participants, although it is possible that boys and girls respond differently to growing up in single-parent families. Third, the same datasets were used a couple of times in different studies. Five datasets were used twice, one dataset was used three times, and one dataset was used six times. When the duplicate datasets were removed, however, the results stayed approximately the same.

There are several suggestions for future research. First, because the majority of the included studies were conducted in the USA, research should also be conducted in other cultural contexts. Second, this review contains many studies that were conducted a couple of decades ago. It is possible that the effects in more recent time periods differ from those found a couple of decades ago because of new regulations, such as co-parenting regulations after a divorce. However, since the studies conducted after the year 2000 show only positive relations, it has to be investigated in more detail why the recent studies more often displayed a higher level of crime by adolescents from single-parent families. Third, this review only contains studies looking at the environmental effects of the family on the criminal behavior of the adolescents. However, it may also be interesting to look at the genetic influences.

Concluding, this systematic review provides insights into the positive relation between single-parent families and crime by adolescents. However, this systematic

review also shows that research is lacking regarding the consequences of growing up in different types of single-parent families. Therefore, we recommend researchers to expand these results and policymakers to wait for those results before making programs that target all children in single-parent families, while maybe these increased levels of crime were only caused by adolescents of one type of single-parent family. Given the fact that a relatively high percentage of western children grow up in a single-parent family and that the consequences of crime are detrimental, it is important to investigate into more detail how this relation between single-parent families and crime works to ensure that criminal behavior by adolescents is minimized.



CHAPTER 3

SINGLE-PARENT FAMILIES AND ADOLESCENT CRIME: UNPACKING THE ROLE OF PARENTAL SEPARATION, PARENTAL DECEASE, AND BEING BORN TO A SINGLE-PARENT FAMILY

Janique Kroese, Wim Bernasco, Aart C. Liefbroer, and Jan Rouwendal

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3.1 Abstract

Addressing a gap in the extant literature on single-parent families and juvenile delinquency, we distinguish between different types of single-parent families. Using Dutch population register data on nearly 1.3 million children, we performed logistic regressions to assess the relation between growing up in a single-parent family before age 12 and the likelihood to engage in juvenile delinquency during adolescence. Our findings suggest that the likelihood of juvenile delinquency increases (1) when children are born to a single parent, followed by children with separated parents and children experiencing parental death, compared to children growing up with both biological parents, (2) when the single-parent family started at a younger age, and (3) when children grow up with only a biological mother, both for sons and daughters, compared to only a biological father. The relationship between growing up in single-parent families and juvenile delinquency is much more complex than often assumed. Future research should pay more attention to diversity in the composition of single-parent families.

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3.2 Introduction

Although most children in Western countries are raised by both of their biological parents, a large minority grows up without their biological father or biological mother. Typically, this is because the biological parents have stopped living together, never lived together, or because one of them passed away. Here, we refer to these situations as single-parent families[3]. At any given time, this holds for 15 percent of the families with children in the European Union (Eurostat, 2019) and for 23 percent of the families in the United States (Pew Research Center, 2019).

A family environment that includes both biological parents is often seen as an important resource for a successful transition through adolescence (Amato, 2001). Therefore, it is important to investigate the consequences of growing up in a single-parent family. One of the negative consequences that has been studied extensively is involvement in criminal behavior as an adolescent. It is well-established in the empirical literature (e.g., Amato, 2001; Kroese et al., 2021) as well as hypothesized by several criminological theories (e.g., *general strain theory* and *social control theory*; Agnew, 2006; Hirschi, 1969) that growing up in a single-parent family and juvenile delinquency are related. This is of high societal relevance, not only because the victims of delinquency suffer injuries, losses, and other harms (Campagna & Zaykowski, 2020), but also because criminal behavior is associated with negative life outcomes to the juvenile committing delinquent acts, such as a lower income (Apel & Sweeten, 2010), health problems (Massoglia, 2008), and a lower well-being and a higher probability of criminal involvement as an adult (Gilman et al., 2015).

In this paper, we attempt to unpack the relationship between criminal behavior of adolescents and growing up in a single-parent family by distinguishing differential characteristics of single-parent families in The Netherlands. More specifically, we differentiate on the basis of the type of single-parent family, the age of the child(ren) when the single-parent family started, and the sex of the biological parent the children grew up with. The reasoning behind our investigation of these characteristics, is the change in increasingly tolerant attitudes and norms regarding single-parent families in Western countries (Kreidl et al., 2017), such as

[3] No official term exists for children who do not grow up in a household with two biological parents. Many terms have been used in the literature. We chose to use the term 'single-parent family', but we are aware of the sensitivities regarding this type of wording.

the Netherlands. First, parental separation and single mothers by choice become a more common experience (CBS, 2018b; 2019a). Second, from 1995 onwards, divorcing parents could request joint legal custody of their children instead of the default of sole custody, and in 1998 joint legal custody became the default option (Staatsblad, 1995; 1997). However, it was still considered best for young children to spend a lot of time with their primary caregiver (e.g., only from age five onwards, children were recommended to stay overnight at the other parent's house). This has changed considerably over the years for younger children after the promotion of shared parenting (Richtlijnen Jeugdhulp, 2020). Third, equality between men and women in Western societies is increasing. For instance, Dutch women are becoming more financially independent, which results in a lower poverty risk for women after a separation (i.e., the poverty risk for women after a separation reduced from 25 percent in 2012 to 17 percent in 2017; CBS, 2020a). The current study thus adds to the existing literature by examining the relationship between criminal behavior during adolescence and (1) how single-parent families were constituted (by parental separation, parental decease, or being born to a single parent), (2) the age of the children when the different types of single-parent families were constituted, and (3) the distinction between children growing up with their biological father or biological mother in the different types of single-parent families. These three aspects have rarely been examined in prior research due to data limitations (e.g., due to a low number of single-father families; Demuth & Brown, 2004). In this study, longitudinal population register data were used that include the complete population of The Netherlands born in 1993-1999. Therefore, this dataset is large enough to allow authoritative answers to our research questions.

3.2.1 Constitution of single-parent families

A potentially important omission in most previous studies about the role of single-parent families in the onset of juvenile delinquency is that they have not considered the constituting event that generates a single-parent family (Kroese et al., 2021). Three types of single-parent families with children residing with one biological parent can be distinguished based on whether the family was generated by (1) parental separation, (2) the death of a parent, or (3) the child being raised by a single parent since birth. Although these experiences all result in single-parent families, they are associated with different processes and may have differential consequences for delinquent behavior.

The *family crisis model* focuses on the processes involved in family disruptions (see Mack et al., 2007). This model suggests that psychological distress, emotional resentment, and social tension are more often related to parental separation than parental death. Moreover, experiencing a crisis event often increases the likelihood for children to display antisocial behavior. Therefore, children who experience a parental separation may feel resentment toward their parents that will, in consequence, increase the likelihood of a reduced family attachment and more engagement in juvenile delinquency. In contrast, parental death is a traumatic event that produces anxiety, emotional distress, and depression, but does not usually involve the same level of emotional resentment as in separated families. Because children born to a single parent did not experience a family disruption crisis, these children are expected to display less criminal behavior than children in the other two types of single-parent families. However, since several criminological theories hypothesized that growing up in a single-parent family and juvenile delinquency are related, we do expect to find a higher likelihood to engage in criminal behavior for children born to a single parent than children living with both biological parents (e.g., *social control theory* (Hirschi, 1969) suggests that children in single-parent families might show more delinquency because they possibly have a less strong attachment to one or both parents). Therefore, based on the family crisis model combined with the other theories about the consequences of single-parent families, we hypothesize that (1) growing up in a single-parent family increases the likelihood to engage in juvenile delinquency compared to growing up with two biological parents (H1a), and, more specifically, that (2) of those children growing up in a single-parent family, children experiencing a parental separation show the highest level of juvenile delinquency, followed by children experiencing a parental death, and that children born to a single parent show the lowest level of juvenile delinquency (H1b).

Several empirical studies investigated the effects of parental separation and parental death. Most of the studies on parental disruption (see Kroese et al., 2021) showed that children with separated parents were more likely to engage in delinquent behavior than children living with both biological parents (e.g., Spohn & Kurtz, 2011; Vanassche et al., 2014) and the remaining studies showed no differences between these families. A study by Berg et al. (2019) on the effects of experiencing a parental death during childhood showed an increased risk of violent crime in adolescents. A study by Juby and Farrington (2001) found that

families disrupted by separation were more criminogenic than families disrupted by parental death when looking at reports on juvenile convictions. However, no differences between these two types of single-parent families were found when delinquency was self-reported. We know of no studies that specifically examined the effect of being born into a single-parent family.

3.2.2 Age of the children at the time of the constituting event

Except for children born to a single parent, children can experience the start of a single-parent family at any age. However, it is not clear yet to what extent the age of the children at the start of the family disruption influences the relation between living in single-parent families and juvenile delinquency.

Bowlby's *attachment theory* (Ainsworth & Bowlby, 1991) suggests that attachment derives from the biological preparation of both child and parents to respond to each other's behaviors in such a way that parents provide the child with care and protection. The loss of a biological parent can lead to weaker attachment and/or the development of insecure attachment, as a key relationship is ruptured. Bowlby proposes that disruptions at younger ages (especially during the first five years of life) have more negative effects than disruptions at a later age, since attachment is formed early in life. Research in several theoretical areas showed that attachment between parents and their child makes a difference in the adolescent's participation in delinquency (Sogar, 2017). Based on Bowlby's attachment theory, we hypothesize that a lower age of the children during the constitution of the single-parent family increases the likelihood to engage in juvenile delinquency (H2a). Moreover, when we combine Bowlby's attachment theory and the family crisis model, we hypothesize that children experiencing a parental separation at a younger age show a higher level of juvenile delinquency compared to children experiencing a parental death at a younger age (H2b).

The existing literature mostly confirms the expected relation between experiencing the constitution of a single-parent family at a younger age and a higher level of juvenile delinquency. Juby and Farrington (2001) reported a higher risk of juvenile delinquency when the parental disruption occurred from zero to four years old, compared to when it occurred from five to nine years old (although the risk again increased between age 10 and 14). Price and Kunz (2003) conducted a meta-analysis about parental divorce; when studies used samples of younger children in comparison with studies with older children, they found larger

criminogenic effect sizes. Berg et al. (2019) did not find statistically significant differences between the age categories with regard to the child's age at the time of death of their parent.

3.2.3 Sex of the biological parents

A number of contradictory ideas about the effects of the sex of the biological parent on juvenile delinquency have been constructed, leading us to formulate three (partially competing) hypotheses.

Bowlby's *attachment theory* (Ainsworth & Bowlby, 1991) predicts that separation from the mother is more harmful than separation from the father. Bowlby believed that it is crucial that a child experiences a warm and loving relationship with a mother figure. The *maternal hypothesis* is very similar, as it states that living with a single mother should be expected to cause a lower level of delinquency than living with a single father, because the mother is better able to exercise a more effective control of the child (see Eitle, 2006). Based on Bowlby's attachment theory and the maternal hypothesis, we hypothesize that growing up with only a biological father in a single-parent family increases the likelihood to engage in juvenile delinquency in comparison with growing up with only a biological mother (H3a). Moreover, when we combine these theoretical ideas and the family crisis model, we hypothesize that children experiencing a parental separation growing up with only a biological father show the highest level of juvenile delinquency, and children born to a single parent growing up with only a biological mother show the lowest level of juvenile delinquency (H3b).

In contrast to Bowlby's attachment theory, the *equality hypothesis* suggests that there is little difference between the single-mother and single-father families with respect to the criminal behavior of the children, because the equality between men and women in Western societies is increasing (see Eitle, 2006). Based on the equality hypothesis, we hypothesize that the sex of the biological parent in a single-parent family does not affect the likelihood to engage in juvenile delinquency (H3c).

The *same-sex hypothesis* states that the biological parent who is of the same sex as the child is the more effective role model for the child (see Eitle, 2006), suggesting that the father is a better role model for the son and the mother is a better role model for the daughter. Based on the same-sex hypothesis, we hypothesize that children growing up in same-sex parent-child dyads are less

likely to engage in juvenile delinquency than children growing up in opposite-sex parent-child dyads, meaning that sons growing up with biological mothers and daughters growing up with biological fathers have an increased likelihood to engage in juvenile delinquency compared to sons growing up with biological fathers and daughters growing up with biological mothers (H3d).

Congruent with these contradicting theories, empirical studies show conflicting results as well. A number of studies found support for the same-sex hypothesis. Ram and Hou (2005) and Eitle (2006) found that living in a single-mother family increases the level of crime for male adolescents compared to female adolescents. Vanassche et al. (2014) noted that growing up in a family with the same-sex parent reduces the level of delinquency of the children. However, Juby and Farrington (2001) found that boys were significantly more likely to self-report delinquency and have arrest records when growing up in a single-father family compared to a single-mother family. Moreover, Demuth and Brown (2004) found that mean levels of delinquency are highest among adolescents residing in single-father families, independent of the sex of the child.

3.2.4 Other factors

In studying the relationship between family structure and delinquency, several factors need to be controlled for. The first factor is parental crime, because several studies find a positive correlation between parental crime and juvenile delinquency (e.g., Besemer et al., 2017). The second factor is the sex of the child, because boys have typically been responsible for the majority of youth crimes (Peterson et al., 2007; Messerschmidt, 2013). The third factor is the income of the household. There are contradictory theories and results regarding household income. *General strain theory* (Agnew, 2006) suggests that delinquent behavior is affected by the strain caused by a relative lack of resources, which is more common in single-parent households. The *stigmatization hypothesis* states that single-parent families were normative in low income neighborhoods, but not in high income neighborhoods (Becker, 1963), resulting in a higher likelihood for children from single-parent families in high income neighborhoods to engage in criminal behavior. The *economic strain model* focuses on how lack of resources may mediate the effects that single-parent families have on adolescent criminal behavior (see Sogar, 2017). Some studies found that single-parent families were more strongly associated with crime in low income families (e.g., Hay et al.,

2006), yet other studies reported only a trivial effect of income on the relation between single-parent families and juvenile delinquency (e.g., Kierkus & Bear, 2003). The fourth factor is the birth year of the children to control for birth cohort effects, since from the 1990s onwards, in many Western countries the level of crime started to decrease (Farrell et al., 2014). The fifth factor is whether or not the single parent started to live together with a new partner. According to *social control theory* (Hirschi, 1969), the arrival of a stepparent should act as a protective factor, because two parents are available again to care for the children. However, according to *general strain theory* (Agnew, 2006), having a stepparent in the household might raise the level of family discord and lead to a greater risk of delinquency. Most empirical studies find results in accordance with general strain theory, showing an increased likelihood of juvenile delinquency after the entry of a stepparent into the family (e.g., Brown, 2006; Vanassche et al., 2014). The sixth factor is the country of birth of the children's biological parents, because several studies showed incongruent results regarding the relation between ethnic minority youths and crime rates (e.g., Rima et al., 2019). The seventh factor is the age of the biological mother at the birth of the child, as children born to younger mothers compared to children born to older mothers are more prone to general delinquency, violence, and arrest (e.g., Pogarsky et al., 2003).

3.3 Method

3.3.1 Data and study population

For the present study, seven complete birth cohorts of individuals born in the period 1993–1999 were selected. These seven birth cohorts were chosen to maximize the number of observed adolescents, since all required microdata sets were available for these birth cohorts. In particular, the data include crime data for each individual between ages 12 and 18. Individuals were excluded from the analysis if they were stillborn, if they passed away before the age of 19, or if they were born outside the Netherlands. If individuals emigrated before the age of 19, they were also removed from the data. The reason for this removal is that the crime data from the Dutch National Police only apply to crimes perpetrated in The Netherlands and does not include crimes perpetrated abroad. This resulted in a sample of 1,296,652 children.

The data used in this study were constructed by combining various register-based datasets accessible via Statistics Netherlands (Centraal Bureau voor de Statistiek).[4] These datasets contain (generally longitudinal) individual or household level data on the entire registered population of the Netherlands. We used the anonymized personal identifiers constructed by Statistics Netherlands to link the microdata sets. The datasets contain information from different sources. Basic demographic and administrative information about individuals and their family members, such as their date of birth and death, sex, registered address, and marital status, were extracted from the population register (Basisregistratie Personen). The population register does not only include current information, but also historical information, such as former addresses and previous marriage partners.

For the present study, it should be noted that at any point in time individuals can only be registered at a single address. Therefore, the registered address may not always have been the children's place of full-time residence, especially for children of separated parents. Often this registered address coincided with the address where they spent most of their time. However, for children of separated parents in 50/50 custody arrangements, the registered address is the place where they spent only half of their time. Based on an in-depth investigation of the validity of the registered home addresses of children of separated parents, Van der Wiel and Kooiman (2019) concluded that, in general, the registered address of children of separated parents adequately represents where children live and sleep. However, they also noted that a small number of children are registered with their father, yet actually live with their biological mother or live in a shared custody arrangement with both biological parents.

Information about household income, juvenile delinquency, and parental crime in the microdata was derived from other sources. Information on household income was based on data from The Dutch Tax and Customs Administration (Belastingdienst) from 2003 to 2010. The Dutch National Police provided data about juvenile delinquency from 2005 to 2017 by means of the Basic Facility for Law Enforcement (Basisvoorziening Handhaving [BVH]) and data about parental crime from 1996 to 2014 by means of the Police Offenders Identification System

[4] Under certain conditions, these microdata sets are accessible for statistical and scientific research. For further information: microdata@cbs.nl.

(Herkenningsdienst Systeem [HKS]). The HKS was dismantled in 2014. The BVH replaced the HKS, and it comprises a more elaborate list of offenses than the HKS system (see Table 1A for an overview of the types of crime in both datasets). Both datasets contain suspects of all ages who have been charged with a serious offense eligible for prosecution. This means that people received a 'procès-verbal', an official report drawn up by a police officer about a crime that has occurred. Although the dataset thus does not only contain data about delinquents who were convicted, over 90 percent of the people in the dataset are estimated to receive a transaction (e.g., a fine) or to be charged and found guilty by a judge (Besjes & Van Gaalen, 2008).

3.3.2 Measures

Family structure is a key concept in our analysis. It is operationalized by two variables, i.e. 'single-parent family' and 'type of single-parent family'.

Single-parent family. The first variable representing family structure is whether or not the individual always lived with both biological parents[5] between birth and age 12. Whether a child lived with both biological parents was measured at the start of each calendar year by verifying that the child's registered address was the same as the registered address of both biological parents. We did not distinguish between married and cohabiting parents. Single-parent families include children living with only one biological parent (possibly in combination with other adults, such as a stepparent or grandparent). Children living without any biological parents were excluded from the analyses (N = 6,792).

Type of single-parent family. Next to differentiating between children living with both biological parents and children living in single-parent families, we also make a distinction between different types of single-parent families, based on the event that resulted in the family becoming single-parent. This means that another key independent variable is the type of family the child lives in before age 12. In the first single-parent family, children live together with only one biological

[5] We are aware of the fact that data of Statistics Netherlands only contains information on legal parenthood. However, research shows that for over 99 percent of the children, their parents are their legal as well as their biological parents (e.g., Larmuseau et al., 2017). In the Netherlands, it is possible for two people of the same sex to both become the legal parents of a child. In our analyses, we will not make a distinction between same-sex couples and opposite-sex couples.

parent after their parents got separated. When one biological parent got a different registered address than the other biological parent and their offspring, this was coded as a parental separation. It is possible that the biological parents reunited after a (couple of) year(s), yet this child will still be categorized as having experienced a parental separation. In most cases, this constitutes families who experienced a parental break-up of a marriage or a cohabiting union. The second single-parent family includes children who live with one biological parent because the other biological parent has deceased. In the third single-parent family, children live together with only one biological parent throughout childhood, because they were born to a single parent (for instance, because one of the biological parents passed away before the child was born or because the biological parents never lived together).

To construct the variable 'type of single-parent family', we first checked whether the children were born to a single parent, and assigned these children to the third category of single-parent families 'living in a single-parent family due to being born to a single parent'. If this was not the case, we checked whether one of their parents had passed away between birth and age 11, and assigned these children to the second category of single-parent families 'living in a single-parent family due to a parental death'. In case this did not happen, we checked whether their biological parents had been separated between birth and age 11, and assigned these children to the first category of single-parent families 'living in a single-parent family due to a parental separation'.

Juvenile delinquency. The dependent variable was based on recorded criminal behavior of the adolescents as registered by the Dutch National Police. See Table 1A for an overview of the items about juvenile delinquency. It was defined as a dichotomous variable indicating whether or not the adolescent has been a suspect of any criminal act (i.e., legally prosecuted) between the age of 12 and 18, independent of the number of crimes or the severity of the crime(s).[6]

Age at family disruption. The age of the child when the single-parent family started was taken into account as an independent variable. For children born to

[6] The variables indicating the criminal behavior of the children and their parents were dichotomized, because they were highly right-skewed. Most people were never a suspect of a crime, and those who were a suspect often only were a suspect of a crime only once.

a single parent, the value of this variable was zero by definition. If the biological parents separate more than once, thus the child having two or more different ages of parental separation, only the first age of the child will be used in our analyses.

Sex of the biological parent. The sex of the biological parent the adolescent lived with during the year(s) of living in a single-parent family was also included as an independent variable. The data set contains an indicator of sex, and not gender identity, which means that only a binary indicator is available. To be able to test hypothesis 3d, the sex of the biological parent was cross-classified with the sex of the child.

Controls. We also included a set of control variables. First, we controlled for criminal behavior committed by the biological parents. See Table 1A for an overview of the items about parental crime, ranging from road traffic offenses to violent property crimes. We defined this variable as whether none of the biological parents, one of the biological parents, or two of the biological parents have been a suspect of a criminal act before the child turned 12 years old, independent of the number of crimes and the severity of the crime(s). Second, to account for the universally observed sex difference in delinquency, we controlled for the sex of the child. Third, we controlled for the annual income of the household in which the child lived at age 12. In order to correct for the impact of household size and composition on household income, we made use of an equivalence scale (CBS, 2019b), by taking into consideration (1) the size of the household and (2) whether the members were adults (18 years and older) or children. Moreover, to prevent households showing a negative household income being excluded from the sample as a consequence of using the natural logarithm function for household income, an additional dummy variable was included for negative household incomes. Fourth, we controlled for the birth cohort of the children consisting of the years 1993 until 1999, to control for unmeasured period effects in crime or in crime reporting practices. Fifth, we controlled for the possibility that a biological parent in a single-parent family got a new partner, by means of repartnering in the form of a cohabiting union or remarriage. We defined this variable as whether none of the biological parents, one of the biological parents, or two of the biological parents had a new partner before the child turned 12 years of age. Sixth, we controlled for the country of birth of the biological parents (based on a distinction made by Statistics Netherlands; CBS, 2021c), categorized as 'both biological parents were born in The Netherlands', 'one or two biological parents were born abroad in a

Western country' (i.e., countries in Europe (excluding Turkey), North America, and Oceania, as well as the countries Indonesia and Japan), and 'one or two biological parents were born in a non-Western country' (countries in Africa, Latin America, and Asia, as well as the country Turkey). If a child has one parent who was born in a Western county and one parent who was born in a non-Western county, this child was categorized as 'one or two biological parents were born in a non-Western country'. Seventh, we controlled for the age of the biological mother when the child was born, consisting of the categories 'until age 19', 'between age 20 and 29', 'between age 30 and 39', and '40 years and older'. To prevent multicollinearity, the age of the biological father was not included because it very strongly correlates with the age of the mother.

3.3.3 Analyses

Data management, record linkage, and analyses were executed on the secure server of Statistics Netherlands with STATA, version 15.0. Since the dependent variable is a dichotomous measure (i.e., whether or not the child has conducted juvenile delinquency between 12 and 18 years old), logistic regression analyses were performed. All analyses included the control variables mentioned above (see the Appendix for the complete tables including the control variables). Because the sample includes multiple siblings from the same families, these siblings have common unmeasured household characteristics. To correct for this violation of the independence assumption, we calculated robust standard errors that correct for common household-membership.

3.4 Results

3.4.1 Descriptive statistics

A total of 1,296,652 children were included in the analyses. Of these children, 77.08% grew up living with both biological parents, 14.47% experienced a parental separation, 1.11% experienced a parental death, and 7.33% was born to a single parent (see Table 1 for the descriptive statistics of each variable for the different types of families).

Table 1

Descriptive Statistics (in percentages, unless stated differently)

	Family with two biological parents	Single-parent family		
		Separated parents	One biological parent passed away	Born to a single parent
Juvenile delinquency				
Did not engage in delinquency	91.51	82.29	85.85	75.12
Engaged in delinquency	8.49	17.71	14.14	24.88
Number of criminal parents				
No criminal parents	90.81	65.25	83.99	53.31
One criminal parent	8.48	29.12	13.99	34.83
Two criminal parents	0.70	5.63	2.02	11.86
Sex of the child				
Son	51.19	51.25	51.03	51.28
Daughter	48.81	48.75	48.97	48.72
Mean age of the child during the disruption (in years)	–	6.48	6.80	0.00
Sex of the single parent				
Only a biological father	–	6.22	31.13	3.73
Only a biological mother	–	93.78	68.87	96.27
Household income (in euros)	40,875	25,446	31,183	22,818
New partner(s)				
No new partners	–	40.57	71.17	50.23
One new partner	–	41.67	27.77	42.88
Two new partners	–	17.76	1.06	6.89
Nationality biological parents				
Both from The Netherlands	83.46	72.37	77.81	51.18
At least one parent from a Western country	3.60	4.68	3.68	5.08
At least one parent from a non-Western country	12.94	22.96	18.51	43.74
Age biological mother				
Until age 19	0.47	1.86	0.57	6.58
Between 20 and 29	39.08	51.28	30.37	48.53
Between 30 and 39	58.46	45.28	63.51	40.84
Age 40 and older	1.99	1.58	5.54	4.05

Table 2

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Type of Family (H1a) and the Different Types of Single-Parent Family (H1b) as Main Independent Variable (*N* = 1,295,683)

	H1a		H1b	
	OR	CIs	OR	CIs
Type of family (Reference category = Intact family)				
Single-parent family	1.70***	[1.67, 1.73]		
Type of single-parent family (Reference category = Intact family)				
Separated parents			1.64***	[1.61, 1.67]
One biological parent passed away			1.62***	[1.54, 1.70]
Born to a single parent			1.91***	[1.86, 1.96]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. See Appendix for all tables containing the results including the covariates.

3.4.2 Growing up in (the different) single-parent families

First, a logistic regression model was estimated to determine the relation between growing up living with both biological parents or living in a single-parent family and becoming a suspect of juvenile delinquency. The results, reported in Table 2, demonstrate that having lived with one biological parent before age 12 (compared to having lived with two biological parents before age 12) significantly increased the odds that the child became a suspect of delinquent behavior during adolescence (OR = 1.70, 95% CI [1.67, 1.73]). This means that hypothesis H1a is confirmed, because growing up in a single-parent family increased the likelihood to engage in juvenile delinquency compared to growing up with two biological parents.

Next, we estimated a model in which the three types of single-parent family categories were included separately and contrasted with children living with both biological parents. The results (see Table 2) show that having separated parents before age 12, having one deceased biological parent before age 12, or being born to a single parent (compared to having lived with two biological parents before age 12) all significantly increased the odds that the child became a suspect of delinquent behavior. Being born to a single parent showed the largest effects (OR = 1.91, 95% CI [1.86, 1.96]), followed by having separated parents (OR = 1.64, 95% CI [1.61, 1.67]) and having one deceased biological parent before age 12 (OR = 1.62,

95% CI [1.54, 1.70]). Being born to a single parent also significantly increased the odds that the child became a suspect of delinquent behavior compared to having separated parents before age 12 (OR = 1.17, 95% CI [1.14, 1.19]) or having one deceased biological parent before age 12 (OR = 1.18, 95% CI [1.12, 1.24]). Having separated parents before age 12 did not significantly increase the odds that the child became a suspect of delinquent behavior compared to having one deceased biological parent before age 12 (OR = 1.01, 95% CI [0.96, 1.07]). Thus, hypothesis H1b is not confirmed, because among children growing up in a single-parent family, children experiencing a parental separation before age 12 did not show the highest likelihood to engage in juvenile delinquency and children born to a single parent did not show the lowest likelihood to engage in juvenile delinquency. Instead, children born to a single parent showed the highest likelihood to engage in delinquency and both children experiencing a parental separation before age 12 and children having one deceased biological parent before age 12 showed the lowest likelihood.

3.4.3 Age of the children during the disruption

A logistic regression model was estimated to establish the relation between the age of the children when the single-parent family was constituted and juvenile delinquency, in comparison with children living with both biological parents. As shown in Figure 1, the higher the age of the children at the start of the single-parent family, the lower the likelihood that they became a suspect of delinquent behavior. The decreasing odds started to stabilize from age six onwards, meaning that there is little difference between children experiencing a disruption at age six or at age 11. These results imply that hypothesis H2a is confirmed, because a lower age of the children during the constitution of the single-parent family increased the likelihood to engage in juvenile delinquency.

Another logistic regression model was estimated to investigate the relation between the age of the children when the different single-parent families were constituted and juvenile delinquency, in comparison with children living with both biological parents (see Figure 1). Age zero represents the children born to a single parent, and these children show a higher likelihood to become a suspect of delinquent behavior (OR = 1.94, 95% CI [1.89, 1.99]) than children living with both biological parents. Both the children experiencing a parental separation and the children with one deceased biological parent show a lower likelihood to become

a suspect of delinquent behavior when the children are older at the start of the single-parent family. We did not find statistically significant differences between children experiencing a parental separation and the children with one deceased biological parent at the different age categories. These results do not confirm hypothesis H2b, because both a lower age of the children when their parents separated and a lower age of the children when one of the parents passed away increased the likelihood to engage in juvenile delinquency.

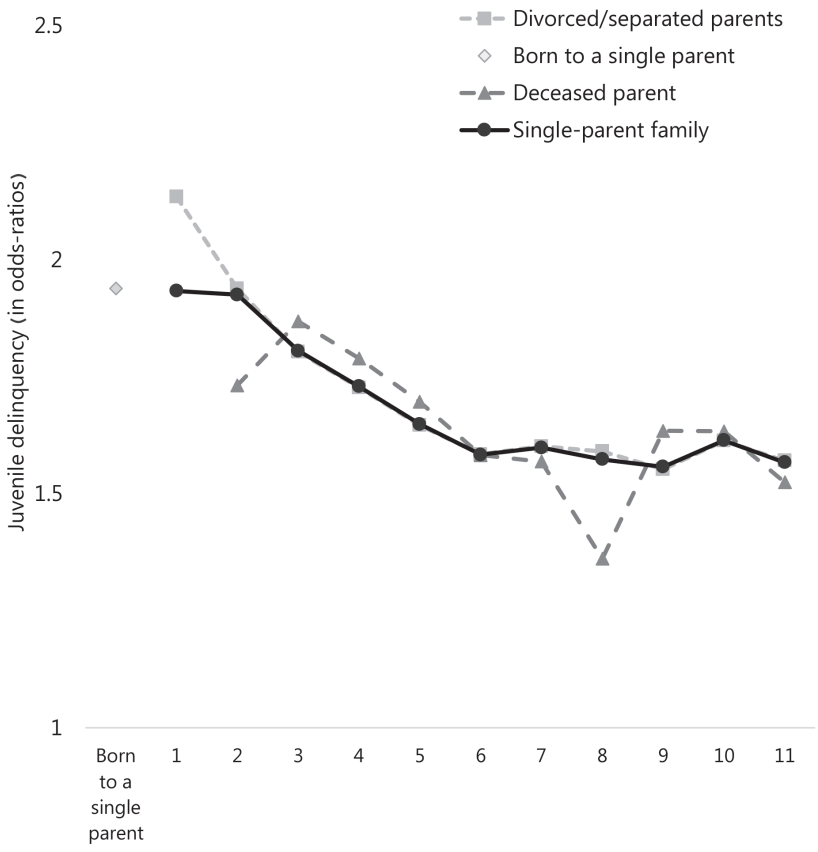


Figure 1. Age of the children when the (different types of) single-parent families were constituted and juvenile delinquency (in odds-ratios, *N* = 1,295,681, reference category = children living with both biological parents). Two children were omitted from the analysis, because the category 'deceased parent' at age 1 only comprised of two children. See Appendix for all tables containing the results including the control variables.

Table 3

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Sex of the Parent in a Single-Parent Family (H3a/H3c), Sex of the Parent in the Different Single-Parent Families (H3b), and Sex of the Parent and Child in Single-Parent Families (H3d) as Main Independent Variable (*N* = 1,295,683)

	H3a/H3c		H3b		H3d	
	OR	CIs	OR	CIs	OR	CIs
Sex of the parent (Reference category = Family with two biological parents)						
Living with only a biological father	1.50***	[1.44, 1.57]				
Living with only a biological mother	1.73***	[1.69, 1.76]				
Sex of the parent (Reference category = Family with two biological parents)						
Living with only a father because parents separated			1.57***	[1.48, 1.66]		
Living with only a mother because parents separated			1.65***	[1.62, 1.69]		
Living with only a father because of a deceased parent			1.53***	[1.39, 1.68]		
Living with only a mother because of a deceased parent			1.67***	[1.57, 1.77]		
Living with only a father because born to a single parent			1.30***	[1.17, 1.43]		
Living with only a mother because born to a single parent			1.95***	[1.90, 2.01]		
Sex of the parent and child (Reference category = Daughter living with both biological parents)						
Son living with both biological parents					3.45***	[3.39, 3.51]
Daughter living with only a biological father					1.79***	[1.66, 1.93]
Son living with only a biological father					4.85***	[4.60, 5.11]
Daughter living with only a biological mother					2.00***	[1.95, 2.05]
Son living with only a biological mother					5.58***	[5.45, 5.71]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. See Appendix for all tables containing the results including the covariates.

3.4.4 Sex of the biological parent in single-parent families

In the next logistic regression, we investigated the relation between the sex of the biological parent in the single-parent family and juvenile delinquency, and compared this to children living with both biological parents (see Table 3). Growing up with only a biological mother (OR = 1.73, 95% CI [1.69, 1.76]) or only a biological father (OR = 1.50, 95% CI [1.44, 1.57]) significantly increased the chance that the child became a suspect of delinquent behavior compared to children growing up with both biological parents. Growing up with a biological mother compared to growing up with a biological father significantly increased the chance that the child became a suspect of delinquent behavior (OR = 1.15, 95% CI [1.10, 1.20]). Based on these results, both hypothesis H3a and hypothesis H3c cannot be confirmed, because growing up with only a biological father in comparison with growing up with only a biological mother did not increase the likelihood to engage in juvenile delinquency (H3a), and we did not find differences in the results because of the sex of the biological parents (H3c). Instead, we found an increased likelihood to become a suspect of delinquent acts among children growing up with only a biological mother compared to growing up with only a biological father.

Another logistic regression was performed to establish the relation between the sex of the biological parent in combination with the type of single-parent family and juvenile delinquency, and again compared this to children living with both biological parents (see Table 3). Growing up with only a biological mother compared to a biological father when the child was born to a single parent (OR = 1.51, 95% CI [1.36, 1.67]) significantly increased the chance that the child became a suspect of delinquent behavior. We did not find statistically significant differences between growing up with only a biological mother or a biological father after a separation (OR = 1.05, 95% CI [1.00, 1.11]), and growing up with only a biological mother or a biological father when one of the parents passed away (OR = 1.09, 95% CI [0.98, 1.22]). Based on these results, hypothesis H3b cannot be confirmed. We hypothesized that children experiencing a parental separation growing up with only a biological father would show the highest level of juvenile delinquency, and children born to a single parent growing up with only a biological mother would show the lowest level of juvenile delinquency (H3b). However, our results showed that children born to a single parent growing up with only a biological mother showed the highest likelihood on becoming a suspect of juvenile delinquency, and children born to a single parent growing up with only a biological father showed the lowest likelihood on becoming a suspect of juvenile delinquency.

3.4.5 Sex of the biological parent and the child in single-parent families

A logistic regression was performed to establish the relation between the sex of the biological parent in combination with the sex of the child in the single-parent family and juvenile delinquency, and compared children in each category to daughters living with both biological parents (the reference category, see Table 3). Note that the estimates reported in Table 3 (and in the other regression result tables) allow us to compare the effects of any two categories by taking the *ratio of their odds ratios*. This feature allows for more meaningful interpretations. In addition, we calculated confidence intervals of these odds ratios.

A daughter growing up with only a biological mother (OR = 2.00, 95% CI [1.95, 2.05]) or only a biological father (OR = 1.79, 95% CI [1.66, 1.93]) significantly increased the chance that the daughter became a suspect of delinquent behavior compared to a daughter growing up with both biological parents. A daughter growing up with a biological mother in comparison with a biological father also significantly increased the chance that the daughter became a suspect of delinquent behavior (2.00 / 1.79 = 1.12, 95% CI [1.03, 1.20]). A son growing up with only a biological mother (OR = 1.62, 95% CI [1.58, 1.65]) or only a biological father (OR = 1.41, 95% CI [1.34, 1.48]) significantly increased the chance that the son became a suspect of delinquent behavior compared to a son growing up with both biological parents. A son growing up with a biological mother in comparison with a biological father also significantly increased the chance that the son became a suspect of delinquent behavior (OR = 5.58 / 4.85 = 1.15, 95% CI [1.09, 1.21]). This means that hypothesis H3d is only partially confirmed, because sons growing up with biological mothers (compared to sons growing up with biological fathers) did show a higher likelihood to engage in juvenile delinquency. However, daughters growing up with biological mothers (comparewd to daughters growing up with biological fathers) also showed an increased likelihood to engage in juvenile delinquency.[7]

[7] As an exploratory analysis, we also performed a logistic regression to establish the relation between the sex of the parent in combination with the sex of the child in the three different single-parent families and juvenile delinquency (thus combining the same-sex hypothesis and the family crisis model) and compare this to daughters living with both parents (see Table 9A in the Appendix). A daughter growing up with only a mother when the daughter is born to a single parent compared to growing up with only a father when the daughter is born to a single parent, significantly increased the chance that the daughter became a suspect of delinquent behavior. No parental sex differences were found when daughters experienced a parental separation or a parental death. A son growing up with only a mother when the son is born to a single parent compared to growing up with only a father when the son is born to a single parent, significantly increased the chance that the son became a suspect of delinquent behavior. Moreover, a son growing up with only a mother due to a parental separation compared to growing up with only a father due to a parental separation, significantly increased the chance that the son became a suspect of delinquent behavior. No parental sex differences were found when sons experienced a parental death.

3.4.6 Control variables

Most of the estimates for the control variables included in all models were in line with expectations from the literature (see Appendix for all tables comprising the results including the control variables). Having one or two criminal biological parents, being a boy, coming from a later birth cohort, having one or two stepparents, and having at least one biological parent from a Western or non-Western country, all increased the likelihood that the child has been a suspect of a criminal act. We found no effect of household income on children's likelihood to engage in juvenile delinquency. Children born to a biological mother before age 20 or children born to a biological mother aged 20 to 29 were more likely to become a suspect of juvenile delinquency than children born to a biological mother aged 30 to 39. Children having an older biological mother (age 40 or older) when they were born also showed a higher level of juvenile delinquency than children born to a biological mother aged 30 to 39.

Both household income and the presence of stepparents could possibly mediate the relation between family composition and delinquency.[8] Therefore, we also performed all analyses of this study without including these two variables, so that the family composition variables capture both direct and indirect effects. Removing these two variables did not change the directions or significance levels of the remaining variables. Consequently, we include household income and the presence of stepparents in the reported outcomes.

3.5 Discussion

By analyzing longitudinal population register data from of the Netherlands, the current study sought to expand existing knowledge on the relationship between growing up in single-parent families and delinquency during adolescence (ages 12-18). Single-parent families were differentiated along three dimensions, namely (1) by how they were constituted (either parental separation, parental decease, or being born to a single parent), (2) by the age of the child when the single-parent family was constituted, and (3) by the sex of the biological parent the child grew up with in the single-parent family. See Table 4 for an overview of the hypotheses and findings in this study.

[8] We thank one of the anonymous reviewers for this observation.

Table 4

An Overview of the Hypotheses and Findings in this Study

Code	Hypothesis	Finding
H1a	Growing up in a single-parent family increases the likelihood to engage in juvenile delinquency compared to growing up with two biological parents.	Hypothesis confirmed.
H1b	Of those children growing up in a single-parent family, children experiencing a parental separation show the highest level of juvenile delinquency, followed by children experiencing a parental death, and that children born to a single parent show the lowest level of juvenile delinquency.	Children born to a single parent showed the highest likelihood to engage in delinquency and both children experiencing a parental separation and children having one deceased biological parent showed the lowest likelihood.
H2a	A lower age of the children during the constitution of the single-parent family increases the likelihood to engage in juvenile delinquency.	Hypothesis confirmed.
H2b	Children experiencing a parental separation at a younger age show a higher level of juvenile delinquency compared to children experiencing a parental death at a younger age.	Both a lower age of the children when their parents separated and a lower age of the children when one of the parents passed away increased the likelihood to engage in juvenile delinquency.
H3a	Growing up with only a biological father in a single-parent family increases the likelihood to engage in juvenile delinquency in comparison with growing up with only a biological mother.	There is an increased likelihood to become a suspect of delinquent acts among children growing up with only a biological mother compared to growing up with only a biological father.
H3b	Children experiencing a parental separation growing up with only a biological father show the highest level of juvenile delinquency, and children born to a single parent growing up with only a biological mother show the lowest level of juvenile delinquency.	Children born to a single parent growing up with only a biological mother performed the highest level of juvenile delinquency, and children born to a single parent growing up with only a biological father performed the lowest level of juvenile delinquency.
H3c	The sex of the biological parent in a single-parent family does not affect the likelihood to engage in juvenile delinquency.	There is an increased likelihood to become a suspect of delinquent acts among children growing up with only a biological mother compared to growing up with only a biological father.
H3d	Children growing up in same-sex parent-child dyads are less likely to engage in juvenile delinquency than children growing up in opposite-sex parent-child dyads (i.e., sons growing up with biological mothers and daughters growing up with biological fathers have an increased likelihood to engage in juvenile delinquency compared to sons growing up with biological fathers and daughters growing up with biological mothers).	Sons growing up with biological mothers (compared to sons growing up with biological fathers) did show a higher likelihood to engage in juvenile delinquency. However, daughters growing up with biological mothers (compared to daughters growing up with biological fathers) also showed an increased likelihood to engage in juvenile delinquency.

First, based on extensive prior evidence (e.g., Kroese et al., 2021), we hypothesized that growing up in a single-parent family would increase the likelihood of engaging in juvenile delinquency, as compared to growing up with both biological parents (H1a). Our results confirmed this hypothesis, showing that having lived with only one biological parent before age 12 increased the likelihood that an adolescent became involved in crime during adolescence.

Second, based on the family crisis model, we hypothesized that, of the three categories of children growing up in a single-parent family, those who experienced a parental separation would display the highest level of juvenile delinquency, followed by those who experienced a parental death. Children born to a single parent were hypothesized to display the lowest levels (H1b). However, children born to a single parent showed the highest level of delinquency. Children who experienced parental separation and children having one deceased biological parent both showed lower levels of delinquency. This is in contrast with the family crisis model. A possible explanation of this finding is that the three categories of single-parent families are confounded with the length of exposure: While children born to a single parent have been exposed their whole life to a single-parent family when they reach adolescence, children experiencing parental separation or decease are on average exposed for a much shorter time period (which is congruent to the results of hypothesis 2). Since children born to a single parent never lived with two biological parents, this might result in a higher risk of juvenile delinquency. Moreover, we did not find the expected difference in delinquency between children who experienced parental separation and children having one deceased biological parent. Since a study by Juby and Farrington (2001) found contradictory results depending on the method used to investigate the differences between parental separation and parental death, and a recent study by Berg et al. (2019) found an increased risk of violent crime after experiencing a parental death, it is possible that the family crisis model is not valid, or is no longer valid.

Third, we hypothesized that a lower age of the children during the constitution of the single-parent family, would increase the likelihood to engage in juvenile delinquency (H2a). Our results confirmed that a lower age during the start of a single-parent family increased the chance that the child has been a suspect of a criminal act during adolescence. This is exactly in line with Bowlby's attachment theory (Ainsworth & Bowlby, 1991), that suggests that disruptions at younger ages (especially during the first five years of life) are more damaging than disruptions

at a later age, and in line with the study conducted by Juby and Farrington (2001), reporting a higher risk of juvenile delinquency when the disruption occurred from zero to four years old. Again, as described above, this could also be influenced by the length of exposure of the child to the single-parent family. Next to this, the likelihood to engage in juvenile delinquency at a higher age of the children during the start of a single-parent family is also substantially higher compared to children growing up with two biological parents.

Fourth, we hypothesized that children experiencing a parental separation at a younger age show a higher level of juvenile delinquency, compared to children experiencing a parental death at a younger age (H2b). This hypothesis was rejected, because children experiencing a parental separation at a younger age and children experiencing a parental death at a younger age both show a higher level of juvenile delinquency, compared to experiencing the start of both types of single-parent families at a higher age. This is in line with Bowlby's attachment theory, but not with the family crisis model, since we did not find a difference between the two types of single-parent families. It is also in line with previous results described above: we did find age effects at the start of the single-parent family, but no effects of the type of single-parent family. Therefore, the findings confirm our thoughts of the importance of the length of exposure to the single-parent family, since all three types of single-parent families show a higher likelihood to engage in juvenile delinquency after experiencing the start at a younger age than at an older age.

Fifth, we hypothesized that growing up with only a biological father compared to only a biological mother in a single-parent family would increase the likelihood to engage in juvenile delinquency (H3a), and we hypothesized that the sex of the biological parent in a single-parent family would not affect the likelihood to engage in juvenile delinquency (H3c). However, contrasting Bowlby's attachment theory, the maternal hypothesis, and the equality hypothesis, our results suggested that growing up with only a biological mother significantly increased the chance that the child has been a suspect of a criminal act. Since we controlled for many variables in our analyses, for instance a lower household income in single-mother families or a higher occurrence of a new stepparent in single-parent families cannot explain our unexpected results. One possible explanation that cannot be tested with population register data is parental closeness. Research on the roles of mothers and fathers in causing delinquency has shown that children are closer to their mother than to their father, but closeness to the father is the better

predictor of delinquent behavior (Johnson, 1987). Moreover, a better father-child relationship was related to a deeper decline trajectory of adolescent delinquency (Yoder et al., 2016). Therefore, higher paternal closeness might be related to the children in single-father families, decreasing the likelihood to engage in juvenile delinquency.

Sixth, we hypothesized that children experiencing a parental separation growing up with only a biological father would show the highest level of juvenile delinquency, and children born to a single parent growing up with only a biological mother would show the lowest level of juvenile delinquency (H3b). However, our results showed that children born to a single parent growing up with only a biological father showed the lowest level of juvenile delinquency, and children born to a single parent growing up with only a biological mother showed the highest level of juvenile delinquency. Factors that otherwise could have been a possible explanation for this finding have already been controlled for in the analysis (e.g., household income, age of the mother, and stepparents).

Seventh, we hypothesized that the sex of the biological parent in a single-parent family would depend on the sex of the child to increase the likelihood to engage in juvenile delinquency (H3d). This hypothesis is only partially confirmed, because sons growing up with biological mothers (compared to sons growing up with biological fathers) did show a higher likelihood to engage in juvenile delinquency. However, daughters growing up with biological mothers (compared to daughters growing up with biological fathers) also showed an increased likelihood to engage in juvenile delinquency, although we expected to find the opposite result. Again, as mentioned above, this might be explained by paternal closeness, since both sons and daughters show a lower likelihood to engage in juvenile delinquency when the closeness to their father is high (Johnson, 1987; Yoder et al., 2016), most likely also occurring in single-father families. Another possible explanation is that sons are more in need of a role model of the same gender than daughters. These two explanations are hypothetical and need further exploration.

3.5.1 Limitations and future research

Although using population register data has many advantages (such as having a large sample size and data provided by reliable sources), it also has some limitations. First, register data do not include information on the mechanisms of

family life during childhood that are potentially relevant. For example, the level of parental conflict before and after the parental separation has been shown to increase the problem behaviors of the children (Amato & Cheadle, 2008). This lack of data on prior family dynamics may be an important source of residual confounding. Second, we cannot extract the full information from the data about the living situation of the families. The children can be registered at only one address in the Dutch population register, yet other types of living situations are possible as well. For instance, after a parental separation, the children can be officially registered at their mothers' address, but unofficially live with their biological father fifty percent of the time as well. These type of co-parenting arrangements cannot be studied, which is unfortunate as an increasing proportion of separated parents in Western countries now have co-parenting arrangements in place (Smyth, 2017). This situation also applies to the biological parents, since it is possible that they have an intimate relationship but live at separate addresses (i.e., Living Apart Together relationship), wanted or unwanted (e.g., due to living away from home for work or due to imprisonment). Third, population register data only uses officially registered information regarding delinquency, while not all delinquent acts are registered by the police, resulting in an underestimation of the number of delinquent behaviors (Groot et al., 2007).

We have three suggestions for future research. First, new studies should examine juvenile delinquency in more detail, including a more detailed distinction between incidental and persistent delinquency, the difference between minor and serious crime, and different types of crime. For instance, because the household income is generally lower in families with only one biological parent, it is possible that the children are more inclined to engage in offenses such as stealing to obtain money. Second, our study did not make a distinction between temporary parental separations and permanent parental separations. It is possible that the separated biological parents reunite after a (couple of) year(s). Although a child in our study is categorized as having experienced a parental separation, which is correct, it would be great to take into account in future research whether the parents permanently separated, reunited before age 12 of the child, or reunited during the child's adolescent years. Third, to this day, many children still grow up in single-parent families, and growing up in a single-parent family still seems to have negative consequences. Thus, for instance, this seems not to be just a consequence of stigma, because if stigma played a major role, the effects would be

relatively minor by now. Therefore, we recommend investigating the mechanisms behind the relation between single-parent families and juvenile delinquency.

3.5.2 Implications

The methodological implication of our research is that this topic regarding family structure and juvenile delinquency could be investigated more extensively with population register data. Because some family structures are relatively rare, such as children living in single-father families and children being born into a single-parent family, researchers had problems with finding enough respondents for their studies (Demuth & Brown, 2004). In contrast with the hypothesis regarding age of the child at the start of the family (with results in line with Bowlby's attachment theory), the hypotheses about the differences between single-parent families (based on the family crisis model) and the sex of the parent whom the children live with (based on Bowlby's attachment theory, the maternal hypothesis, the equality hypothesis, and the same-sex hypothesis) were not confirmed. Since researchers were able to study the effects of age at the start of the single-parent family, it is not surprising that Bowlby's attachment theory, previous studies (e.g., Juby & Farrington, 2001), and our study show similar results. The other hypotheses about how the differences between single-parent families and the sex of the parent the children live with are related to juvenile delinquency, resulted in mixed outcomes with regard to theories, previous studies and the present study. Therefore, and aware of the fact that availability of such data for scientific research varies widely between countries, we recommend using population register data more often to study the relation between single-parent families and juvenile delinquency, to obtain more knowledge about the validity of these theories.

Our results potentially also have theoretical implications. We clearly found evidence for the criminological theories (e.g., *general strain theory* and *social control theory*; Agnew, 2006; Hirschi, 1969) stating that growing up in a single-parent family and juvenile delinquency are related. However, as described above, we found mixed results with regard to some of the other theories. Based on the family crisis model, we expected to find that children experiencing a parental separation would show the highest level of juvenile delinquency, followed by children experiencing a parental death, and that children born to a single parent would show the lowest level of juvenile delinquency. However, both children experiencing a parental separation and children having one deceased biological

parent showed a similar likelihood to engage in juvenile delinquency. This may be caused by the change towards increasingly tolerant attitudes and norms regarding single-parent families in Western countries (Kreidl et al., 2017) and the promotion of shared parenting (Richtlijnen Jeugdhulp, 2020), resulting in a reduced likelihood to engage in delinquency over the last couple of decades for children who experienced a parental separation. Moreover, children born to a single parent showed the highest likelihood to engage in delinquency. Therefore, it is possible that the family crisis model is not valid, or is no longer valid, since the children who did not experience a crisis event showed the highest level of juvenile delinquency. Our results also showed that disruptions at younger ages are more damaging than disruptions at a later age (in line with Bowlby's attachment theory). However, when looking at the sex of the parent, our results showed that children born to a single parent growing up with only a biological father performed the lowest level of juvenile delinquency. This would imply that the sex of the parent is a stronger predictor of juvenile delinquency than the age of the child during the disruption. We indeed found an increased likelihood to become a suspect of delinquent acts among children growing up with only a biological mother compared to growing up with only a biological father. This is in contrast with all theories mentioned regarding the sex of the single parent combined with juvenile delinquency (Bowlby's attachment theory, the maternal hypothesis, the equality hypothesis, and the same-sex hypothesis). However, although our results indeed showed a statistically significant difference between single fathers and single mothers, these differences are rather small (i.e., this is an enormous dataset and tiny associations observed will often be significant), and we found no gender differences for children experiencing a parental separation and children having one deceased biological parent when specifically looking at the type of single-parent family. Concluding, except for the criminological theories stating that growing up in a single-parent family and juvenile delinquency are related, we found unexpected results with regard to other theories mentioned. More research is warranted on this topic for an unequivocal answer with regard to our unexpected results, as well as to be able to provide recommendations for practice and policy.

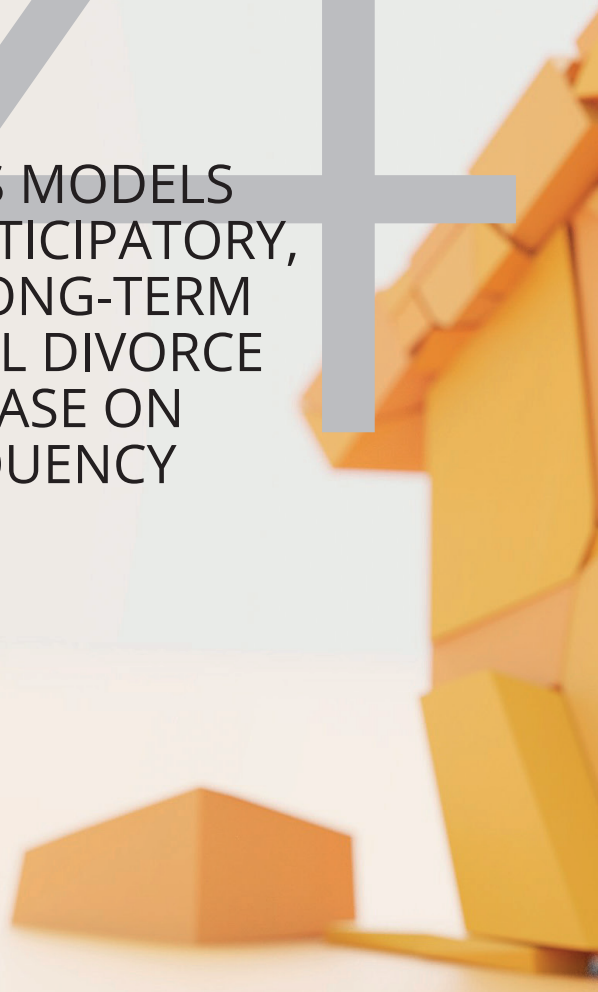
3.5.3 Conclusion

Compared to children living with both biological parents, findings suggest that the likelihood of juvenile delinquency increases (1) when children are born

to a single parent, followed by children with separated parents and children experiencing parental death, (2) when the single-parent family started at a younger age, and (3) when children grow up with only a biological mother, both for sons and daughters, compared to only a biological father. This implies that the relationship between growing up in single-parent families and juvenile delinquency is much more complex than often assumed. Future research should pay more attention to diversity in the composition of single-parent families

CHAPTER 4

USING FIXED-EFFECTS MODELS TO ESTIMATE THE ANTICIPATORY, SHORT-TERM, AND LONG-TERM EFFECTS OF PARENTAL DIVORCE AND PARENTAL DECEASE ON ADOLESCENT DELINQUENCY



Janique Kroese, Wim Bernasco, Aart C. Liefbroer, and Jan Rouwendal

4.1 Abstract

Studies investigating the role of single-parent families in adolescent delinquency have seldom differentiated between types of single-parent families. Furthermore, they have typically assumed that parental disruption is a discrete event marking an abrupt change between dual-parenthood and single-parenthood. Using Dutch population register data, we estimated fixed-effects panel models to assess the effects of a parental separation or a parental decease on the likelihood to engage in adolescent delinquency. We also distinguished between anticipatory, short-term, and long-term effects. We found that both parental separation and parental decease boost adolescent delinquency, and we found no difference between these types of single-parent families. In addition, we found a short-term increase in adolescent delinquency after a parental separation, and an anticipatory reduction in adolescent delinquency before a parental decease. Future research should pay more attention to diversity in the composition of single-parent families, as well as to the anticipatory, short-term and long-term consequences.

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4.2 Introduction

Many studies have examined the effects of broken homes on the delinquent behavior of offspring. These studies showed that offspring growing up in single-parent families is more likely to engage in delinquent behavior than offspring growing up in two-parent families (Kroese et al., 2021). Since delinquency has many negative consequences, both for the person committing the behavior (e.g., health problems, a lower income and well-being, and a higher probability of adult criminal involvement; Apel & Sweeten, 2010; Gilman et al., 2015; Massoglia, 2008) as well as for the victim(s) of the delinquent behavior (e.g., injuries, mental health issues, and financial loss; Campagna & Zaykowski, 2020), it is important to discover how to reduce adolescent delinquency. Although many studies have addressed the relation between single-parent families and adolescent delinquency, many questions about this relation remain.

Several gaps in the literature can be noted. First, previous studies have used statistical methods that are not tailored to rigorously estimate the causal effects of living in a single-parent family on delinquency (e.g., cross-sectional data; Spohn & Kurtz, 2011; Vanassche et al., 2014). These models rely on strong and untestable assumptions. Consequently, it is possible that the observed association between single-parent families and delinquency in these studies is confounded due to spurious associations, and does not represent a causal effect. In contrast, fixed-effects panel models make much weaker assumptions, and can provide stronger evidence on the causal effects of living in single-parent families on adolescent delinquency. Second, other studies have treated parental disruption as a single event instead of as a long-term event (e.g., Banyard et al., 2006; Kierkus & Hewitt, 2009). They have thus assumed a homogenous 'low risk' period before the parental disruption and a homogenous 'high risk' period after the event. This assumption prevents an exploration of the possibility that the increased likelihood to engage in delinquency already commenced before the single-parent family started, or that increased delinquency quickly reduces after the start of the single-parent family. Third, most studies only look at single-parent families caused by parental separation or look at single-parent families in general (i.e., a combination of single-parent families caused by parental separation or by parental decease), but they do not distinguish between the effects of parental separation and parental decease on adolescent delinquency (e.g., Brown, 2006; Champion et al., 2008; Vanassche et al., 2014). Because experiencing a parental decease before adulthood is relatively

rare in most parts of the industrialized world, this caused researchers to have difficulties in investigating this topic (Demuth & Brown, 2004). Therefore, we do not know whether single-parent families caused by parental separation or parental decease have a different impact on adolescent delinquency, although finding a difference between these two single-parent families may help us get a step closer to finding the mechanism that causes this relation between single-parent families and delinquency. Fourth, to our knowledge, studies have only assessed the effects of growing up in a single-parent family from a young age onwards on adolescent delinquency (Kroese et al., 2021). Hence, we are unaware of how entering a single-parent family as an adolescent affects delinquent behavior. Since adolescence is a period of both growing autonomy and continued connectedness to parents (Laible et al., 2000), it is interesting to see how adolescents respond to a parental disruption.

4.2.1 Single-parent families formed by parental separation and parental death

Many theories have been used to investigate the delinquency-stimulating effects of growing up in a single-parent family, including *attachment theory* (Ainsworth & Bowlby, 1991), the *economic strain model* (Sogar, 2017), the *family crisis model* (Mack et al., 2007), *general strain theory* (Agnew, 2006), the *social control/ parental absence model* (Gottfredson & Hirschi, 1990), and *social control theory* (Hirschi, 1969). These theories all argue that single-parent households create conditions that make offspring more likely to engage in delinquent behavior. However, only the family crisis model makes a distinction between single-parent families caused by separation and single-parent families caused by a parental death.

The family crisis model suggests that experiencing a parental separation causes psychological distress, emotional resentment, and social tension in offspring, more than a parental death. The emotional resentment of offspring towards their parents may decrease the level of family attachment and increase offspring's criminal behavior. In contrast, the model suggests that experiencing a parental death causes anxiety, emotional distress, and depression, but does not generate the same level of emotional resentment as experiencing a parental separation does (see Mack et al., 2007). Therefore, the family crisis model argues that offspring is more likely to display juvenile delinquency in response to parental

separation than in response to parental death. However, according to a recent systematic review (Kroese et al. 2021), only one empirical study investigated this relation. Juby and Farrington (2001) compared delinquency rates between offspring who experienced parental separation and offspring who experienced parental death. They found reports of juvenile convictions, but not self-reported delinquency, to be higher amongst offspring of separated parents. Therefore, there is currently scarce and mixed evidence on the differential effects of parental separation and parental death on juvenile delinquency.

A joint feature of parental separation and parental death is the transition from a two-parent household to a single-parent household, but there are also differences. After a parental separation, offspring sees one of their parents or both parents less often, depending on the co-parenting agreement the parents decided on (Meyer et al., 2017). Moreover, the relation between offspring and their parents can suffer from a parental separation, for instance due to high-conflict divorces (Harman et al., 2019). This is all in contrast with a parental death, when offspring is unable to interact with the deceased parent. Differences between delinquency rates of offspring in post-separation and post-decease single-parent families may further our insight in the mechanisms underlying the well-corroborated link between single-parent families and adolescent delinquency.

4.2.2 Constitution of the single-parent family during adolescence

Most theories and empirical studies focused on single-parent families that were constituted when the offspring was still relatively young. For instance, Bowlby's attachment theory (Ainsworth & Bowlby, 1991) suggests that parental disruption can lead to weaker attachment and/or the development of insecure attachment. Since attachment is formed early in life, this theory proposes that disruptions at younger ages (especially during the first five years of life) have more adverse effects than disruptions at later ages. Many empirical studies confirm this expected relation between experiencing the constitution of a single-parent family before adolescence and a higher level of adolescent delinquency (Kroese et al., 2021; Price & Kunz, 2003).

However, because empirical studies have only assessed the effects of growing up in a single-parent family from a relatively young age onwards on adolescent delinquency (Kroese et al., 2021), we do not know how experiencing the start of a single-parent family as an adolescent affects their more immediate delinquent

behavior. Since adolescents already experience a great amount of change in their lives (i.e., next to biological and cognitive developments, adolescents also experience social developments such as a growing reliance on peers for support; Laible et al., 2000), it is interesting to examine how experiencing the start of a single-parent family during adolescence affects adolescent delinquency.

4.2.3 Causal effects of single-parent families on adolescent delinquency

Empirical studies attempting to study the effects of single-parent families on offspring, have used numerous ways to test causal effects (Amato & Anthony, 2014). Researchers have tried to 1) control for all possible confounding variables (e.g., Banyard et al., 2006; Champion et al., 2008), despite not knowing whether all relevant variables were included in the model, 2) use propensity score methods to match offspring in single-parent families and two-parent families on parents' propensity to separate (e.g., Frisco et al., 2007), despite not knowing whether all factors causing a parental separation as well as all adverse offspring outcomes were included in the model, and 3) incorporate lagged dependent variables controlling for the same outcome measured prior to the start of the single-parent family (e.g., Keller, 2002), despite the high susceptibility to measurement errors and omitted-variable bias (Johnson, 2005). Since there are spurious associations between single-parent families and offspring's outcomes (i.e., due to a selection bias by the parents, especially in case of a parental separation), it is important to use a non-experimental method that is optimal for teasing out causal effects.

When longitudinal data is available with the relevant variables present at all time points, it is possible to use fixed-effects panel models (Allison, 2009). Fixed-effects panel models make weaker assumptions and can therefore provide stronger evidence for causal effects than alternative models. In fixed-effects panel models, each adolescent functions as his or her own control, and all observed and non-observed time-invariant variables are controlled for (including, for example, gender, genetic factors, and ethnicity). To our knowledge, fixed-effects panel models have thus far not been used to investigate the effects of parental separation and parental death on adolescent delinquency. Only a few studies looked at other outcomes than delinquency by means of fixed-effects panel models. Studies related to the effects of parental separation showed an increase alcohol and marijuana use (Arkes, 2013), a decrease in reading scores and an increase in math scores (Aughinbaugh et al., 2005), and a decline in achievement

and adjustment (Amato & Anthony, 2014). One study regarding the effects of parental death showed a decline in the well-being of the offspring (Amato & Anthony, 2014). Since fixed-effects panel models offer a more rigorous method of estimating causal effects than alternative non-experimental techniques, we use them to investigate the effects of parental separation and parental death on adolescents.

4.2.4 Parental disruption: a discrete event or a long-lasting event?

Two competing theoretical models can be used to predict how long the offspring experiences effects from a parental separation and a parental death (Amato, 2000). The crisis model views the start of a single-parent family as a crisis, implying that this event is only a short-term stressor to which most adolescents are able to adapt over time. However, the chronic strain model views the start of a single-parent family as a chronic strain, implying that adolescents will experience negative consequences of this event for a long time, if not indefinitely. Empirical studies have not yet looked at both the short-term and long-term effects of parental disruption on adolescent delinquency, but treated parental disruption as a discrete event.

Next to the issue of how long effects of parental disruption last, one could also argue that there may be anticipation effects in the build-up to the parental disruption. Parental separation is often associated with conflicts between parents before they separate (Amato & Anthony, 2014). It is even possible that the offspring experiences more intimate partner violence and hostility between the parents in the two-parent household before a parental separation occurred (Kelly, 2000). However, other studies suggest that parents show little overt conflict before a parental separation, often surprising the offspring with a break-up (Amato & Hohmann-Marriott, 2007; Hetherington & Kelly, 2002). Moreover, many stable marriages also involve levels of chronic conflict (Hawkins & Booth, 2005), implying that offspring experiencing a parental death, could have also been faced with conflicts between their parents prior to the death of one of their parents. Next to this, offspring experiencing a parental death could have witnessed a long-term illness of one of their parents, which could have influenced their mental well-being as well.

Besides the possible negative experiences before a parental disruption, there are also events that could occur after a parental disruption (e.g., a high-

conflict divorce or a long mourning process) that could influence the adolescent delinquency. One study about other outcomes than delinquency after a parental separation showed short-term negative psychological outcomes for the offspring before and after the separation, as well as long-term negative consequences for their school results before and after the separation (Sun & Li, 2011). Since there are no empirical studies about the development of the adolescent delinquency before and after parental separation and parental death, it is important to investigate the pre-, post-, and longer-term effects on adolescent delinquency.

4.2.5 Research questions

We aim to answer two research questions about the relation between single-parent families and adolescent delinquency. We address the four gaps mentioned above in our study, by using fixed-effects panel models to test the effects of parental separation and parental death on adolescent delinquency, as well as incorporating several time points before and after the parental disruption. First, we test whether parental disruptions cause increases in adolescent delinquency after the parental disruption occurred. We analyze parental separation and parental death separately and treat them as discrete events. Based on the reviewed theories and empirical studies, we expect a higher likelihood to engage in adolescent delinquency after the adolescent experiences the parental disruption. Second, we investigate the existence of anticipatory (before the event) and lagged (after the event) short-term and long-term effects of parental disruption. Again, we will look at parental separation and parental death independently. We do not have a specific hypothesis for this exploratory research question, since there are no well-defined theoretical models about anticipatory effects, and because theoretical models about the lagged effects of parental disruption (i.e., the crisis model and the chronic strain model) contradict each other.

4.3 Method[9]

4.3.1 Data and study population

The data used in this study were constructed by combining various register-based datasets accessible via Statistics Netherlands (Centraal Bureau voor de

[9] The data and measurements instruments used in this study are quite similar to the study of Kroese et al. (2021).

Statistiek).[10] These datasets contain (generally longitudinal) data on the entire registered population of the Netherlands. We used the anonymized personal identifiers constructed by Statistics Netherlands to link datasets. They contain information from different sources. Basic demographic and administrative information about individuals and their family members, such as their registered address and marital status, were extracted from the population register (Basisregistratie Personen). This register also includes historical information, such as former addresses and previous marriage partners. At any point in time, individuals can only be registered at a single address. For offspring of separated parents, this registered address will often coincide with the address where they spent most of their time. However, for offspring of separated parents in 50/50 custody arrangements, the registered address is the place where they spent only half of their time. Based on an in-depth investigation of the validity of the registered home addresses of offspring of separated parents, Van der Wiel and Kooiman (2019) concluded that, in general, the registered address of offspring of separated parents adequately represents where the offspring lives and sleeps. However, they also noted that a small number of these sons and daughters are registered with their father, yet actually live with their biological mother or live in a shared custody arrangement with both biological parents.

Information about juvenile delinquency, parental crime, and household income is derived from other register-based sources. Information on household income was based on data from The Dutch Tax and Customs Administration (Belastingdienst). The Dutch National Police provided data about juvenile delinquency and parental crime from 2005 to 2018 by means of the Basic Facility for Law Enforcement (Basisvoorziening Handhaving [BVH]). This dataset contains suspects of all ages who have been charged with a serious offense eligible for prosecution. This means that people received a 'procès-verbal', an official report drawn up by a police officer about a crime that has occurred. Although the BVH does not only contain data about convictions, over 90 percent of the people in the dataset are estimated to receive a transaction (e.g., a fine) or to be charged and found guilty (Besjes & Van Gaalen, 2008). The offenses are divided into eight categories, including violent sex offenses (rape or sexual assault), other sex

[10] Under certain conditions, these microdata sets are accessible for statistical and scientific research. For further information: microdata@cbs.nl.

offenses (excluding rape or sexual assault), violent property crimes, property crimes (excluding violent property crimes), criminal damages and crimes against public order, road traffic offenses, drug offenses, and other offenses.

For the present study, eight complete birth cohorts of individuals born in the Netherlands in the period 1993–2000 were selected. These cohorts were chosen to maximize the period over which crime data is available, since all required microdata sets were available for these cohorts. In particular, the data included crime data for all individuals of these cohorts between the ages 12 and 18. Individuals were excluded from the analyses if they passed away before the age of 12, if they experienced a parental disruption or parental death before the age of 12, or if they were born outside the Netherlands. If adolescents emigrated, they were removed from the data from that year onwards.[11] If emigrated Dutch adolescents moved back to the Netherlands, they were reincluded in our sample from that year onwards. If adolescents passed away after the age of 12, these adolescents were removed from the sample from their year of death onwards.

4.3.2 Dependent variable

Juvenile delinquency. The dependent variable was based on recorded criminal behavior of the adolescents as registered by the Dutch National Police. It was defined as a time-varying dichotomous variable indicating whether or not the adolescent has been a suspect of a criminal act (i.e., legally prosecuted), independent of the number of crimes or the severity of the crime(s), reported separately for every year between ages 12 and 18.

4.3.3 Independent variables

Type of single-parent family. We distinguished between children who live at the same address with two biological parents, children who live with only one biological parent after their parents have divorced or separated, and children who live with one biological parent because the other biological parent has deceased. Children living without any biological parents were excluded from the analysis. The type of family is measured at January 1st of every year, between the age of 12

[11] The reason for this removal is that the crime data from the Dutch National Police only apply to crimes perpetrated in The Netherlands and do not include crimes perpetrated abroad.

and 18. To construct this variable, we first checked whether one of the parents had passed away. In case this did not happen, we checked whether their biological parents had been separated. The remaining children live together at the same address with their two biological parents.

Number of years before and after the single-parent family started. The number of years before and after the single-parent family was formed is measured at January 1st of every year, between the age of 12 and 18. We divided this into the following categories, separately for parental separation and parental death: 'one year before the parental disruption', 'year of the parental disruption', 'first year after the parental disruption', 'second year after the parental disruption', and 'third to seventh year after the parental disruption'.

4.3.4 Covariates

Parental crime. First, we controlled for criminal behavior committed by the biological parent(s). We defined this variable as whether 'none of the biological parents have been a suspect of a criminal act' or 'one or both of the biological parents have been a suspect of a criminal act', reported separately for every year between age 12 and 18 of the adolescent. We did not distinguish between one or both biological parents having been a suspect of a criminal act, because it is impossible that both of the biological parents have been a suspect of a criminal act in case one of the parents has passed away.

Household income. Second, we controlled for the annual income of the household in which the adolescent lived, reported separately for every year between ages 12 and 18. In order to correct for differences in household size and composition, we used an equivalence scale (CBS, 2019b), by taking into consideration 1) the size of the household and 2) whether the members were adults (18 years and older) or adolescents. Moreover, to prevent households showing a negative household income being excluded from the sample as a consequence of using the natural logarithm function for household income, an additional dummy variable was included for negative household incomes and the original household income variable showing a negative value was altered to an income of '1'.

Stepparents. Third, we controlled for the possibility that a biological parent in a single-parent family repartnered in the form of a cohabiting union or remarriage. We defined this variable as whether 'none of the biological parents

had a new partner' or 'one or two of the biological parents had a new partner', reported every year between age 12 and 18 of the adolescent. We combined the adolescents with one or both biological parents with a new partner, because it is impossible that both of the biological parents had a new partner in case one of the parents has passed away.

Age. Fourth, to account for the age-crime curve with regard to juvenile delinquency (i.e., a universally found phenomenon involving a steep increase in delinquency until humans reach the center years of adolescence, followed by a subsequent decrease; Moffitt, 1993), we controlled for the age of the adolescent. This is reported separately for every year between age 12 and 18.

4.3.5 Analyses

A person-year file was created with each adolescent contributing a record for each year he or she was observed between ages 12 and 18. Using this file, a fixed-effects panel analysis was performed to estimate the relation between single-parent families and juvenile delinquency. A fixed-effects panel model examines only within-individual change (e.g., in family structure, family income, delinquency) and controls for all observed and unobserved stable individual characteristics (e.g., gender, country of birth). By controlling for both observed and unobserved differences between individuals, the fixed-effects panel model is very useful to control for time-constant selection bias (Allison, 2009). In addition, it is possible to control for time-varying variables that might influence the relation between single-parent families and juvenile delinquency. A disadvantage of the fixed-effects model is that the effect of stable background characteristics cannot be estimated, because the model controls for these characteristics.

Since the dependent variable is a dichotomous measure (i.e., whether or not adolescents were a suspect of a criminal act in a given year), logistic regression analyses were performed to test all models. Data management, record linkage, and analyses were executed on the secure server of Statistics Netherlands with STATA, version 16.0.

4.4 Results

4.4.1 Descriptive statistics

The study population consisted of 1,163,975 adolescents. However, adolescents who were never a suspect of a criminal act and adolescents who were a suspect every year (i.e., no within-individual change on the dependent variable) were dropped from the fixed-effects analyses, resulting in a total of 95,219 adolescents included in the final analyses (examined for 6.9 years on average). See Table 1 for the descriptive statistics of each variable. More adolescents experienced a parental separation than a parental death. With an increasing age of the adolescent, we found 1) a reduction in the percentage of adolescents with one or two parents who engaged in criminal behavior, 2) an increase in the percentage of adolescents with parents with one or two new partner(s), and 3) a higher household income. Moreover, an age-crime curve with a peak around ages 16-17 is also visible in our population.

Table 1

Descriptive Statistics

Age	12	13	14	15	16	17	18
% with separated parent	1.67	3.21	4.65	6.06	7.43	8.73	9.93
% with deceased parent	0.16	0.35	0.55	0.77	1.00	1.25	1.52
% engaged in juvenile delinquency	0.40	0.90	1.60	2.03	2.20	2.25	2.12
% with one or two parents who engaged in crime	1.49	1.47	1.44	1.36	1.30	1.23	1.09
Household income (in euros)	41977	43293	44497	45350	46446	48578	44595
% with parents with one or two new partner(s)	0.36	0.87	1.47	2.12	2.79	3.48	4.14

Table 2

Parameter Estimates of a Fixed-Effects Panel Model with Juvenile Delinquency as Dependent Variable and Type of Single-Parent Family as Main Independent Variable (*N* = 95,219)

	OR	CIs
Type of single-parent family – Ref: when the same adolescent would have lived in a standard family		
Separated parents	1.06**	[1.02, 1.11]
One biological parent passed away	1.14*	[1.03, 1.27]
Number of parents who engaged in crime – Ref: no parents who engaged in crime		
One or two biological parent(s) who engaged in crime	1.68***	[1.63, 1.74]
Age – Ref: 12		
13	2.44***	[2.36, 2.53]
14	4.78***	[4.62, 4.95]
15	6.38***	[6.17, 6.60]
16	7.11***	[6.87, 7.35]
17	7.38***	[7.14, 7.63]
18	6.89***	[6.66, 7.13]
Household income	0.97**	[0.96, 0.99]
Negative household incomes	0.70***	[0.58, 0.85]
New partner(s) – Ref: no new partners		
One or two new partner(s)	0.95	[0.90, 1.00]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

4.4.2 Type of single-parent family

Table 2 shows the results of the fixed-effects analysis of the effect of single-parent families on adolescent delinquency. Parental separation (OR = 1.06) was significantly related to juvenile delinquency. This implies that an adolescent who experienced a parental separation is more likely to engage in juvenile delinquency compared to when that same adolescent would have continued to live with both parents. Parental death (OR = 1.14) was also significantly associated with juvenile delinquency. This means that an adolescent who experienced a parental death is more likely to engage in juvenile delinquency in comparison with when that same adolescent would have continued to live with both parents. When comparing parental separation and parental death, the results did not show a statistically significant difference between the two types of single-parent families (OR = 1.14

/ 1.06 = 1.08). Adolescents who experienced a parental death were equally likely to engage in juvenile delinquency as adolescents who experienced a parental separation.

Table 3

Parameter Estimates of a Fixed-Effects Panel Model with Juvenile Delinquency as Dependent Variable and Number of Years before or after the Parental Separation or the Parental Death as Main Independent Variables (*N* = 95,219)

	OR	CIs
Number of years before or after the parental disruption – Ref: more than one year before the parental disruption		
Parental separation		
One year before the parental separation	1.07	[1.00, 1.15]
Year of the parental separation	1.12**	[1.04, 1.19]
First year after the parental separation	1.15***	[1.08, 1.23]
Second year after the parental separation	1.13**	[1.05, 1.21]
Third to seventh year after the parental separation	1.03	[0.96, 1.11]
Parental death		
One year before the parental death	0.71***	[0.60, 0.85]
Year of the parental death	0.83*	[0.70, 0.97]
First year after the parental death	0.96	[0.82, 1.11]
Second year after the parental death	1.03	[0.87, 1.22]
Third to seventh year after the start of the parental death	0.87	[0.73, 1.03]
Number of parents who engaged in crime – Ref: no parents who engaged in crime		
One or two biological parent(s) who engaged in crime	1.67***	[1.62, 1.73]
Age – Ref: 12		
13	2.44***	[2.35, 2.53]
14	4.79***	[4.62, 4.95]
15	6.40***	[6.18, 6.62]
16	7.14***	[6.90, 7.38]
17	7.42***	[7.17, 7.68]
18	6.95***	[6.72, 7.19]
Household income	0.98**	[0.96, 0.99]
Negative household incomes	0.71**	[0.59, 0.87]
New partner(s) – Ref: no new partners		
One or two new partner(s)	0.98	[0.93, 1.04]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

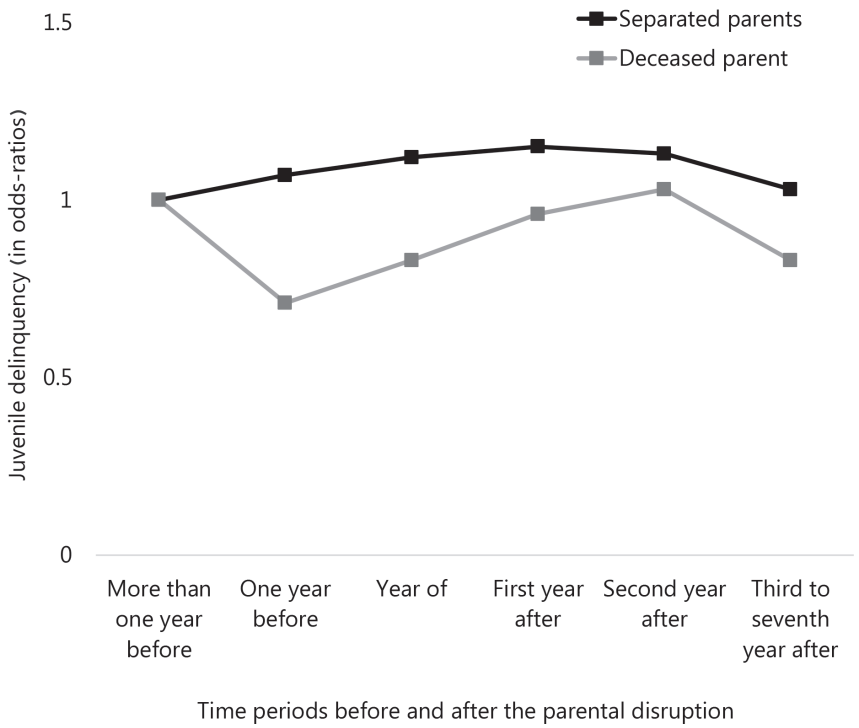

Figure 1. Parameter estimates of a fixed-effects panel model with juvenile delinquency as dependent variable and number of years before or after the parental separation or the parental death as main independent variables (in odds-ratios, *N* = 95,219, reference-category: more than one year before the parental disruption).

4.4.3 Number of years before and after the single-parent family started

Table 3 and Figure 1 show the results of the fixed-effects analysis with regard to the number of years before and after the single-parent family started, separately for adolescents who experienced a parental separation and adolescents who experienced a parental death. The reference category consists of the period of more than one year before the parental disruption, when the adolescent still lived with both parents.

With regard to the adolescents who experienced a parental separation, we found statistically significant positive outcomes for the year of the parental separation (OR = 1.12), the first year after the parental separation (OR = 1.15),

and the second year after the parental separation (OR = 1.13). This implies that adolescents in the year they experienced a parental separation and in the next two years afterwards show an increased likelihood to engage in delinquency compared to the period of more than one year before the separation occurred. We did not observe a statistically significant effect for the year before the parental separation and for three to seven years after the parental separation.

Adolescents who experienced a parental death showed quite different results. We only found statistically significant negative results for the year before the parental death (OR = 0.71) and the year of the parental death (OR = 0.83). This implies that during these two years adolescents are less likely to engage in delinquency than in the period of more than one year before the parent died, when they lived with both parents. The other periods do not statistically significantly differ from the reference category.

4.4.4 Covariates

In a given year, criminal involvement of parents increased their offspring's likelihood of criminal involvement. Moreover, with an increasing age of the adolescent, we found an increase in the likelihood to engage in delinquency. In contrast, increases in household income reduced delinquency and we did not find statistically significant outcomes for the presence of stepparents.

4.5 Discussion

By using longitudinal population register data and by applying fixed-effect panel analysis, this study tried to enlarge our knowledge about the effects of living in a single-parent family on adolescent delinquency. More specifically, we tested 1) whether the event of parental disruption, either by parental separation or by parental decease, increases subsequent adolescent delinquency, and 2) whether parental disruption, either by parental separation or by parental decease, has anticipatory, immediate or delayed effects on adolescent delinquency. The first test assumes that parental disruption is an event with a discrete effect that moves delinquency to a new level. The second test allows for behavioral changes to take effect in anticipation of the event, or to take effect after the event with some delay.

We found that adolescents who experienced a parental separation or a parental death are more likely to engage in juvenile delinquency compared to

when that same adolescent would have continued to live with both parents. These results confirm the expectations of many theories (e.g., attachment theory, general strain theory, and social control theory; Agnew, 2006; Ainsworth & Bowlby, 1991; Hirschi, 1969) and outcomes in literature reviews (Kroese et al., 2021; Price & Kunz, 2003) about growing up in single-parent families, stating that single-parent households and juvenile delinquency are related. Next to this, our results showed that adolescents who experienced a parental separation and adolescents who experienced a parental death were equally likely to engage in delinquency. These results do not confirm the expectations of the family crisis model (Mack et al., 2007), stating that offspring is more likely to display negative behavior after experiencing a parental separation than after experiencing a parental death. However, not many empirical studies have tested this difference between the two types of single-parent families in relation to juvenile delinquency. We are aware of only one study, conducted by Juby and Farrington (2001), that found that offspring from families disrupted by separation is more likely to engage in juvenile delinquency than families disrupted by parental death when they checked reports on juvenile convictions, yet found no differences when juvenile delinquency was self-reported by the offspring. Therefore, there is no well-established relation between the different effects of parental separation and parental death, possibly explaining our finding.

In a second step, we examined whether the effects of parental disruption changed over time. Indeed, we found that parental separation only had a short-term effect on delinquency. Adolescents' likelihood to engage in delinquency increased in the year of the parental separation and in the next two years. Afterwards the likelihood of delinquency decreased again to pre-separation levels. This result confirms the expectations of the crisis model (Amato, 2000), implying that a parental separation could be an event to which most adolescents are able to adjust over time. A parental separation might be difficult for adolescents in an emotional and practical way. They have to get used to not being able to see both parents as often as before the parental separation as well as to practical changes, such as a new school and new neighborhood. However, our result suggests that after the short-term negative effects on delinquency, adolescents generally are able to adapt to these changes and that a parental separation does not affect their likelihood to engage in adolescent delinquency in the long run. Naturally, this result is in contrast with the chronic strain model, that views the start of a

single-parent family as a chronic strain, implying that adolescents will experience negative consequences of this event for a long time.

The results for adolescents who experienced a parental death were quite different, since we observed a statistically significant negative effect for the year before the parental death and the year of the parental death. This suggests some level of anticipatory behavior, with adolescents less likely to engage in delinquent behavior in the run-up to and during the year of parental decease. One possible explanation for this finding is that the adolescent knew that one of their parents was going to pass away soon, and therefore resulting in preferring to stay at home with their ill parent instead of engaging in crime.

At first glance, the results on the effect of parental death in Table 2 and Table 3 might look contradictory, but this is not necessarily true. Table 2 shows that, on average, adolescents are more likely to engage in delinquency once a parent passed away, but Table 3 suggests that this is mainly due to adolescents being much less likely to engage in delinquency in the year before a parent dies. So the positive effect in Table 2 is mainly caused by the much reduced incidence of delinquency in the run-up to parental death.

Our results underscore the importance of modeling parental separation and parental separation as an event with anticipatory, short-term and long-term consequences. Looking at the overall effect of disruption only would have led us to underestimate the short-term association between parental separation and adolescent delinquency and overestimate (i.e., since we found positive effects when treating parental death as a discrete event and negative effects when treating parental death as a long-term event) the association between parental death and adolescent delinquency. Moreover, we found a negative result for the year before the parental death, implying that anticipatory effects should also be considered in studying parental disruptions.

A key strength of our approach is that we use population data in combination with a fixed-effect approach, that allows us to get a much better grasp on the causal mechanisms linking parental disruption and delinquent behavior during adolescence. Nevertheless, this study also has limitations. First, due to the nature of register data, several possible confounding time-varying variables could not be included in the fixed-effects panel analyses. For example, interesting time-varying variables that would have been added in case they would have been available

are 1) the number and the severity of conflicts between the parents before the parental disruption occurred and, in case of the families disrupted by a parental separation, conflicts after the parental separation as well, 2) the quality of the caregiving by the parents in a stressful period (e.g., parental supervision), and 3) the quality of a possible new neighborhood and new school after having to move away. Second, it would have been interesting in studying the role of parental death to be able to include the cause of death, but these data are only allowed to be accessed under very strict circumstances due to privacy reasons. This means we do not know whether the parent passed away due to (short-term or long-term) illness, due to a suicide, or due to murder; reasons that could impact how a family handles parental death.

Finally, we have a few suggestions for future research, building on the results of our study. First, future studies could examine delinquency in more detail, including a more detailed distinction between incidental and persistent delinquency, between minor and serious delinquency, and between different types of delinquency. For instance, because the household income is generally lower in families with only one biological parent, it is possible that the adolescents are more inclined to engage in offenses such as burglary to obtain money. Second, we recommend studying the topic of family structure and delinquency more extensively with population register data as well. Data limitations caused researchers to have difficulties in studying this topic (Demuth & Brown, 2004). Because some family structures are relatively rare, such as offspring living in single-father families and offspring being born into a single-parent family, researchers experienced problems with finding enough respondents for their studies. Since some of our results do not confirm existing theories, we recommend to use population register data more often to study the relation between single-parent families and delinquency to obtain more knowledge about the validity of these theories.

CHAPTER 5

INTERGENERATIONAL TRANSMISSION OF CRIME: DOES PARENTAL SEPARATION HELP TO PREVENT OFFSPRING OFFENDING?

Janique Kroese, Tara Renae McGee, and Susan M. Dennison

5.1 Abstract

Objective: In this study, we investigate the effect of parental separation on the intergenerational transmission of crime. Background: Previous research has shown that both parental criminal behavior and parental separation are related to a higher likelihood of offspring engaging in criminal behavior. This raises the question of whether the co-existence of parental offending and parental separation produces a cumulative risk for offspring offending or whether the separation mitigates the intergenerational transmission of offending. Method: Using Dutch population register data, we estimated fixed effects panel models to assess the effects of parental separation on the intergenerational transmission of crime. We distinguished between three types of crimes: property crimes; destruction and crimes against public order and authority; and violent and sexual crimes. Results: We found a protective effect of parental separation when adolescents lived with the single parent who did not engage in destruction and crimes against public order and authority or violent and sexual crimes. Additionally, we found a protective effect of parental separation for both adolescents who lived with a single parent who did not engage in property crimes and those who lived with a single parent who did engage in property crimes. Conclusion: In certain family situations, such as living in the same house as a single parent who engages in criminal behavior, generally a parental separation that leads to living with the parent who does not engage in criminal behavior appears to reduce the risk of offspring offending.

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5.2 Introduction

There is mounting evidence that criminal behavior runs in families. For example, in the Pittsburgh Youth Study (Loeber et al., 2008), just eight percent of the families accounted for 43 percent of the arrested family members. Similarly, in the Cambridge Study in Delinquent Development (Farrington et al., 2006), six percent of the families accounted for half of all the convictions of all family members. Although offending appears to be 'transmitted' from one generation to the next, the factors that may reduce or disrupt such patterns of offending remain understudied. For example, it is not known under what conditions parental separation may reduce or exacerbate the risk of offspring offending in families with a history of parental offending. It is generally assumed that parental separation affects offspring in a negative way, with research finding an increased likelihood of engaging in adolescent crime following parental separation (Kroese et al., 2021). Therefore, parental offending and parental separation may have a cumulative effect on offspring offending. However, it is also possible that parental separation could be a protective factor by reducing offspring exposure to, and social learning from, parental offending behaviors and attitudes. As a result, offspring may 'escape' the transmission of the criminal behavior. In this study, we address the question of whether parental separation has a preventative or cumulative effect on offspring offending and whether such an effect is dependent on the type of parental offending.

5.2.1 Intergenerational transmission of crime

Intergenerational transmission implies that some characteristic or behavior is seen in both the parent and their offspring (Liefbroer, 2005). One of these behaviors is the transmission of criminal behavior from one generation to the next. Farrington et al. (2001) gave six, not mutually exclusive, explanations for the intergenerational transmission of crime. First, generations in one family might be exposed to the same risk factors, such as living in poverty and residing in deprived neighborhoods. Second, assortative mating might be involved, since people who offend are more likely to date or marry a person who also offends, and offspring with two parents who offend are more likely to engage in this behavior as well. Third, family members may directly and mutually influence each other (e.g., people may imitate the criminal behavior of parents and older siblings) due to social learning mechanisms. Fourth, environmental mechanisms may mediate the

relationship between the criminal behavior of the parents and their offspring (e.g., males who offend are more likely to impregnate young women, which increases the likelihood their offspring engaging in criminal behavior). Fifth, genetic factors may play a role as well, since parents who engage in crime may have a genetic predisposition for criminal behavior, which might be transmitted to their offspring. Sixth, there might be a bias by the police and the criminal justice system against families who offend, because offspring may experience an increased risk for conviction if their convicted parents are monitored more extensively by the police and the criminal justice system. This study does not explicitly test these mechanisms but they instead provide an understanding of why we might expect associations between parent and offspring criminal behaviors.

Intergenerational transmission of crime has been researched extensively over the last couple of decades, with several longitudinal studies conducted (e.g., the Cambridge Study in Delinquent Development and the Transfive Study; Farrington et al., 2009; Van de Weijer et al., 2014). A systematic review and meta-analysis by Besemer et al. (2017) combining these studies, showed that offspring are 2.4 times more likely to engage in crime when their parents displayed criminal behavior.

Studies looking at the effects of specific types of crime, mostly looked at the effects of intergenerational transmission of violence. For instance, violence within families (i.e., between romantic partners and between parent and offspring) seems to be transmitted intergenerationally, such as relationship violence (Kwong et al., 2003) and child maltreatment (Thornberry & Henry, 2013). Some studies also assessed the different intergenerational effects of different types of crime. Van de Weijer et al. (2014) found that the intergenerational transmission of violence between father and son is stronger than the intergenerational transmission of non-violent crimes. Besjes and Van Gaalen (2008) found that adolescents who lived with a parent who had been accused of violent crimes, drug crimes, or other types of crimes were at higher risk for criminal behavior than those who lived with a parent who had not been accused of a crime. They did not find an effect for sexual crimes; the authors suggest that this is due to the relatively small number of sexual crimes compared to the other type of crimes. In contrast, when Van de Rakt et al. (2006) tested whether specific forms of crime were transmitted from father to offspring, they found no intergenerational transmission of violent crimes and property crimes after controlling for convictions for other crimes.

5.2.2 Parental separation and offspring criminal behavior

In addition to the influence of parental crime, parental separation has also been demonstrated to have an effect on the criminal behavior of offspring. Many theories have been used to explore the effects of a parental separation on their offspring, including *attachment theory* (Ainsworth & Bowlby, 1991), *economic strain model* (see Sogar, 2017), *family crisis model* (see Mack et al., 2007), *general strain theory* (Agnew, 2006), *social control/parental absence model* (Gottfredson & Hirschi, 1990), and *social control theory* (Hirschi, 1969). These theories all argue that single-parent households create conditions (e.g., a lower household income or a lower attachment to one or both parents) that make it more likely for offspring to engage in criminal behavior.

Most empirical studies find support for the relationship between parental separation and offspring criminal behavior. A recent systematic review (Kroese et al., 2021) showed that two-thirds of the studies examining this relationship found that offspring with separated parents were more likely to engage in criminal behavior during adolescence than offspring from intact families (e.g., Spohn & Kurtz, 2011; Vanassche et al., 2014).

With regard to the effect of parental separation on different types of offending, studies tend to focus on sexual and violent crimes. Researchers have found that after experiencing parental separation, adolescents are more likely to engage in physical dating violence and sexual coercion (Banyard et al., 2006; Champion et al., 2008; Margari et al., 2015). Living in neighborhoods with higher proportions of single-parent families also increases the risk of adolescents engaging in violent crimes (Knoester & Haynie, 2005).

5.2.3 Escaping the intergenerational transmission of crime through parental separation?

Since both parental engagement in offending and parental separation are expected to increase the likelihood for adolescents to engage in crime, it may be logical to expect that a combination of these risk factors has a cumulative effect leading to offspring offending behaviors. However, such a relationship may be more complex. For instance, Farrington et al. (2001) suggested that the removal of opportunities for social learning of criminal behaviors may help to reduce the likelihood of offspring engaging in criminal behavior after a parental separation. As such, the intergenerational transmission of crime may be reduced due to a parental separation, rather than increased, or there may be a net negative effect.

Parental separation may have a particular preventative effect in relation to the intergenerational transmission of *violent* criminal behaviors. When looking at the mechanisms elucidated by Farrington et al. (2001), one mechanism may play a role. Social learning mechanisms may be more prominent in the intergenerational transmission of violent behavior, because the offspring of parents who commit violent crimes are more likely to be exposed to the violent behavior of their parents than those from parents who commit other types of crimes (Van de Weijer, 2014), particularly when violence is displayed in the household (e.g., intimate partner violence and child maltreatment).

Several studies have investigated the intergenerational transmission of crime in conjunction with parental separation. These studies have all found evidence that suggests parental separation may diminish the intergenerational transmission of crime. An examination of maternal reports of father's antisocial behavior, of 5-year-old children (Jaffee et al., 2003) in the Environmental Risk Longitudinal Twin Study showed than when fathers engaged in high levels of antisocial behavior, offspring showed more conduct problems when fathers resided with their offspring compared to offspring whose fathers did not reside with them. Thornberry et al. (2009) used data from the Rochester Intergenerational Study, a prospective multi-generation panel study of 9-year-old children. They found significant levels of intergenerational continuity in antisocial behavior for mothers and for fathers who live with or supervise their offspring, but not for fathers who have low levels of contact with their offspring. Blazei et al. (2008) used data about 11- and 17-year-old twins from the Minnesota Twin Family Study. They found that offspring demonstrated higher rates of externalizing behavior when they were born to antisocial fathers, as well as when they were raised without their father in the home. Moreover, the association between the antisocial behavior of the father and the offspring was stronger when the father was present for a longer period of the offspring's life. Van de Rakt et al. (2010) used data from the Criminal Career and Life Course Study, with an age range from 12 to 39 for the offspring. They found that in the year a father is convicted, the chance of conviction for the offspring increases less when the parents are separated than when parents are together. It is important to note that three of the four studies mentioned above are looking at the broader category of antisocial behavior instead of solely adjudicated crime. Antisocial behavior in these studies involves actions as 'swearing or bad language', 'temper tantrums or hot temper', and 'lying or cheating'. Moreover, none of these studies distinguish between different types of crime.

We know of only one study that distinguishes between types of crime in combination with experiencing parental separation during childhood (between ages 0-18). Van de Weijer et al. (2015) used a sample of the Transfive Study, with an age range from 18 to 55 for the offspring. With regard to violent crimes, the results showed that intergenerational transmission of violent crime only occurred if the violent father remained married to the mother during the offspring's childhood. When children of violent fathers experienced parental separation during childhood, violent offending was not transmitted. Thus, there might be a protective effect of parental separation on the intergenerational transmission of violent crime. The researchers found a different result for non-violent criminal behavior. Among the more recent generations, the intergenerational transmission of non-violent criminal behavior was stronger if the parents were separated. This suggests that there might be a cumulative effect of parental separation on the intergenerational transmission of non-violent crime.

5.2.4 The current study

This study examines the intergenerational transmission of different types of crime in combination with offspring's experience of parental separation. These behaviors (i.e., the criminal behavior of the parent, the criminal behavior of the offspring, and the separation of the parents) were all recorded during the adolescence of the offspring (ages 12-18). We distinguish between three types of crime: property crimes; destruction and crimes against public order and authority; and violent and sexual crimes. A unique feature of our study is that we use longitudinal population register data and, therefore, are able to estimate fixed effects panel models. Fixed effects panel models provide stronger evidence for causal effects than alternative models.

Based on the reviewed theories, proposed mechanisms for transmission, and empirical studies, we consider three hypotheses regarding the intergenerational transmission of the three types of crime in combination with experiencing a parental separation. We expect that: 1) all types of crime committed by the parents increase the likelihood for adolescents to engage in that type of crime as well; 2) parental separation increases the likelihood for adolescents to engage in the three types of crime; and that 3) parental separation has a protective effect on offspring offending when considered in conjunction with parental offending. That is, we will see a preventative effect when adolescents continue to live with a non-

offending parent post separation, in comparison to living with the single parent who engages in crime *or* remain in their family unit with one or both parents who engage in crime.

5.3 Method

5.3.1 Data and study population

The data used in this study were constructed by combining various register-based datasets accessible via Statistics Netherlands (Centraal Bureau voor de Statistiek). Under certain conditions, these microdata sets are accessible for statistical and scientific research (for further information: microdata@cbs.nl). These datasets contain (generally longitudinal) data on the entire registered population of the Netherlands. We used the anonymized personal identifiers constructed by Statistics Netherlands to link datasets. Basic demographic and administrative information about individuals and their family members, such as their registered address and marital status, were extracted from the population register (Basisregistratie Personen). This register also includes historical information, such as former addresses and previous marriage partners. At any point in time, individuals can only be registered at a single address. For most of the offspring of separated parents this registered address will coincide with the address where they spent most of their time. However, for offspring of separated parents in 50/50 custody arrangements, the registered address is the place where they spent only half of their time. Based on an in-depth investigation of the validity of the registered home addresses of offspring of separated parents, Van der Wiel and Kooiman (2019) concluded that, in general, the registered address of the offspring of separated parents adequately represents where the offspring lives and sleeps. However, they also noted that a small number of the offspring are registered with their father, yet actually live with their biological mother or live in a shared custody arrangement with both biological parents.

Information about adolescent crime, parental crime, and household income in the microdata is derived from other register-based sources. Information on household income was based on data from The Dutch Tax and Customs Administration (Belastingdienst). The Dutch National Police provided data about adolescent crime and parental crime from 2005 to 2019 via the Basic Facility for Law Enforcement (Basisvoorziening Handhaving). This dataset contains suspects

of all ages who have been charged with a serious offense eligible for prosecution. This means that people received a 'procès-verbal', an official report drawn up by a police officer about a crime that has occurred. Although the dataset does not contain conviction records, over 90 percent of the people in the dataset are estimated to receive a transaction (e.g., a fine) or to be charged and found guilty by a judge (Besjes & Van Gaalen, 2008). In this study we use the term 'suspect of a crime' rather than parental 'offending' to acknowledge that the sample reflects criminal charges rather than recorded convictions.

For the present study, nine complete birth cohorts of individuals born in the Netherlands in the period 1993–2001 were included. These cohorts were chosen to maximize the period over which crime data is available, since all required data were accessible for these cohorts. In particular, they include crime data for all individuals of these cohorts between the ages 12 and 18. Individuals were excluded from the analyses if they were stillborn, if they had passed away before the age of 12 or if they had experienced a parental separation before the age of 12 (since we specifically look at the effects on adolescents), or if they were born outside of the Netherlands. If adolescents emigrated, they were removed from the data from that year onwards. The reason for this removal is that the crime data from the Dutch National Police only includes crimes perpetrated in The Netherlands and does not include crimes perpetrated abroad. If emigrated adolescents moved back to the Netherlands, they were reincluded in our sample from that year onwards. If adolescents passed away after the age of 12, these adolescents were removed from the sample from their year of death onwards.

5.3.2 Dependent variable

Adolescent crime. The dependent variable was based on recorded criminal behavior of the adolescents as registered by the Dutch National Police. It was constructed as a time-varying dichotomous variable indicating whether or not the adolescent has been a suspect of a criminal act, reported separately for every year between ages 12 and 18. We focused on the three most common types of criminal behavior, based on the classification described in the Criminaliteit en Rechtshandhaving 2019 (Meijer et al., 2020), including 'property crimes', 'destruction and crimes against public order and authority', and 'violent and sexual crimes' (see Table 10A). We did not include the category 'other offenses' in our analyses. It is possible that adolescents engage in more than one type of crime.

5.3.3 Independent variable

Parental crime combined with parental separation. We combined the criminal behavior committed by the biological parent(s), with whether the adolescents experienced a parental separation. This resulted in a variable with five categories, including 'adolescent lived in a two-parent family and parents were not a suspect of a crime', 'adolescent lived in a two-parent family and one or both parent(s) were a suspect of a crime', 'adolescent lived with one parent after a separation and parents were not a suspect of a crime', 'adolescent lived with one parent after a separation and lived with the parent who was a suspect of a crime', and 'adolescent lived with one parent after a separation and did not live with the parent who was a suspect of a crime'. This was recorded separately for every year between age 12 and 18 of the adolescent. Again, we focused on the three most common types of criminal behavior, including 'property crimes', 'destruction and crimes against public order and authority', and 'violent and sexual crimes (see Table 10A). It is possible that parents were a suspect of more than one type of crime. When one legal parent had a different registered address than the other legal parent and their offspring, this was coded as a parental separation. In most cases, this constitutes families who experienced a parental break-up of a marriage or a cohabiting union. Adolescents living without any biological parents and adolescents living with one biological parent because the other biological parent was deceased were excluded from the analysis.

5.3.4 Covariates

Household income. We controlled for the annual income of the household in which the adolescent lived, which was reported separately for every year between ages 12 and 18. In order to correct for the impact of household size and composition on household income, we used an equivalence scale (CBS, 2019b), by taking into consideration 1) the size of the household and 2) whether the members were adults (18 years and older) or minors. Moreover, to prevent households showing a negative household income from being excluded from the sample as a consequence of using the natural logarithm function for household income, an additional dummy variable was included for negative household incomes. The original household income variable showing a negative value was recoded to an income of '1'.

Repartnering. We also controlled for the possibility that a biological parent in family where the biological parents had separated, repartnered in a cohabiting union or remarriage (based on their registered address). We defined this variable as whether 'none of the biological parents had a new partner' or 'one or two of the biological parents had a new partner', reported every year between age 12 and 18 of the adolescent.

Age. To account for the age-crime curve with regard to adolescent crime (i.e., a universal phenomenon involving a steep increase in criminal behavior until mid- to late-adolescence, followed by a subsequent decrease; Moffitt, 1993), we controlled for the age of the adolescent. This is reported separately for every year between age 12 and 18.

5.3.5 Analyses

A fixed effects panel model was used to estimate the relationship between parental crime, family structure, and adolescent crime. A fixed effects panel model examines only within-individual change (e.g., family structure, family income, criminal behavior) and controls for all observed and unobserved stable individual characteristics (e.g., sex, country of birth). By controlling for both observed and unobserved differences between individuals, the fixed effects panel model is very useful to control for time-constant selection bias (Allison, 2009). In addition, it is possible to control for time-varying variables that might influence the relationships among parental crime, family structure, and adolescent crime. A disadvantage of the fixed effects model is that the effect of stable background characteristics cannot be estimated, because the model controls for these characteristics.

Since the dependent variable is a dichotomous measure (i.e., whether or not the adolescent has conducted a certain type of crimes), logistic regression analyses were performed. Data management, record linkage, and analyses were executed on the secure server of Statistics Netherlands with STATA, version 16.0.

5.4 Results

5.4.1 Descriptive statistics

The study population consisted of 1,265,963 adolescents. On average, an adolescent was examined for 6.9 years. See Table 1 for the descriptive statistics of

each variable. With the increasing age of the adolescent, we found 1) a reduction in the percentage of adolescents with a separated parent (it is a cumulative variable), 2) a reduction in the percentage of adolescents with one or two parents who were a suspect of crime, 3) an increase in the percentage of adolescents who have parents with one or two new partner(s), and 4) a higher household income. Moreover, the standard age-crime curve is also visible in our population.

It is important to note that adolescents who were never the suspect of a criminal act or adolescents who were a suspect every year (i.e., no within-individual change on the dependent variable) were removed from the fixed effects analyses, because a fixed effects panel model examines only within-individual change. Consequently, 49,512 adolescents remained in the analysis regarding property crimes, 38,051 adolescents remained in the analysis regarding destruction and crimes against public order and authority, and 28,058 adolescents remained in the analysis regarding violent and sexual crimes.

Table 1

Descriptive Statistics

Age	12	13	14	15	16	17	18
% with separated parent	1.68	3.24	4.72	6.16	7.56	8.91	10.16
% engaged in adolescent crime	0.37	0.85	1.52	1.93	2.09	2.14	2.05
% with one or two criminal parent(s)	1.45	1.44	1.40	1.32	1.26	1.18	1.05
Household income (in euros)	42592	43906	45002	45930	47195	49351	44811
% with parents with one or two new partner(s)	0.35	0.85	1.44	2.08	2.74	3.41	4.05
% living with one or two criminal parents	1.37	1.32	1.23	1.14	1.06	0.97	0.86

5.4.2 Property crime

Table 2 shows the results of the fixed effects analysis regarding the intergenerational transmission of property crime in combination with parental separation. First, our results suggest that when one or both parents were a suspect of property crime, adolescents showed a higher likelihood to also become a suspect of property crime (OR = 3.02, c^2 = 670.54). Second, we found no statistically significant effects of parental separation on the likelihood for

adolescents to become a suspect of property crime (OR = 1.03, c^2 = 0.98). Third, when one or both parents were a suspect of property crime, adolescents showed a lower likelihood of becoming a suspect of property crime when they lived with the separated parent who was a suspect of property crime compared to adolescents who continued to live with both parents (OR = 1.98 / 3.02 = 0.65, c^2 = 10.98). Fourth, when one or both parents were a suspect of property crime, adolescents showed a lower likelihood of becoming a suspect of property crime when they lived with the separated parent who was *not* a suspect of property crime compared to adolescents who continued to live with both parents (OR = 1.56 / 3.02 = 0.51, c^2 = 29.02). In addition, when one or both parents were a suspect of property crime, we did not find a statistically significant difference between those adolescents who lived with the separated parent who was a suspect of property crime and those adolescents who lived with the separated parent who was *not* a suspect of property crime (OR = 1.56 / 1.98 = 0.79, c^2 = 2.13).

5.4.3 Destruction and crimes against public order and authority

Table 2 shows the results of the fixed effects analysis regarding the intergenerational transmission of *destruction and crimes against public order and authority* in combination with parental separation. First, our results suggest that when one or both parents were a suspect of destruction and crimes against public order and authority, adolescents showed a higher likelihood to become a suspect of destruction and crimes against public order and authority as well (OR = 3.98, c^2 = 431.88). Second, parental separation increased the likelihood for adolescents to become a suspect of destruction and crimes against public order and authority (OR = 1.08, c^2 = 4.73). Third, when one or both parents were a suspect of destruction and crimes against public order and authority, we found no statistically significant difference in likelihood to become a suspect of destruction and crimes against public order and authority between adolescents when they lived with the separated parent who was a suspect of destruction and crimes against public order and authority and those who continued to live with both parents (OR = 3.57 / 3.98 = 0.90, c^2 = 0.25). Fourth, when one or both parents were a suspect of destruction and crimes against public order and authority, adolescents were less likely to become a suspect of destruction and crimes against public order and authority when they lived with the separated parent who was not a suspect of destruction and crimes against public order and authority compared to adolescents who continued to

live with both parents (OR = 1.55 / 3.98 = 0.39, c^2 = 20.85). In addition, when one or both parents were a suspect of destruction and crimes against public order and authority, we found a statistically significant difference between adolescents who lived with the separated parent who was a suspect of destruction and crimes against public order and authority and adolescents who lived with the separated parent who was not a suspect of destruction and crimes against public order and authority. Adolescents who lived with the separated parent who was not a suspect of destruction and crimes against public order and authority were less likely to become a suspect of destruction and crimes against public order and authority (OR = 1.55 / 3.57 = 0.44, c^2 = 8.59).

5.4.4 Violent and sexual crimes

Table 2 shows the results of the fixed effects analysis examining the intergenerational transmission of *violent and sexual crimes* combined with parental separation. First, our results suggest that when one or both parents were a suspect of violent and sexual crimes, adolescents have a higher likelihood of becoming a suspect of violent and sexual crimes as well (OR = 2.84, c^2 = 646.48). Second, we found no statistically significant effects of parental separation on the likelihood of adolescents becoming a suspect of violent and sexual crimes (OR = 1.08, c^2 = 3.61). Third, when one or both parents were a suspect of violent and sexual crimes, we found no statistically significant difference in likelihood to become a suspect of violent and sexual crimes between adolescents when they lived with the separated parent who was a suspect of violent and sexual crimes and those who continued to live with both parents (OR = 3.07 / 2.83 = 1.08, c^2 = 0.37). Fourth, when one or both parents was a suspect of violent and sexual crimes, adolescents were less likely to become a suspect of violent and sexual crimes when they lived with the separated parent who was not a suspect of violent and sexual crimes compared to adolescents who continued to live with both parents (OR = 1.94 / 2.83 = 0.68, c^2 = 11.29). Table 2 between adolescents who lived with the separated parent who was a suspect of violent and sexual crimes and adolescents who lived with the separated parent who was not a suspect of violent and sexual crimes. Adolescents who lived with the separated parent who was not a suspect of violent and sexual crimes were less likely to become a suspect of violent and sexual crimes (OR = 1.94 / 3.07 = 0.63, c^2 = 8.52).

Parameter Estimates of a Fixed Effects Panel Model about the Intergenerational Transmission of Property Crimes (*N* = 49,512), Destruction and Crimes against Public Order and Authority (*N* = 38,051), and Violent and Sexual Crimes (*N* = 28,058), Combined with Parental Separation

	Property Crimes		Destruction and Crimes against Public Order and Authority		Violent and Sexual Crimes	
	OR	CIs	OR	CIs	OR	CIs
Type of family structure and parental crime – Ref: Adolescent lived in a family with both biological parents and parents were not a suspect of a crime						
Adolescent lived in a family with both biological parents and one or both parent(s) were a suspect of a crime	3.03***	[2.78, 3.29]	3.98***	[3.50, 4.54]	2.84***	[2.62, 3.08]
Adolescent lived with one parent after a separation and parents were not a suspect of a crime	1.03	[0.97, 1.09]	1.08*	[1.01, 1.16]	1.08	[1.00, 1.17]
Adolescent lived with one parent after a separation and lived with a parent who was a suspect of a crime	1.98***	[1.55, 2.51]	3.57***	[2.35, 5.41]	3.07***	[2.39, 3.95]
Adolescent lived with one parent after a separation and did not live with the parent who was a suspect of a crime	1.56***	[1.24, 1.96]	1.55*	[1.06, 2.28]	1.94***	[1.56, 2.40]
Age – Ref: 12						
13	2.92***	[2.76, 3.08]	2.07***	[1.97, 2.18]	2.38***	[2.21, 2.56]
14	6.34***	[6.02, 6.69]	3.37***	[3.21, 3.54]	4.45***	[4.15, 4.78]
15	8.84***	[8.39, 9.31]	3.86***	[3.68, 4.05]	6.12***	[5.71, 6.55]
16	9.25***	[8.78, 9.74]	4.07***	[3.88, 4.27]	7.18***	[6.70, 7.68]
17	8.24***	[7.81, 8.69]	3.92***	[3.73, 4.11]	8.19***	[7.65, 8.77]
18	6.64***	[6.29, 7.01]	3.25***	[3.09, 3.41]	8.48***	[7.92, 9.09]
Household income	0.95***	[0.93, 0.97]	0.97*	[0.95, 1.00]	0.96**	[0.93, 0.99]
Negative household incomes	0.53***	[0.40, 0.70]	0.62**	[0.45, 0.86]	0.75	[0.52, 1.07]
Repartnering – Ref: no new partners						
One or two new partner(s)	0.90*	[0.84, 0.98]	0.91*	[0.83, 1.00]	0.93	[0.84, 1.03]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

In addition, when one or both parents were a suspect of violent and sexual crimes, we found a statistically significant difference

5.5 Discussion

In this study, we examined the intergenerational transmission of three types of crime in combination with parental separation. The investigated types of crime were property crimes; destruction and crimes against public order and authority; and violent and sexual crimes. We considered three hypotheses for the intergenerational transmission of the three types of crime in combination with experiencing a parental separation. We expected to find that 1) all types of crime committed by the parents increase the likelihood for adolescents to engage in that type of crime as well; 2) a parental separation increases the likelihood for adolescents to engage in all the three types of crime; and 3) a protective effect of parental separation when it is considered in conjunction with parental crime. That is, when adolescents continue to live with the single parent who does not engage in crime, in comparison to when adolescents continue to live with the single parent who engages in crime *or* adolescents who live in a family with both biological parents with one or both parents who engage in crime.

With the exception of the relationship between parental separation and the engagement of adolescents in violent and sexual crimes, all results for destruction and crimes against public order and authority and violent and sexual crimes were consistent with what we expected. First, the engagement in destruction and crimes against public order and authority or violent and sexual crimes by the parent(s) increased the likelihood of adolescents also becoming a suspect of the same type of crime as their parents. These results are consistent with the results of a systematic review and meta-analysis by Besemer et al. (2017), which showed that offspring were 2.4 times more likely to engage in crime when their parents displayed criminal behavior. Second, parental separation increased the likelihood of adolescents becoming a suspect of destruction and crimes against public order and authority, yet parental separation did not increase the likelihood of adolescents becoming a suspect of violent and sexual crimes. A systematic review by Kroese et al. (2021) showed that offspring with separated parents were more likely to engage in criminal behavior than offspring from intact families. However, contradictory to our results, several studies have shown that after experiencing parental separation, offspring are more likely to engage in physical dating violence and sexual coercion (Banyard et al., 2006; Champion et al., 2008; Margari et al., 2015). Third, we found a protective effect of parental separation when adolescents continued to live with the single parent who was not a suspect of destruction

and crimes against public order and authority or violent and sexual crimes, in contrast to when adolescents continued to live with the single parent who was a suspect of one of these types of crimes *or* when adolescents lived in a family with both biological parents with one or both parents who were a suspect of one of these types of crimes. This is in line with the results of the study conducted by Van de Weijer et al. (2015), showing that intergenerational transmission of violent crime only occurred if the violent father remained married to the mother during their offspring's childhood. When the offspring of violent fathers experienced a parental separation during their childhood, violent crime was not transmitted (Van de Weijer et al., 2015).

With regard to property crimes, we only found evidence for an increased likelihood of adolescents becoming a suspect of property crimes when their parents also were a suspect of property crimes, similar to the results for destruction and crimes against public order and authority and violent and sexual crimes. However, in line with the results about violent and sexual crimes, parental separation did not increase the likelihood of adolescents becoming a suspect of property crimes. Third, to our surprise, we found protective effects of parental separation both when adolescents continued to live with either the single parent who was not a suspect of property crimes *and* when they lived with the single parent who was a suspect of property crimes, in contrast to when adolescents live in a family with both biological parents with one or both parents who were a suspect of property crimes. We also found no difference between adolescents who continued to live with the single parent who was not a suspect of property crimes and adolescents who continued to live with the single parent who was a suspect of property crimes. These results are contrary to our expectations, as well as different from the findings of Van de Weijer et al. (2015), since they found that intergenerational transmission of non-violent crime was more likely if the parents were separated.

We did not expect to find protective effects of parental separation in the form of living with a single parent who engaged in property crimes. Nevertheless, we have two possible explanations for this result. Firstly, similar to the families that engage in other types of crime, adolescents could have been exposed to conflicts between their parents before they separated. However, because property crimes are often only committed outside of the household (in contrast to, for instance, violent and sexual crimes; Van de Weijer, 2014), adolescents might not be aware of,

nor observe, the crimes committed by their parents. Therefore, when adolescents continue to live with a single parent who engages in property crime, they might escape the previous conflicts between their parents and remain unaware of the property crimes committed by their parent. Secondly, during adolescence, property crimes are more often committed together with peers than other types of crime (Andresen and Felson, 2010; Carrington, 2009). Since adolescents sometimes have to move after a parental separation, it is possible that adolescents lose friends with whom they may have co-offended and therefore engage fewer in property crimes. These two explanations are hypothetical and need further exploration in future research.

5.5.1 Limitations and future research

The use of population data in combination with a fixed effect approach is an important substantive and methodological contribution to understanding the intergenerational transmission of crime combined with parental separation, because it gives us a better understanding of the causal mechanisms linking these phenomena. However, the use of population data also has limitations. Due to the nature of population data, several possibly interesting confounding time-varying variables could not be included in the fixed effects panel analyses. These include 1) the number and the severity of conflicts between the parents before the separation occurred, 2) the frequency and quality of contact between the adolescent and both parents after the separation, and 3) whether the adolescent was (often) exposed to the criminal behavior of the parent(s). Furthermore, registered addresses do not tell us the whole story about the living situation of a family. For example, for offspring of separated parents in 50/50 custody arrangements, the registered address is the place where they spent only half of their time. Furthermore, some parents who lived together at first, yet chose for a living apart together (LAT) relationship later on, may have been categorized as 'parental separation' due to changes in residential addresses, while these parents still constitute a romantic couple (22 percent of Dutch people who do not share a household with partner have a LAT relationship, yet no statistical data is available about whether these people have children and, if yes, whether their current partner is the father of the children or not; CBS, 2015).

We have three suggestions for future research. First, it would be interesting to examine whether other forms of parental separation and absence, such as

parental death, parental military deployments, and parents employed as 'fly-in fly-out' (FIFO) workers, influences the intergenerational transmission of crime differently. Second, it is important to examine whether the intergenerational transmission of offending, and preventive effects of such, found in this study continue into adulthood within this same sample. Third, adding official records of domestic violence and high-conflict divorce would enable a more nuanced and context-rich examination of the role of parental separation in preventing or contributing to offspring offending.

5.5.2 Implications

Our results have implications for theory, practice, and methodology. The theoretical implications of our research are related to our differentiation between three types of crime. When looking at the intergenerational transmission of criminal behavior in conjunction with parental separation, other researchers found a protective effect of parental separation when the parent who engaged in criminal behavior did not live with their offspring anymore (e.g., Blazei et al., 2008; Thornberry et al., 2009). When we recoded the three types of crime of our study into one variable, we obtained similar results as the other researchers (see Table 11A for an analysis examining criminal behavior in general excluding 'other offenses', as well as a separate analysis examining criminal behavior in general including 'other offenses'). By differentiating between the three types of crime, our results also showed a protective effect of a parental separation when the adolescent lived with the single-parent who engaged in property crimes. Hence, our research shows that it is necessary to distinguish between types of crimes when investigating the intergenerational transmission of crime in conjunction with parental separation.

Our research results also have implications for practice. Our results suggest that adolescents who live in a family with both biological parents where one or both of their parent(s) engaged in criminal behavior, *and* adolescents who live with a single parent who engaged in criminal behavior (except for property crimes), showed a higher likelihood of also engaging in criminal behavior. Therefore, with the exception of property crimes, parental offending by a parent living in one's household is detrimental for young people. In order to mitigate such risk, interventions designed to support family relationships, improve parenting, and address adolescent problematic behaviors (e.g., family systems therapy

or multisystemic therapy; Huey et al., 2000; Thompson et al., 2019), should be available when parents have contact with the criminal justice system. It would be important to evaluate whether such interventions are effective in reducing intergenerational transmission of offending.

Finally, the results from our research reveal some methodological implications. Despite the limitations mentioned above, the usage of population register data also has advantages. Other studies often used mother-reported criminal behavior of the father and did not consider the criminal behavior committed by the mother (e.g., Blazei et al., 2008; Jaffee et al., 2003). Moreover, studies that rely exclusively on fathers who are willing to be interviewed, often do not contain many fathers who engage in the most serious criminal behaviors due to the difficulty to interview these fathers (Blazei et al., 2008). In fact, most studies only focused on antisocial behavior instead of criminal behavior (e.g., Blazei et al., 2008; Thornberry et al., 2009). Since our dataset includes the registered criminal behavior (charges) of both parents and their offspring longitudinally, this provides a more complete image about the relationship between the intergenerational transmission of crime and parental separation.

5.5.3 Conclusion

We found a protective effect of parental separation when adolescents lived with the single parent who did not engage in destruction and crimes against public order and authority *or* violent and sexual crimes. Additionally, we found a protective effect of parental separation for both adolescents who lived with a single parent who *did not* engage in property crimes and those who lived with a single parent who *did* engage in property crimes. This implies that in certain family situations, such as living in the same house as a single parent who engages in criminal behavior, generally a parental separation that leads to living with the parent who does not engage in criminal behavior appears to reduce the risk of offspring offending. We need further examination of the contexts surrounding parental separation to understand these findings.

CHAPTER 6

GENERAL DISCUSSION

6 General discussion

The aim of this dissertation was to assess the effect of growing up in a single-parent family during childhood and adolescence on adolescents' involvement in delinquency. A more specific aim was to investigate whether different types of single-parent families have different effects, and whether these effects depend on parental involvement in crime. These questions were investigated by means of a systematic review based on the extant empirical literature and three empirical studies based on Dutch population register data provided by Statistics Netherlands.

6.1 Dissertation summary

The first study (Chapter 2) systematically reviewed the empirical literature regarding the effect of being raised in a single-parent family on criminal behavior of adolescent offspring, and also focused on whether this effect depends on how single-parent families were constituted (either by parental divorce or separation, by parental decease, or by being born to a single parent). A systematic search identified 48 relevant empirical studies on this topic. Two general conclusions could be drawn from these empirical studies. First, there is substantial evidence that growing up in a single-parent family and adolescent involvement in crime are related. Of the 48 relevant empirical studies, 34 studies reported a statistically significant positive relation between single-parent families and crime, whereas 14 studies showed no statistically significant relation. Second, it was concluded that more research is needed on the effects of the different constituting events of single-parent families on crime. Only a single study reports on the differences between families disrupted by divorce/separation and families disrupted by parental decease. In this study (Juby & Farrington, 2001), findings based on police-recorded and self-reported delinquency provided contradictory results. Since there was only one study on the different constituting events of single-parent families and this study also showed contradictory results, it was concluded that this issue required more research. Although the experience of a parental divorce or separation, a parental decease, or being born to a single parent all result in single-parent families, they are associated with different processes and may have differential consequences for delinquent behavior.

The second study (Chapter 3) empirically assessed the relation between growing up in a single-parent family before age 12 and the likelihood to engage

in juvenile delinquency during adolescence (age 12-18), and focused on whether this effect depends on how single-parent families were constituted (by parental divorce or separation, by parental decease, or by being born to a single parent). Dutch population register data from Statistics Netherlands was used. First, the results showed that offspring growing up in a single-parent family were 1.70 times more likely to engage in juvenile delinquency compared to offspring growing up with two biological parents. When taking the different constituting events of single-parent families into account, the results showed that offspring born to a single parent showed the highest likelihood to engage in delinquency (i.e., offspring born to a single parent were 1.91 times more likely to engage in delinquency compared to offspring growing up with two biological parents). Both offspring experiencing parental separation and offspring experiencing parental decease showed a lower likelihood to engage in delinquency than offspring born to a single parent. Nevertheless, offspring experiencing a parental separation and offspring experiencing a parental decease were more likely to engage in delinquency compared to offspring growing up with two biological parents (i.e., 1.64 and 1.62 times more likely, respectively). Second, our results confirmed that a lower age at the start of a single-parent family increased the chance that the offspring engaged in delinquency during adolescence, compared to offspring who experienced the start of a single-parent family at a later age and compared to offspring growing up with two biological parents. When considering the types of single-parent families separately, offspring in all three types of single-parent families showed a higher likelihood to engage in juvenile delinquency after experiencing the start at a young age. For a given age category, there were no statistically significant differences between offspring experiencing a parental separation and offspring experiencing a parental decease. Third, compared to offspring growing up with two biological parents, our results suggested that growing up with only a biological mother (1.73 times more likely) or only a biological father (1.50 times more likely) significantly increased the chance that the offspring engaged in delinquency. Moreover, when taking into account the sex of the offspring as well, our results suggested that both sons and daughters growing up with only a biological mother showed a higher likelihood to engage in juvenile delinquency compared to sons and daughters growing up with only a biological father. Additionally, when combining the sex of the parent and all three types of single-parent families, offspring born to a single parent growing up with only a biological father showed the lowest level of juvenile

delinquency (1.30 times more likely than offspring growing up with two biological parents), and offspring born to a single parent growing up with only a biological mother showed the highest level of juvenile delinquency (1.95 times more likely than offspring growing up with two biological parents).

The third study (Chapter 4) examined the effects of living in a single-parent family as an adolescent (age 12-18) due to parental separation or due to parental decease, on the likelihood to engage in delinquency during adolescence (age 12-18). In addition, anticipatory and (short-term as well as long-term) delayed effects of parental separation or parental death on delinquency were taken into account. Dutch population register data from Statistics Netherlands was used. Note that both Chapter 3 and Chapter 4 addressed adolescent delinquency as an outcome, but Chapter 3 investigated the effects of experiencing the start of a single-parent family before age 12, while Chapter 4 addressed the effects of experiencing the start of a single-parent family between age 12 and 18. This distinction is reflected in the statistical techniques that were applied. Whereas Chapter 3 distinguished between childhood and adolescence and applied a cross-sectional logit model, Chapter 4 utilized the panel structure of the data and estimated fixed effects panel models. Fixed effects panel models examine only within-individual change and control for all observed and unobserved stable individual characteristics. The first model assumed that parental disruption is an event with a discrete effect that moves delinquency to a new level, whereas the second model allowed for behavioral changes to take effect in anticipation of the event, or to take effect after the event with some delay. The results showed that adolescents who experienced a parental divorce/separation or a parental death were more likely to engage in juvenile delinquency compared to when that same adolescent would have continued to live with both parents (1.06 and 1.14 times more likely, respectively). No differences between adolescents who experienced a parental divorce/separation or a parental death were found. In addition, the results showed a short-term increase of adolescent delinquency after a parental divorce/separation (i.e., in the year of the parental divorce/separation and the two years afterwards). Subsequently, the likelihood of delinquency decreased again to pre-divorce/separation levels. In contrast, the results showed an anticipatory reduction in adolescent delinquency before a parental decease (i.e., one year before the parental death and in the year of the parental death).

The fourth study (Chapter 5) investigated the involvement of adolescents in three different types of crime (i.e., property crimes, destruction and crimes against public order and authority, and violent and sexual crimes) caused by the parental involvement in these types of crime (i.e., intergenerational transmission of crime), to assess whether a parental separation can help to break the vicious cycle of crime in families with adolescents (age 12-18). Dutch population register data from Statistics Netherlands was used. As in Chapter 4, fixed effects panel models were performed. The reference category in all analyses are adolescents in a family with two biological parents and their parents were not a suspect of a crime. The results showed a protective effect of parental separation when adolescents lived with the single parent who did not engage in destruction and crimes against public order and authority (1.55 times more likely) *or* violent and sexual crimes (1.94 times more likely). Therefore, the positive effect of parental involvement in crime on adolescent delinquency was reduced due to parental separation. This is in contrast to when adolescents continued to live with the single parent who did engage in one of these types of crimes (3.57 and 3.07 times more likely, respectively) *or* when adolescents lived in a family with one or both biological parents who engaged in one of these types of crimes (3.98 and 2.84 times more likely, respectively). Additionally, there was a protective effect of parental separation when adolescents lived with a single parent who did not engage in property crime (1.56 times more likely) or, surprisingly, lived with the single parent who did engage in property crime (1.98 times more likely), in contrast to when adolescents lived in a family with both biological parents where one or both parents engaged in property crime (3.03 times more likely).

6.2 Theoretical implications

The results of this dissertation have important theoretical implications. As described in the systematic review (Chapter 2), there are many criminological theories about growing up in single-parent families (e.g., social control theory; Hirschi, 1969), stating that growing up in a single-parent household and engaging in juvenile delinquency are causally related. The results of Chapter 2, 3, and 4 confirm the existence of a positive association between single-parent families and adolescent delinquency, because a majority of the included studies in the systematic review found a positive relation and both empirical studies found a positive relation between experiencing the start of a single-parent family during

childhood and adolescence, and the involvement in juvenile delinquency during adolescence. The results of Chapter 5 also confirm this association, yet only for adolescents whose parents are not involved in crime. This implies that there is indeed a relationship between single-parent families and adolescent crime, as the criminological theories stated.

But it also implies that the findings do not speak in favor of or against any particular theory. After all, scientific progress implies that superior theories survive inferior theories that can be discarded. To further assess the merits of alternative theories, it is important to further scrutinize the mechanisms that cause the association between single-parent families in general and adolescent delinquency. The majority of the studies in the systematic review containing multivariate analyses (see Chapter 2), controlled for parental attachment (which is important for social control theory and the social control/parental absence model; Gottfredson & Hirschi, 1990; Hirschi, 1969) and/or parental resources (which is important for the economic strain model; see Sogar, 2017). However, adding these constructs did not alter the significant relation between single-parent families in general and adolescent delinquency. Moreover, all empirical studies in this dissertation (see Chapter 3-5) controlled for parental resources, measured as household income. In Chapter 3, household income was not statistically significant. In Chapter 4 and 5, household income was statistically significant, implying that a higher household income decreased the likelihood to engage in crime. Nevertheless, household income did not influence the statistically significant relation between single-parent families and adolescent delinquency. This implies that the social control theory (Hirschi, 1969), the social control/parental absence model (Gottfredson & Hirschi, 1990), and the economic strain model (see Sogar, 2017) cannot completely explain the relation between single-parent families and adolescent delinquency.

Moreover, there is also no clarity regarding the mechanisms that cause the differences between the three types of single-parent families and adolescent delinquency. The family crisis model (Mack et al., 2007) states that parental resentment is an important factor explaining the negative consequences for different types of single-parent families. The family crisis model suggests that, due to parental resentment, offspring is more likely to display criminal behavior after experiencing a parental divorce/separation than after experiencing a parental death. Also, it suggests that offspring in families with two biological parents and offspring born to a single parent are expected to display less criminal behavior,

because they did not experience a family disruption crisis. However, there were no studies in the systematic review (see Chapter 2) that controlled for parental resentment. Additionally, none of the empirical studies in this dissertation (see Chapter 3-5) controlled for parental resentment, because this variable was not available in the Dutch population register data. Furthermore, the results in this dissertation do not confirm the expected outcomes of the family crisis model. The systematic review in Chapter 2 showed that there is only one study on the differences between types of single-parent families and criminal behavior of the offspring, and this study also shows contradictory results when using different research methods. Chapter 3 and 4 showed that children and adolescents experiencing a parental separation display a similar likelihood to engage in adolescent delinquency as children and adolescents with a deceased biological parent. Moreover, Chapter 3 showed that offspring born to a single parent showed the highest likelihood to engage in delinquency, which implies that, of the three types of single-parent families, offspring who did not consciously experience a crisis event showed the highest level of adolescent delinquency. This means that the results in this dissertation show that the family crisis model cannot explain the relation between single-parent families and adolescent delinquency. However, the chapters in this dissertation do not provide specific information on the effects of parental resentment (i.e., due to the unavailability of this variable in the data) in different types of families on adolescent delinquency, thus it may be the case that parental resentment does have an effect, yet that parental resentment, for instance, is stronger for offspring born to a single-parent family. It is also possible that offspring feels equal resentment towards divorced/separated parents as towards deceased parents.

There are two hypotheses in this dissertation that may help to explain the unexpected results with respect to the different types of single-parent families. The results of the first hypothesis (see Chapter 3) regarding the effects of age of the offspring, may help to explain the results regarding offspring born to a single parent showing the highest likelihood to engage in adolescent delinquency. The results in Chapter 3 showed that a lower age during the start of a single-parent family increased the chance that the offspring engaged in delinquency during adolescence. This is exactly in line with Bowlby's attachment theory (Ainsworth & Bowlby, 1991), that suggests that disruptions at younger ages (especially during the first five years of life) have more impact than disruptions at a later age. Because

a lower age during the start of a single-parent family increased the chance that the offspring engaged in adolescent delinquency, this might be the reason that offspring born to a single parent showed the highest likelihood to engage in adolescent delinquency. A related explanation is that the three categories of single-parent families are confounded with the length of exposure. While offspring born to a single parent have been exposed their whole life to a single-parent family when they reach adolescence, offspring experiencing a parental separation or a parental decease are on average exposed for a much shorter time period. Since offspring born to a single parent never lived with two biological parents, this might result in a higher risk of juvenile delinquency.

One result that can challenge this explanation of age of the offspring as an important factor for the unexpected results regarding the different types of single-parent families, is the result about the sex of the parent (see Chapter 3). The general results showed that offspring growing up with only a biological mother, both for sons and daughters, showed a higher likelihood to engage in juvenile delinquency compared to growing up with only a biological father. Moreover, when combining the sex of the parent and all three types of single-parent families, the results suggested that offspring born to a single parent growing up with only a biological mother showed the highest level of juvenile delinquency. This is in line with the other results in this thesis (yet in contrast with all theories mentioned regarding the sex of the single parent combined with juvenile delinquency; Bowlby's attachment theory, the maternal hypothesis, the equality hypothesis, and the same-sex hypothesis). However, the results also suggested that offspring born to a single parent growing up with only a biological father showed the lowest level of juvenile delinquency, which contradicts all results about the type of single-parent family and the age of the offspring. Therefore, the explanation of age of the offspring as an important factor for the unexpected results regarding the different types of single-parent families can be challenged due to this outcome. This implies that growing up with only a biological mother may be a more important predictor of adolescent delinquency. This outcome may be explained by paternal closeness, since both sons and daughters show a lower likelihood to engage in juvenile delinquency when the closeness to their father is high (Johnson, 1987; Yoder et al., 2016), most likely also occurring in single-father families. Another possible explanation is that sons are more in need of a role model of the same sex than daughters. These two explanations are hypothetical and need further exploration in future research.

The results on the second hypothesis (see Chapter 4) regarding the anticipatory and (short-term as well as long-term) delayed effects of parental disruption, may help to explain why offspring experiencing a parental separation are equally likely to engage in adolescent delinquency as offspring with a deceased biological parent. The results in Chapter 4 showed a short-term increase of adolescent delinquency after a parental divorce/separation. Subsequently, the likelihood of delinquency decreased again to pre-divorce/separation levels. This result confirms the expectations of the crisis model (Amato, 2000), implying that a parental divorce/separation could be an event to which most adolescents only briefly respond with an increase in delinquent behavior, but are able to adjust to over time. However, the results regarding parental decease were unexpected, because they showed an anticipatory reduction in adolescent delinquency before a parental decease. This suggests some level of anticipatory behavior, with adolescents less likely to engage in delinquent behavior in the run-up to and during the year of parental decease. This means that considering parental separation and parental decease as a discrete event results in adolescents showing similar likelihoods to engage in adolescent delinquency, yet the effects on the offspring were quite different when parental separation and parental divorce were modeled as an event with anticipatory, short-term and long-term consequences. While experiencing a parental divorce increased the likelihood to engage in adolescent crime, experiencing a parental death actually decreased the likelihood to engage in adolescent crime before the parental death occurred and the likelihood to engage in adolescent crime returned to the original likelihood after the parental death occurred. This means that modeling parental separation and parental death as an event with anticipatory, short-term and long-term consequences, provided results that are in line with the expectations of the family model, because the family model states that offspring is more likely to display criminal behavior when experiencing a parental divorce/separation than when experiencing a parental death. At the same time, these results call for an improved understanding of the social and psychological processes in the adolescents' lives that that play a role in family disruptions.

All criminological theories as well as all results described above, suggest that there is a positive relation between living in a single-parent family during childhood and adolescence, and the involvement in juvenile delinquency during adolescence. These theories all assume that the presence of both parents is beneficial for their offspring. However, do situations exist where a parental

disruption might be beneficial for the offspring? Because both parental crime (Besemer et al., 2017) and single-parent families separately are related a higher risk on offspring's criminal behavior, it is interesting to see how experiencing both parental events influences offspring's criminal behavior. If a parent engages in criminal behavior and the parents separate, this situation might be 1) beneficial for the offspring if they can 'escape' the transmission of the criminal behavior, because they are less likely to learn or imitate the criminal behavior of that parent due to the parental separation (i.e., a protective effect; based on an explanation by Farrington et al. (2001)), or 2) detrimental for the offspring, since both parental crime and experiencing the start of a single-parent family separately are related to a higher likelihood to engage in crime and this could be intensified due to a combination of these life events (i.e., a cumulative effect). The results in Chapter 5 showed a protective effect of parental separation when adolescents lived with the single parent who did not engage in destruction and crimes against public order and authority or violent and sexual crimes, in contrast to when adolescents continued to live with the single parent who did engage in one of these types of crimes or when adolescents lived in a family with both biological parents where one or both parents engaged in one of these types of crimes. These results show that in certain family situations, such as living in the same house as a single parent who engages in criminal behavior, generally a parental separation that leads to living with the parent who does not engage in criminal behavior reduces the risk of offspring offending. Therefore, the positive relation between living in a single-parent family during childhood and adolescence and the involvement in juvenile delinquency during adolescence, does not always hold true in specific situations. However, these results most certainly do not imply that there is no relationship between single-parent families and adolescent delinquency, but rather that it may not always be the case that a parental separation is detrimental for the outcomes of the offspring when considering the whole family situation.

Additionally, the results in Chapter 5 showed that there was a protective effect of parental separation when adolescents lived with a single parent who did not engage in property crime or, surprisingly, lived with the single parent who did engage in property crime, in contrast to when adolescents lived in a family with both parents where one or both parents engaged in property crime. However, when looking at the intergenerational transmission of criminal behavior without differentiating between types of crimes in conjunction with parental separation,

other researchers found a protective effect of parental separation in general when the parent who engaged in criminal behavior did not live with their offspring anymore (e.g., Blazei et al., 2008; Thornberry et al., 2009). When the three types of crime in Chapter 5 were recoded into one variable about crime in general, similar results as the other researchers were obtained. Therefore, this study shows that it is necessary to distinguish between types of crimes when investigating the intergenerational transmission of crime in conjunction with parental separation.

There are two possible explanations for this unexpected result with regard to property crimes. Firstly, similar to the families that engage in other types of crime, adolescents could have been exposed to conflicts between their parents before they separated. However, because property crimes are often only committed outside of the household (in contrast to, for instance, violent and sexual crimes; Van de Weijer, 2014), adolescents might not be aware of, nor observe, the crimes committed by their parents. Therefore, when adolescents continue to live with a single parent who engages in property crime, they might escape the previous conflicts between their parents and remain unaware of the property crimes committed by their parent. Secondly, during adolescence, property crimes are more often committed together with peers than other types of crime (Andresen and Felson, 2010; Carrington, 2009). Since adolescents sometimes have to move after a parental separation, it is possible that adolescents lose friends with whom they may have co-offended and therefore engage fewer in property crimes. These two explanations are hypothetical and need further exploration in future research.

6.3 Implications for practice

In the Netherlands, there are many support options for both the parent(s) and their offspring who experienced a separation or death and/or who engage in problem behavior. In general, when the parent(s) and the offspring are able to cope with the new family situation, professional counseling is not offered and people are also not forced to participate in professional counseling. However, there are evidence-based options that could be beneficial for the parent(s) and their offspring, both for internalizing (e.g., depression) and externalizing behavior (e.g., delinquent behavior).

Examples of options that can help offspring who experienced a parental divorce or separation, include 1) an online buddy program by the foundation Villa

Pinedo in which a young adult who also experienced a parental separation as a child, helps a child who is currently experiencing a parental separation (Van der Wal et al., 2021), 2) a group training for young children with divorced parents which teaches the children how to cope with the divorce (e.g., 'Dappere Dino's' and 'Stoere Schildpadden' designed by TNO; Klein Velderman & Pannebakker, 2014), and 3) going to a child psychologist in case the offspring gets psychological problems due to the parental separation. Moreover, programs exist for the offspring and their parents when the parents are involved in a high-conflict divorce. A family can volunteer to take part in this intervention program or can be referred to the intervention program by child protection agencies or a judge. One example is the group intervention 'Kinderen uit de Knel', consisting of multiple sessions for the offspring as well as for both parents (Van Lawick & Visser, 2014). Examples of options that can help offspring who experienced a parental death, include 1) getting in contact with fellow-sufferers (Kúti et al., 2004) and 2) in case the offspring is not able to cope with the parent's death, cognitive behavioral therapy which consists of several sessions for both the offspring and their parent (Spuij, 2017). Furthermore, many intervention programs exist to stop the offspring from engaging in problem behavior or criminal behavior, often focusing on the parents of these children to improve their parenting skills (e.g., the program 'OUDERS van Tegendraadse Jeugd' and the 'Parent Management Training Oregon model'; Boendermaker et al., 2010; Forgatch & Gewirtz, 2017).

Although the results of this dissertation do not provide directions on which interventions the offspring and/or parents could or should take when experiencing a parental disruption, this dissertation does have implications for practice. Instead, this dissertation provides useful information for practice on which children are more likely to engage in crime when experiencing a parental disruption, which types of single-parent families are more likely to engage in crime, and whether the child's engagement in crime alters when parental separation is combined with parental crime.

The results in Chapter 2 showed that all studies conducted in Europe found a statistically significant positive relation between single-parent families and juvenile delinquency (the results in North America were mixed, implying that more research is needed in North America first). The results of Chapter 2 and 3 showed that the sex distribution of a sample did not affect the results, which means that both boys and girls are affected by the parental disruption. The results of Chapter

3 showed that offspring born to a single parent and offspring who have a lower age during the start of a single-parent family, show an increased likelihood to engage in delinquency during adolescence. In short, these results show that interventions, especially, should target European boys and girls who were born to a single parent or experienced a parental disruption at a young age.

The results in Chapter 4 showed that offspring are affected differently by parental separation and parental death. The results showed a short-term increase of adolescent delinquency after a parental divorce/separation. Subsequently, the likelihood of delinquency decreased again to pre-divorce/separation levels. In contrast, the results showed an anticipatory reduction in adolescent delinquency before a parental decease. These results show that, with respect to adolescent delinquency, interventions should focus less on offspring who experienced a parental death, because experiencing a parental death actually decreased the likelihood to engage in adolescent crime before the parental death occurred, and the likelihood to engage in adolescent crime returned to the original likelihood after the parental death occurred. However, experiencing a parental divorce increased the likelihood to engage in adolescent crime, albeit a short-term increase. Therefore, these results show that, with respect to adolescent delinquency, interventions should focus on offspring who experienced a parental separation, especially during the first couple of years after the separation.

The results of Chapter 5 showed that a parental separation does not always increase the likelihood for the offspring to engage in adolescent delinquency. In certain family situations, such as living in the same house as a single parent who engages in criminal behavior, generally a parental separation that leads to living with the parent who does not engage in criminal behavior appears to reduce the risk of offspring offending. Therefore, these results show that, in certain family situations, the adolescents who do not experience a parental separation may need to participate in an intervention, because these adolescents continue to be affected by the criminal behavior of the parent. Furthermore, these results legitimate the practice of courts in the Netherlands to award single custody (as opposed to joint custody) when there are exceptional circumstances, such as when one parent has been convicted of a violent criminal act. This may prevent the intergenerational transmission of crime.

6.4 Methodological implications

Because of the systematic review (see Chapter 2), it became clear what type of study was lacking in the empirical literature. For instance, previous studies 1) often used self-reported data which more often leads to an underestimation of the true levels of crime due to social desirability and often do not have enough respondents to also report more serious criminal behavior, 2) only focused on the criminal behavior of the father (without considering the criminal behavior of the mother) in combination with the mother who became a single-parent after the parental disruption (without considering single-father families), and 3) quite often only focused on the effects of single-parent families on boys, while it is possible that boys and girls respond differently to growing up in single-parent families. Additionally, it became clear that 1) more recent studies were needed to keep up with the changing cultural values regarding this topic, as well as that 2) more studies were needed that were conducted outside the United States of America to be able to investigate different cultural contexts.

By means of using population register data, all of these issues could be resolved. In this dissertation, the topic of single-parent families and adolescent delinquency could be investigated more extensively with population register data (see Chapter 3-5), and benefit from the advantages of these data. This provided several methodological implications.

First, population register data are provided by reliable sources. For instance, the data about crime are officially reported data provided by The Dutch National Police. Therefore, the studies in this dissertation did not need, for instance, to rely on mother-reported criminal behavior of the father or to only focus on antisocial behavior instead of criminal behavior (although not all delinquent acts are registered by the police and the police does not solve all recorded delinquent acts, resulting in an underestimation of the number of delinquent behaviors in the official data; Groot et al., 2007). Moreover, the data about family structure are provided by the Dutch population register. By means of population register data from the Netherlands, the studies in this dissertation were able to include all couples in the Netherlands with offspring who lived together, irrespective of the type of relationship agreement they have or had (i.e., marriage, registered partnership, and cohabitation). This is important, because, for example, 30 percent of the young children live with parents who cohabit without being married in the

Netherlands (CBS, 2016) and one of the parents may already have moved to a different address while it can take years to officially finalize the divorce.

Second, population register data provide large sample sizes and complete longitudinal data. Large samples allow the detection of rare associations or rare events that cannot be reliably studied with small samples, as small samples are generally only appropriate for discovering average behavior (Lin et al., 2013). Some family structures are relatively rare, such as offspring living in single-father families and offspring being born to a single-parent family. Moreover, criminal behavior committed by the mother often could not be considered in other studies, because offending by females occurs less often (Estrada et al., 2016). With population register data available, researchers do not experience difficulties anymore with respect to finding enough respondents for their studies. Besides this, non-random participation is also a problem that could influence the sample size, and undermines the representativeness of the study sample (Eisner et al., 2019). This is applicable to, for instance, surveys and interviews. Due to certain characteristics of the parent(s) and/or the offspring, the participation in studies regarding child and adolescent development can be biased. For example, offspring with primary caregivers who speak languages other than the official regional language are less likely to participate in surveys (Eisner et al., 2019), whereas people with a non-Dutch migration background are more likely to become a suspect of crime in the Netherlands (CBS, 2020b). Next to a larger sample size, population register data also provides complete longitudinal data. Longitudinal studies are very important when trying to investigate the developmental processes behind child and adolescent development (Eisner et al., 2019). In other type of studies, such as survey and interviews, non-random attrition takes place. This means that people tend to drop-out of a study over time when a study consists of multiple waves. This non-random attrition reduces statistical power and can introduce spurious developmental effects or disguise genuine developmental effects. For example, people who display the highest levels of crime, are more likely to drop-out of studies (Brame & Piquero, 2003). Overall, population register data prevents the problems mentioned above due to the availability of a large sample size and the completeness of longitudinal data.

Third, the availability of high-quality longitudinal data (i.e., the Dutch population register data includes the family structure as well as the registered criminal behavior of both parents and their offspring longitudinally) gives us a

more complete image of the relationship between parental crime (in Chapter 5 in particular), single-parent families, and juvenile delinquency. In Chapter 3, it was possible to look at the relation between growing up in a single-parent family (age 0-11) and the likelihood to engage in juvenile delinquency during adolescence (age 12-18) by means of a logistic regression. Only association and not causation can be inferred from the results (Sedgwick, 2014), because the observed association between single-parent families and juvenile delinquency may have been the result of confounding. Not all factors that may have affected the outcome of juvenile delinquency were measured and controlled for in the analyses. However, other type of research methods to test this relationship between growing up in a single-parent family and adolescent delinquency were unavailable. For instance, performing a fixed effects panel model is impossible due to the absence of juvenile delinquency data from age 0 to 11. Therefore, while causation could not be inferred from the results in Chapter 3, this research method combined with the use of population data provides the best way to test the association between growing up in a single-parent family and the likelihood to engage in juvenile delinquency during adolescence. In Chapter 4 and 5, the relation between experiencing a change in family structure during adolescence (combined with parental crime in Chapter 5) and adolescent crime was estimated. Due to the availability of panel data (i.e., observations on the same individual for multiple periods of time), it was possible to use fixed effects panel models. A fixed effects panel model examines only within-individual change (e.g., family structure, family income, criminal behavior) and controls for all observed and unobserved stable individual characteristics (e.g., sex, country of birth). By controlling for both observed and unobserved differences between individuals, the fixed effects panel model is very useful to control for time-constant selection bias (Allison, 2009). In addition, it is possible to control for time-varying variables that might influence the relationships. A disadvantage of the fixed effects model is that the effect of stable background characteristics cannot be estimated, because the model controls for these characteristics. Other statistical models often rely on strong and untestable assumptions. In contrast, fixed effects panel models make much weaker assumptions, and can provide stronger evidence on the causal effects of living in single-parent families on adolescent delinquency. Using panel data combined with fixed effects models is an exceptionally powerful tool for causal inference (Facure, 2021). However, using fixed effects panel models is not a panacea when

there is either reverse causality or when unmeasured confounding factors change over time. Reverse causality is the error of mistaking cause for effect and vice versa. In the present dissertation, the issue of potential reverse causality does not seem very plausible. Unless under very unique circumstances (e.g., because of the criminal gang membership of offspring, one of their parents gets murdered due to a revenge killing by a rival gang member), most single-parent families will cause the engagement in adolescent delinquency instead of the other way around. However, it is possible that certain important confounders that change over time are lacking in the statistical analyses of Chapter 4 and 5, because several variables could not be included in the analyses due to the nature of population register data (see Section 6.5 on the limitations). Therefore, it also cannot be guaranteed that the results in Chapter 4 and 5 are causal. However, in the absence of more powerful research designs such as randomized controlled trials, fixed effects panel models are amongst the most convincing methods for causal inference with non-experimental data (Facure, 2021). See Section 6.6 on suggestions for future research that could help to investigate causal effects.

6.5 Limitations

The limitations of this dissertation mostly apply to the limitations of population register data. Although using population register data has many advantages (see Section 6.4), it also has some limitations.

First, due to the nature of population register data, several essential variables could not be included in analyses, while these could provide information on the mechanisms that could explain the relation between single-parent families and adolescent delinquency. Examples of variables that would have been added in case they would have been available are 1) the number and the severity of conflicts between the parents before the parental disruption occurred and, in case of the families disrupted by a parental separation, conflicts after the parental separation as well (e.g., in case of a high-conflict divorce), 2) the frequency and quality of contact between the offspring and their parent(s) after the parental disruption, 3) the quality of the caregiving (e.g., parental supervision) by the parent(s) in a possibly stressful period before, during, and after the parental disruption, 4) the quality of a possible new neighborhood and new school after having to move away, and, 5) if applicable, whether the offspring was (often) exposed to the criminal behavior

of the parent(s). This lack of data on prior and contemporary family dynamics may restrain the knowledge about possible mechanisms explaining the relation between single-parent families and adolescent delinquency.

Second, despite the preciseness and completeness of the measured variables in the population register data, it was impossible to extract the full information from the data about the living situation of the families. It is possible to make a distinction between families that are disrupted due to a parental separation, due to a parental decease, or due to being born to a single parent. However, we do not know the exact details of the living situation of these families. With regard to families disrupted by a parental separation, it is not possible 1) to check whether a co-parenting arrangement is in place (i.e., offspring are officially registered at their mother's address, yet unofficially live with their biological father fifty percent of the time as well), since the offspring can be registered at only one address in the Dutch population register, and 2) to check whether parents who lived together at first, opted (wanted or unwanted) for a living apart together (LAT) relationship later on, which resulted in the categorization 'parental separation' due to their different registered addresses. With regard to families disrupted by a parental decease, a parental decease can be caused by various reasons, such as a short-term or long-term illness, a suicide, or a murder; reasons that could impact how a family handles the parental death. However, data regarding the cause of death are only allowed to be accessed under very strict circumstances due to privacy reasons. Similarly, a wide range of events could lead to offspring growing up in a single-parent family from the start; from a teenage pregnancy without the father knowing to an older single mother by choice. However, the exact details about the reasons that initiated the start of this type of single-parent family are not available in the population register data, while this could make a difference with regard to the quality of the family situation.

Third, population register data only uses officially registered information regarding delinquency. While self-reported delinquency has clear disadvantages, official police-reported delinquency also has disadvantages. Not all delinquent acts are registered by the police and the police does not solve all recorded delinquent acts, resulting in an underestimation of the number of delinquent behaviors in the official data, especially with regard to less severe types of delinquent acts (Groot et al., 2007). Moreover, the dataset that was used in this dissertation to investigate delinquency, contains suspects who have been charged with a serious

offense eligible for prosecution. This means that people received a 'procès-verbal', an official report drawn up by a police officer about a crime that has occurred. This means that the dataset does not contain actual conviction records. Over 90 percent of the people in this dataset are estimated to receive a transaction (e.g., a fine) or to be charged and found guilty by a judge (Besjes & Van Gaalen, 2008), yet this also means that nearly 10 percent of the people in this dataset are not convicted.

6.6 Suggestions for future research

In the future, more research could be executed to gain more knowledge about the relation between single-parent families and offspring delinquency.

Future studies could examine delinquency in more detail when studying single-parent families. This includes a more detailed distinction 1) between incidental and persistent delinquency, 2) between minor and serious delinquency, and 3) between different types of delinquency. For instance, because the household income is generally lower in families with only one biological parent, it is possible that the offspring is more inclined to engage in offenses such as burglary to obtain money. The distinction between different types of delinquency was only made in Chapter 5. However, this study did not investigate the relation between single-parent families and different types of juvenile delinquency by itself. Next to this, future studies could add the possible consequence of parental crime, namely imprisonment. When a parent leaves the household for several months, it will not be visible in the Dutch population register, yet a short-term leave of a parent who engages in crime may be beneficial for their offspring.

Furthermore, it would be great if future studies would be able to include more information on the family structure and family dynamics. As mentioned in Section 6.5, several possibly interesting variables could not be included in analyses due to the nature of population register data. However, these variables could provide information on the mechanisms that could explain the relation between single-parent families and adolescent delinquency. Examples are 1) the number and the severity of conflicts between the parents before the parental disruption occurred, 2) the frequency and quality of contact between the offspring and their parent(s) after the parental disruption (including whether a co-parenting arrangement is in place), 3) the reason why the parental separation or parental death occurred,

and 4) the presence of stepparents and stepsiblings. Therefore, it is necessary to also focus on investigating single-parent families and adolescent delinquency with other methods and sources. For instance, questionnaires and interviews could be used to ask questions to parents and their offspring about their family dynamics. I am aware of the disadvantages of these research methods, such as a smaller sample size and shorter observation periods. However, this could give us more insight into the mechanisms behind the relationship between single-parent families and delinquency, which is impossible when only using population register data.

Moreover, it would be interesting to investigate the relation between single-parent families and delinquency when the offspring in this study are older. First, it would be helpful to investigate the relation between experiencing the start of a single-parent family as a child or as an adolescent (possibly combined with parental crime during childhood or adolescence), and the offspring's criminal behavior during adulthood. This would provide more insight into the long-term effects of these parental events on the criminal behavior of their offspring. The results of Chapter 4 suggest that experiencing a parental separation or a parental death as an adolescent does not affect their likelihood to engage in adolescent delinquency in the long run. This means that there seems to be no effect on adolescents three to seven years after the event, yet these adolescents may be affected by these parental events in the future as an adult. Second, it would be useful to research the relation between experiencing the start of a single-parent family as an adult (possibly combined with parental crime during adulthood), and the criminal behavior of the offspring during adulthood. This would give insight into the effects of these parental events on the criminal behavior of their adult offspring. Chapter 3 showed that a lower age during the start of a single-parent family increased the chance that the offspring engaged in delinquency. Moreover, Chapter 5 showed that a parental separation that leads to living with the parent who does not engage in criminal behavior appears to reduce the risk of offspring offending. This way, offspring can 'escape' the intergenerational transmission of the criminal behavior, because adolescents are less likely to learn or imitate the criminal behavior of the parent who moved out of the house due to the parental separation. Therefore, it would be interesting to see whether a parental disruption when their offspring are adults affects the criminal behavior of adult offspring, since they are older and often do not live with their parents anymore.

Besides focusing on conducting more empirical research, researchers could also concentrate on the following two issues. First, the definition of 'single-parent families' states that this is a family that consists of one parent and one or more minor children (age 0-17) that live in the same household (CBS, 2021a), excluding the presence and support of a spouse or adult partner who is able to share the responsibility of parenting. However, most studies included in the systematic review (see Chapter 2; Kroese et al., 2021) did not distinguish between single-parent families with and without a stepparent. Moreover, the empirical studies in this dissertation (see Chapter 3-5) used stepparents as a covariate and, thus, continued to classify families as single-parent families when a stepparent started to live at the same registered address. This means that the official definition excludes the presence of a stepparent, yet it is important for research to take into account the presence of stepparents in single-parent families (e.g., due to a higher change of more parental supervision and more financial stability). Therefore, it is necessary to think about how the presence of a stepparent should be investigated (e.g., as a covariate or as a separate category of the variable 'type of single-parent families'). Second, it would be great if the number of microdata sets in population register data could be expanded. Adding sets about psychological constructs (e.g., levels of conscientiousness or self-esteem) could be more difficult, because these are often unobservable behaviors which makes these data more difficult to collect on the complete population of the Netherlands. However, to be able to collect these data on a representative sample of the population would also help, because we could combine these data with the reliable data from the Dutch population register. Next to this, being able to add official records on observable behaviors could also help to investigate the mechanisms behind the relation between single-parent families and adolescent delinquency. Examples of official records that could be relevant are official records of domestic violence cases and high-conflict divorces, to be able to check how well (ex-)partners and their offspring get along before, during, and after the parental disruption.

6.7 Conclusion

This dissertation has contributed to the literature by looking at the effect of growing up in a single-parent family during childhood and adolescence on adolescents' involvement in delinquency. More specifically, it investigated whether different types of single-parent families have different effects, and whether

these effects depend on parental involvement in crime. These relationships were investigated by means of a systematic review based on empirical literature and three empirical studies based on Dutch population register data provided by Statistics Netherlands. This dissertation has shown that 1) there is a positive relation between experiencing the start of a single-parent family as a child or adolescent and the engagement in crime during adolescence, 2) there is a higher likelihood for offspring born to a single parent to engage in crime, followed by offspring with separated parents and offspring experiencing parental death, 3) there is a higher likelihood for offspring to engage in crime when the single-parent family starts at a younger age compared to a later age or when children grow up with only a biological mother, both for sons and daughters, compared to only a biological father, 4) there is a short-term increase of adolescent delinquency after a parental separation and an anticipatory reduction in adolescent delinquency before a parental death, and 5) in certain family situations, such as living in the same house as a single parent who engages in criminal behavior, generally a parental separation that leads to living with the parent who does not engage in criminal behavior appears to reduce the risk of offspring engaging in crime.

Overall, this dissertation underscores the importance of researching the effects of single-parent families on the offspring, because growing up in a single-parent family influences the future of the offspring with regard to their delinquent behavior. To be able to obtain a complete image about the effects of growing up in a single-parent family and adolescent delinquency, it is very important to continue to perform high-quality research on this topic in the future.

7

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8

APPENDIX

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TITLE-ABS-KEY (((“single parent” OR “single-parent” OR “single parents” OR “single-parents” OR “single parenthood” OR “single-parenthood” OR “broken home” OR “broken homes”) OR (“divorce” OR “divorced” OR “separation” OR “separated” OR “split-up” OR “breakup” OR “break up” OR “broke up”) OR (“out-of-wedlock” OR “out of wedlock” OR “born outside marriage” OR “unmarried childbearing”) OR (“decease” OR “deceased” OR “die” OR “died” OR “pass away” OR “passed away” OR “death” OR “widow” OR “widower” OR “widowed”)) AND (“parent” OR “parents” OR “parental” OR “mother” OR “mothers” OR “maternal” OR “father” OR “fathers” OR “paternal”) AND (“children” OR “child” OR “childhood” OR “offspring” OR “adolescent” OR “adolescents” OR “adolescence” OR “teenager” OR “teenagers” OR “youth” OR “youths” OR “youngster” OR “youngsters” OR “young people” OR “juvenile” OR “minor” OR “minors” OR “son” OR “sons” OR “daughter” OR “daughters”) AND (“criminal” OR “crime” OR “criminality” OR “felony” OR “felonies” OR “delinquency” OR “delinquent” OR “problem behavior” OR “problem behaviour” OR “lawbreaking” OR “law-breaking” OR “offender” OR “offenders” OR “offending” OR “offence” OR “offense” OR “offences” OR “offenses”)) AND (LIMIT-TO (DOCTYPE , “ar “)) AND (LIMIT-TO (SRCTYPE , “j”))

Table 1A

Overview of the items about juvenile delinquency and parental crime

Juvenile delinquency	Parental crime
- Number of car thefts (with or without violence)	- Number of violent sex offenses (rape or sexual assault)
- Number of car break-ins (with or without violence)	- Number of other sex offenses (excluding rape or sexual assault)
- Number of bicycle thefts	- Number of violent property crimes
- Number of house burglaries	- Number of property crimes (excluding violent property crimes)
- Number of burglaries in a basement, garage, shed, or garden house (with or without violence)	- Number of criminal damages and crimes against public order
- Number of moped thefts (with or without violence)	- Number of road traffic offenses
- Number of burglaries in a school (with or without violence)	- Number of drug offenses
- Number of burglaries in a sport complex (with or without violence)	- Number of other offenses
- Number of pickpocket thefts	
- Number of street crimes	
- Number of burglaries in a store, company, or office (with or without violence)	
- Number of shoplifting offenses (with or without violence)	
- Number of other types of burglaries and thefts	
- Number of frauds	
- Number of forgery crimes	
- Number of handling stolen goods offenses	
- Number of blackmailing offenses	
- Number of other property crimes	
- Number of destructions of a car	
- Number of destructions of a public building	
- Number of other destructions	
- Number of assaults	
- Number of trespassing offenses	
- Number of computer trespassing offenses	
- Number of other assaults	
- Number of arson or explosion offenses	
- Number of times an official order is disobeyed	
- Number of other crimes against public authority	
- Number of assaults	
- Number of threats	
- Number of stalking offenses	

- Number of sexual assaults
- Number of rapes
- Number of indecent exposures
- Number of fornications with a minor
- Number of other sexual assaults
- Number of murders and manslaughters
- Number of deprivations of liberty or kidnapping
- Number of other violent crimes
- Number of other assaults according to the Dutch law book
- Number of offenses of leaving the place of an accident
- Number of drink-driving offenses
- Number of times driven with a suspended license
- Number of other road traffic offenses
- Number of drug offenses
- Number of weapon offenses
- Number of other offenses
- Number of offenses – category unknown

Table 2A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Type of Family as Main Independent Variable (*N* = 1,295,683)

	OR	CIs
Type of family (Reference category = Family with two biological parents)		
Single-parent family	1.70***	[1.67, 1.73]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.02***	[1.99, 2.05]
Two criminal biological parents	3.83***	[3.72, 3.96]
Sex of the child (Reference category = Son)		
Daughter	0.31***	[0.31, 0.32]
Household income	1.00	[0.99, 1.01]
Negative household incomes	0.92	[0.84, 1.02]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.88, 0.91]
1995	0.78***	[0.77, 0.80]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.08***	[1.06, 1.11]
Two new partners	1.15***	[1.11, 1.18]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.19***	[1.15, 1.23]
At least one parent from a non-Western country	1.95***	[1.92, 1.98]
Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.67***	[1.60, 1.75]
Between 20 and 29	1.25***	[1.23, 1.26]
Age 40 and older	1.09***	[1.05, 1.14]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Type of Single-parent Family as Main Independent Variable (*N* = 1,295,683)

	OR	CIs
Type of single-parent family (Reference category = Family with two biological parents)		
Separated parents	1.64***	[1.61, 1.67]
One biological parent passed away	1.62***	[1.54, 1.70]
Born to a single parent	1.91***	[1.86, 1.96]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.01***	[1.98, 2.05]
Two criminal biological parents	3.77***	[3.65, 3.89]
Sex of the child (Reference category = Son)		
Daughter	0.31***	[0.31, 0.32]
Household income	1.00	[1.00, 1.01]
Negative household incomes	0.92	[0.84, 1.02]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.88, 0.92]
1995	0.78***	[0.77, 0.80]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.08***	[1.05, 1.11]
Two new partners	1.16***	[1.12, 1.20]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.18***	[1.15, 1.22]
At least one parent from a non-Western country	1.93***	[1.90, 1.96]
Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.63***	[1.56, 1.71]
Between 20 and 29	1.25***	[1.23, 1.27]
Age 40 and older	1.09***	[1.04, 1.13]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 4A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Age of the Children when the Single-Parent Family was Constituted as Main Independent Variable (*N* = 1,295,683)

	OR	CIs
Age of disruption (Reference category = Family with two biological parents)		
0 – Born to a single parent	1.94***	[1.89, 1.99]
1 – Separated parents or one deceased parent	1.93	[0.80, 4.65]
2 – Separated parents or one deceased parent	1.93***	[1.84, 2.01]
3 – Separated parents or one deceased parent	1.81***	[1.74, 1.88]
4 – Separated parents or one deceased parent	1.73***	[1.66, 1.80]
5 – Separated parents or one deceased parent	1.65***	[1.58, 1.72]
6 – Separated parents or one deceased parent	1.58***	[1.52, 1.49]
7 – Separated parents or one deceased parent	1.60***	[1.53, 1.67]
8 – Separated parents or one deceased parent	1.57***	[1.51, 1.64]
9 – Separated parents or one deceased parent	1.56***	[1.49, 1.62]
10 – Separated parents or one deceased parent	1.61***	[1.55, 1.68]
11 – Separated parents or one deceased parent	1.57***	[1.50, 1.64]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.01***	[1.97, 2.04]
Two criminal biological parents	3.73***	[3.61, 3.85]
Sex of the child (Reference category = Son)		
Daughter	0.31***	[0.31, 0.32]
Household income	1.00	[1.00, 1.00]
Negative household incomes	0.93	[0.84, 1.03]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.88, 0.92]
1995	0.78***	[0.76, 0.79]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.07***	[1.04, 1.09]
Two new partners	1.13***	[1.09, 1.17]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.18***	[1.14, 1.22]
At least one parent from a non-Western country	1.92***	[1.89, 1.95]

Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.62***	[1.55, 1.70]
Between 20 and 29	1.25***	[1.24, 1.26]
Age 40 and older	1.08***	[1.04, 1.13]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 5A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Age of the Children when the Different Single-Parent Families were Constituted as Main Independent Variable (*N* = 1,295,681)

	OR	CIs
Age of disruption (Reference category = Family with two biological parents)		
0 – Born to a single parent	1.94***	[1.89, 1.99]
1 – Separated parents	2.13	[0.89, 5.13]
2 – Separated parents	1.94***	[1.85, 2.03]
3 – Separated parents	1.80***	[1.73, 1.88]
4 – Separated parents	1.73***	[1.66, 1.80]
5 – Separated parents	1.65***	[1.58, 1.72]
6 – Separated parents	1.58***	[1.52, 1.65]
7 – Separated parents	1.60***	[1.53, 1.67]
8 – Separated parents	1.59***	[1.52, 1.66]
9 – Separated parents	1.55***	[1.49, 1.62]
10 – Separated parents	1.61***	[1.54, 1.69]
11 – Separated parents	1.57***	[1.50, 1.64]
1 – Deceased parent	1.00[12]	
2 – Deceased parent	1.73***	[1.46, 2.06]
3 – Deceased parent	1.87***	[1.61, 2.17]
4 – Deceased parent	1.79***	[1.54, 2.08]
5 – Deceased parent	1.70***	[1.46, 1.97]
6 – Deceased parent	1.58***	[1.36, 1.84]
7 – Deceased parent	1.57***	[1.35, 1.82]
8 – Deceased parent	1.36**	[1.16, 1.59]
9 – Deceased parent	1.63***	[1.41, 1.89]
10 – Deceased parent	1.63***	[1.41, 1.90]
11 – Deceased parent	1.52***	[1.31, 1.77]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.01***	[1.97, 2.04]
Two criminal biological parents	3.73***	[3.61, 3.85]
Sex of the child (Reference category = Son)		
Daughter	0.31***	[0.31, 0.32]

[12] The category 'deceased parent' at age 1 was omitted from the analysis, because this category comprised of only two children.

Household income	1.00	[1.00, 1.01]
Negative household incomes	0.93	[0.84, 1.03]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.88, 0.92]
1995	0.78***	[0.76, 0.79]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.07***	[1.04, 1.09]
Two new partners	1.13***	[1.09, 1.17]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.18***	[1.14, 1.22]
At least one parent from a non-Western country	1.92***	[1.89, 1.95]
Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.62***	[1.55, 1.70]
Between 20 and 29	1.24***	[1.23, 1.26]
Age 40 and older	1.08***	[1.04, 1.13]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 6A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Sex of the Parent in a Single-Parent Family as Main Independent Variable (*N* = 1,295,683)

	OR	CIs
Sex of the parent (Reference category = Family with two biological parents)		
Living with only a biological father	1.50***	[1.44, 1.57]
Living with only a biological mother	1.73***	[1.69, 1.76]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.02***	[1.98, 2.05]
Two criminal biological parents	3.82***	[3.70, 3.94]
Sex of the child (Reference category = Son)		
Daughter	0.31***	[0.31, 0.32]
Household income	1.00	[1.00, 1.01]
Negative household incomes	0.93	[0.84, 1.02]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.88, 0.92]
1995	0.78***	[0.77, 0.80]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.08***	[1.05, 1.10]
Two new partners	1.14***	[1.10, 1.17]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.19***	[1.15, 1.23]
At least one parent from a non-Western country	1.95***	[1.92, 1.98]
Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.67***	[1.60, 1.75]
Between 20 and 29	1.25***	[1.23, 1.26]
Age 40 and older	1.09***	[1.05, 1.14]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 7A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Sex of the Parent in the Different Single-Parent Families as Main Independent Variable (*N* = 1,295,683)

	OR	CIs
Sex of the parent (Reference category = Family with two biological parents)		
Living with only a father because parents separated	1.57***	[1.48, 1.66]
Living with only a mother because parents separated	1.65***	[1.62, 1.69]
Living with only a father because of a deceased parent	1.53***	[1.39, 1.68]
Living with only a mother because of a deceased parent	1.67***	[1.57, 1.77]
Living with only a father because born to a single parent	1.30***	[1.17, 1.43]
Living with only a mother because born to a single parent	1.95***	[1.90, 2.01]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.01***	[1.98, 2.04]
Two criminal biological parents	3.75***	[3.63, 3.87]
Sex of the child (Reference category = Son)		
Daughter	0.31***	[0.31, 0.32]
Household income	1.00***	[1.00, 1.01]
Negative household incomes	0.93***	[0.84, 1.02]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.89, 0.92]
1995	0.78***	[0.77, 0.80]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.07***	[1.05, 1.10]
Two new partners	1.15***	[1.11, 1.19]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.19***	[1.15, 1.22]
At least one parent from a non-Western country	1.93***	[1.90, 1.96]
Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.64***	[1.57, 1.72]
Between 20 and 29	1.25***	[1.23, 1.27]
Age 40 and older	1.08***	[1.04, 1.13]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 8A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Sex of the Parent and Child in Single-Parent Families as Main Independent Variable (*N* = 1,295,683)

	OR	CIs
Sex of the parent and child (Reference category = Daughter living with both biological parents)		
Son living with both biological parents	3.45***	[3.39, 3.51]
Daughter living with only a biological father	1.79***	[1.66, 1.93]
Son living with only a biological father	4.85***	[4.60, 5.11]
Daughter living with only a biological mother	2.00***	[1.95, 2.05]
Son living with only a biological mother	5.58***	[5.45, 5.71]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.01***	[1.98, 2.05]
Two criminal biological parents	3.79***	[3.68, 3.91]
Household income	1.00	[1.00, 1.01]
Negative household incomes	0.93	[0.84, 1.02]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.88, 0.92]
1995	0.78***	[0.77, 0.80]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.08***	[1.05, 1.10]
Two new partners	1.14***	[1.10, 1.17]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.19***	[1.15, 1.23]
At least one parent from a non-Western country	1.95***	[1.92, 1.98]
Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.67***	[1.59, 1.74]
Between 20 and 29	1.25***	[1.23, 1.26]
Age 40 and older	1.09***	[1.05, 1.14]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 9A

Parameter Estimates of a Logistic Regression Model with Juvenile Delinquency as Dependent Variable and Sex of the Parent and Child in the Different Single-Parent Families as Main Independent Variable (*N* = 1,295,683)

	OR	CIs
Sex of the parent and child (Reference category = Daughter living with both biological parents)		
Son living with both biological parents	3.45***	[3.39, 3.50]
Daughter living with only a father after separation	1.95***	[1.78, 2.15]
Son living with only a father after separation	4.97***	[4.66, 5.30]
Daughter living with only a mother after separation	1.90***	[1.84, 1.96]
Son living with only a mother after separation	5.37***	[5.23, 5.51]
Daughter living with only a father after parental death	1.76***	[1.50, 2.07]
Son living with only a father after parental death	4.97***	[4.45, 5.56]
Daughter living with only a mother after parental death	1.88***	[1.70, 2.08]
Son living with only a mother after parental death	5.46***	[5.08, 5.86]
Daughter living with only a father after born to single parent	1.38**	[1.15, 1.66]
Son living with only a father after born to single parent	4.37***	[3.87, 4.93]
Daughter living with only a mother after born to single parent	2.29***	[2.21, 2.38]
Son living with only a mother after born to single parent	6.24***	[6.04, 6.45]
Number of criminal parents (Reference category = No criminal parents)		
One criminal biological parent	2.01***	[1.98, 2.04]
Two criminal biological parents	3.72***	[3.61, 3.84]
Household income	1.00	[1.00, 1.01]
Negative household incomes	0.93	[0.84, 1.02]
Birth cohort (Reference category = 1993)		
1994	0.90***	[0.89, 0.92]
1995	0.78***	[0.77, 0.80]
1996	0.67***	[0.65, 0.68]
1997	0.58***	[0.57, 0.59]
1998	0.50***	[0.49, 0.51]
1999	0.45***	[0.44, 0.46]
New partner(s) (Reference category = No new partners)		
One new partner	1.07***	[1.05, 1.10]
Two new partners	1.15***	[1.11, 1.19]
Nationality biological parents (Reference category = Both parents Dutch)		
At least one parent from a (non-Dutch) Western country	1.19***	[1.15, 1.22]
At least one parent from a non-Western country	1.93***	[1.90, 1.96]

Age biological mother (Reference category = Between age 20 and 39)		
Until age 19	1.64***	[1.56, 1.71]
Between 20 and 29	1.25***	[1.23, 1.27]
Age 40 and older	1.08***	[1.04, 1.13]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 10A

Overview of the crime types included in measures of parental crime and adolescent crime

Property crimes	Destruction and crimes against public order and authority	Violent and sexual crimes	Other offenses
- Car thefts (with or without violence)	- Destructions of a public building	- Assaults	- Offenses of leaving the place of an accident
- Car break-ins (with or without violence)	- Destructions of a car	- Threats	- Drink-driving offenses
- Bicycle thefts	- Other destructions	- Stalking offenses	- Times driven with a suspended license
- Burglaries in a school (with or without violence)	- Assaults	- Sexual assaults	- Other road traffic offenses
- Burglaries in a sport complex (with or without violence)	- Trespassing offenses	- Rapes	- Drug offenses
- Moped thefts (with or without violence)	- Computer trespassing offenses	- Indecent exposures	- Weapon offenses
- House burglaries	- Other assaults	- Fornications with a minor	- Other offenses
- Burglaries in a basement, garage, shed, or garden house (with or without violence)	- Arson or explosion offenses	- Other sexual assaults	- Offenses – category unknown
- Pickpocket thefts	- Times an official order is disobeyed	- Murders and manslaughters	
- Burglaries in a store, company, or office (with or without violence)	- Other crimes against public authority	- Deprivations of liberty or kidnapping	
- Street crimes		- Other violent crimes	
- Shoplifting offenses (with or without violence)		- Other assaults according to the Dutch law book	
- Other types of burglaries and thefts			
- Frauds			
- Forgery crimes			
- Handling stolen goods offenses			
- Blackmailing offenses			
- Other property crimes			

Table 11A

Parameter Estimates of a Fixed Effects Panel Model about the Intergenerational Transmission of Crime in General, Excluding Other Offenses (N = 92,063) and Including Other Offenses (N = 101,845), Combined with Parental Separation

	Crime in General excluding Other Offenses		Crime in General including Other Offenses	
	OR	CIs	OR	CIs
Type of family structure and parental crime – Ref: Adolescent lived in a family with both biological parents and parents were not a suspect of a crime				
Adolescent lived in a family with both biological parents and one or both parent(s) were a suspect of a crime	1.99***	[1.90, 2.08]	1.75***	[1.68, 1.81]
Adolescent lived with one parent after a separation and parents were not a suspect of a crime	1.09***	[1.04, 1.14]	1.08***	[1.04, 1.13]
Adolescent lived with one parent after a separation and lived with a parent who was a suspect of a crime	1.92***	[1.68, 2.20]	1.84***	[1.64, 2.06]
Adolescent lived with one parent after a separation and did not live with the parent who was a suspect of a crime	1.49***	[1.34, 1.67]	1.43***	[1.06, 1.57]
Age – Ref: 12				
13	2.46***	[2.37, 2.55]	2.47***	[2.39, 2.56]
14	4.80***	[4.64, 4.96]	4.86***	[4.70, 5.02]
15	6.31***	[6.10, 6.52]	6.52***	[6.31, 6.74]
16	6.75***	[6.53, 6.98]	7.26***	[7.03, 7.50]
17	6.48***	[6.26, 6.70]	7.57***	[7.33, 7.82]
18	5.64***	[5.45, 5.83]	7.20***	[6.97, 7.44]
Household income	0.96***	[0.95, 0.98]	0.97***	[0.95, 0.98]
Negative household incomes	0.62***	[0.50, 0.75]	0.66***	[0.54, 0.79]
Repartnering – Ref: no new partners				
One or two new partner(s)	0.90***	[0.85, 0.96]	0.93**	[0.88, 0.98]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

9

SUMMARIES

English summary

Although most children in Western countries are raised by both of their biological parents, a large minority grows up in a single-parent family. Typically, this is because the biological parents have divorced or separated, because one of the biological parents passed away, or because the biological parents never lived together. As a family environment that includes both biological parents is often seen as an important resource for a successful transition through adolescence, it is important to investigate the consequences of growing up in a single-parent family. One of the negative consequences that has been studied extensively is involvement in criminal behavior as an adolescent. This is of high societal relevance, not only because the victims of delinquency suffer injuries, losses, and other harms, but also because criminal behavior is associated with negative life outcomes to the adolescent committing delinquent acts.

Therefore, the aim of this dissertation was to assess the effect of growing up in a single-parent family during childhood and adolescence on adolescents' involvement in delinquency. A more specific aim was to investigate whether different types of single-parent families (i.e., constituted by parental divorce or separation, by parental decease, or by being born to a single parent) have different effects, and whether the effects of single-parent families depend on parental involvement in crime.

Literature and research methods

The general introduction of this dissertation (**Chapter 1**) presented an overview of 1) the existing literature and 2) the used research methods.

First, a summary was provided about key theories and previous empirical research. It is hypothesized by several criminological theories (e.g., general strain theory and social control theory; Agnew, 2006; Hirschi, 1969) that growing up in a single-parent family and juvenile delinquency are related. Moreover, prior literature reviews consistently show positive associations between single-parent families and juvenile delinquency. However, these literature reviews show several limitations, because these reviews are often rather outdated, too broad, or too limited in scope. Due to these three limitations, it was necessary to 1) obtain a full overview of the existing literature about single-parent families and juvenile delinquency (see Chapter 2), as well as 2) conduct more empirical studies about

single-parent families and juvenile delinquency and whether the relation is dependent on how single-parent families were constituted (see Chapter 3 and 4).

Theories and previous empirical research have shown that, next to single-parent families, parental criminal behavior is also related to a higher likelihood of offspring engaging in criminal behavior (i.e., intergenerational transmission of crime). This raises the question of whether the co-existence of parental offending and parental separation produces a cumulative risk for offspring offending, or whether the separation mitigates the intergenerational transmission of offending. Several studies have tried to investigate the intergenerational transmission of crime in conjunction with a parental separation. Although all these studies have found evidence that suggests a parental separation may diminish the intergenerational transmission of crime, it is important to note that most studies are looking at the broader category of antisocial behavior instead of having a sole focus on adjudicated crime. Therefore, more research is needed to examine the effects of a parental separation on the intergenerational transmission of crime, including a distinction between types of crime (see Chapter 5).

Second, a detailed description of the used research methods was provided, including their advantages and limitations. In the first study of this dissertation, the research method was a systematic review. Cochrane (2021) provides the following definition of systematic reviews: "A systematic review attempts to identify, appraise, and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a specific research question". Rigorous methods (e.g., inclusion and exclusion criteria that determine the eligibility of studies and a comprehensive systematic search to identify all relevant studies) distinguish systematic reviews from traditional reviews. The other three studies in this dissertation were empirical studies using Dutch population register data, named Microdata, from Statistics Netherlands (Centraal Bureau voor de Statistiek). Microdata are linkable data at the level of individuals, companies, and addresses, containing (generally longitudinal) data on the entire registered population of the Netherlands. The information for the microdata sets are derived from the population register and other sources, such as the 'Dutch Tax and Customs Administration' and the 'Dutch National Police'. These microdata sets provide information about, for instance, parental crime, marriage status, juvenile delinquency, and household income.

Results of the systematic review and the empirical studies

The first study (**Chapter 2**) systematically reviewed the empirical literature regarding the effect of being raised in a single-parent family on criminal behavior of adolescent offspring, and also focused on whether this effect depends on how single-parent families were constituted (either by parental divorce or separation, by parental decease, or by being born to a single parent). A systematic search identified 48 relevant empirical studies on this topic. Two general conclusions could be drawn from these empirical studies. First, there is substantial evidence that growing up in a single-parent family and adolescent involvement in crime are related. Of the 48 empirical studies, 34 studies reported a statistically significant positive relation between single-parent families and crime, whereas 14 studies showed no statistically significant relation. Second, it was concluded that more research is needed on the effects of the different constituting events of single-parent families on crime. Only a single study reports on the differences between families disrupted by divorce/separation and families disrupted by parental decease. In this study (Juby & Farrington, 2001), findings based on police-recorded and self-reported delinquency provided contradictory results. Since there was only one study on the different constituting events of single-parent families and this study also showed contradictory results, it was concluded that this issue required more research. Although the experience of a parental divorce or separation, a parental decease, or being born to a single parent all result in single-parent families, they are associated with different processes and may have differential consequences for delinquent behavior.

The second study (**Chapter 3**) empirically assessed the relation between growing up in a single-parent family before age 12 and the likelihood to engage in juvenile delinquency during adolescence (age 12-18), and focused on whether this effect depends on how single-parent families were constituted (by parental divorce or separation, by parental decease, or by being born to a single parent). Dutch population register data from Statistics Netherlands was used. First, the results showed that offspring growing up in a single-parent family were 1.70 times more likely to engage in juvenile delinquency compared to offspring growing up with two biological parents. When taking the different constituting events of single-parent families into account, the results showed that offspring born to a single parent showed the highest likelihood to engage in delinquency (i.e., offspring born to a single parent were 1.91 times more likely to engage in

delinquency compared to offspring growing up with two biological parents). Both offspring experiencing parental separation and offspring experiencing parental decease showed a lower likelihood to engage in delinquency than offspring born to a single parent. Nevertheless, offspring experiencing a parental separation and offspring experiencing a parental decease were more likely to engage in delinquency compared to offspring growing up with two biological parents (i.e., 1.64 and 1.62 times more likely, respectively). Second, the results confirmed that a lower age at the start of a single-parent family increased the chance that the offspring engaged in delinquency during adolescence, compared to offspring who experienced the start of a single-parent family at a later age and compared to offspring growing up with two biological parents. When considering the types of single-parent families separately, offspring in single-parent families due to a parental separation or due to a parental decease both showed a higher likelihood to engage in juvenile delinquency after experiencing the start at a young age. For a given age category, there were no statistically significant differences between offspring experiencing a parental separation and offspring experiencing a parental decease. Third, compared to offspring growing up with two biological parents, the results suggested that growing up with only a biological mother (1.73 times more likely) or only a biological father (1.50 times more likely) significantly increased the chance that the offspring engaged in delinquency. Moreover, when taking into account the sex of the offspring as well, the results suggested that both sons and daughters growing up with only a biological mother showed a higher likelihood to engage in juvenile delinquency compared to sons and daughters growing up with only a biological father. Additionally, when combining the sex of the parent and all three types of single-parent families, offspring born to a single parent growing up with only a biological father showed the lowest level of juvenile delinquency (1.30 times more likely than offspring growing up with two biological parents), and offspring born to a single parent growing up with only a biological mother showed the highest level of juvenile delinquency (1.95 times more likely than offspring growing up with two biological parents).

The third study (**Chapter 4**) examined the effects of living in a single-parent family as an adolescent (age 12-18) due to parental separation or due to parental decease, on the likelihood to engage in delinquency during adolescence (age 12-18). In addition, anticipatory and (short-term as well as long-term) delayed effects of parental separation or parental death on delinquency were taken into

account. Dutch population register data from Statistics Netherlands was used. Note that both Chapter 3 and Chapter 4 addressed adolescent delinquency as an outcome, but Chapter 3 investigated the effects of experiencing the start of a single-parent family before age 12, while Chapter 4 addressed the effects of experiencing the start of a single-parent family between age 12 and 18. This distinction is reflected in the statistical techniques that were applied. Whereas Chapter 3 distinguished between childhood and adolescence and applied a cross-sectional logit model, Chapter 4 utilized the panel structure of the data and estimated fixed effects panel models. Fixed effects panel models examine only within-individual change and control for all observed and unobserved stable individual characteristics. The first model assumed that parental disruption is an event with a discrete effect that moves delinquency to a new level, whereas the second model allowed for behavioral changes to take effect in anticipation of the event, or to take effect after the event with some delay. The results showed that adolescents who experienced a parental divorce/separation or a parental death were more likely to engage in juvenile delinquency compared to when that same adolescent would have continued to live with both parents (1.06 and 1.14 times more likely, respectively). No differences between adolescents who experienced a parental divorce/separation or a parental death were found. In addition, the results showed a short-term increase of adolescent delinquency after a parental divorce/separation (i.e., in the year of the parental divorce/separation and the two years afterwards). Subsequently, the likelihood of delinquency decreased again to pre-divorce/separation levels. In contrast, the results showed an anticipatory reduction in adolescent delinquency before a parental decease (i.e., one year before the parental death and in the year of the parental death).

The fourth study (**Chapter 5**) investigated the involvement of adolescents in three different types of crime (i.e., property crimes, destruction and crimes against public order and authority, and violent and sexual crimes) caused by the parental involvement in these types of crime (i.e., intergenerational transmission of crime), to assess whether a parental separation can help to break the vicious cycle of crime in families with adolescents (age 12-18). Dutch population register data from Statistics Netherlands was used. As in Chapter 4, fixed effects panel models were performed. The reference category in all analyses are adolescents in a family with two biological parents, and these parents were not a suspect of a crime. The results showed a protective effect of parental separation when

adolescents lived with the single parent who did not engage in destruction and crimes against public order and authority (1.55 times more likely) *or* violent and sexual crimes (1.94 times more likely). Therefore, the positive effect of parental involvement in crime on adolescent delinquency was reduced due to parental separation. This is in contrast to when adolescents continued to live with the single parent who did engage in one of these types of crimes (3.57 and 3.07 times more likely, respectively) *or* when adolescents lived in a family with one or both biological parents who engaged in one of these types of crimes (3.98 and 2.84 times more likely, respectively). Additionally, there was a protective effect of parental separation when adolescents lived with a single parent who did not engage in property crime (1.56 times more likely) or, surprisingly, lived with the single parent who did engage in property crime (1.98 times more likely), in contrast to when adolescents lived in a family with both biological parents where one or both parents engaged in property crime (3.03 times more likely).

Conclusions and implications

The general discussion of this dissertation (**Chapter 6**) provided an overview of the results and discussed the implications of these results.

This dissertation has shown that 1) there is a positive relation between experiencing the start of a single-parent family as a child or adolescent and the engagement in crime during adolescence, 2) there is a higher likelihood for offspring born to a single parent to engage in crime, followed by offspring with separated parents and offspring experiencing parental death, 3) there is a higher likelihood for offspring to engage in crime when the single-parent family starts at a younger age compared to a later age or when children grow up with only a biological mother, both for sons and daughters, compared to only a biological father, 4) there is a short-term increase of adolescent delinquency after a parental separation and an anticipatory reduction in adolescent delinquency before a parental death, and 5) in certain family situations, generally a parental separation that leads to living with the parent who does not engage in criminal behavior appears to reduce the risk of offspring engaging in crime.

The results of this dissertation have important theoretical, practical, and methodological implications. There are many criminological theories about growing up in single-parent families, stating that growing up in a single-parent household and engaging in juvenile delinquency are causally related. The results

in this dissertation imply that there is indeed a relationship between single-parent families and adolescent crime, as the criminological theories stated. However, based on the results, the social control theory (Hirschi, 1969), the social control/parental absence model (Gottfredson & Hirschi, 1990), and the economic strain model (see Sogar, 2017) cannot completely explain the relation between single-parent families and adolescent delinquency. Additionally, the results showed that the family crisis model (see Mack et al., 2007) cannot explain the relation between different types of single-parent families and adolescent delinquency. Moreover, the results showed that, in certain family situations, generally a parental separation that leads to living with the parent who does not engage in criminal behavior reduces the risk of offspring offending. Therefore, the positive relation between living in a single-parent family during childhood and adolescence and the involvement in juvenile delinquency during adolescence, does not always hold true in specific situations. However, these results most certainly do not imply that there is no relationship between single-parent families and adolescent delinquency, but rather that it may not always be the case that a parental separation is detrimental for the outcomes of the offspring when considering the whole family situation.

With regard to the practical implications, this dissertation provides useful information for practice on which adolescents are more likely to engage in crime when experiencing a parental disruption, which types of single-parent families are more likely to engage in crime, and whether the child's engagement in crime alters when parental separation is combined with parental crime. The results of Chapter 2 and 3 showed that interventions, especially, should target European boys and girls who were born to a single parent or experienced a parental disruption at a young age. The results of Chapter 4 showed that, with respect to experiencing a parental disruption during adolescence, interventions should focus on offspring who experienced a parental separation, especially during the first couple of years after the separation. The results of Chapter 5 showed that, in certain family situations, the adolescents who do not experience a parental separation may need to participate in an intervention, because these adolescents continue to be affected by the criminal behavior of the parent. Furthermore, these results legitimate the practice of courts in the Netherlands to award single custody when there are exceptional circumstances, such as when one parent has been convicted of a violent criminal act. This may prevent the intergenerational transmission of crime.

In this dissertation, the topic of single-parent families and adolescent delinquency could be investigated more extensively with population register data, and benefit from the advantages of these data (although population data also have some limitations). This provides several methodological implications. First, population register data are provided by reliable sources. Second, population register data provide large sample sizes and complete longitudinal data. Large samples allow the detection of rare associations or rare events that cannot be reliably studied with small samples. Third, the availability of high-quality longitudinal data gives us a more complete image of the relationship between parental crime (in Chapter 5 in particular), single-parent families, and juvenile delinquency.

Overall, this dissertation underscores the importance of researching the effects of single-parent families on the offspring, because growing up in a single-parent family influences the future of the offspring with regard to their delinquent behavior. To be able to obtain a complete image about the effects of growing up in a single-parent family and adolescent delinquency, it is very important to continue to perform high-quality research on this topic in the future.

Dutch summary / Nederlandse samenvatting

Alhoewel de meeste kinderen in Westerse landen worden opgevoed door beide biologische ouders, groeit een grote minderheid op in een eenoudergezin. Meestal komt dit doordat de biologische ouders zijn gescheiden, doordat een van de biologische ouders is overleden of omdat de biologische ouders nooit hebben samengewoond waardoor het kind opgroeit bij één ouder vanaf de geboorte. Aangezien een gezinsomgeving waarin beide biologische ouders aanwezig zijn gezien wordt als een belangrijke bron voor een succesvolle transitie door de adolescentie, is het belangrijk om de consequenties te onderzoeken van het opgroeien in een eenoudergezin. Een van de negatieve consequenties die uitgebreid is onderzocht, is de betrokkenheid van adolescenten bij criminaliteit. Dit heeft een hoge maatschappelijke relevantie, niet alleen omdat de slachtoffers van deze criminele activiteiten verwondingen, financiële verliezen en andere schade hieraan kunnen overhouden, maar ook omdat crimineel gedrag gerelateerd is aan negatieve gevolgen voor het leven van de adolescent zelf.

Daarom was het doel van dit proefschrift om het effect van het opgroeien in een eenoudergezin tijdens de kindertijd en tijdens de adolescentie te onderzoeken op de betrokkenheid van adolescenten bij criminele activiteiten. Een meer specifiek doel was om te onderzoeken of de drie soorten eenoudergezinnen (doordat de biologische ouders zijn gescheiden of uit elkaar zijn gegaan, doordat een van de biologische ouders is overleden of doordat de biologische ouders nooit hebben samengewoond waardoor het kind opgroeide bij één ouder vanaf de geboorte) verschillende effecten hebben op het plegen van criminaliteit door adolescenten, en of de effecten van eenoudergezinnen op het plegen van criminaliteit door adolescenten afhangen van het criminele gedrag van ouders.

Literatuur en onderzoeksmethoden

De algemene introductie van dit proefschrift (**Hoofdstuk 1**) verschafte een overzicht van 1) de bestaande literatuur en 2) de gebruikte onderzoeksmethoden.

Ten eerste werd een samenvatting gegeven van de belangrijkste theorieën en van bestaand empirisch onderzoek. Door meerdere criminologische theorieën (bijvoorbeeld *general strain theory* en *social control theory*; Agnew, 2006; Hirschi, 1969) wordt verondersteld dat het opgroeien in een eenoudergezin gerelateerd is aan jeugdcriminaliteit. Daarnaast laten bestaande literatuuronderzoeken

consistent zien dat er een positieve relatie lijkt te bestaan tussen eenoudergezinnen en jeugdcriminaliteit. Echter, deze literatuuronderzoeken hebben meerdere beperkingen, zoals dat deze onderzoeken vaak gedateerd zijn, te algemeen zijn of te beperkt van omvang zijn. Door deze drie beperkingen was het nodig om zowel 1) een volledig overzicht te krijgen van de bestaande literatuur over eenoudergezinnen en criminaliteit door adolescenten (zie Hoofdstuk 2), als 2) meer empirisch onderzoek te doen naar eenoudergezinnen en criminaliteit door adolescenten en daarbij te kijken of deze relatie afhangt van hoe de eenoudergezinnen ontstaan zijn (zie Hoofdstuk 3 en 4).

Theorieën en bestaand empirisch onderzoek hebben laten zien dat, naast eenoudergezinnen, ook door de ouders gepleegde criminaliteit gerelateerd is aan een verhoogde kans op het plegen van criminaliteit door adolescenten (dit wordt 'intergenerationele overdracht van criminaliteit' genoemd). Dit roept de volgende vraag op; indien een adolescent zowel meemaakt dat een ouder criminaliteit pleegt als dat de ouders uit elkaar gaan, wordt dan de kans verhoogd dat de adolescent zelf criminaliteit pleegt of wordt de intergenerationele overdracht van criminaliteit hierdoor juist verminderd? Meerdere studies hebben geprobeerd om de intergenerationele overdracht van criminaliteit in samenhang met een ouderlijke scheiding te onderzoeken. Hoewel al deze studies bewijs hebben gevonden dat een ouderlijke scheiding ervoor kan zorgen dat de intergenerationele overdracht van criminaliteit wordt verminderd, is het belangrijk om te benoemen dat deze studies kijken naar antisociaal gedrag in het algemeen in plaats van specifiek naar criminaliteit. Daarom is meer onderzoek nodig om uit te zoeken wat de effecten zijn van een ouderlijke scheiding op de intergenerationele overdracht van criminaliteit, inclusief een onderscheid tussen verschillende soorten criminaliteit (zie Hoofdstuk 5).

Ten tweede werd een gedetailleerde beschrijving gegeven van de gebruikte onderzoeksmethoden, inclusief de bijbehorende voordelen en beperkingen. In de eerste studie van dit proefschrift werd gebruik gemaakt van een systematisch literatuuronderzoek. Cochrane (2021) definieert een systematisch literatuuronderzoek als volgt: "Een systematisch literatuuronderzoek probeert al het empirisch bewijs te herkennen, te beoordelen, en samen te vatten dat voldoet aan vooraf gespecificeerde geschiktheidscriteria om een specifieke onderzoeksvraag te beantwoorden". Grondige methoden (zoals inclusie- en exclusiecriteria die de geschiktheid van studies bepalen en een omvangrijke

systematische zoektocht om alle relevante studies te vinden) onderscheiden systematische literatuuronderzoeken van traditionele literatuuronderzoeken. De drie overige studies in dit proefschrift waren empirische studies die gebruik maakten van data over de Nederlandse bevolking, genaamd Microdata, van het Centraal Bureau voor de Statistiek. Microdata zijn data die te koppelen zijn op het niveau van individuen, bedrijven en adressen, en bevatten (doorgaans longitudinale) data over de gehele geregistreerde bevolking van Nederland. De informatie voor de microdatabestanden zijn afkomstig uit het bevolkingsregister en andere bronnen, zoals de Belastingdienst en de Nationale Politie. Deze microdatabestanden geven informatie over, bijvoorbeeld, gepleegde criminaliteit door de ouders, huwelijkse staat, jeugdcriminaliteit en huishoudinkomen.

Resultaten van het systematisch literatuuronderzoek en de empirische studies

Het eerste onderzoek (**Hoofdstuk 2**) heeft systematisch de empirische literatuur beoordeeld over het effect van het opgroeien in een eenoudergezin op het criminele gedrag van adolescenten, en keek ook of dit afhangt van hoe eenoudergezinnen zijn ontstaan (doordat de biologische ouders zijn gescheiden of uit elkaar zijn gegaan, doordat een van de biologische ouders is overleden of omdat de biologische ouders nooit hebben samengewoond waardoor het kind opgroeide bij één ouder vanaf de geboorte). Een systematische zoektocht vond 48 relevante empirische studies over dit onderwerp. Twee algemene conclusies konden worden getrokken uit het overzicht van deze empirische studies. Ten eerste werd geconcludeerd dat er substantieel bewijs is dat een relatie bestaat tussen het opgroeien in een eenoudergezin en de betrokkenheid van adolescenten bij criminaliteit. Van de 48 empirische studies, rapporteerden 34 studies een statistisch significante positieve relatie tussen eenoudergezinnen en criminaliteit door adolescenten, terwijl 14 studies geen statistisch significante relatie vonden. Ten tweede werd er geconcludeerd dat meer onderzoek nodig is naar de verschillende effecten van de drie soorten eenoudergezinnen op criminaliteit door adolescenten. Slechts één studie vermeld de verschillen tussen eenoudergezinnen die door een scheiding ontstaan en eenoudergezinnen die door het overlijden van een ouder zijn ontstaan. In deze studie (Juby & Farrington, 2001) werden verschillende resultaten gevonden als data werd gebruikt dat door de politie was gerapporteerd of als zelf-gerapporteerde data werd gebruikt. Aangezien er slechts één studie bestaat over de verschillen tussen soorten

eenoudergezinnen en deze studie tegenstrijdige resultaten liet zien, werd er geconcludeerd dat er meer onderzoek over dit onderwerp nodig is. Hoewel een scheiding van de ouders, een overlijden van een van de ouders, of het nooit samenwonen van de biologische ouders waardoor het kind opgroeit bij één ouder vanaf de geboorte, allemaal zorgen voor het ontstaan van een eenoudergezin, zijn deze gezinssituaties allemaal geassocieerd met verschillende processen en kunnen daardoor verschillende gevolgen hebben voor crimineel gedrag.

Het tweede onderzoek (**Hoofdstuk 3**) onderzocht empirisch de relatie tussen het opgroeien in een eenoudergezin voordat het kind 12 jaar oud is en de kans om criminaliteit te plegen tijdens de adolescentie (leeftijd 12-18), en onderzocht of dit effect afhangt van hoe de eenoudergezinnen zijn ontstaan (doordat de biologische ouders zijn gescheiden of uit elkaar zijn gegaan, doordat een van de biologische ouders is overleden of omdat de biologische ouders nooit hebben samengewoond waardoor het kind opgroeit bij één ouder vanaf de geboorte). Data van het Centraal Bureau voor de Statistiek over de complete Nederlandse bevolking werden hiervoor gebruikt. Ten eerste toonden de resultaten aan dat adolescenten die in een eenoudergezin opgegroeid zijn, 1.70 keer meer kans hebben om criminaliteit te plegen dan adolescenten die bij twee biologische ouders opgegroeid zijn. Wanneer er werd gekeken naar de verschillende soorten eenoudergezinnen, lieten de resultaten zien dat adolescenten die vanaf hun geboorte bij één ouder woonden de hoogste kans vertoonden om criminaliteit te plegen (1.91 keer meer kans dan adolescenten die bij twee biologische ouders opgegroeid zijn). Zowel adolescenten die een ouderlijke scheiding hebben meegemaakt als adolescenten waarvan een van de ouders is overleden, lieten een lagere kans zien om criminaliteit te plegen dan adolescenten die vanaf hun geboorte bij één ouder woonden. Desalniettemin lieten adolescenten die een ouderlijke scheiding hebben meegemaakt en adolescenten waarvan een van de ouders is overleden een hogere kans zien dan adolescenten die bij twee ouders opgegroeid zijn (respectievelijk 1.64 en 1.62 keer meer kans). Ten tweede bevestigden de resultaten dat een jongere leeftijd tijdens het ontstaan van een eenoudergezin de kans verhoogde op het plegen van criminaliteit tijdens de adolescentie, in vergelijking met adolescenten die op een latere leeftijd het ontstaan van een eenoudergezin meemaakten en in vergelijking met adolescenten die bij beide biologische ouders opgegroeid zijn. Wanneer de verschillende soorten eenoudergezinnen afzonderlijk bekeken werden, lieten adolescenten die een ouderlijke scheiding hebben meegemaakt of adolescenten

waarvan een van de ouders is overleden allebei een hogere kans zien op het plegen van criminaliteit na het ontstaan van het eenoudergezin op een jongere leeftijd. Per leeftijdscategorie werden geen statistisch significante verschillen gevonden tussen adolescenten die een ouderlijke scheiding hebben meegemaakt of adolescenten waarvan een van de ouders is overleden. Ten derde toonden de resultaten aan dat, in vergelijking met adolescenten die bij twee ouders opgegroeid zijn, het opgroeien in een eenoudergezin met alleen een biologische moeder (1.73 keer meer kans) of met alleen een biologische vader (1.50 keer meer kans) statistisch significant de kans verhoogde om criminaliteit te plegen als adolescent. Daarnaast lieten de resultaten zien dat, wanneer het geslacht van de kinderen in ogenschouw werd genomen, zowel zonen als dochters die opgroeiden in een eenoudergezin met alleen een biologische moeder, een hogere kans hadden op het plegen van criminaliteit tijdens de adolescentie in vergelijking met zonen en dochters die opgroeiden in een eenoudergezin met alleen een biologische vader. Als laatste werd gekeken naar de combinatie van het geslacht van de ouders en de drie soorten eenoudergezinnen. Kinderen die vanaf hun geboorte alleen bij hun vader woonden lieten de laagste kans zien op het plegen van criminaliteit tijdens de adolescentie (1.30 keer meer kans dan kinderen die bij twee ouders opgegroeid zijn). Kinderen die vanaf hun geboorte alleen bij hun moeder woonden lieten de hoogste kans zien op het plegen van criminaliteit tijdens de adolescentie (1.95 keer meer kans dan kinderen die bij twee ouders opgegroeid zijn).

Het derde onderzoek (**Hoofdstuk 4**) onderzocht de effecten van het opgroeien in een eenoudergezin als adolescent (leeftijd 12-18) doordat de biologische ouders zijn gescheiden of doordat een van de biologische ouders is overleden, op de kans om criminaliteit te plegen tijdens de adolescentie (leeftijd 12-18). Daarnaast werd gekeken naar anticiperende effecten en uitgestelde effecten (op de korte termijn en lange termijn) van een ouderlijke scheiding of het overlijden van een ouder op het plegen van criminaliteit door de adolescent. Data van het Centraal Bureau voor de Statistiek over de complete Nederlandse bevolking werden hiervoor gebruikt. Zowel Hoofdstuk 3 en Hoofdstuk 4 keken naar criminaliteit tijdens de adolescentie als uitkomstvariabele, maar Hoofdstuk 3 onderzocht de effecten van het opgroeien in een eenoudergezin voordat het kind 12 jaar oud is, terwijl Hoofdstuk 4 de effecten onderzocht van het opgroeien in een eenoudergezin die tussen leeftijd 12 en 18 van het kind is ontstaan. Dit verschil is terug te vinden in de statistische technieken die werden toegepast. Terwijl Hoofdstuk 3 onderscheid

maakte tussen de kindertijd en adolescentie en daardoor een cross-sectioneel logit-model werd geschat, maakte Hoofdstuk 4 gebruik van de panelstructuur van de data waardoor fixed effects panel modellen werden geschat. Fixed effects panel modellen onderzoeken alleen veranderingen binnen een individu en controleren voor alle geobserveerde en niet-geobserveerde stabiele individuele eigenschappen. Het eerste model van deze derde studie veronderstelde dat het ontstaan van een eenoudergezin een gebeurtenis is met een onmiddellijk effect dat criminaliteit naar een nieuw niveau brengt, terwijl het tweede model toestond dat er gedragsveranderingen plaatsvonden ter voorbereiding op de gebeurtenis of pas enige tijd na de gebeurtenis. De resultaten toonden aan dat adolescenten die een scheiding hebben meegemaakt of waarvan een van de ouders was overleden een grotere kans hadden op het plegen van criminaliteit in vergelijking met wanneer diezelfde adolescent bij beide ouders was blijven wonen (respectievelijk 1.06 en 1.14 keer meer kans). Er werden geen verschillen gevonden tussen adolescenten die een scheiding hebben meegemaakt en adolescenten waarvan een van de ouders was overleden. Daarnaast toonden de resultaten aan dat er een kortdurende stijging was van criminaliteit door adolescenten na een ouderlijke scheiding (in het jaar van de scheiding en in de twee jaren erna). Vervolgens nam de kans op het plegen van criminaliteit weer af naar hetzelfde niveau van voor de ouderlijke scheiding. Daarentegen lieten de resultaten zien dat voorafgaand aan het overlijden van een ouder een anticiperende afname te zien was in de gepleegde criminaliteit door adolescenten (in het jaar voorafgaand aan het overlijden van de ouder en in het jaar zelf).

Het vierde onderzoek (**Hoofdstuk 5**) onderzocht de betrokkenheid van adolescenten bij drie soorten criminaliteit (namelijk 1) vermogensmisdrijven, 2) vernielingen en misdrijven tegen de openbare orde en gezag en 3) gewelds- en seksuele misdrijven) welke is veroorzaakt door de betrokkenheid van hun ouders bij deze soorten misdrijven (intergenerationele overdacht van criminaliteit), om te zien of een ouderlijke scheiding de vicieuze cirkel van criminaliteit zou kunnen doorbreken in families met adolescenten (leeftijd 12-18). Data van het Centraal Bureau voor de Statistiek over de complete Nederlandse bevolking werden hiervoor gebruikt. Wederom werden fixed effects panel modellen geschat om dit te onderzoeken. De referentiecategorie in alle analyses bestond uit adolescenten die bij beide biologische ouders woonden en waarvan hun ouders geen criminaliteit hebben gepleegd. De resultaten toonden aan dat er een beschermend effect

was van een ouderlijke scheiding wanneer adolescenten in een eenoudergezin woonden waarbij de ouder zich niet bezighield met vernielingen en misdrijven tegen de openbare orde en gezag (1.55 keer meer kans) of met gewelds- en seksuele misdrijven (1.94 keer meer kans). Dit betekent dat het positieve effect van de betrokkenheid van ouders in criminaliteit op het plegen van criminaliteit door adolescenten was verkleind door een ouderlijke scheiding. Dit staat in contrast met adolescenten die in een eenoudergezin woonden waarbij de ouder zich wel bezighield met een van deze twee soorten criminaliteit (respectievelijk 3.57 en 3.07 keer meer kans) of wanneer adolescenten bij beide biologische ouders woonden waarvan een of beide ouders zich bezighielden met een van deze twee soorten criminaliteit (respectievelijk 3.98 en 2.84 keer meer kans). Daarnaast was er een beschermend effect van een ouderlijke scheiding wanneer adolescenten in een eenoudergezin woonden waarbij de ouder zich niet bezighield met vermogensmisdrijven (1.56 keer meer kans) of, opvallend genoeg, wanneer adolescenten in een eenoudergezin woonden waarbij de ouder zich wel bezighield met vermogensmisdrijven (1.98 keer meer kans), in vergelijking met adolescenten die bij beide biologische ouders woonden waarvan een of beide ouders zich bezighielden met vermogensmisdrijven (3.03 keer meer kans).

Conclusies en implicaties

De algemene discussie van dit proefschrift (**Hoofdstuk 6**) gaf een overzicht weer van de resultaten en benoemde de implicaties van deze resultaten.

Dit proefschrift heeft aangetoond dat 1) er een positieve relatie bestaat tussen het meemaken van het ontstaan van een eenoudergezin als een kind of adolescent en de betrokkenheid bij criminaliteit als een adolescent, 2) er een hogere kans is op het plegen van criminaliteit als de ouders nooit hebben samengewoond waardoor het kind opgroeit bij één ouder vanaf de geboorte, gevolgd door adolescenten met een gescheiden ouder en adolescenten waarvan een ouder is overleden, 3) er een hogere kans is op het plegen van criminaliteit door het kind als het eenoudergezin op een jonge leeftijd ontstaat, of wanneer kinderen (zowel zoons als dochters) alleen met een biologische moeder opgroeien in plaats van een biologische vader, 4) er na een ouderlijke scheiding een kortdurende stijging van crimineel gedrag plaatsvindt en voorafgaand aan het overlijden van een ouder een afname van crimineel gedrag plaatsvindt, en 5) in bepaalde familiesituaties, een ouderlijke scheiding ervoor kan zorgen dat de kans op het plegen van criminaliteit door

adolescenten wordt verkleind indien de scheiding ervoor zorgt dat het kind bij de ouder woont die geen criminaliteit pleegt.

De resultaten van dit proefschrift hebben belangrijke theoretische, praktische en methodologische implicaties. Er zijn veel criminologische theorieën over het opgroeien in eenoudergezinnen, die stellen dat er een causaal verband bestaat tussen het opgroeien in een eenoudergezin en het plegen van jeugdcriminaliteit. De resultaten in dit proefschrift suggereren inderdaad dat er een relatie bestaat tussen eenoudergezinnen en criminaliteit door adolescenten, zoals de criminologische theorieën veronderstellen. Echter, gebaseerd op de resultaten kunnen de theorieën *social control theory* (Hirschi, 1969), *social control/parental absence model* (Gottfredson & Hirschi, 1990) en *economic strain model* (zie Sogar, 2017) de relatie tussen eenoudergezinnen en criminaliteit door adolescenten niet geheel verklaren. Bovendien laten de resultaten zien dat de theorie *family crisis model* (zie Mack et al., 2007) de relatie tussen verschillende soorten eenoudergezinnen en criminaliteit door adolescenten niet kan verklaren. Daarnaast laten de resultaten zien dat, in bepaalde familiesituaties, een ouderlijke scheiding ervoor kan zorgen dat de kans op het plegen van criminaliteit door adolescenten wordt verkleind indien de scheiding ervoor zorgt dat het kind bij de ouder woont die geen criminaliteit pleegt. Daarom houdt de positieve relatie tussen het opgroeien in een eenoudergezin tijdens de kindertijd en adolescentie en de criminaliteit door adolescenten, niet altijd stand in specifieke situaties. Echter, deze resultaten betekenen absoluut niet dat er geen relatie bestaat tussen eenoudergezinnen en criminaliteit door adolescenten, maar wel dat het niet altijd zo hoeft te zijn dat een ouderlijke scheiding schadelijk is voor de uitkomsten van het kind wanneer de familiesituatie in ogenschouw wordt genomen.

Met betrekking tot de praktische implicaties, geeft dit proefschrift nuttige informatie voor de praktijk ten aanzien van welke adolescenten die uit een eenoudergezin komen meer geneigd zijn om criminaliteit te plegen, in welke soorten eenoudergezinnen meer criminaliteit door adolescenten voorkomt, en of het plegen van criminaliteit door adolescenten verandert wanneer een ouderlijke scheiding samenvalt met het plegen van criminaliteit door een ouder. De resultaten van Hoofdstuk 2 en Hoofdstuk 3 laten zien dat interventies zich specifiek zouden moeten richten op Europese jongens en meisjes die opgroeien bij één ouder vanaf de geboorte of die het ontstaan van een eenoudergezin op een jonge leeftijd mee hebben gemaakt. De resultaten van Hoofdstuk 4 laten zien dat, met betrekking tot

het meemaken van het ontstaan van een eenoudergezin tijdens de adolescentie, interventies zich moeten richten op adolescenten die een ouderlijke scheiding hebben meegemaakt, met name tijdens de eerste paar jaar na de scheiding. De resultaten van Hoofdstuk 5 laten zien dat, in bepaalde familiesituaties, de adolescenten die geen ouderlijke scheiding hebben meegemaakt deel zouden kunnen nemen aan een interventie, omdat deze adolescenten blootgesteld blijven worden aan het criminele gedrag van de ouder. Bovendien bevestigen deze resultaten het beleid van rechtbanken in Nederland om ouderlijk gezag aan één ouder toe te wijzen wanneer er uitzonderlijke omstandigheden zijn, zoals wanneer een ouder is veroordeeld voor een gewelddadig misdrijf. Dit zou de kans op de intergenerationele overdracht van criminaliteit kunnen verminderen.

In dit proefschrift kon het onderwerp van eenoudergezinnen en criminaliteit door adolescenten uitgebreider onderzocht worden middels data over de complete Nederlandse bevolking, en gebruik maken van de voordelen van deze data (hoewel bevolkingsdata ook enkele nadelen heeft). Dit zorgt voor meerdere methodologische implicaties. Ten eerste zijn deze data over de Nederlandse bevolking verstrekt door betrouwbare bronnen. Ten tweede bevatten deze data veel mensen en complete longitudinale gegevens. Een grote hoeveelheid mensen in een dataset zorgt ervoor dat zeldzame associaties en zeldzame gebeurtenissen beter ontdekt kunnen worden dan met een kleine hoeveelheid mensen. Ten derde heeft de beschikbaarheid van longitudinale data van hoge kwaliteit ervoor gezorgd dat we een completer beeld hebben van de relatie tussen gepleegde criminaliteit door de ouders (met name in Hoofdstuk 5), eenoudergezinnen en jeugdcriminaliteit.

Samenvattend onderstreept dit proefschrift het belang van het onderzoeken van de effecten van eenoudergezinnen op hun kinderen, omdat het opgroeien in een eenoudergezin de toekomst van de kinderen beïnvloedt met betrekking tot het plegen van criminaliteit. Om een compleet beeld te kunnen krijgen van de effecten van het opgroeien in eenoudergezinnen op jeugdcriminaliteit, is het belangrijk om in de toekomst onderzoek van hoge kwaliteit over dit onderwerp uit te blijven voeren.

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ADDITIONAL INFORMATION

About the author

Janique Kroese (January 8, 1993) obtained her bachelor's degree in Psychology at Universiteit Utrecht (2014) and her research master's degree in Social Psychology at the Vrije Universiteit Amsterdam (2016). Early in her studies, Janique realized that she was very interested in romantic relationships and family dynamics. This was confirmed during her research master's thesis, in which she explored the long-term effects of high-conflict divorces on the well-being of both ex-partners and their children. After her graduation, Janique was employed by the Vrije Universiteit Amsterdam as a research assistant and junior teacher.

In 2017, Janique started as a PhD candidate at the Vrije Universiteit Amsterdam and the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR). She was supervised by prof. dr. Wim Bernasco, prof. dr. Aart C. Liefbroer, and prof. dr. Jan Rouwendal. During her PhD project, she examined the effect of growing up in a single-parent family during childhood and adolescence on adolescents' involvement in delinquency.

In addition to her PhD project, Janique attended national and international conferences, continued teaching and obtained the Basic Teaching Qualification, and published papers derived from the research master's phase. Moreover, Janique co-authored a successful Politie & Wetenschap grant proposal which resulted in a research report on the relation between crime and domestic violence. Since 2019, she is a member of the editorial board of the Tijdschrift voor Criminologie, in which she is responsible for arranging book reviews and chronicles. Since 2021, she is a member of the organizing committee of the Dutch Demography Day of the Netherlands Demographic Society.

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Contributions by the authors of each article

Chapter 2: Article 1

Janique Kroese conducted the systematic database search to find empirical studies and, together with research assistant Tuan Cassim, independently screened studies for eligibility. Janique Kroese wrote the manuscript. Wim Bernasco, Aart C. Liefbroer, and Jan Rouwendal provided feedback on drafts of the manuscript.

Chapter 3: Article 2

Janique Kroese and Wim Bernasco performed the statistical analyses. Janique Kroese wrote the manuscript. Wim Bernasco, Aart C. Liefbroer, and Jan Rouwendal provided feedback on drafts of the manuscript.

Chapter 4: Article 3

Janique Kroese performed the statistical analyses and wrote the manuscript. Wim Bernasco, Aart C. Liefbroer, and Jan Rouwendal provided feedback on drafts of the manuscript.

Chapter 5: Article 4

Janique Kroese performed the statistical analyses and wrote the manuscript. Tara R. McGee and Susan M. Dennison provided feedback on drafts of the manuscript.